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SYSTEMATIC MINING, RESERVES ESTIMATION, GRADE AND USES OF BAUXITE, LATERITE AND CLAY MINERALS IN MINING INDUSTRY DEPOSITED AT TIKARIYA VILLAGE IN KATNI DISTRICT OF (M.P.)

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ABSTRACT

The production of minerals is very useful for human being and every living creature. Mineral are playing very vital role for living creature on the earth. Every mineral plays a different role with different combination as well as different type of productive nature. Minerals are deposited in different way on the earth's i.e., igneous deposit, Sedimentary deposit and metamorphic deposit. Here we are talking Bauxite, Laterite and clay deposit and its "Systematic mining, Reserves estimation, grade and uses of Bauxite, Laterite and Clay minerals in mining industries'' in Jabalpur and Katni district area. Jabalpur district

Katni district area : It is the most developed and exploited bauxite area of M.P. Bauxites are associated with low level laterites and clay. The average thickness of bauxite in the leasehold of various area varies from 2 to 12m. Bauxite is derived from Vindhyan limestone and shale. Katni bauxite has good reserve of refractory grade as well metal grade.

KEYWORD:

Mineral Bauxite, Laterite and Fireclay, Katni deposit; Deccan traps.

INTRODUCTION

As per abstract Mineral resources are very useful for human being and it is being played very import role for human through Mining and mining industry. There are so many Mining leases granted by state or Central government by undertaking by govt. or it is granted by private ownership. Mining lease granted for different minerals like Iron ore, Manganese, Limestone, Dolomite Bauxite, Laterite, Clay , Copper, Gold, etc. . Here we are focusing A mining lease of Bauxite, Laterite and clay mine situated in Tikariya village of Katni District of M.P. state. Object of focusing over this Mines is that Explore the minerals in the mines in the form of exploration i.e. bore hole, pit and assess the quantity of minerals in the form of Reserves and after the assessing the mineral or estimating the minerals quantity we can do the systematic mining and established the proper grade of the minerals and its

uses for different industry. So far we are focusing on this mining lease to explore it in proper way to bring out the minerals over the earth in proper and systematic way and analysis the minerals(in the form of chemical analysis of minerals from NABL or registered Lab) for used for human being and well as mining industries

LITERATURE REVIEW

AbubakerAlansari et al. [1] analyses the relative volume of clay minerals causative to the microporosity is the main chin that stimuli the assessment of water saturation in hydrocarbon reservoirs. For evolving a genuine thoughtful of basin quality, the present study illuminated the petrography, quantification of clay minerals, & microporosity, besides their upshot on the petrophysical parameters. The endorsed method is a mixing of core data, SEM (Scanning Electron Microscopy), XRD, & thin slice. The most identified clay minerals in order of decreasing abundance are kaolinite (45%), Illite (35%), a mixed layer (10%), smectite (5%) and others are 5%. The estimation of clay inert microporosity was based on the SEM photomicrographs. Mixed mud reserves have a change of touches with microporosity values that range from 10 to 55%. In this esteem, the clay microporosity data was used to analyze the active clay volume; the clay bound water, the effective water saturation & porosity. oreover, the microporosity based water overload lessened dramatically when linked to log values up to 22. 37%. The above-estimated values allied with both core & log analyses using linear relapse. The derived contacts with a high association coefficient (R2) were used to reason microporosity, mud bound water, operative saturation & real porosity in the uncored well interval. The parallel coefficient R2 is higher than 90%.

GuiomarCalvo and Alicia Valero [2] analyses to keep the growth in global average illness below 2 ◦C the use of renewable energy causes is essential. There are various scenarios for this energy evolution depending on the amounts & types of renewable verves implemented. Thirteen deliberate elements for the renewable energy sector have been scrutinized which could generate supply shortages in the medium to long term. From the supply side, production, current possessions & data related to future making have been compiled. From the claim side, division use in solar power (PV & CSP), wind energy (on and off-shore), & electric vehicles have been studied, as well as the petition of apiece division in other sectors from 2018 to 2050. Of the 13 elements included in this study, cobalt, lithium, tellurium, and nickel are the most critical of all. Technologies ought be added real in their use. Governments & firms should unite policies related to the conservation & extension of its life through recycling & servitisation to duck store lessening.

