NOTARY
GOVT OF GOA (INDIA)
Notified P.P.S Gracias
STATE OF GOA
Expiry Date
27/04/2029

BEFORE THE NATIONAL GREEN TRIBUNAL WESTERN ZONE BENCH, PUNE

APPEAL NO. 15 OF 2025 (WZ)

Vijay Ravalnath Gaonkar
& Anr **...Appellants**

Versus

Salgaoncar Shipping Company
Pvt. Ltd. & Ors **...Respondents**

AFFIDAVIT-IN-REPLY ON BEHALF OF GSEIAA RESPONDENT NO. 6.

I, Shri Sachin Desai, major of age, holding the post of Member Secretary, Goa State Environment Impact Assessment Authority ("**GSEIAA**") i.e., Respondent No. 6 herein, having office at 4th Floor Dempo Towers, Patto, Panaji, Goa, do hereby make solemn affirmation and state as under:-

1. I say that I am holding the post of Member Secretary, GSEIAA. I say that I am filing the present affidavit based on the records available with my office and that I am competent to depose in this case.

2. At the very outset, Respondent No. 6 (**"Answering Respondent"**) denies all the averments, allegations and contentions raised by the Appellant *in toto*, save and what are matter(s) of record. Nothing stated in the present appeal shall be deemed to be admitted by the Answering Respondent unless specifically admitted hereinafter.

3. I say that I am filing the present Affidavit-in-Reply for the purpose bringing certain facts on record before this Hon'ble Tribunal and opposing the reliefs sought by the Appellant. Nothing in the aforementioned Appeal filed by the Appellant may be deemed to have been admitted for mere want of specific denial. Nothing may be deemed to have been admitted for want of *traverse seriatim*.

4. I say that the reliefs sought in the instant Appeal are unfounded, baseless and the same are liable to be rejected at the very outset by this Hon'ble Tribunal.

5. I say that the present Appeal challenges the Environmental Clearance (**"Impugned EC"**) dated 09.10.2024 issued by Ministry

of Environment, Forests & Climate Change (MOEF&CC) to Salgaoncar Shipping Company Pvt. Ltd i.e., Respondent No 1 herein, to produce 1 MTPA of iron ore in Block-II, Sirigao Mayem Mineral Block (Lease area – 171.2472 Ha) located in plot bearing Survey No. 1, 2, 3, 4, 5, 6, 7, 46, 47, 48, 84, 90, 91, 92, 93, 94, 95, 96, 97, 98 & Road Sirigao village, Bicholim taluka and Survey No 12, 47, 60, 61, 62, 79, 80, 84, Road, 48, 56, 57, 58 & 59, Mayem Village, Bicholim Taluka.

6. The Appellant has filed the present appeal on the following alleged issues of environment law which are reproduced herein for ready reference:

> *"A. Whether an iron-ore mine operative since 1949, can be considered as a fresh grant ignoring almost seven decades of mining including the havoc caused by it to the surrounding villages and also ignoring the specific queries in Terms of Reference (ToR) i.e. the EIA Notification, 2006?*
>
> *B. Whether such an iron ore mine (mentioned above) the EIA process should take into consideration "prior environmental performance" including violations, pollution and damage caused (studies carried out by independent*

scientific bodies like NEERI which report was accepted by Bombay High Court at Goa and Goa State Pollution Control Board, Tata Energy Research Institute (TERI), Water Resources Department, Dept. of Mines & Geology, Goa University etc.) in the past before granting a fresh Environmental Clearance (EC)?

C. Whether cumulative impact assessment of two mining blocks within 1 km with one mining block adjacent to present project is to be carried out as envisaged in the EIA Notification, 2006 (Para 6, S. No. 9 of Form – I at Appendix – I)? Both the two neighbouring mining blocks are as old a present one and have equally devasted the ecology and environment."

7. I say that the present appeal is barred by the principles of *res judicata* and *constructive res judicata*, inasmuch as the very issues raised herein were earlier raised and adjudicated in PIL Writ Petition No. 1 of 2008 before the Hon'ble High Court of Bombay at Goa. The said writ petition was disposed of by Judgment and Order dated 30.01.2025, wherein the Hon'ble High Court recorded that all issues concerning past pollution had already been redressed

and that recovery of costs had been effected from the erstwhile mining leaseholders. I say that, therefore, the present appeal, being a repetition of matters already decided, is liable to be dismissed on this ground alone.

8. I say that the grounds as canvassed by the Appellant in the present appeal are devoid of merit and the present appeal is liable to be dismissed.

9. I say that mining in Goa came to a halt from the year 2018. I say that mining as an industry is a very important to a small State like Goa as it generates substantial employment and revenue.

10. I say that the Block No. II, corresponds to the erstwhile Mining Concession bearing T. C. No. 5/49 granted under the Portuguese regime. I say that upon enactment of the Goa, Daman and Diu Mining Concessions (Abolition and Declaration as Mining Leases) Act 1987 ("**Abolition Act**"), the erstwhile mining concessions were abolished and they were deemed to be mining leases granted under the Mines and Minerals (Development and Regulation) Act, 1957 ("**MMDR Act**").

11. I say that the Hon'ble Supreme Court in the case of Goa Foundation v. Union of India, (2014) 6 SCC 590 ("**Goa Foundation-I Judgment**"), held that the deemed mining leases of the lessees in Goa expired on 22nd November, 1987 and the period of First Renewal (20 years), of the deemed Mining leases in Goa expired on 22nd November 2007.

12. I say that pursuant to the Goa Foundation-I judgment, several mining leaseholders applied for second renewal of their mining leases. I say that the second renewal orders issued by the State Government were challenged before the Hon'ble Supreme Court in Goa Foundation v. Sesa Sterlite Ltd & Ors, (2018) 4 SCC 218 ("**Goa Foundation–II**")

13. I say that the Hon'ble Supreme Court vide Judgment 07.02.2018 Goa Foundation–II quashed the Second Renewals granted in respect of the 88 mining leases. The Hon'ble Supreme Court further directed that in terms of the decision, declaration and the directions in Goa Foundation-1, the State of Goa was obliged to

grant fresh mining leases in accordance with law and not second renewals of the mining leaseholders.

14. I say that by its order dated 23.04.2018, the MoEF cancelled the ECs granted to 88 mining leases covered by the Hon'ble Supreme Court's decision in Goa Foundation-II.

Annexed hereto is a copy of the MoEF & CC order dated 23.04.2018 marked as "**Annexure A**".

15. I say that pending Goa Foundation-II Petition in the Hon'ble Supreme Court, there has been legislative amendment to the MMDR Act, by Amendment Act of 2015 with effect from 12th January, 2015. I say that by virtue of Section 8A of the Amendment Act, 2015, the lease period of the mining leases have been extended upto period ending 31st March, 2020 or period of 50 years from the date of "grant of lease", i.e., whichever is later.

16. I say that the MMDR (Amendment) Act 2015 provides that grant of mining leases shall be only through auction process. I say that the subject Block No. II was put up for auction following all

due procedure. I say that Respondent No. 1 was declared to be the successful bidder of the subject Block No. II.

17. I say that the Parliament enacted Mineral Laws (Amendment) Act, 2020 introducing Section 8B with limited retrospective effect from 10.01.2020 (the date of the Ordinance). I say that this provision transfers all valid approvals, rights, clearances, and licenses of a previous lessee to a new lessee for a period of two years.

18. I say that the Parliament, by MMDR (Amendment) Act 2021, which entered into force on 28.03.2021, substituted the amended Section 8B by removing the validity period of two years regarding valid approvals, rights, clearances, and licenses. The substituted Section 8B transferred and vested in the new lessee the valid approvals, rights, clearances and licenses. As a result, new lessees could operate mining leases based on valid approvals, rights, clearances, and licenses granted to former lessees.

19. I say that the Government of Goa had earlier opined that Section 8B of the MMDR Act would apply to the mineral blocks in

Goa comprising of the 88 leases that were the subject matter of Goa Foundation II as well.

20. I say that W.P. (f) No. 400 of 2023 was filed before the Hon'ble High Court of Bombay at Goa in which the primary issue was the effect of Section 8B of the Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act) upon the environmental clearances (ECs) for mining leases that were the subject matter of the decisions of the Hon'ble Supreme Court in Goa Foundation Vs Union of India (GF-I) and Goa Foundation Vs Sesa Sterlite Limited and others (GF-II).

21. I say that the Hon'ble High Court of Bombay at Goa vide its order dated 26.04.2023 in the abovementioned W.P. (f) No. 400 of 2023 held that the proper interpretation of Section 8B of the MMDR Act, 1957 indicates that only valid ECs were to stand transferred and vested in the new lessees/successful auction purchasers. The Hon'ble High Court held that since the ECs of the 88 leases were cancelled by the MoEF by order dated 23.04.2018, they would not amount to "valid" ECs. The Hon'ble High Court directed that held that fresh ECs will have to be obtained even by

the successful bidders to Block -VII or other Blocks to which the decisions of the Hon'ble Supreme Court in GF-I and GF-II apply or to mining blocks in respect of which the ECs were cancelled by the MoEF by order dated 23.04.2018.

Annexed hereto are copies of judgment of the Hon'ble Supreme Court in Goa Foundation I, Goa Foundation II and the judgment of the Hon'ble Bombay High Court dated 26.04.2023 in W.P. (f) No. 400 of 2023 marked as "**Annexure B-colly**".

22. I say that pursuant to the above directions of the Hon'ble High Court, the successful bidders were asked to obtain fresh ECs for the purpose of mining operations in the said auctioned mineral blocks.

23. I say that the subject Mining Project is a new mining project is new/fresh project as is evident from the perusal of the judgments of the Hon'ble Supreme Court in the case of Goa Foundation I and Goa Foundation II.

24. I say that the subject Mining Project has been correctly classified as a "Fresh Grant".

25. I say that it is pertinent to note that Clause 7(i) of the EIA Notification 2006 provides for "Stages in the Prior Environmental Clearance (EC) Process for New Projects" i.e., 'Fresh Grants'. I say that the stages include (a) Screening, (b) scoping, (c) Public Consultation and (d) Appraisal by the EAC. I say that Clause 7(ii) of the EIA 2006 provides for "Prior Environmental Clearance (EC) process for Expansion or Modernization or Change of product mix in existing projects" i.e., 'Existing Projects'. I say that in case of 'Existing Projects', the stages of Screening, scoping and Public Consultation are not contemplated. Applications for ECs of 'Existing Projects' are directly sent for the consideration of the concerned EAC.

26. I say that the process for grant of EC to a "Fresh Grant" is more rigorous and stringent as compared to an "Existing Project".

27. I say that the issues relating to contamination of nearby fields, rivers, springs, and other natural resources, as raised in the

present matter, have already been adjudicated upon by the Hon'ble High Court of Bombay at Goa in PIL Writ Petition No. 1 of 2008. I therefore submit that the said issues are barred by the principles of *res judicata*, *constructive res judicata*, and the *doctrine of issue estoppel*. I say that all allegations concerning environmental pollution or degradation caused by the erstwhile mining lessees were the subject matter of the aforesaid writ petition, which came to be finally disposed of by the Hon'ble High Court by its Judgment and Order dated 30.01.2025.

Annexed hereto is a copy of the Judgment and Order dated 30.01.2025 of the Hon'ble High Court of Bombay at Goa in PIL Writ Petition No. 1 of 2008 marked as "**Annexure C**".

28. I further say that the Hon'ble High Court, while disposing of the said matter, was pleased to take on record the report of the Water Resources Department, Government of Goa, which confirmed that de-siltation of all fields in the mining-affected areas had been duly completed. The Hon'ble High Court thereafter directed that the erstwhile mining lessees bear the entire cost incurred towards such de-siltation. It is therefore evident that all

issues relating to the alleged environmental damage caused by the previous mining operations stand conclusively decided by the Hon'ble High Court. Accordingly, the Appellants cannot be permitted to re-agitate the same issues in the present proceedings.

29. With reference to Ground A, the contents thereof are denied. I say that the subject Mining Project has been correctly classified as a "Fresh Grant". I say that the process for grant of EC to a "Fresh Grant" is more rigorous and stringent as compared to an "Existing Project". I say that with regard to the allegations that the EIA Report is based on misrepresentation or wilful suppression of information, the Appellant has failed to specify or substantiate any such instance. The Appellant is therefore put to strict proof of these vague and unsubstantiated allegations. I say that the EIA Report was duly examined and considered by the Goa State Environment Impact Assessment Authority (GSEIAA) at the time of granting the Environmental Clearance, and all requisite procedures were duly complied with.

Annexed hereto is a copy of the EIA Report marked as "**Annexure D**"

30. With reference to Ground B, the contents thereof are denied. I say that a Mine Closure Plan is implemented only upon the exhaustion of mineral reserves, that is, at the end of the operational life of the mine when further extraction is no longer feasible. I say that, in the present case, the concerned mining block continues to contain extractable mineral deposits which can be efficiently and economically mined, and therefore the question of implementing a Mine Closure Plan does not arise at this stage.

31. With reference to Ground E, the contents thereof are denied. I say that Respondent No. 4 herein was not the erstwhile lessee of the said mining block. The observations made in PIL Writ Petition No. 1 of 2008 pertain exclusively to the activities of the previous mining lessees and cannot, in any manner, be attributed to Respondent No. 4. In any event, I say that the said PIL Writ Petition No. 1 of 2008 has been finally disposed of by the Hon'ble High Court vide its Judgment and Order dated 30.01.2025, and all issues raised therein stand concluded. Accordingly, I submit that the same issues cannot now be re-agitated before this Hon'ble Tribunal.

32. With reference to Grounds E, F & G, the contents thereof are denied. I say that the EC has been granted with a specific condition that in case the mining scheme envisages intersection of ground water table, the Impugned EC shall be operational only after receiving formal clearance from the Central Ground Water Authority (**"CGWA"**). I say that the EC further imposes a specific condition that the Project Proponent shall follow the mitigation measures provided in MoIFCC's Office Memorandum No. Z-11013/57/2014-IA.II (M), dated 29th October, 2014, titled "Impact of mining activities on Habitations-Issues related to the mining Projects wherein Habitations and villages are the part of mine lease areas or Habitations and villages are surrounded by the mine lease area". I say that the EC also provides for a specific condition mandating the Project Proponent to regularly monitor and maintain records w.rt. ground water level and water quality in and around the mine lease by establishing a network of existing wells as well as new piezo-meter installations during the mining operation in consultation with Central Ground Water Authority/State Ground Water Department. The Report on changes in Ground water level and quality is to be submitted on six-monthly basis to the Regional

Office of the Ministry, CGWA and State Groundwater Department / State Pollution Control Board. I say that the EC also imposes a specific condition on the Project Proponent to undertake regular monitoring of natural water course water resources/springs and perennial nallahs existing/ flowing in and around the mine lease including upstream and downstream. Sufficient number of gullies shall be provided at appropriate places within the lease for management of water. The parameters to be monitored shall include their water quality vis--vis suitability for usage as per SPCB/CPCB criteria and flow rate.

33. With reference to Ground H, the contents thereof are denied. The Appellant has not produced any material or evidence to substantiate the allegations made therein. The Appellant is, therefore, put to strict proof of these vague and unsubstantiated assertions. I further say that the issue concerning transportation of ore in the State of Goa was the subject matter of PIL Writ Petition No. 6 of 2024 before the Hon'ble High Court of Bombay at Goa. I say that while the said petition was initially confined to the difficulties faced by the residents of village Mayem due to ore transportation, the Hon'ble High Court, by subsequent orders,

expanded the scope of the petition to cover transportation of ore through various villages across Goa.

34. I say that the Hon'ble High Court examined in detail the regulatory measures already in place to govern the transportation of ore. The Hon'ble High Court, while disposing of the said petition by its Judgment dated 29.06.2024, specifically referred to the various Office Memoranda (OMs) and Standard Operating Procedures (SOPs) issued by the Ministry of Environment, Forest and Climate Change (MoEF&CC) and the Directorate of Mines and Geology (DMG), including the corrigendum dated 06.06.2023. Upon such examination, the Hon'ble High Court held that adequate safeguards and regulatory mechanisms already exist for transportation of ore and directed that the same be duly implemented by the State of Goa.

Annexed hereto is a copy of the Judgment dated 29.06.2024 of the Hon'ble High Court of Bombay at Goa in PILWP No. 6 of 2024 marked as "**Annexure E**".

35. With reference to Ground I, the contents thereof are denied. I specifically deny that there has been any blatant violation or dereliction of statutory duty or obligation under Paragraph V of the EIA Notification, 2006 by the Expert Appraisal Committee (EAC). I say that the EAC has duly conducted the appraisal strictly in accordance with law and by following the prescribed procedure, and therefore, its appraisal cannot be faulted on any ground. I further say that the EAC has carefully examined the objections raised during the Public Hearing, considered the responses submitted by the Project Proponent, and has provided detailed reasons for rejecting such objections.

36. With reference to Ground I & K, the contents thereof are denied. I say that Mining Block–I, Mining Block–II, and Mining Block–III are operated by three distinct entities, each functioning as an independent project proponent. Accordingly, each project proponent is required to obtain a separate Environmental Clearance (EC) for its respective mining block. I say that, as part of this process, every proponent is subjected to conditions specific to its project, based on factors such as the geographical area, mineral reserves, extraction capacity, and site-specific environmental

sensitivities. I further say that the environmental impact assessment and appraisal under the EIA Notification, 2006, are to be carried out independently for each project proponent, as each mining lease constitutes a distinct and self-contained project. The law does not mandate a cumulative impact assessment of unrelated or separately operated mining blocks merely because they are located in geographical proximity. Each mining block is appraised on its own merits, based on its individual environmental impact, mitigation measures, and compliance obligations. Therefore, I say that the contention of the Appellant that a cumulative assessment ought to have been undertaken is misconceived and contrary to the statutory framework governing environmental clearances. The Environmental Appraisal Committee (EAC) and the Goa State Environment Impact Assessment Authority (GSEIAA) have acted strictly in accordance with law by assessing each project independently, as required under the EIA Notification, 2006. With regards 'overburden' and 'waste generated', the EC imposes stringent conditions on the project proponent to stack the Overburden (O.B.), waste and topsoil generated during the mining operations at earmarked OB dump site(s) only and that it should not be kept active for a long period of time. The physical

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GOA (INDIA)

parameters of the OB / waste dumps / topsoil dump like height, width and angle of slope shall be governed as per the approved Mining Plan and the guidelines/circulars issued by D.G.M.S. The topsoil shall be used for land reclamation and plantation.

37. With reference to Ground M, the contents thereof are denied. I say that on 19.06.2024 a public hearing was conducted by the Collector as per the EIA Notification 2006 with respect of the subject Mineral Block. I say that the public hearing was held at Narayan Zantye Multipurpose Sports Complex, at Sarvan, Bicholim Taluka, Goa. I say that the venue of the public hearing is at a distance of 5.2 km if calculated as a birds flight distance and is at a distance of 8.5 km if calculated by road. I say that the venue of the public hearing was within the same Taluka where the subject Mineral Block is situated. I say that the views/comments/objections of the Village Panchayat were considered at this public hearing as is evident from the minutes dated 19.06.2024 of the said public hearing dated 19.06.2024. I say that the views/objections/suggestions of all the individuals present at the public hearings were also considered. I say that the recorded minutes were read out/explained to the public in Konkani and

subsequently after receiving suggestions, were signed by the Collector and a Member of the GSPCB. I say that the people present at the public hearing were asked to file their written objections/suggestions within 7 days to GSPCB, if they so desired. It is pertinent to note that a total of 110 persons attended the public hearing. I say that 5 written objections/suggestions were received. I say that 5742 written communications supporting the project were received.

(*A copy of the Minutes of the Public Hearing dated 19.06.2024 is annexed to the Appeal Memo at pages 182-193*)

38. With reference to Ground N, the contents thereof are denied as the same is not applicable to the case at hand. I say that the portion of the MoEF&CC letter dated 29.04.2020 relied upon by the Appellant pertains solely to the transfer of a prior Environmental Clearance (EC) previously obtained by the State or Union Territory, if any, in favour of the subsequent project proponent. I say that the said provision has no application to the present case, as the current project proponent applied for a fresh grant of Environmental Clearance pursuant to and in compliance with the Judgment dated 29.06.2024 passed by the Hon'ble High

Court of Bombay at Goa in PIL Writ Petition No. 6 of 2024, which, inter alia, directed that fresh environmental clearances be obtained for newly allotted mining blocks. Hence, the reliance placed by the Appellant on the MoEF&CC letter dated 29.04.2020 is entirely misplaced and devoid of merit.

39. With reference to Ground O, the contents thereof are denied. With regards the contention that the subject lease has temples and residential houses within it, I say that the approved mining plan depict the spots where the mining operations are proposed to be based. I say that the said mining plan does not include in the spots depicted for mining operations, the Temples, the residential houses of the residents of the village of Sirigao nor any other commercial or educational institution of the villagers. I say that the mining plan is not under challenge in the present appeal. Be that as it may, I say that in the event the Appellants are aggrieved by the spots where the mining operations are proposed as depicted on the approved mining plan, then the Appellant should place their grievances before the Revisional Authority under the MCR Rules 2016, which is the appropriate forum.

Annexed hereto is a copy of the mining plan marked as "**Annexure F**".

40. I say that in view of the above, the present appeal bears no merit and is liable to be dismissed.

41. I say that what has been stated in Paras 1 to 40 are true to my own knowledge and/or are based on documents/records available with the Respondent and the contents of the same are true and correct and nothing material has been concealed herein.

Solemnly Affirm on Oath
Place: Panaji, Goa.
Date: 24.10.2025

DEPONENT

Solemnly affirmed before me
Sachin S. Desai
Who is identified before me by
Shri/Smt .....
.....At Panjim - Goa
Sr. No. 144/10/2025
Dated. 24/10/2025

Venefrada C.P.P.B Gracias
Advocate & Notary Goa State

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By Speed Post

F.No. L-11011/211/2017-IA.II(M)
Government of India
Ministry of Environment, Forest & Climate Change
Impact Assessment Division

3rd Floor, Vayu Wing,
Indira Paryavaran Bhawan,
Jorbagh Road, Aliganj,
New Delhi-110003
Dated: 23rd April, 2018

To

The Principal Secretary,
Environment,
Government of Goa,
Secretariat, Panaji,
Goa-403001

Office of the PCCF
Inward No. 1496 Book No. 1/18
Date: 24/05/18

Sub: Cancellation of the ECs granted to 88 mine leases in the State of Goa in view of the Hon'ble Supreme Court Judgment dated 07.02.2018-reg.

Sir,

Hon'ble Supreme Court in their Judgment dated 07.02.2018 in Special Leave to Appeal (Civil) No. 32138 of 2015 in the matter of Goa Foundation Vs. M/s Sesa Sterlite Ltd. & Ors and the interlocutory matters SLP(C) Nos. 32699-32727 of 2015, Writ Petition(C) No. 711 of 2015 and Writ Petition (C) No. 720 of 2015 has inter-alia cancelled the 88 mine leases and directed the mine lease holders to stop all mining operations in the State of Goa with effect from 16th March, 2018, until fresh mining leases (not fresh renewals or other renewals) are granted and fresh environmental clearances are granted, and that the Ministry of Environment and Forest should also take all necessary steps to grant fresh environmental clearances to those who are successful in obtaining fresh mining leases.

2. The matter was examined in the Ministry and it has been decided that the ECs of the 88 mine lease holders covered in the above mentioned judgment should be cancelled. Accordingly, the ECs for all these mines, earlier issued by the Ministry and irrespective of their validity as on date, are hereby cancelled with immediate effect. The details are as under:

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Sr. No	Lease No.	Name of the Lessee	EC letter number and date of issue
1	40/51	Late Shri.N.S. Narvekar rep. By M/s N.S. Narvekar Minerals	J-11015/101/2005-IA,II(M) dt. 14.5.2007
2	35/52	M/s V.S.Dempo & Co.Pvt. Ltd/Sesa Resources Ltd	J-11015/156/2005-IA.II (M) dt:17.11.2005 & extended by J-11015/156/2005-IA-II(M) dt: 02.01.2008.
3	6/61	Shri.Gandhar.N. Agrawal	J-11015/402/2005.IA II (M) 22-12-2006
4	29/52	Shri.Pramod P. Timblo legal heir of late shri Pandurang Timblo	J- 11015/359/2007-IA.III. I (M) Dt: 26/7/2007.
5	34/50	Sociedade Timblo Irmaos Limitada represented by M/s. Panduronga Timblo Industrias.	J-11015/360/2007-IA,II(M) dt. 26.7.2007
6	39/56	M/s V. M. Salgaocar & Bro. Pvt. Ltd	J-11015/43/2005-IA.II (M) dt:17.11.2005
7	01/55	M/s Damodar Mangalji & Co.Ltd.	J-11015/609/2005-IA.II (M) Dated: 17.11.2006
8	02/51	M/s M.S.Talaulikar & Sons Pvt.Ltd.	J-11015/105/2005-IA.II (M) Dated: 25.11.2005 extended by J-11015/105/2005-IA-II(M) dt: 16.10.2007
9	03/54	M/s Sesa Goa Ltd/Sesa Sterlite Ltd	J-11015/28/2006-IA.II (M) Dated: 6.7.2007
10	03/57	Kunda Gharse	J-11015/149/2005-IA.II (M) Dated: 30.9.2005 amended by J-11915/149/2005-IA.II(M) dated 06.07.2007
11	04/49	M/S RAJARAM BANDEKAR (SIRIGAO) MINES PVT. LTD.	No. J-11015/40/2006-IA.II (M) Dt: 17.1.2007.
12	05/53	Shri Manuel Da Costa	J-11015/29/2005-IA.II (M) dated 30.9.2005 extended by J-11015/29/2005-IA.II(M) dated 31.07.2007
13	08/50	Shri Raju R. Poiguinkar LH of Late Ramakanta Rajaram Poinguinkar	J-11015/148/2005-IA (M) dated 30.9.2005
14	08/61	M/s Medachem Bhat Mines Pvt. Ltd.	J-11015/475/2006-IA.II (M) Dated: 21.1.2008
15	09/49	M/s Sesa Goa Ltd/Sesa Sterlite Ltd	J-11015/28/2006-IA.II (M) Dated: 6.7.2007
16	10/49	M/s Sesa Goa Ltd/Sesa Sterlite Ltd	J-11015/28/2006-IA.II (M) Dated: 6.7.2007
17	10/51	Shri shabbar Khan LH of. Late Haider Kasim Khan	J-11015/365/2005-IA.II (M) dt:15.2.2006
18	110/53	M/s.Cosme Costa & Sons	J-11015/350/2005-IA.II (M) dt:4.9.2006 and J-11015/26/2008-IA.II (M) Dated: 26.3.2009