Michael Di Mare et al. [3] performed an experiment on computational tool using Microsoft Excel was developed to identify opportunities to repurpose bauxite residue as a raw material in the production of Portland cement. The tool measures the value of operating BR in this style in terms of fiscal & conservational factors, including on-site & off-site electricity making & carbon taxes. This qualifies the tool to provide an optimization of the extent of bauxite residue to be used based on the user's provisions. The system considers valorisation of bauxite scum

separately as both an factor in the raw meal & a added cementitious material to maximize the breaks to utilize the residue. The tool is considered to be used by users of both the alumina & cement industries & is compatible

with the desires of apiece sector to consider the costs of commercialization, transportation, & cost advantages of valorising bauxite scum.

Dmitry VALEEV et al. [4] done an research on chemical & inert structures of bauxite enhanced from the Severoonezhsk Bauxite Mine(Arkhangelsk region, Russia) were deliberate by XRD, ICP-OES, TG/DSC, SEM, TEM, & Mossbauer spectrometry. The iron-containing reserves of the bauxites were recruit to contain alum gothite (*α*-Fe1−*x*Al*x*OOH), alum hematite(*α*-(Fe1−*x*Al*x*)2O3), alumoakaganeite (*β*-Fe1−*x*Al*x*O (OH, Cl)), & chromite (FeCr2O4). The competence of Fe mining from the bauxite by HCl escape was 82.5% at 100 °C, HCl meditation of 10%, solid/liquid ratio of 1:10, & the development time of 60 min, with aluminium harm from the bauxites beneath 4.5% of the total Al guts in the bauxite. Study of the kinetics of the iron ooze course proved diffusion to be the restrictive stage of the process at90−100 °C. Bauxite scum later escape presented beads of *α*-Fe−*x*Al*x*OOH & *β*-Fe1−*x*Al*x*O (OH, Cl), & record of the tough satisfied was in the FeCr2O4. In bauxite scum after HCl ooze, in calculation to hard oxide, the guts of chromium & calcium oxides significantly lessened. The iron chloride liquor later ooze contained the rare earth basics (REE) of 6.8 mg/L Sc, 4.1 mg/L Ce and 2.3 mg/L Ga.