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19	12/52	Late Shri.N.S. Narvekar rep. By M/s N.S. Narvekar Minerals	J-11015/101/2005-IA.II(M) dt. 14.5.2007/2006
20	12/57	CHOWGULE & CO.PVT. LTD	J-11015/65/2006-IA.II (M) dt:1.12.2006
21	126/53	SESA STERLITE Limited	J-11015/27/2005-IA.II (M) dated 6.9.2005 and J-11015/1133/2007-IA.II (M) Dt: 29.12.2008.
22	13/49	M/s. Chowgule & Co. Ltd.	J-11015/32/2005-IA.II (M) dt: 27.12.2005 extended by J-11015/32/2005-IA.II(M) dated 05/11/2007
23	13/55	M/s. V.M. Salgaocar & Bro. Pvt Ltd.,	J-11015/384/2005-IA.II (M) dt:28.3.2006
24	14/52	M/s. Baddrudin Hussainbhai Mavani	J-11015/42/2005-IAII. (M) dated 30.9.2005 amended by J-11-15/42/2005-IA.II(M) dated 14.08.2007
25	14/53	Sociedade Timblo Irmoas Ltda. (SFI), rept. By Sociedade de Fomento Industries Pvt. Ltd.	J-11015/259/2007-IA.II(M) dt. 20.8.2007 ammended by J-11015/259/2007-IA-II(M) dt: 04.03.2016
26	14/58	SOCIEDADE TIMBLO IRMAOS LTDA REPT. TIMBLO PVT. LTD;	J-11015/60/2006-IA.II (M) Dated: 5.7.2007
27	143/53	M/s. Sociedade Timblo Irmaos Ltda., (PTI)	J-11015/345/2005-IA.II (M) dt: 18.5.2006
28	16/51	Shri Vijay V. Chowgule, LH of late V.D. Chowgule	J-11015/64/2006-IA.II (M) dt:24.11.2006
29	16/55	M/s V. G. Quenim	J-11015/310/2005-IA.II (M) dt:18.5.2006 extended by J-11015/310/2005-IA-II(M) dt: 27.06.2007
30	18/53	M/s Damodar Mangalji &Co.Ltd.,	J-11015/884/2007-IA.II (M) dt: 14.5.2009
31	19/62	M/s. V.M. Salgaocar & Bro. Pvt Ltd.,	J-11015/43/2005-IA.II (M) dt:17.11.2005
32	19/54	Smt. Kunda R.Gharse	J-11015/149/2005-IA.II (M) dated 30.9.2005 amended by J-11915/149/2005-Ia.II(M) dated 06.07.2007
33	19/58	M/s. V.M. Salgaocar & Bro. Pvt Ltd.,	J-11015/385/2005-IA.II (M) dt:28.03.2006
34	22/50	CHOWGULE & CO.PVT. LTD	J-11015/65/2006-IA.II (M) dt:1.12.2006
35	23/53	M/s Emco Pvt Ltd	J-11015/34/2005-IA.II (M) dt:16.2.2006
36	24/57	Shri Ramakanta V.S. Velingkar	J-11015/344/2005-IA.II (M) dt:19.2.2007 Further expansion given vide Lr. No. J-11015/344/2005-IA. II (M), dated 19/02/2008.
37	28/51	M/s Sesa Goa Ltd/Sesa-Sterlite Ltd	J-11015/27/2006-IA.II (M) dt:15.9.2006 Further expansion given vide No. J-11015/1239/2-007-IA.II (M) Dt: 24.12.2009.
38	29/54	M/s. V.M. Salgaocar & Bro. Pvt Ltd.,	J-11015/385/2005-IA.II (M) dt: 28.03.2006

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39	29/55	Shri A.V.S. Velinglear (Late)	J-11015/162/2005-IA.II (M).dt:26.12.2005 amended J-11015-162/2005-IA.II(M) dated 23.10.2007
40	31/53	M/s. Chowgule & Co. Pvt. Ltd.	J-11015/20/2006-IA.II (M) dt:24.11.2006
41	33/53	M/s Damodar Mangalji & Co.Ltd.	J-11015/508/2007-IA.II (M) Dated: 23.10.2007
42	33/57	Kunda R. Gharse	J-11015/149/2005-IA.II (M) dated 30.9.2005 amended by J-11915/149/2005-IA.I)(M) dated 06.07.2007
43	38/51	CHOWGULE & CO.PVT. LTD	J-11015/65/2006-IA.II (M) dt:1.12.2006
44	4/55	Marzook & Cadar Pvt. Ltd.	J-11015/34/2006-IA,II(M) dt. 30.4.2007
45	40/50	Shri Vijay V. Chowgule, LH of late V.D. Chowgule	J-11015/64/2006-IA.II (M) dt:24.11.2006
46	41/54	Ahiliabai Sardessai	11015/60/2005-IA.II (M) Dt: 11.11.2005 extended J-011015/60/2005-IA.II(M) dated January 2,2008
47	41/55	M/S Salgaocar Mining Industries	J-11015/274/2006-IA,II(M) dt. 27.7.2007
48	41/56	M/s. Chowgule & Co. Pvt. Ltd.	J-11015/20/2006-IA.II (M) dt:24.11.2006
49	44/56	M/s. V.M. Salgaocar & Bro. Pvt Ltd.,	J-11015/43/2005-IA.II (M) dt:17.11.2005
50	45/52	M/s Sociedade Timbio Irmoas Ltda. (SFI) rep. By Sociedade de Fomento Industries Pvt. Ltd.	J-11015/260/2007-IA,II(M) dt. 22.8.2007
51	45/54	M/S SOVA	J-11015/58/2005-IA (M)-dated 28.10.2005 extended J-11015/58/2005-IA(M) dated 23.10.2007
52	47/54	M/s. V.M. Salgaocar & Bro. Pvt Ltd.,	J-11015/384/2005-IA.II (M) Dated: 28.03.2006
53	48/58	Shri Devendra Sawant Talaulikar	J-11011/537/2007-IA,II(I) dt. 31.12.2008
5	5/49	M/s. Chowgule & Co. Ltd,	J-11015/32/2005-IA.II (M) dt: 27.12.2005 extended by J-11015/32/2005-IA.II(M) dated 05/11/2007
55	50/53	M/s. V.M. Salgaocar & Bro. Pvt Ltd.,	J-11015/384/2005-IA.II (M) dt:28.3.2006
56	51/52	Smt.Kunda R. Gharse	J-11015/386/2005-IA.II (M) dt:23.3.2006
57	59/51	Smt.Annapurna Dayanand Neugui, Legal heirs of Shri Zairam B. Neugi	J-11015/521/2007-IA II (M), Dt:18.10.2007
58	6/55	M/s. Sesa Sterlite Ltd.	J-11015/437/2005-IA.II (M) dt:5.12.2006 Further expansion given vide No. J-11015/1241/2007-IA.II (M) Dt: 24.12.2009

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59	61/53	SOCIEDADE TIMBLO IRMAOS LTDA.REPT. BY PANDURANG TIMBLO INDUSTRIES	J-11015/161/2005-IA II (M) dated 20.10.2005
60	62A/52	Smt. Shashikala Kalodkar & Others D. B. Bandodkar & Sons Pvt. Ltd.	J-11015/36/2006-IA.II (M) Dated: 9.10.2006
61	62B/52	M/s. V.M. Salgaocar & Bro. Pvt Ltd.,	J-11015/385/2005-IA.II (M) dt:28.3.2006
62	69/51	SESA STERLITE Limited	J-11015/27/2005-IA.II (M) dated 6.9.2005(1094) and J-11015/1133/2007-IA.II (M) Dt: 29.12.2008
63	7/41	M/s Emco Pvt Ltd	J-11015/34/2005-IA.II (M) dt:16.2.2006
64	70/52	SESA STERLITE Limited	J-11015/27/2005-IA.II (M) Dated: 06.09.2005 & expansion J-11015/1133/2007-IA.II (M) Dated: 29.12.2008
65	76/52	M/s Sesa Sterlite Ltd	J-11015/70/2006-IA.II (M) Dated: 16.04.2007
66	8/41	SHRI GANGADHAR N. AGRAWAL	J-11015/100/2005-IA.II (M) Dated: 26.10.2005 amended by J-11015/100/2005-IA.II (M) dt: 13.08.2007
67	83/52	M/s. V.M. Salgaocar & Bro. Pvt Ltd.,	J-11015/385/2005-IA.II (M) dt:28.3.2006
68	84/52	M/s Bandekar Bros.Pvt. Ltd.	No. J-11015/351/2005-IA.II (M) Dt: 18.4.2007
69	86/53	Sallshe Oyes Pvt. Limited	J-11015/415/2005-IA.II(M) dt. 30.4.2007
70	87/53	M/s. Sociedade Timblo Irmaos Ltda., (PT1)	J-11015/343/2005-IA.II (M) dt.13.7.2006
71	88/52	M/s. Sociedade Timblo Irmaos Ltda., (SP1)	J-11015/104/2005-IA.II(M) dt. 3.9.2007
72	89/52	M/S Litholerro	J-11015/305/2006-IA.II(M) dt. 4.5.2007
73	92/52	Sociedade, Timblo Irmaos Ltd., Rep. by Timblo Pvt., Ltd.,	J-11015/36/2005-IA.II (M) dt:30.9.2005 amended by J-11015/36/2005-IA.II(M) dated 19.07.2007
74	95/52	Damodar Mangalji & Co.Ltd.	J-11015/302/2006-IA.II(M) dt. 9.4.2007
75	96/52	M/s. Chowgule & Co. Pvt.Ltd	J-11015/399/2005-IA.II (M) dt:17.8.2006 extended by J-11015/399/2005-IA.II (M) dated 05/11/2007
76	56/51	Geetabala M. N. Parulekar	J-11015/401/2005-IA.II (M) dt: 17.1.2007 amended by J-11015/55/2008-IA.II (M) dt: 13.12.2008 and further extension given vide No. J-11015/157/2009-IA-II (M) Dt: 18.1.2010
77	70/51	M/s R.S. Sheoye & Bros.	J-11015/56/2005-IA.II (M) dated 30.9.2005 extended by J-11015/56/2005-IA-II(M) dt 21.08.2007

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78	06/49	Shri Uday H. Gosalia LH of Late Hiralal Khodidas	J-11015/180/2006-IA,II(M) dt: 12.3.2007
79	11/41	M/s Sesa Mining Corp. LTd.	J-11015/45/2005-IA.II (M) dt:17.11.2005 and J-11015/45/2005-IA.II (M) dt:17.09.2007
80	12/41	M/s Sesa Mining Corp. LTd.	J-11015/45/2005-IA.II (M) dt:17.11.2005 and J-11015/45/2005-IA.II (M) dt:17.09.2007
81	13/41	M/s Sesa Mining Corp. LTd.	J-11015/45/2005-IA.II (M) dt:17.11.2005 and J-11015/45/2005-IA.II (M) dt:17.09.2007.
82	14/41	M/s Sesa Mining Corp. LTd.	J-11015/45/2005-IA.II (M) dt:17.11.2005 extended by J-11015/45/2005-IA.II (M) dt:17.09.2007
83	15/41	M/s Sesa Mining Corp. LTd.	J-11015/45/2005-IA.II (M) dt:17.11.2005 and extended by J-11015/45/2005-IA.II (M) dt:17.09.2007
84	3/51	SESA RESOURCES LTD.	J-11015/155/2005-IA.II (M) dt:17.11.2005 and extended by J-11015/155/2005-IA-II(M) DT: 02.01.2008
85	40/54	SESA RESOURCES LTD.	J-11015/155/2005-IA.II (M) dt:17.11.2005 and extended by J-11015/155/2005-IA-II(M) dt: 02.01.2008
86	21/54	M/s Sesa Resources Ltd.,	J-11015/44/2004-IA.II (M) dt :17.11.2005 and extended by J-11015/44/2004-IA-II(M) dt: 01.01.2008
87	5/54	M/s. Sesa Resources Ltd.	J-11015/44/2004-IA.II (M) dt:17.11.2005 and extended by J-11015/44/2004-IA-II(M) dt: 01.01.2008
88	20/54	M/s. Sesa Resources Ltd.	J-11015/44/2004-IA.II (M) dt :17.11.2005 and extended by J-11015/44/2004-IA-II(M) dt: 01.01.2008

3. As and when Govt. of Goa grants fresh mine lease, the lease holders may apply to MoEF&CC as per EIA Notification, 2006 to get fresh EC.

4. This issues with the approval of the competent authority.

(Surendra Kumar)
Advisor / Scientist 'G'

Copy to:

1. The concerned 88 project proponents.
2. The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
3. The Principal Secretary, Department of Mines and Geology, Government of Goa, Panaji.
4. The Principal Secretary, Department of Forests, Government of Goa, Panaji.
5. The Chief Wildlife Warden, Government of Goa, Panaji.

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6. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
7. The Chairman, Goa State Pollution Control Board, Dempo Tower, EDC Plaza, 1st Floor, Panaji, Goa- 403 001
8. The Member Secretary, Central Ground Water Authority, A2, W- 3 Curzon Road Barracks, K.G. Marg, New Delhi-110001.
9. The Controller General, Indian Bureau of Mines, Indira Bhavan, Civil Lines, Nagpur- 440 001.
10. The Additional Principal Chief Conservator of Forests, Regional Office Chennai, Kendriya Sadan, 4th Floor E&F, Wings 17th Main Road, 1 Block, Koramangala, Bangalore-560 034.
11. Monitoring File.
12. Guard File.
13. MoEF Website

23/4/18

(Surendra Kumar)
Advisor / Scientist 'G'

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(2014) 6 Supreme Court Cases 590 : 2014 SCC OnLine SC 354

In the Supreme Court of India

(BEFORE A.K. PATNAIK, S.S. NIJJAR AND F.M. IBRAHIM KALIFULLA, JJ.)

GOA FOUNDATION . . Petitioner;

Versus

UNION OF INDIA AND OTHERS . . Respondents.

Writ Petition (C) No. 435 of 2012[1] with Nos. 99, 184 of 2013, Transferred Cases Nos. 131-36 and 138-43 of 2013, decided on April 21, 2014

A. **Environment Protection and Pollution Control — Mining — Illegal and uncontrolled and unmonitored mining affecting environment and revenue — Expired mining leases in State of Goa — Continuance of, in violation of Ss. 8(2) & (3), MMDR Act — Impermissibility and consequential remedial measures**

— S. 8(2) of MMDR Act permitting only one time renewal option for a period not exceeding 20 yrs (availing said option, present leases renewed from 22-11-1987 to 22-11-2007) — S. 8 (3) permitting a second renewal for specified minerals (that is those not mentioned in Sch. I Pts. A & B, MMDR Act) but conditions in S. 8(3) for second renewal not having been fulfilled (that is State Government not having formed any opinion nor recording the same that the second renewal is in the interest of mineral development) — Held, said illegal mining leases cannot continue beyond 22-11-2007 neither under S. 8(2) nor under S. 8(3), MMDR Act — Therefore, impugned orders suspending said leases and keeping in abeyance their environmental clearances (that is impugned orders dt. 10-9-2012 and 14-9-2012 of State Government and MoEF respectively), held, were proper — Said orders directed to continue till issue of grant of fresh leases by State Government and environmental clearances by MoEF had been duly decided as per law — Mines and Minerals (Development and Regulation) Act, 1957, Ss. 8(2), 8(3) and Sch. I Pts. A, B & C

(Paras 24 to 28, 82, 87.1 and 89)

B. **Environment Protection and Pollution Control — Mining — Illegal and uncontrolled/unmonitored mining affecting environment and revenue — Expired mining leases in State of Goa — Minerals excavated after expiration of lease — Sale proceeds after e-auction of said minerals as per directions of Supreme Court — Manner of utilisation and appropriation of said sale proceeds — Directions issued**

— State Government (under supervision of Monitoring Committee) directed to make the following payments (after duly calculating the same): (a) Average/approximate costs (not actual costs) of excavation of minerals to lessees, (b) 50% of wages and DA to eligible workers as per S. 25-C, ID Act who suffered due to suspension of mining leases by State Government, (c) 50% of claim towards storage charges of Marmagao Port Trust for storage of minerals after 5-10-2012 (that is, date from which Supreme Court suspended mining leases) — After said payments 10% of balance amount directed to be paid to Goa Iron Ore Permanent Fund for the purpose of sustainable

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development and intergenerational equity — And the rest of balance amount directed to be appropriated by State Government as owners of said ore — Labour Law — Industrial Disputes Act, 1947 — S. 25-C — Compensation under, for affected eligible workers, for suspension of mining leases under directions of Government/Court — Entitlement to

(Paras 85, 86 and 88.8)

C. **Mines and Minerals — Mineral Concession Rules, 1960 — Rr. 24-A(8), (6), (9), (4), (5) and R. 42-A(9) — Deemed renewal of mining leases if applications for renewal are not disposed of within stipulated time under R. 24-A(8) — Such applications having been made and such time having expired, mining leases, held, had been duly renewed up to 21-11-2007 — Thus, finding of Shah Commission that continuance of leases up to 21-11-2007 was without valid renewal, is**

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not correct

(Paras 20 to 23)

D. **Mines and Minerals (Development and Regulation) Act, 1957 — Ss. 8(3) & (2) — Renewal of mining lease under R. 8(3) — General principle of R. 24-A(6) of 1960 Rules (that there cannot be any hiatus in mining), held, is inapplicable to said renewal without express orders of State Government recording reasons for said renewal — Mineral Concession Rules, 1960, R. 24-A(6)**

(Para 28)

Goa Foundation v. *Union of India*, (2014) 6 SCC 738, *relied on*

Tisco Ltd. v. *Union of India*, (1996) 9 SCC 709, *affirmed*

Goa Foundation v. *Union of India*, WP (C) No. 435 of 2012, order dated 5-10-2012 (SC), *vacated*

Vassudeva Madeva Salgaocar v. *Union of India*, (1985) 1 Bom CR 36; *Shantilal Khushaldas and Bros. (P) Ltd.* v. *Union of India*, WP No. 177 of 1990, decided on 20-6-1997 (Bom); *Shantilal Khushaldas and Bros. (P) Ltd.* v. *Union of India*, SLP (C) No. 23827 of 1997, order dated 2-3-1998 (SC); *State of U.P.* v. *Lalji Tandon*, (2004) 1 SCC 1, *referred to*

E. **Public Accountability, Vigilance and Prevention of Corruption — Commissions of Inquiry Act, 1952 — Ss. 8-B and 8-C — Principles of natural justice under — Non-compliance with — Effect on Inquiry Commission report — Extent to which findings in report may be relied on**

— Shah Commission inquiring into illegal mining in State of Goa giving its report without giving any opportunity of hearing to lessees of alleged illegal mining — Central Government and State Government pleading that they would not take any action against said lessees on basis of said findings prior to giving an opportunity of hearing to lessees — Therefore, Shah Commission Report not quashed (as prayed for by the lessees) — At the same time, the prosecution of mining leases cannot be directed on the basis of the findings in the Report of the Justice Shah Commission, if they have not been given the opportunity of being heard and to produce evidence in their defence and not allowed the right to cross-examine and the right to be represented by a legal practitioner before the Commission as provided in Ss. 8-B and 8-C — However, the legal and environmental issues raised in the Report of the Justice Shah Commission can be examined and on the basis of the said findings on these issues the reliefs prayed for from both sides can be considered — Administrative Law — Natural Justice — Audi Alteram Partem — Right to Hearing — Reasonable Opportunity/Right of Representation

(Para 14)

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Kiran Bedi v. *Committee of Inquiry*, (1989) 1 SCC 494; *State of Bihar* v. *Lal Krishna Advani*, (2003) 8 SCC 361; *Union of India* v. *Tulsiram Patel*, (1985) 3 SCC 398 : 1985 SCC (L&S) 672, *referred to*

F. **Environment Protection and Pollution Control — Mining — Mining waste — Dumping of, outside leased area, held, is not permissible under MMDR Act and Rules made thereunder — Clarified that even if land outside the mining area is privately owned mineral wastes cannot be dumped there without prior environmental clearance under R. 5(3) of 1986 Rules**

— Expert Committee directed to submit its report within six months on how the mining dumps in the State of Goa should be dealt with — Environment (Protection) Rules, 1986 — R. 5 (3) — Mines and Minerals (Development and Regulation) Act, 1957 — Ss. 9, 4 and 3(d) — Mineral Concession Rules, 1960 — R. 64-C and R. 31 r/w Form K — Terms of lease deed under Form K and principles of dumping of mineral waste under R. 64-C — Clarified — None of said provisions, held, permits dumping of mineral waste outside leased area — Mineral Conservation and Development Rules, 1988 — R. 16 — Forest (Conservation) Act, 1980, S. 2

(Paras 30 to 37, 87.2 and 88.11)

Central Bank of India v. *Workmen*, AIR 1960 SC 12, *relied on*

Samaj Parivartana Samudaya v. *State of Karnataka*, (2013) 8 SCC 154, *referred to*

G. **Environment Protection and Pollution Control — Mining — Safety/prohibition zones around natural parks, wildlife sanctuaries and protected areas — Extent of prohibition zones for State of**

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Goa, considering its local needs for development, occupational structure and geographical availability of land

— Reiterating direction of Supreme Court in *T.N. Godavarman Thirumulpad*, (2010) 13 SCC 740, all mining within a distance of 1 km from national parks and sanctuaries, held, are prohibited — Regarding extension of safety zones to 10 kms at six proposed sites, MoEF directed to proceed as per statutory procedure and consider the objections of State Government in this regard (that is regarding needs of local people, development needs, availability of land and geographical constraints peculiar to State of Goa) — Environment (Protection) Rules, 1986 — Rr. 5(1)(viii) & (x) and Rr. 5(2) & (3) — Environment (Protection) Act, 1986 — S. 3(2)(v) — Wildlife (Protection) Act, 1972 — S. 5-C(2)(b) — Constitution of India, Arts. 21 and 32

(Paras 38 to 53, 87.3, 87.4 and 88.1)

Noida Memorial Complex near Okhla Bird Sanctuary, In re, (2011) 1 SCC 744, *relied on*

T.N. Godavarman Thirumulpad v. *Union of India*, (2010) 13 SCC 740, *explained* and *relied on*

Goa Foundation v. *Union of India*, (2011) 15 SCC 791, *explained*

T.N. Godavarman Thirumulpad v. *Union of India*, (2002) 10 SCC 634, *referred to*

H. **Mines and Minerals — Mineral Concession Rules, 1960 — Rr. 37(1)(a) and 38 — Violation of, by mining lessees by resorting to illegal transfers and amalgamations — Clarified that iron ore mines (not being specified in Sch. I Pt. A or B but being specified in Pt. C, MMDR Act) could**

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not be transferred without the previous written consent of State Government — Further clarified that amalgamation of mines is not permitted, if the State Government has not recorded its reasons for said amalgamation — And that the period of such amalgamation cannot exceed the period of lease whose term expires first — State Government, therefore, directed to initiate action against all mining lessees who had violated Rr. 37 and 38, MC Rules so that there is no loss of revenue and mining is effectively controlled — Mines and Minerals (Development and Regulation) Act, 1957 — Sch. I Pts. A, B and C — Transfer of Property Act, 1882 — Ss. 10 and 11 — Statutory bars on transfer of property

I. **Mines and Minerals — Mineral Concession Rules, 1960 — R. 37 — Intent of rule-making authorities under, explained — The intent is to ensure that there is no loss of revenue and mining is effectively controlled**

Held :

The Justice Shah Commission has found in its Report that in the State of Goa, 16 companies/firms/individuals are carrying out mining operations under different leases granted to them as a single unit as if the leases are amalgamated. CEC has reported that there are several complaints received by the State Government that the leases have been operated by persons other than the lessees. As per Rule 37(1)(*a*) of the MC Rules, 1960 the lessee cannot assign, sub-let, mortgage, or in any other manner, transfer the mining lease, or any right, title or interest therein, without the previous consent in writing of the State Government in the case of those minerals which are not specified in Part A and Part B of the First Schedule to the MMDR Act. Since iron ore is specified in Part C of the First Schedule to the MMDR Act, the previous consent in writing of the State Government is necessary before any such transfer is made by a mining lessee.

(Paras 54 to 57)

The intent of the rule-making authority in making these provisions in Rule 37 of the MC Rules, 1960 is that the liabilities and conditions in a mining lease are also enforceable against the transferee and that the transferee pays his dues towards income tax regularly. Rule 37, therefore, cannot be allowed to be violated by the lessees with impunity and the State Government cannot overlook transfers by saying that the transfers of the mining leases are part of the mining practice in the State of Goa. If these violations of Rule 37 of the MC Rules, 1960 are allowed, there shall be substantial leakage of revenue and mining operations cannot be effectively regulated and controlled by the State Government. The State Government, therefore, must initiate action against those mining leases who violate Rule 37 of the MC Rules, 1960.

(Para 60)

Rule 38 of the MC Rules, 1960 provides that the State Government may, in the interest of mineral development and with reasons to be recorded in writing, permit amalgamation of two or more adjoining

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leases held by a lessee, provided that the period of amalgamated leases shall be co-terminus with the lease whose period will expire first. If the State Government has not permitted amalgamation of adjoining leases in the interest of mineral development and has not recorded the reasons for such permission, the State Government cannot allow the amalgamation of the leases. The State Government will initiate action against those mining lessees who violate Rules 37 and 38 of the MC Rules, 1960.

(Para 61)

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J. **Environment Protection and Pollution Control — Mining — Illegal and uncontrolled/unmonitored mining affecting environment and revenue — Monitoring and regulatory mechanism — Need of strict implementation of statutory provisions and powers by regulatory bodies — Directions issued to regulatory bodies**

— Judicial notice taken of fact that Goa (Prevention of Illegal Mining, Storage and Transportation of Minerals) Rules, 2013 has adequate provisions to deal with illegal mining and that the regulatory bodies have failed in their endeavour to restore the environment from the damage caused by mining — State of Goa directed to enforce provision of MMDR Act and Rules made there under and to strictly enforce 2013 Rules — Goa State Pollution Control Board also directed to exercise the immense powers conferred under S. 33-A, 1974 Act and 31-A, 1981 Act — Further directed that as and when Regulator as directed in *T.N. Godavarman Thirumulpad*, (2014) 4 SCC 61, is appointed, it would carry out its functions as per order passed under S. 3(3), Environment (Protection) Act, 1986 — Mines and Minerals (Development and Regulation) Act, 1957 — S. 23-C — Air (Prevention and Control of Pollution) Act, 1981 — S. 31-A — Water (Prevention and Control of Pollution) Act, 1974, S. 33-A

(Paras 62, 63, 69 to 71, 75 to 78 and 88.6)

K. **Environment Protection and Pollution Control — Mining — Sustainable development — Illegal and uncontrolled/unmonitored mining affecting environment and revenue — Rationale why mining cannot be totally prohibited in State of Goa, explained — Goa is heavily dependent upon iron ore mining for its revenue and employment — People have taken bank loans, purchased trucks and many people depend upon mining for their livelihood — Therefore, mining cannot be totally prohibited in Goa**

(Paras 77, 78, 88.9 and 88.10)

L. **Constitution of India — Arts. 21 and 32 — Sustainable development — Goa Iron Ore Permanent Fund — In future, lessees directed to deposit 10% of their sale proceeds from iron ore towards said fund in the interest of sustainable development and inter-generational equity as the damage caused cannot be rectified by regulation/monitoring alone — CEC directed to submit a comprehensive scheme within six months in this regard — Environment Protection and Pollution Control — Polluter pays principle**

(Paras 77, 78, 88.9 and 88.10)

M. **Constitution of India — Arts. 21 and 32 — Sustainable development — Cap on annual excavation of iron ore in State of Goa — Based on reports of experts, and until a final report by Expert Committee, a cap of 20 Million MT on said excavation fixed — Expert Committee directed to submit said report within 12 months — Environment Protection and Pollution Control — Sustainable development**

(Paras 88.4 and 88.5)

T.N. Godavarman Thirumulpad v. *Union of India*, (2014) 4 SCC 61; *Lafarge Umiam Mining (P) Ltd.* v. *Union of India*, (2011) 7 SCC 338, *considered*

Goa Foundation v. *Union of India*, (2014) 6 SCC 738; *Goa Foundation* v. *Union of India*, WP (C) No. 435 of 2012, order dated 18-11-2013 (SC); *Samaj Parivartana Samudaya* v. *State of Karnataka*, (2013) 8 SCC 154, *referred to*

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Report of Expert Committee, Reports of ISM, Dhanbad and Neeri, *referred to*