PREAMBLE

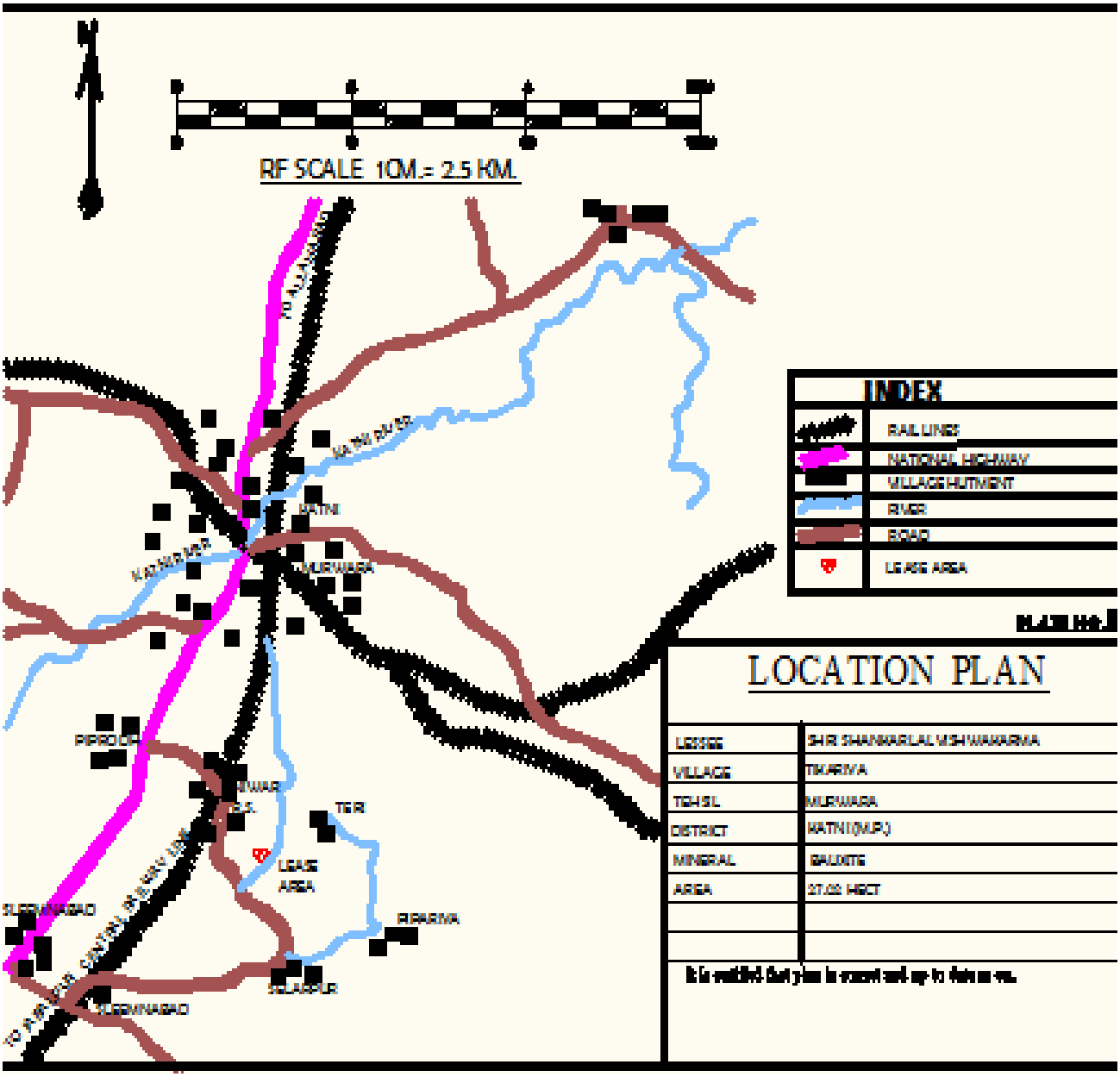
On the earth Mineral Resources are in fixed way we cannot generate these mineral Resources only we can extract them through earth. If we will extract them in systematic and scientific way it will be benefited for human being as well as environments also. Extraction or production of minerals will be benefited to our nation to grow up economy and due to most of mineral resources deposit in rural area it will be produce employment as well development in the rural areas.

1.1 Location

Existing Bauxite , Laterite and Clay mining project is located at Village- Tikariya, TehsilMurwara District-Katni (M.P.) . The lease area is 27.02 hect. Is being operated by the lessee Shri Shankarlal Vishwakarma having office at Jalpa Devi Ward, Katni P.O.Katni Dist Katni (M.P.) Pin 483501 and lessee is private Individual . The mining activity in the area has been under worked for the mining of Bauxite, laterite and Clay since lease granted i.e. from 06-03-203 to 05-03-2053.

1.2 Approach and accessibility and transport

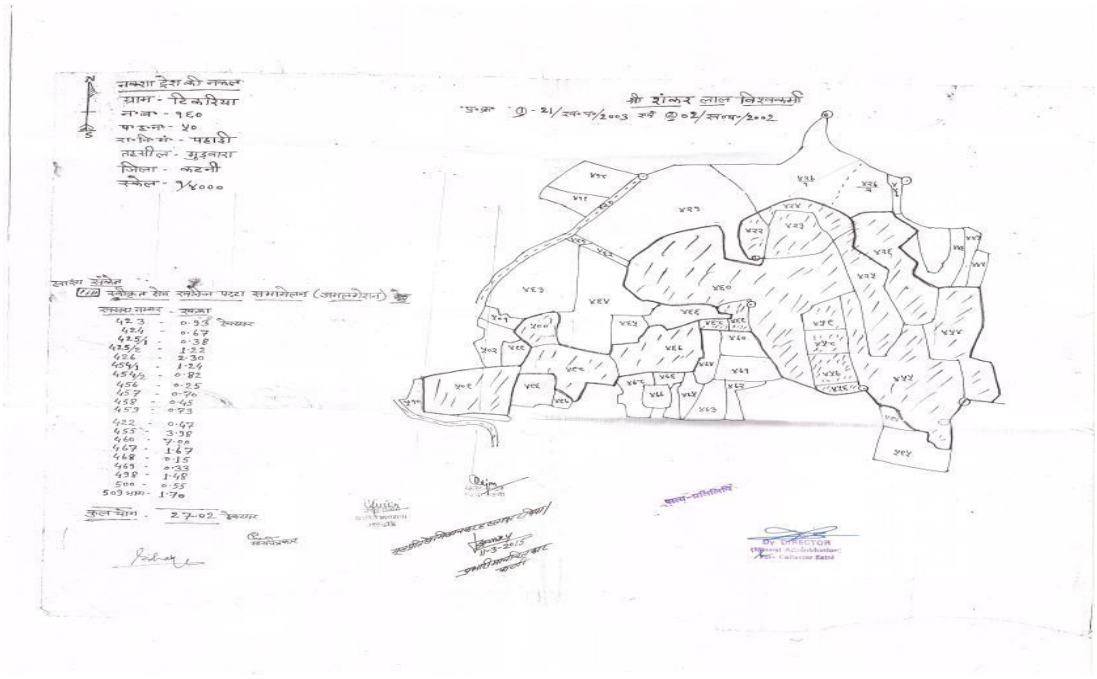
Lease area is located 23 km. south east of district headquarter Katni, approach for lease area from Katni is follows , Katni to Niwar turning on national highway is 13 km, from Niwar turning to Niwar Village distance is 5 km., east of Niwar turning , distance from village Niwar to lease area is about 5 km. north east of village Niwar. All the basic facilities like school, primary health , post office and in Niwar village. Nearest railway station Niwar is 5 km. south west of the area ,located on Jabalpur – Katni broad gauge section of west central railway. Nearest airport Dumna is 120 km. south west of the area



1.3 Lease area details

Village	Tehsil	Dist	Khasra no.	Area in hect.	Land use
Tikariya	Murwara	Katni (M.P.)	423 424 425/1	0.93 0.67 0.38	Govt. Waste land Private Pooranlal Vishwakarma Private ---------//----------

			425/2	1.22	Private ---------//----------
			426	2.30	Govt. Waste land
			454/1	1.24	Private Shankarlal Vishvakarma
			454/2	0.82	Private Pooranlal Vishvakarma
			456	0.25	Shankarlal Vishvakarma
			457	0.70	---------//-------//----------
			458	0.45	---------//-------//----------
			459	0.73	Omprakash Vishvakarma
			422	0.47	Govt. Waste land
			455	3.98	----------//----------
			460	7.0	----------//----------
			467	1.67	Private Pooranlal Vishvakarma
			468	0.15	Smt. Kalavati W/o PL Vishwakarma
			469	0.33	Shankarlal Vishvakarma
			498	1.48	Private Balaprasad S/o Bhura kusmi
			500	0.55	Govt. Waste land
			509(p)	1.70	Private Shankar lal Vishwakarma
			Total	27.02 h.	