N. **Environment Protection and Pollution Control — Mining — Mining leases — Mode by which should be granted — Whether State Government should be directed to grant said leases only by way of auction — Held, it is for the State Government to decide as a matter of policy, in what manner the leases are to be granted — MMDR Act does not prohibit the State from holding auction — The State Government may also adopt any other method — But said methods must conform to Constitution and law and are subject to judicial review — Mines and Minerals (Development and Regulation) Act, 1957 — Ss. 4 to 11 — Constitution of India — Arts. 21, 32 and 39(b) — Government Grants, Largesse, Public Property and Premises — Allotment/Grant/Lease/Licence of land — Mode of grant of**

(Paras 79 to 81 and 87.5)

Natural Resources Allocation, In re, Special Reference No. 1 of 2012, (2012) 10 SCC 1, *relied on*

Centre for Public Interest Litigation v. *Union of India*, (2012) 3 SCC 1, *referred to*

SS-D/53204/C

Advocates who appeared in this case:

A.N.S. Nadkarni, Advocate General, Suryanarayana Singh, Additional Advocate General, Datta Prasad Lawande, Government Advocate, Nikhil D. Pai and Ms Neha Umesh Kholkar, Additional Government Advocates, Mukul Rohatgi, Senior Advocate [Prashant Bhushan, Amit Sharma, Yashraj Singh Deora, M/s K.J. John & Co., Harish Pandey, P.S. Sudheer, M/s Mitter & Mitter Co., A. Venayagam Balan, Abhijat P. Medh, P.V. Yogeswaran, Ms Jyoti Mendiratta, Ms Madhu Sikri, Dr (Ms) Vipin Gupta, Ninad Laud, Ms Aparna Singhal, Mahesh Agarwal, E.C. Agarwala, Ms Sudha Gupta, M/s Parekh & Co., Shadman Ali, D.S. Mahra, Yashraj Singh Deora, Mohan Pandey, Shreekant N. Terdal, M/s J.S. Wad & Co., Abhijit Gosavi, Jayant Mohan, Harish Pandey, M/s K.J. John & Co., Chander Shekhar Ashri, Mohit Abraham, Shiv Kr. Suri, P.S. Sudheer, T. Mahipal, Parijat Sinha, S.M. Walawaikar, Rameshwar Prasad Goyal, M.P. Jha, Siddharth Bhatnagar, Ms A. Subhashini, Bhavanishankar V. Gadnis, A. Venayagam Balan, Prafulla Hede, Advocates] for the appearing parties.

Chronological list of cases cited ***on page(s)***

1. (2014) 6 SCC 738, *Goa Foundation* v. *Union of India* 599*d-e*, 600*a-b*, 626*d-e*, 62
635*d-e*, 635*f*, 63

2. (2014) 4 SCC 61, *T.N. Godavarman Thirumulpad* v. *Union of India* 632*b*

3. (2013) 8 SCC 154, *Samaj Parivartana Samudaya* v. *State of Karnataka* 609*d*, 63

4. WP (C) No. 435 of 2012, order dated 18-11-2013 (SC), *Goa Foundation* v. *Union of India* 626*d*

5. (2012) 10 SCC 1, *Natural Resources Allocation, In re, Special Reference No. 1 of 2012* 634*b-c*, 63

6. (2012) 3 SCC 1, *Centre for Public Interest Litigation* v. *Union of India* 633*e*

7. WP (C) No. 435 of 2012, order dated 5-10-2012 (SC), *Goa*

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Foundation v. *Union of India* 599*a*, 635*d*, 638

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16. WP No. 177 of 1990, decided on 20-6-1997 (Bom), *Shantilal Khushaldas and Bros. (P) Ltd.* v. *Union of India* 597*b-c*, 59

17. (1996) 9 SCC 709, *TISCO Ltd.* v. *Union of India* 607*a*, 60

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The Judgment of the Court was delivered by

A.K. PATNAIK, J.— This batch of writ petitions and transferred cases relate to mining in the State of Goa and as issues raised are common to the writ petitions and the transferred cases, the cases have been analogously heard and are being disposed of by this common judgment.

Facts relating to mining in Goa

2. Prior to 19-12-1961 when Goa was a Portuguese territory, its Portuguese Government had granted mining concessions in perpetuity to concessionaires. On 19-12-1961, Goa was liberated and became part of the Indian Union and on 1-10-1963, the Mines and Minerals (Development and Regulation) Act, 1957 (for short "the MMDR Act") was made applicable to the State of Goa. On 10-3-1975, the Controller of Mining Leases issued a Notification calling upon every lessee and sub-lessee to file returns under Rule 5 of the Mining Leases (Modification of Terms) Rules, 1956 and sent copies of the notification to the concessionaires in Goa. Aggrieved, the concessionaires moved the Bombay High Court, Goa Bench, and by judgment dated 29-9-1983, in *Vassudeva Madeva Salgaocar* v. *Union of India*[1], the Bombay High Court restrained the Union of India from treating the concessions as mining leases and from enforcing the notification against the concessionaires.

3. Parliament thereafter passed the Goa, Daman and Diu Mining Concessions (Abolition and Declaration as Mining Leases) Act, 1987 (for short "the Abolition Act") which received the assent of the President on 23-5-1987. Section 4 of the Abolition Act abolished the mining concessions and declared that with effect from the 20th day of December, 1961, every mining concession will be deemed to be a mining lease granted under the MMDR Act and that the provisions of the MMDR Act will apply to such mining lease. Section 5 of the Abolition Act further provided that the concession holder shall be deemed to have become a holder of the mining lease under

the MMDR Act in relation to the mines in which the concession relates and the period of such lease was to extend up to six months from the date when the Abolition Act received President's assent i.e. up to 22-11-1987. On 14-10-1987, sub-rules (8) and (9) were inserted in Rule 24-A of the Mineral Concession Rules, 1960 (for short "the MC Rules") which deal with renewal of mining leases in Goa, Daman and Diu.

4. The Abolition Act was challenged by the lessees before the Bombay High Court in a writ petition. The High Court passed an interim order permitting the lessees to carry on mining operations and the mining business in the concessions for which renewal applications had been filed under Rule 24-A of the MC Rules. Subsequently, the High Court held in its judgment dated 20-6-1997[2] that the Abolition Act was valid but Section 22(*1*)(*a*) of the Abolition Act would operate prospectively and not retrospectively. The concessionaires filed special leave petition against the judgment dated 20-6-1997[2] before this Court. On 2-3-1998[3], this Court passed an interim order permitting the concessionaires to carry on mining operations and mining business in the mining areas for which renewal applications have been made on the condition that the lessee pays to the Government dead rent from the date of commencement of the Abolition Act. Subsequently, this Court granted leave in the special leave petition and continued the aforesaid interim order[3].

The Justice Shah Commission and its Report

5. As reports were received from various State Governments of widespread mining of iron ore and manganese ore in contravention of the provisions of the MMDR Act, the Forest

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(Conservation) Act, 1980, the Environment (Protection) Act, 1986 and other rules and guidelines issued thereunder, the Central Government appointed the Justice Shah Commission under Section 3 of the Commissions of Inquiry Act, 1952 by Notification dated 22-11-2010. Paras 2 and 3 of the Notification, which are relevant, are extracted hereinbelow:

"**2.** The terms of reference of the Commission shall be—

(*i*) to inquire into and determine the nature and extent of mining and trade and transportation, done illegally or without lawful authority, of iron ore and manganese ore, and the losses therefrom; and to identify, as far as possible, the persons, firms, companies and others that are engaged in such mining, trade and transportation of iron ore and manganese ore, done illegally or without lawful authority;

(*ii*) to inquire into and determine the extent to which the management, regulatory and monitoring systems have failed to deter, prevent, detect and punish offences relating to mining, storage, transportation, trade and export of such ore, done illegally or without lawful authority, and the persons responsible for the same;

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(*iii*) to inquire into the tampering of official records, including records relating to land and boundaries, to facilitate illegal mining and identify, as far as possible, the persons responsible for such tampering; and

(*iv*) to inquire into the overall impact of such mining, trade transportation and export done illegally or without lawful authority, in terms of destruction of forest wealth, damage to the environment, prejudice to the livelihood and other rights of tribal people, forest dwellers and other persons in the mined areas, and the financial losses caused to the Central and State Governments.

3. The Commission shall also recommend remedial measures to prevent such mining, trade, transportation and export done illegally or without lawful authority."

6. The Justice Shah Commission visited Goa and issued notices under Section 4 of the Commissions of Inquiry Act, 1952 calling for information from the authorities concerned and the lessees and submitted its interim report on 15-3-2012 to the Ministry of Mines, Union of India. On 7-9-2012, the Justice Shah Commission Report on Goa was tabled in Parliament along with an Action Taken Report of the Ministry of Mines and on 10-9-2012 the State Government of Goa passed an Order suspending all mining operations in the State of Goa with effect from 11-9-2012. Pursuant to this Order of the State Government, on 11-9-2012 and 12-9-2012 the District Magistrates of the State of Goa banned transportation of iron ore in their respective districts and the Director of Mines and Geology ordered for verification of mineral ore which was already extracted. On 13-9-2012, the Director of Mines and Geology, Government of Goa issued show-cause notices to 40 mining leases. On 14-9-2012, the Ministry of Environment and Forests of the Union of India also directed that all environmental clearances granted to mines in the State of Goa be kept in abeyance.

7. On the basis of findings in the Report of the Justice Shah Commission on illegal mining in the State of Goa, Goa Foundation has filed Writ Petition (C) No. 435 of 2012 as public interest litigation praying for directions to the Union of India and the State of Goa to take steps for termination of the mining leases of lessees involved in mining in violation of the Forest (Conservation) Act, 1980, the Mines and Minerals (Development and Regulation) Act, 1957, the Mineral Concessions Rules, 1960, the Environment (Protection) Act, 1986, the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 as well as the Wild Life (Protection) Act, 1972. Goa Foundation has prayed that a direction be issued to the respondents to

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prosecute all those who have committed offences under the different laws and are involved in the pilferage of State revenue through illegal mining activities in the State of Goa including the public servants who have aided and abetted the offences. Goa Foundation has also sought for appointment of an independent authority with full powers to take control, supervise and regulate mining operations in the State of Goa and to ensure the implementation of the laws. Besides, the

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aforesaid main reliefs, Goa Foundation has also prayed for some incidental and consequential reliefs.

8. On 5-10-2012, this Court issued notice in *Goa Foundation* v. *Union of India*[4] to the respondents and directed the Central Empowered Committee (for short "CEC") to submit its report on the writ petition and also directed that till further orders, all mining operations in the leases identified in the report of the Justice Shah Commission and transportation of iron ore and manganese ore from those leases, whether lying at the mine-head or stockyards, shall remain suspended, as recommended in the report of the Justice Shah Commission.

9. Different mining lessees of the State of Goa and the Goa Mining Association also filed writ petitions in the Bombay High Court, Goa Bench for a declaration that the report of the Shah Commission is illegal and for quashing the findings in the Report of the Justice Shah Commission and also for quashing the Order dated 10-9-2012 of the Government of Goa suspending mining operations in the State of Goa and the Order dated 14-9-2012 of the Ministry of Environment and Forests, Government of India, directing that the environmental clearances granted to the mines in the State of Goa be kept in abeyance. These writ petitions have been transferred to this Court for hearing along with the hearing of Writ Petition (Civil) No. 435 of 2012 filed by Goa Foundation.

10. The writ petitions and the transferred cases were heard during September, October and November 2013. On 11-11-2013[5], an order was passed by this Court directing that the inventory of the excavated mineral ores lying in different mines/stockyards/jetties/ports in the State of Goa made by the Department of Mines and Geology of the Government of Goa be verified and thereafter the whole of the inventoried mineral ores be sold by e-auction and the sale proceeds (less taxes and royalty) be retained in separate

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fixed deposits (leasewise) by the State of Goa till the Court delivers the judgment in these matters on the legality of the leases from which the mineral ores were extracted. The Court has also directed that this entire process of verification of the inventory, e-auction and deposit of sale proceeds be monitored by a Monitoring Committee appointed by the Court. By the said order dated 11-11-2013[5], this Court also constituted an Expert Committee to conduct a macro-EIA study on what should be the ceiling of annual excavation of iron ore from the State of Goa considering its iron ore resources and its carrying capacity, keeping in mind the principles of sustainable development and intergenerational equity and all other relevant factors. On 11-11-2013 the case was also reserved for judgment.

Challenge to the Report of the Justice Shah Commission

11. As we have already noticed, in the cases transferred from the Bombay High Court to this Court, the mining lessees have prayed for quashing the Report of the Justice Shah Commission. Mr K.K. Venugopal, learned Senior Counsel appearing for the mining lessees,

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submitted that the Justice Shah Commission did not issue any notice under Section 8-B of the Commissions of Inquiry Act, 1952 to the mining lessees giving a reasonable opportunity of being heard in the inquiry and to produce evidence in their defence. He further submitted that the Justice Shah Commission also did not permit the mining lessees to cross-examine the witnesses, to address the Commission and to be represented by legal practitioners before the Commission contrary to the provisions of Section 8-C of the Commissions of Inquiry Act, 1952. He submitted that even otherwise there is gross breach of the principles of natural justice and fair play by the Justice Shah Commission and, therefore, the Report of the Commission was violative of Article 14 of the Constitution. He submitted that the Report of the Justice Shah Commission should, therefore, be quashed. In support of this submission, he relied on the decisions of this Court in *Kiran Bedi* v. *Committee of Inquiry*[6], *State of Bihar* v. *Lal Krishna Advani*[7] and *Union of India* v. *Tulsiram Patel*[8].