Khasra map (lease allotted map)

PROBLEM INDENTIFICATION AND SOLUTION

2.1 Problem. After visiting the lease, it is found that owner or lessee facing problem is not able to explore the area proper to extract the mineral from the lease area and not able to do systematic and scientific mining due to not proper exploration knowledge upgrade the mineral grade with systematic way and find the proper users.

2.2 Solution: - After visiting the lease under the guidance of Working head of mines suggestion of exploration the area studies the area in the form of topography, geology in the form of Regional Geology, Local geology, bore holes pitting, methodology of mineral reserves resources estimation and grade of minerals and their uses and up gradation of minerals grade as well systematic mining all these things are given as follows.

GEOLOGY AND EXPLORATION WORK IN MINERAL

Topography of the area is gentle rolling ground , highest elevation of the area is 414 m. in south eastern part of the area whereas lowest elevation of the area is 402 m. in north eastern part of the area. Elevation difference between highest elevation and lowest elevation is about 12 m. About 8 working pits are developed in the area (Pit A to H). Five waste dumps and 15 stocks of mineral are there in the area shown in surface plan. Mine road is developed along the working pits within the area. 0ne power line of 220 volt passes in south eastern part of the area. A high-tension power line of 11000 K.V. passes across the lease area having north east – south west alignment. Fuel station and mine office is located along the south eastern boundary of the area having facility of bore well kitchen/ mess. A small temple/ Sidha chabutra is located outside the along the south western boundary of the area. Plantation is done inside the boundary of my office.

3.1) LOCAL GEOLOGY

Surrounding outside lease area is mining lease area of bauxite, laterite and fire clay, most of mines are old mines reached up to 30 m. depth. Recovery of bauxite is about 60% by volume, having bulk density 2.1 tonnes per cubic m. Laterite of the area is the form of boulders, brown to dark brown in color, medium hard in nature. Recovery of mineral laterite is about 20% by volume, having bulk density 2.7 tonnes per cube m. Fire clay of the area is light cream to white in color, semi plastic to non-plastic in nature having bulk density 2.1 tonnes per cubic m. Recovery of fire clay is about 10% by volume. Thus Remaining 10% volume will generate as waste in the form of murrum. Details of logging of various lithounits seen in the pit / bore holes excavated in the area is mentioned in Table 1 &2.0

METHODOLOGY AND MINERAL RESERVES / RESOURCES ESTIMATION OF BAUXITE, LATERITE AND CLAY

Mineral Reserves/Resources: Mineral reserves and resources are estimated purely based on level of exploration, with reference to the threshold value of minerals declared by IBM (Indian Bureau of Mines). Resources and Reserves within the lease are arrived after applying results feasibility/prefeasibility study and economic evaluation of deposit based on various factors such as: Geological study of the area, findings seen during the working pits, borehole drilled, and any exploration carried out, chemical analysis report etc. 4.1 Reserves estimation Method Reserves of mineral established by cross sectional method. Eight pits are there in the area in which exposures of mineral are seen along pit faces, in pit -A exposures of mineral are seen up to 30 m. depth, eleven bore holes are drilled in the area , which also proves the extent of deposit up to 30 m. (BH-2, chemical analysis report of sample from 30 m. depth is also enclosed) depth. About 2 m. thickness of OB and 28 m. thickness of mineral is considered up to 30 m. depth . Spacing between bore holes and locations of working pits full fill the requirement of G-1 category therefore reserves of mineral are estimated in 111 categories.

GRADE OF MINERAL AND USES OF MINERALS

Uses of minerals Bauxite produced from the area will be sold for use in cement industry and if market is available will be sold in mettle industry. Laterite and clay will also sold to cement and colour industry or local use for colouring.

5.4 Processing / beneficiation of the Minerals Reject is planned to be conducted, briefly describe nature of processing / beneficiation. This may indicate size and grade of feed material and concentrate (finished marketable product), recovery etc.

No processing / beneficiation of the ROM or minerals is in practice. Manual sorting sizing and screening will be increase the grade of minerals which will be industry usable and as per buyers specification requirements. This process will be done at mine site as per requirement and mutual agreement between lessee and trader/ consumer/buyers.

MINING

OPEN CAST MINING: 6.1) Briefly describe the existing as well as proposed method of excavation with all design parameters indicating on plans / sections. Present mining operations are being carried out by open cast mining method. Machines are used for excavation and loading of mineral. Due to soft nature of mineral explosive is not in use and not proposed. Initial manual sorting of mineral is being done at mine site. From pit face waste material bauxite and minor mineral will be loaded to truck, and will be placed near pit face separately. After sorting minor mineral will be placed at places where location of minor mineral stocks are shown in plate no., five year dev. and production plan . Mine waste generated along with mineral will be used for backfilling of already excavated barrier zone as shown in plate no. Location of proposed working is in different pits therefore such stocking of ROM will be different in individual year near working pits. Mineral bauxite will be stack at temporary suitable location in nearby area from where can be loaded using machinery. Mineral will be sold to only registered buyer with IBM. directly from mine site ,thus these mineral stocks will be temporary stocks till dispatch to consumers and traders. Mineral is being sold regularly hence area will not be blocked for long period. 6.2) Extent of mechanization Calculation for adequacy and type of machinery and equipment proposed to be used in different activities of drilling, material handling in development and hauling, hoisting to surface, surface transportation and any other operation.

MEASURES TO IMPROVE SOCIOECONOMIC CONDITIONS

Measures to improve socio-economic conditions. The impacts of this project the impacts of this project would be felt in integrated manner on the socio-economic environment in the study area. There is no village in core zone and further no displacement is required for the proposed project therefore impact will be positive side rather negative. The impacts on the different components viz. employment, housing, educational and medical and transport facilities, fuel availability, economics, status health agriculture will be positive there will be no adverse effect due small project and it will be definitely increasing the employment opportunity and economic wealth of country and well as state. Approximately of these effects would be valuable.

- The project will have a strong positive employment and income effect direct as well as indirect.
- Migrant –Non migrant ratio will be down side due employment and work generation.
- This project will increase literacy level as well as transport facilities, infrastructure facilities
- This project will increase CSR activity for local people
- In the form of conclusion this project will grow up and it will help to grow up surrounding people as well as local people regarding mining activity, education, higher technical services
- Mining activities is bound to have adverse impact on existent environment.

An considerate of the nature & level of various effects is crucial in devising the methods & loan planning to mitigate the bearings & ultimately return the land to useful conditions.

CONCLUSION

The object of focusing was that the mines was not explored properly i.e the most of the area of mines was virgin on this basis we could not say what part of mines was mineralized what part is mineralized. After proper exploration mostly part of the area will be indentified as mineralized, this will help to the owner/lessee to do proper mining and extract the mineral in proper way to sell it proper place and to increase wealth of govt. and well as himself. Thus, production of minerals in systematic way will help to good quality of minerals and a competitive price of mineral to developed systematic way.

FUTURE PROSPECT AND SCOPE

In the future on this basis remaining area which is not explored properly which will be create a base to explore further more studies the area to increase the quantity of minerals and their quality as well as production capacity and quality. In future the use of mineral and up gradation of minerals can be done through the beneficiation / benefication plant process or processing through new technique as per demand of mining industries and users are beneficiation trough

washing process or any other process with proper explore the area.

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[5] Khasra Map (provided by state govt. Khanij Shakha Dist Jabalpur)

[6] District Resource Map (Published by Geological survey by India) for resources in district as well as geology of the district

[7] Mines view photograph (Provided by Mine owner)

[8] Mineral stock photo (provided by Mine owner)

[9] Chemical analysis report from NABL Report (provided by Mine owner)

[10] Machinery details Provided by owner

[11] Uses of mineral and buyer provided by Owner