12. Mr Mohan Parasaran, learned Solicitor General for the Union of India, on the other hand, submitted that as the Notification dated 22-11-2010 of the Central Government appointing the Justice Shah Commission under Section 3 of the Commissions of Inquiry Act, 1952 would show, reports were received from various State Governments of widespread mining of iron ore and manganese ore in contravention of the MMDR Act, the Forest (Conservation) Act, 1980 and the Environment (Protection) Act, 1986 or other rules and licences issued thereunder and for this reason, the Central Government appointed the Justice Shah Commission for the purpose of making inquiry into these matters of public importance. He submitted that

after the Justice Shah Commission submitted the Report pointing out various illegalities, the Union Government has kept the environment clearances in abeyance and it will take legal action on the basis of its own assessment of the facts and not on the basis of the facts as found in the Justice Shah Commission's Report.

13. Similarly, Mr Atmaram N.S. Nadkarni, the Advocate General appearing for the State of Goa, submitted that after going through the Report of the Justice Shah Commission, the State Government has suspended all mining and transportation of ores and no legal action will be taken against the mining lessees on the basis of the findings in the Justice Shah Commission's Report unless due opportunity is given to the mining lessees to place their defence against the findings of the Justice Shah Commission.

14. We find that Section 8-B of the Commissions of Inquiry Act, 1952 provides that if a person is likely to be prejudicially affected by the inquiry, the Commission shall give to that person a reasonable opportunity of being heard and to produce evidence in his defence and Section 8-C of the Commissions of Inquiry Act, 1952 provides that every such person will have a right to cross-examine and the right to be represented by a legal practitioner before the Commission. As the State Government of Goa has taken a stand before us that no action will be taken against the mining lessees only on the basis of the findings in the Report of the Justice Shah Commission without making its own assessment of facts and without first giving the mining lessees the opportunity of hearing and the opportunity to produce evidence in their defence, we are not inclined to quash the Report of the Justice Shah Commission on the ground that the provisions of Sections 8-B and 8-C of the Commissions of Inquiry Act, 1952 and the principles of natural justice have not been complied with. At the same time, we cannot also direct prosecution of the mining lessees on the basis of the findings in the Report of the Justice Shah Commission, if they have not been given the opportunity of being heard and to produce evidence in their defence and not allowed the right to cross-examine and the right to be represented by a legal practitioner before the Commission as provided in Sections 8-B and 8-C respectively of the Commissions of Inquiry Act, 1952. We will, however, examine the legal and

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environmental issues raised in the Report of the Justice Shah Commission and on the basis of our findings on these issues consider granting the reliefs prayed for in the writ petition filed by Goa Foundation and the reliefs prayed for in the writ petitions filed by the mining lessees, which have been transferred to this Court.

Whether the leases held by the mining lessees have expired

15. According to the Justice Shah Commission Report, prior to 7-1-1993, sub-rule (4) of Rule 24-A of the MC Rules provided that the renewal application of the lessee is required to be disposed of within six months from the date of its receipt and sub-rule (5) of Rule 24-A provided that if the

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application is not disposed of within stipulated time, the same shall be deemed to have been refused. The Justice Shah Commission has found that the applications of several mining leases for renewal were not disposed of within the stipulated time and there was no provision in the MC Rules to condone the delay and, therefore, these leases are in contravention of the MC Rules and are void and have no effect as provided in Section 19 of the MMDR Act.

16. CEC in its report has stated that under Section 4 of the Abolition Act, the concessions were abolished from 23-5-1987 and treated as deemed leases under the MMDR Act and the period of deemed leases under Section 5 of the Abolition Act was extended up to six months with effect from the date of assent to the Abolition Act (23-5-1987) i.e. up to 22-11-1987. CEC has further stated that by Notifications dated 20-11-1987 and 20-5-1988, however, the Government of Goa allowed extension of six months each (totalling one year) for making applications for the first renewal of deemed mining leases and this one year period expired on 22-11-1988. CEC has further stated that as per the information provided to CEC, out of 595 mining concessions abolished and converted into deemed mining leases under Section 4 of the Abolition Act, as many as 379 deemed mining lease-holders have filed applications for the first renewal of the mining leases before 22-11-1988 and 59 such lessees have filed applications for the first renewal of the deemed mining leases after 22-11-1988 i.e. beyond the time-limit permitted under Rule 24-A(8) of the MC Rules.

17. In reply, the learned counsel for the lessees and Mr Arvind Datar, learned Senior Counsel appearing for the State of Goa, submitted that sub-rules (4) and (5) of Rule 24-A of the MC Rules did not apply to the State of Goa. They submitted that sub-rules (8) and (9) of Rule 24-A of the MC Rules apply specifically to the State of Goa and sub-rule (8) of Rule 24-A of the MC Rules provides that an application for the first renewal of the deemed mining lease referred to in Section 4 of the Abolition Act shall be made to the State Government in Form J before the period of six months of the mining lease as provided in Section 5(1) of the Abolition Act. They submitted that the proviso to sub-rule (8) of Rule 24-A of the MC Rules conferred power on the State Government to extend time for making such application up to a total period not extending one year. They submitted that, by two Notifications, the State Government extended time for a period of one year up to 22-11-1988 and within this period most of the lessees have applied for the first renewal of the deemed mining lease. The learned counsel for the lessees and the learned counsel for the State of Goa submitted that sub-rule (9) of Rule 24-A of the MC Rules makes it clear that if an application for first renewal is made within the time referred to in sub-rule (8) of Rule 24-A of the MC Rules or within the time allowed by the State Government under the proviso to sub-rule (8) of Rule 24-A of the MC Rules, the period of that lease shall be deemed to have been extended by a further period till the State Government passes orders thereon.

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18. For easy reference, Chapter II containing Sections 4 and 5 of the Abolition Act is extracted hereinbelow:

"CHAPTER II

ABOLITION OF MINING CONCESSIONS AND DECLARATION AS MINING LEASES UNDER THE MINES AND MINERALS ACT

4. *Abolition, etc., of mining concessions*.—(1) Every mining concession specified in the First Schedule shall, on and from the appointed day, be deemed to have been abolished, and shall, without effect from that day, be deemed to be a mining lease granted under the Mines and Minerals Act, and the provisions of that Act shall, save as otherwise provided in this Act, apply to such mining lease.

(2) Every mining concession specified in the Second Schedule shall, on and from the day next after the date of grant of the said concession and specified in the corresponding entry in the eighth column of the said Schedule, be deemed to have been abolished, and shall, with effect from that day, be deemed to be a mining lease granted under the Mines and Minerals Act, and the provisions of that Act shall, save as otherwise provided in this Act, apply to such mining lease.

(3) If, after the date of assent, the Central Government is satisfied, whether from any information received by it or otherwise, that there has been any error, omission or misdescription in relation to the particulars of any mining concession or the name and residence of any concession holder specified in the First or the Second Schedule, it may, by notification, correct such error, omission or misdescription, and on the issue of such notification, the First or the Second Schedule, as the case may be, shall be deemed to have been amended accordingly.

5. *General effect of declaring the mining concessions to be mining leases*.—(1) Where a mining concession has been deemed to be a mining lease under Section 4, the concession holder shall, on and from the day mentioned in that section, be deemed to have become the holder of such mining lease under the Mines and Minerals Act in relation to the mine to which the mining concession relates, subject to the condition that the period of such lease shall, notwithstanding anything contained in that Act, extend up to a period of six months from the date of assent.

(2) On the expiry of the period of any mining lease under sub-section (1), it may, if so desired by the holder of such lease and on an application being made by him in accordance with the provisions of the Mines and Minerals Act and the rules made thereunder, be renewed on such terms and conditions, and up to the maximum period, for which such lease can be renewed under the provisions of that Act and the rules made thereunder."

19. For easy reference, Rule 24-A of the MC Rules is also extracted hereinbelow:

"**24-A. *Renewal of mining lease*.**—(1) An application for the renewal of a mining lease shall be made to the State Government in Form J, at least twelve months before the date on which the lease is due to expire, through such officer or authority as the State Government may specify in this behalf.

(2) The renewal or renewals of a mining lease granted in respect of a mineral specified in Part A and Part B of the First Schedule to the Act may

be granted by the State Government with the previous approval of the Central Government.

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(3) The renewal or renewals of a mining lease granted in respect of a mineral not specified in Part A and Part B of the First Schedule to the Act may be granted by the State Government:

Provided that before granting approval for second or subsequent renewal of a mining lease, the State Government shall seek a report from the Controller General, Indian Bureau of Mines, as to whether it would be in the interest of mineral development to grant the renewal of the mining lease.

Provided further that in case a report is not received from Controller General, Indian Bureau of Mines in a period of three months of receipt of the communication from the State Government, it would be deemed that the Indian Bureau of Mines has no adverse comments to offer regarding the grant of the renewal of mining lease.

(4) An application for the renewal of a mining lease shall be disposed of within a period of six months from the date of its receipt. (*Omitted*)

(5) If an application is not disposed of within the period specified in sub-rule (4) it shall be deemed to have been refused. (*Omitted*)

(6) If an application for the renewal of a mining lease made within the time referred to in sub-rule (1) is not disposed of by the State Government before the date of expiry of the lease, the period of the lease shall be deemed to have been extended by a further period till the State Government passes order thereon.

(7) *Omitted*.

(8) Notwithstanding anything contained in sub-rule (1) and sub-rule (6) an application for the first renewal of a mining lease, so declared under the provisions of Section 4 of the Goa, Daman and Diu Mining Concessions (Abolition and Declaration as Mining Leases) Act, 1987, shall be made to the State Government in Form J before the expiry of the period of mining lease in terms of sub-section (1) of Section 5 of the said Act, through such office or authority as the State Government may specify in this behalf:

Provided that the State Government may, for reasons to be recorded in writing and subject to such conditions as it may think fit, allow extension of time for making of such application up to a total period not exceeding one year.

(9) If an application for first renewal made within the time referred to in sub-rule (8) or within the time allowed by the State Government under the proviso to sub-rule (8), the period of that lease shall be deemed to have been extended by a further period till the State Government passes orders thereon.

(10) The State Government may condone delay in an application for renewal of mining lease made after the time-limit prescribed in sub-rule (1) provided the application has been made before the expiry of the lease."

20. Sub-rule (8) of Rule 24-A of the MC Rules has been inserted by G.S.R. 855(E), dated 14-10-1987 and this sub-rule (8) of Rule 24-A of the MC Rules provides that notwithstanding anything contained in sub-rule (1) and sub-rule (6), an application for the first renewal of a deemed mining lease, referred to in Section 4 of the Abolition Act, shall be made to the State Government in Form J before the expiry of the six months' period of deemed

mining lease as provided in Section 5(1) of the Abolition Act. The proviso to sub-rule (8) of Rule 24-A of the MC Rules, however, empowers the State Government to extend the time for making such application up to a total period not extending one year. In exercise of these powers in the proviso to sub-rule (8) of Rule 24-A of the MC Rules, the State Government of Goa has, in fact, extended time for making applications for first renewal up to 22-11-1988, by two Notifications dated 20-11-1987 and 20-5-1988.

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21. Sub-rule (9) of Rule 24-A of the MC Rules, which was also inserted by G.S.R. 855 (E), dated 14-10-1987, reads as follows:

> "In an application for first renewal made within the time referred to in sub-rule (8) or within the time allowed by the State Government under the proviso to sub-rule (8), the period of that lease shall be deemed to have been extended by a period of one year from the date of expiry of lease or date of receipt of application, whichever is later, provided that the period of deemed extension of lease shall end with the date of receipt of the orders of the State Government thereon, if such orders are made earlier."

Sub-rule (9) was substituted by G.S.R. 724(E) dated 27-9-1994 by the existing sub-rule (9) (extracted above at para 19) to provide that if an application for first renewal is made within the time referred to in sub-rule (8) or within the time allowed by the State Government under the proviso to sub-rule (8), the period of that lease shall be deemed to have been extended by a further period till the State Government passes orders thereon. In our considered opinion, the intention of the rule-making authorities is very clear from sub-rule (9) as was originally inserted by G.S.R. 855(E), dated 14-10-1987 and sub-rule (9) as was substituted by G.S.R. 724(E), dated 27-9-1994, that until orders were passed by the State Government on an application for first renewal of a lease filed by a lessee within the time allowed, the lease was deemed to have been extended.

22. The lessees have contended that they had filed their applications by 22-11-1988 i.e. the date up to which the State Government had allowed time under the proviso to sub-rule (8) of Rule 24-A of the MC Rules. The State Government has also taken the stand that most of the applications for first renewal were filed within the time allowed by the State Government and this stand is also supported by the facts found by CEC. The result is that most of the mining leases in which the State Government has not passed orders are deemed to have been extended under sub-rule (9) of Rule 24-A of the MC Rules. Hence, the finding in the Justice Shah Commission Report that the applications for renewal were not disposed of within the stipulated time and the leases are in contravention of the MC Rules is, thus, not correct. This opinion of the Justice Shah Commission, as we have noticed, was based on sub-rules (4) and (5) of Rule 24-A of the MC Rules, which were applicable generally to an application for renewal of mining leases, stood excluded to the extent that specific provisions have been subsequently made by the rule-making authorities in sub-rules (8) and (9) of Rule 24-A of the MC Rules in respect of the deemed leases in Goa.

23. Mr Prashant Bhushan, learned counsel for Goa Foundation, however, submitted that sub-section (2) of Section 8 of the MMDR Act prior to its amendment provided that a mining lease may be renewed for only ten years and, therefore, if the deemed mining leases of the lessees expired on 22-11-1987, even if the lease was renewed on the application of first renewal made by the lessees in Goa, the period of lease under the first renewal would expire on 21-11-1997 and after 21-11-1997, there can be no deemed extension. Alternatively, he submitted that sub-section (2) of Section 8 of the MMDR Act as amended by Act 25 of 1994 provided that the mining lease may be renewed for a maximum period not exceeding twenty years. He submitted that as the deemed mining leases expired on 22-11-1987, the lessees would be entitled to a renewal for a maximum period of twenty years up to 21-11-2007 and after 21-11-2007, the lessees would not be entitled to any renewal and hence the lessees were not entitled to operate the lease beyond 21-11-2007.

24. The learned counsel for the lessees, on the other hand, submitted that sub-section (3) of Section 8 of the MMDR Act makes it clear that notwithstanding anything contained in sub-section (2) of Section 8 of the MMDR Act, the State Government can authorise

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renewal of a mining lease in respect of minerals not specified in Part A and Part B of the First Schedule for a further period or periods not exceeding twenty years in each case. They submitted that iron ore is specified in Part C in the First Schedule and hence the State Government can authorise renewal of the mining lease in respect of iron ore for a period or periods not exceeding twenty years in each case. They also referred to sub-rule (3) of Rule 24-A which provided that renewal or renewals of a mining lease granted in respect of a mineral not specified in Part A and Part B of the First Schedule to the MMDR Act may be granted by the State Government provided that before granting approval for second or subsequent renewal of a mining lease, the State Government shall seek a report from the Controller General, Indian Bureau of Mines, as to whether it would be in the interest of mineral development to grant the renewal of the mining lease. The learned counsel for the lessees submitted that as the application of the lessees for renewal of mining leases have not been disposed of by the State Government before the date of expiry of lease, the period of lease shall be deemed to have been extended by a further period till the State Government passes orders thereon as provided in sub-rule (6) of Rule 24-A of the MC Rules. They submitted that it will be clear from sub-rule (6) of Rule 24-A of the MC Rules that the intention of rule-making authorities is that there may not be any hiatus in mining, and mineral development in the country may continue without break, without any loss to the economy and loss of revenue to the Government. They cited the judgment of this Court in *State of U.P.* v. *Lalji Tandon*[2], in which this Court has held that there is a difference between an extension of lease and renewal of lease and whereas in the case of extension of lease it is not necessary to have a

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fresh deed of lease executed, in case of renewal of lease, a fresh deed of lease shall have to be executed between the parties. They also cited *Tisco Ltd.* v. *Union of India*[10] in support of their argument that under sub-section (3) of Section 8 of the MMDR Act, the Government can renew the mining lease for a further period if it was in the interest of mineral development.

25. Mr Nadkarni, learned Advocate General for the State of Goa, submitted that the then State Government of Goa allowed the working of the mines from 2007 till 2012 based on deemed extension status but it has been decided by the State Government now in the Goa Mining Policy of 2013 that no mine can be allowed on deemed extension basis. The clear stand of the State Government of Goa in the résumé of arguments filed by the learned Advocate General Mr Nadkarni is that the deemed extension status would not mean that a mine can be allowed to run indefinitely without a decision on the renewal application.

26. Section 8 of the MMDR Act is extracted hereinbelow:

"**8. *Periods for which mining leases may be granted or renewed*.**—(1) The maximum period for which a mining lease may be granted shall not exceed thirty years:

Provided that the minimum period for which any such mining lease may be granted shall not be less than twenty years;

(2) A mining lease may be renewed for a period not exceeding twenty years.

(3) Notwithstanding anything contained in sub-section (2), if the State Government is of opinion that in the interests of mineral development it is necessary so to do, it may, for reasons to be recorded, authorise the renewal of a mining lease in respect of minerals not specified in Part A and Part B of the First Schedule for a further period or periods not exceeding twenty years in each case.

(4) Notwithstanding anything contained in sub-section (2) and sub-section (3), no mining lease granted in respect of mineral specified in Part A or Part B of the First

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Schedule shall be renewed except with the previous approval of the Central Government."

27. Sub-section (1) of Section 8 of the MMDR Act, which provides the maximum and minimum periods for which a mining lease may be granted will not apply to deemed mining leases in Goa because sub-section (1) of Section 5 of the Abolition Act provides that the period of such deemed mining leases will extend up to six months from the date of assent notwithstanding anything contained in the MMDR Act. In other words, notwithstanding anything contained in sub-section (1) of Section 8 of the MMDR Act, the period of a deemed mining lease in Goa was to expire on 22-11-1987 (six months from the date of assent). Under sub-section (2) of Section 8 of the MMDR Act, a mining lease may be renewed for a period not exceeding twenty years. Sub-section (3) of Section 8, however, provides that notwithstanding anything contained in sub-section (2), if the State Government is of the opinion that in the interest of mineral development, it is

necessary so to do, it may for reasons to be recorded, authorise the renewal of a mining lease in respect of minerals not specified in Part A and Part B of the First Schedule for a further period or periods not exceeding twenty years in each case. Thus, renewal beyond the first renewal for a period of twenty years is conditional upon the State Government forming an opinion that in the interest of mineral development, it is necessary to do so and also conditional upon the State Government recording reasons for such renewal of a mining lease in respect of iron ore which is not specified in Part A and Part B of the First Schedule. In *Tisco Ltd.* v. *Union of India*[10], this Court has held (at SCC p. 720, para 34) that the language of sub-section (3) of Section 8 is quite clear that ordinarily a lease is not to be granted beyond the time specified in sub-section (2) and only if the Government is of the view that it would be in the interest of mineral development, it is empowered to renew lease of a lessee for a further period after recording sound reasons for doing so. This Court has further held in the aforesaid case that this measure has been incorporated in the legislative scheme as a safeguard against arbitrariness and the letter and spirit of the law must be adhered to in a strict manner.

28. The MC Rules have been made under Section 13 of the MMDR Act by the Central Government and obviously could not have been made in a manner inconsistent with the provisions of the Act. Sub-rule (6) of Rule 24-A of the MC Rules provides that:

"**24-A. (6)** If an application for renewal of a mining lease made within the time referred to in sub-rule (1) is not disposed of by the State Government before the date of expiry of the lease, the period of that lease shall be deemed to have been extended by a further period till the State Government passes order thereon."

This sub-rule cannot apply to a renewal under sub-section (3) of Section 8 of the MMDR Act because the renewal under this provision cannot be made without express orders of the State Government recording reasons for renewal in the interest of mineral development. In other words, so long as there is a right of renewal in the lessee which in the case of a mining lease is for a maximum period of twenty years, the provision regarding deemed extension of a lease can operate, but if the right of renewal of a mining lease is dependent upon the State Government forming an opinion that in the interest of mineral development it is necessary to do so and the State Government recording reasons therefor, a provision regarding deemed extension till orders are passed by the State Government on the application of renewal cannot apply. We are, therefore, of the opinion that sub-rule (6) of Rule 24-A of the MC Rules will apply to a case of first renewal under sub-section (2) of Section 8 of the MMDR Act other than a case covered under sub-rule (9) of Rule 24-A of the MC Rules, but will not apply to renewal under sub-section (3) of Section 8 of the MMDR Act. In our view, the deemed mining leases of the lessees in Goa expired on 22-11-1987 under

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sub-section (1) of Section 5 of the Abolition Act and the maximum of 20 years renewal period of the deemed mining leases in Goa as provided in sub-section (2) of Section 8 of the MMDR Act read with sub-rules (8) and (9) of Rule 24-A of the MC Rules expired on 22-11-2007.

Whether dump can be kept beyond the lease area?

29. The Report of the Justice Shah Commission states that about 2796.24 ha of area have been found to be under encroachment by the mining lessees out of which about 578.42 ha have been found to have been illegally used for extraction/removal of iron ore. CEC in its report has stated that CEC visited some of the areas stated to be under encroachments and a number of lease-holders have filed representations against the findings of the Shah Commission stating that they are not involved in any encroachment. According to Goa Foundation, this was a gross illegality committed by the mining lessees.

30. Mr A.D.N. Rao, Amicus Curiae, referred to Section 9 of the MMDR Act to submit that any removal of minerals from the leased area can be made by holder of a mining lease only on payment of royalty. He submitted that the waste material and overburden, therefore, cannot be dumped outside the leased area without payment of royalty. He referred to para 48 of the judgment of this Court in *Samaj Parivartana Samudaya* v. *State of Karnataka*[11] in which this Court has observed that dumping of mining waste (overburden dumps) also constitutes mining operations within the meaning of Section 3 (*d*) of the MMDR Act and, therefore, the use of forest land for such activity would require clearances under the Forest (Conservation) Act, 1980. He submitted that in the event dumping of mining waste outside the leased area is to be done, it can only be done after clearance is obtained under the Forest (Conservation) Act, 1980.

31. The learned counsel appearing for the mining lessees submitted that the lessees have actually used areas outside the mining lease which are also owned mostly by the lessees for clearing the dump and this was permissible under the Mineral Conservation and Development Rules, 1988 (for short "the MCD Rules") and the MC Rules. In particular, they referred to Rule 16 of the MCD Rules, which provides for separate stacking of non-saleable minerals, such as overburden and waste material obtained during mining operation, on the ground earmarked for the purpose, which should be away from the working pit. They also referred to Rule 64-C of the MC Rules which provides that on removal of tailings or rejects from the leased area for dumping outside leased area, such tailings or rejects are not liable for payment of royalty. The State Government has supported this stand of the mining lessees that dumping of the overburden and mining waste outside the lease area was permissible under the MC Rules and the MCD Rules.

32. Sections 4(1) and 9(2) of the MMDR Act, Rule 64-C of the MC Rules and Rule 16 of the MCD Rules are extracted below:

"**4. *Prospecting or mining operations to be under licence or lease*.**—(1) No person shall undertake any reconnaissance, prospecting or mining operations in any area, except under and in accordance with the terms and conditions of a reconnaissance permit or of a prospecting licence or, as the case may be, a mining lease, granted under this Act and the rules made thereunder:

Provided that nothing in this sub-section shall affect any prospecting or mining

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operations undertaken in any area in accordance with the terms and conditions of a prospecting licence or mining lease granted before the commencement of this Act which is in force at such commencement:

Provided further that nothing in this sub-section shall apply to any prospecting operations undertaken by the Geological Survey of India, the Indian Bureau of Mines, the Atomic Minerals Directorate for Exploration and Research of the Department of Atomic Energy of the Central Government, the Directorates of Mining and Geology of any State Government (by whatever name called), and the Mineral Exploration Corporation Limited, a Government company within the meaning of Section 617 of the Companies Act, 1956:

Provided also that nothing in this sub-section shall apply to any mining lease (whether called mining lease, mining concession or by any other name) in force immediately before the commencement of this Act in the Union Territory of Goa, Daman and Diu.

* * *

9. *Royalties in respect of mining leases*.—(1) * * *

(2) The holder of a mining lease granted on or after the commencement of this Act shall pay royalty in respect of any (mineral removed or consumed by his agent, manager, employee, contractor of sub-lessee) from the leased area at the rate for the time being specified in the Second Schedule in respect of that mineral."

"**64-C. *Royalty on tailings or rejects*.**—On removal of tailings or rejects from the leased area for dumping and not for sale or consumption, outside leased area such tailings or rejects shall not be liable for payment of royalty:

Provided that in case so dumped tailings or rejects are used for sale or consumption on any later date after the date of such dumping, then, such tailings or rejects shall be liable for payment of royalty."

"**16. *Separate stacking of non-saleable minerals*.**—(1) The overburden and waste material obtained during mining operations shall not be allowed to be mixed with non-saleable or sub-grade minerals/ores. They shall be dumped and stacked separately on the ground earmarked for the purpose.

(2) The ground selected for dumping of overburden, waste material, the sub-grade or non-saleable ores/minerals shall be away from working pit. It shall be proved for absence or presence of underlying mineral deposits before it is brought into use for dumping.

(3) Before starting mining operations, the ultimate size of the pit shall be determined and the dumping ground shall be so selected that the dumping is not carried out within the limits of the ultimate size of the pit except in cases where concurrent backfilling is proposed."

33. Under Section 4 of the MMDR Act, a person who holds a mining lease granted under the MMDR Act and the Rules made thereunder is entitled to carry on mining operations in accordance with the terms of the lease in the leased area and may carry on all other activities connected with mining within the leased area. Rule 31 of the MC Rules prescribes that the lease deed will be in Form K or in a form near thereto. Part I of Form K delineates the area of the lease and Part II of Form K authorises the activities that can be done by the lessee in the leased area. Thus, a holder of a mining lease does not have any right to dump any reject, tailings or waste in any area outside the leased area of the mining lease on the strength of a mining lease granted under the MMDR Act and the Rules made thereunder. Such area outside the leased area of the mining lease may belong to

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the State or may belong to any private person, but if the mining lease does not confer any right whatsoever on the holder of a mining lease to dump any mining waste outside the leased area, he will have no legal right whatsoever to remove his dump, overburden, tailings or rejects and keep the same in such area outside the leased area. In other words, dumping of any waste materials, tailings and rejects outside the leased area would be without a valid authorisation under the lease deed.

34. Moreover, Section 9(2) of the MMDR Act makes the holder of a mining lease granted on or after the commencement of the Act liable to pay royalty in respect of any mineral removed or consumed by him or by his agent, manager, employee, contractor or sub-lessee from the leased area. Thus, the moment the mineral is removed or consumed from the leased area, the holder of a mining lease has to pay royalty. By virtue of Section 9 of the MMDR Act, tailings and rejects excavated during mining operations being minerals will also be exigible to royalty the moment they are removed from the leased area.

35. Rule 64-C of the MC Rules states that on removal of tailings or rejects from the leased area for dumping and not for sale or consumption, outside leased area such tailings or rejects shall not be liable for payment of royalty. Rule 64-C of the MC Rules, therefore, exempts the removal of tailings or rejects from the leased area for the purpose of dumping and not for the purpose of sale or consumption from the levy of royalty. Rule 64-C of the MC Rules does not authorise dumping of tailings or rejects in any area outside the leased area. This Court has held in *Central Bank of India* v. *Workmen*[12] that "if a rule goes beyond what the section contemplates, the rule must yield to the statute". In our view, if Rule 64-C of the MC Rules suggests that tailings or rejects can be dumped outside the leased area, it must give way to Section 4 of the MMDR Act, which does not authorise dumping of minerals outside the leased area and must give way to Section 9 of the MMDR Act which does not authorise removal of minerals outside the leased area without payment of royalty. We, therefore, hold that dump cannot be kept by the lessees beyond the leased area.

36. Rule 16 of the MCD Rules provides that the overburden and waste material obtained during mining operations shall be dumped and stacked separately on the ground earmarked for the purpose and the ground selected for dumping of overburden, waste material shall be away from working pit. There is nothing in sub-rules (1), (2) and (3) of Rule 16 of the MCD Rules, which provides that such overburden or waste material obtained from mining operations shall be kept "outside the leased area". On the other hand, clause (7) of Part II of Form K provides as follows:

> "***7. To use land for stacking, heaping, depositing purposes***.—Liberty and power to enter upon and use a sufficient part of the surface of the said lands for the purpose of stacking, heaping, storing or depositing therein any produce of the mines or works carried on and any tools, equipment, earth and materials and substances dug or raised under the liberties and powers mentioned in this part."

The expression "said lands" in clause (7) of Part II of Form K quoted above refers to the area of the lease in Part I of Form K and, therefore, is confined to the leased area. Rule 16 of the MCD Rules, therefore, cannot be read to permit dumping of overburden and waste materials obtained from mining operations outside the leased area.

37. The learned counsel for the lessees, however, submitted that many of these areas in which they have dumped the overburdens, tailings and rejects are lands owned by them and by virtue of their ownership right they could dump the mining waste on their own lands. This contention of the learned counsel appearing for the lessees loses sight of the fact that most of these lands are located in forest areas where non-forest activity, such as

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mining, is prohibited under Section 2 of the Forest (Conservation) Act, 1980 without the prior permission of the Central Government. Moreover, the notification issued under sub-rule (3) of Rule 5 of the Environment (Protection) Rules, 1986 requiring prior environmental clearance covers the activity of mining. Sub-rule (3) of Rule 5 empowers the Central Government to impose prohibition or restrictions on the location of an industry or the carrying on of processes and operations in an area for the purpose of protecting the environment. Inasmuch as the activity of dumping mineral wastes will pollute the environment, it will come within the meaning of activity of mining included in the Schedule to the notification issued under sub-rule (3) of Rule 5 of the Environment (Protection) Rules, 1986. Thus, for dumping of mining waste on a private land, a prior clearance of the Central Government under the notification issued under sub-rule (3) of Rule 5 of the Environment (Protection) Rules, 1986 would be necessary. We, therefore, do not find any merit in the contention of the learned counsel for the lessees that they can dump mining waste outside the leased area.

Within what distance from the boundaries of National Parks and Wildlife Sanctuaries, is mining not permissible in the State of Goa?

38. The Justice Shah Commission has stated in its Report that the National Board for Wildlife (NBWL) adopted "the Wild Life Conservation

Strategy, 2002" and took a decision in its meeting held on 21-1-2002 under the chairmanship of the Prime Minister to notify the areas within 10 km from the boundaries of national parks and sanctuaries as eco-fragile zones under Section 3(*v*) of the Environment (Protection) Act and Rule 5 sub-rules (1)(*viii*) and (*x*) of the Environment (Protection) Rules and this decision has been communicated on 5-2-2002 to the Chief Wildlife Warden, Government of Goa and the State Government has been requested to list out such areas and furnish a detailed proposal for their notification as eco-sensitive areas under the Environment (Protection) Act, 1986. The Justice Shah Commission has found that this has not been done till date but the Government of Goa has allowed mines to operate.

39. In this context, the Justice Shah Commission Report has referred to the order dated 4-12-2006 of this Court in *Goa Foundation* v. *Union of India*[11] by which this Court had directed MoEF to refer to the Standing Committee of the National Board for Wildlife, under Sections 5-B and 5-C(2) of the Wild Life (Protection) Act, the cases in which environmental clearance has already been granted where activities are within 10 km zone. According to the Report of the Justice Shah Commission, in spite of the clear provisions of Section 3(2)(*v*) of the Environment (Protection) Act, 1986 and the EIA notifications, conferring the jurisdiction, power and authority on the Central Government (MoEF) to grant or refuse prior environment clearance for any iron ore mining activity within 10 km of national parks, sanctuaries and protected areas and despite provisions in Section 5-C(2)(*b*) of the Wild Life (Protection) Act, 1972 putting a restriction on mining activities inside national parks, sanctuaries and other protected and eco-sensitive areas, mining activities have been permitted within 10 km and inside the national parks, sanctuaries and protected areas.

40. The Report of the Justice Shah Commission further states that out of the environmental clearances, the clearances with regard to 74 mining leases should have been placed before the Standing Committee of the National Board for Wildlife in accordance with the order dated 4-12-2006[11] of this Court. The Report of the Justice Shah Commission further states that there has been a total failure on the part of MoEF in not considering this issue while granting the environmental clearances.

41. The Justice Shah Commission in its Report has further stated that in the order dated 4-8-2006 of this Court in *T.N. Godavarman Thirumulpad* v. *Union of India*[14], this Court has taken a view that 1 km from the boundaries of national parks and sanctuaries

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would be a safety zone, subject to the orders that may be made in IA No. 1000 regarding Jamua Ramgarh Sanctuary and the State will not grant any temporary working permit (TWP) in these safety zones comprising 1 km from the boundaries of national parks and sanctuaries and yet some of the mines within 1 km from the boundaries of national parks and sanctuaries have been allowed in the State of Goa.

42. CEC in its report is of the view that had MoEF implemented this Court's orders dated 14-2-2000[15] and 4-12-2006[13], the unregulated and environmentally unsustainable manner in which mining has taken place in Goa would have been avoided. CEC has suggested that all environmental clearances granted for mining leases located up to a distance of 10 km from the boundaries of national parks and wildlife sanctuaries should be directed to be kept in abeyance and the environmental clearances should be directed to be considered by the Standing Committee of the National Board for Wildlife in accordance with this Court's order dated 4-12-2006[13] and the Additional Principal Chief Conservator of Forests, Regional Office, MoEF, Bangalore, should be directed to verify, after examining the EIA/EMP reports and other relevant details, whether the mining operations will have adverse impact on the flora, fauna and wildlife habitat and whether the distance of the national parks/wildlife sanctuaries and that the status of the "forest" have been correctly stated in the EC/application for taking a decision regarding ECs and only after considering the recommendations of the Standing Committee of the National Board of Wildlife and the report of the Additional Principal Chief Conservator of Forests (Central) and other relevant information/details, this Court may take a decision.

43. Mr Prashant Bhushan, learned counsel appearing for Goa Foundation, submitted that there should be no mining activity within any national parks/wildlife sanctuaries or within 10 km from the boundaries of national parks and wildlife sanctuaries so that the flora, fauna and wildlife habitat of national parks and wildlife sanctuaries are protected.

44. The learned counsel for the lessees, on the other hand, stated that so far as the State of Goa is concerned, on the one side, there is a coastal regulation zone in which mining is not permitted and, on the other side, are the national parks and wildlife sanctuaries in which again mining is not permitted and as a consequence a very small strip of land is available for mining. They submitted that there is no basis for presuming that an area outside the limits of a national park or a wildlife sanctuary is required to be maintained as a buffer zone. They submitted that by the order dated 4-12-2006 of this Court passed in *Goa Foundation* v. *Union of India*[13], this Court did not finally fix the buffer zone of 10 km from the boundaries of national parks and wildlife sanctuaries, but granted a last opportunity to the States to submit their recommendations for eco-sensitive zone and that the issue is still pending in IA No. 1000 in Writ Petition No. 202 of 1995 in *T.N. Godavarman Thirumulpad* v. *Union of India*. They further argued that by the order dated 4-8-2006[14], this Court had only directed that no mining would be permitted by temporary working permits within 1 km from the national parks and wildlife sanctuaries and by the said order, absolute ban has not been imposed against mining even within 1 km from the boundaries of national

parks and wildlife sanctuaries. They argued that for declaration of eco-sensitive zone, a notification under Section 3 of the Environment (Protection) Act, 1986 is mandatory and till date no such notification has been issued for the State of Goa delineating any eco-sensitive zone and in the absence of such a notification mining activities cannot be

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prohibited beyond the boundaries of a national park/wildlife sanctuary.

45. Mr Nadkarni, learned Advocate General appearing for the State of Goa, submitted that presently the State of Goa is not permitting mining inside any national park or wildlife sanctuary. He submitted that each of the seven wildlife sanctuaries in the State of Goa have got revenue villages and local habitation of people inside the sanctuaries and before notifying the buffer zone around a wildlife sanctuary the consequences of the restrictions of the buffer zone on the local population and on the local development have to be weighed. He submitted that the State Government is of the considered opinion that while evolving a conservation strategy, the following peculiar local constraints in the State of Goa have to be considered:

(*i*) The State of Goa is the third smallest State in the Union; with a total geographical area of only 3702 sq m; and out of that, an area of 1440 sq m is under "forest" (protected/reserved/private) which is almost about 38% of the total geographical area;

(*ii*) Out of the said area under "forest" nearly 62% i.e. 75.35 sq m has been declared as "national park", and/or "wildlife sanctuary";

(*iii*) An area of approximately or more than 70 sq km falls under the "coastal regulation zone" (CRZ). Indeed, CRZ runs into 106 km, of the coastal belt of the State of Goa;

(*iv*) In fact, the total land mass available to the State of Goa, free from various restrictions, would further be reduced by 196.80 sq km i.e. up to 5.32%, on account of rivers, lakes and other water bodies;

(*v*) Indeed, approximately 40% of the land is under agriculture which the Government has decided not to be diverted under any circumstances;

(*vi*) Further, the State Government has also directed that no "forest land" is to be diverted for any mining purpose.

He submitted that considering all these constraints, the State Government has recommended that an area up to 1 km from the boundaries of national parks/wildlife sanctuaries should be treated as safety zones but even in these safety zones mining activity should be prohibited in a phased manner in 5 to 10 years.

46. Mr Mohan Parasaran, learned Solicitor General, submitted that the Principal Chief Conservator of Forests and Chief Wildlife Warden, Government of Goa, vide his letter dated 2-5-2013 has submitted six proposals for declaration of eco-sensitive zones around six protected areas in the State of Goa (national parks/wildlife sanctuaries) and the proposals were referred to a committee constituted under the chairmanship of Dr Rajesh Gopal, Additional Director General of Forests and Member Secretary of National Tiger Conservation Authority, with the following terms of reference:

(*i*) The Committee will undertake a site-specific site survey of all six protected areas in Goa, with reference to studying the topography and report on the existing natural boundaries around that is outside each protected area. Such boundaries could include inter alia rivers, hills, etc.

(*ii*) The Committee will draw up a definition of what could constitute a credible natural boundary, always keeping in mind that the object is to protect the flora, fauna and biodiversity in the PA from biotic pressure.

(*iii*) The Committee will submit its views on whether any of the natural boundaries of the PAs in Goa could be an effective boundary of a robust eco-sensitive zone around the PA.

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Mr Parasaran submitted that the Committee has submitted its report on 18-10-2013 and the report has been considered by the Ministry of Environment and Forests and by Office Memorandum dated 24-10-2013, the Ministry of Environment and Forests has not accepted the recommendation of the Government of Goa regarding buffer zone and instead accepted the recommendation of the Committee to define the eco-sensitive zones in site-specific manner subject to the relevant Court orders on the subject and that a draft notification defining eco-sensitive zones around each of the six protected areas would be issued for stakeholder consultations.

47. We have considered the submissions of the learned counsel for the parties and we find that presently no mining operations are being carried on inside any national park or wildlife sanctuary, and the State of Goa has taken a stand before us that it will not permit any mining operations inside any national park or wildlife sanctuary. Hence, the only question that we have to decide is whether mining could have been permitted or could be permitted within a certain distance from the boundaries of the national park or wildlife sanctuary in the State of Goa.

48. This Court in exercise of its power under Article 32 of the Constitution can direct the State to prohibit mining activities in an area adjacent to a national park or a wildlife sanctuary for the purpose of protecting the flora, fauna and wildlife habitat of the national park/wildlife sanctuary because these constitute part of the natural environment necessary for healthy life of persons living in the State of Goa. The right to life under Article 21 of the Constitution is a guarantee against the State and for enforcing this fundamental right of persons the State, which alone has a right to grant mining leases of the mines located inside the State, can be directed by the Court by an appropriate writ or direction not to grant mining leases or not to allow mining that will be violative under Article 21 of the Constitution. *Noida Memorial Complex near Okhla Bird Sanctuary, In re*[15] a three-Judge Bench (Forest Bench) of this Court has observed: (SCC pp. 776-77, para 74)

> "*74.* ... Environment is one of the facets of the right to life guaranteed under Article 21 of the Constitution. Environment is, therefore, a matter directly under the Constitution and if the Court

perceives any project or activity as harmful or injurious to the environment it would feel obliged to step in."

Thus, the submissions of the learned counsel for the lessees that until a notification is issued under the Environment (Protection) Act, 1986 and the Rules made thereunder prohibiting mining activities in an area outside the boundaries of a national park/wildlife sanctuary, no mining can be prohibited by this Court is misconceived.

49. We may now examine whether this Court has by the orders passed on 4-8-2006[14] and 4-12-2006[13], prohibited mining activities around national parks or wildlife sanctuaries. When we read the order of this Court passed on 4-8-2006 in *T.N. Godavarman Thirumulpad* v. *Union of India*[14], we find that the Court while considering the question of grant of temporary working permits for mining activities in national parks, sanctuaries and forest areas, directed that temporary working permits shall be granted only where the conditions stipulated in the said order are satisfied. Conditions (*ii*) and (*iii*) stipulated in the order dated 4-8-2006[14] are extracted hereinbelow: (SCC p. 743, para 19)

> "*19.* ... (*ii*) The mine is not located inside any national park/sanctuary notified under Sections 18, 26-A or 35 of the Wild Life (Protection) Act, 1972;
>
> (*iii*) The grant of TWP would not result in any mining activity within the safety zone around such areas referred to in (*ii*) above (as an interim measure, one kilometre safety zone shall be maintained subject to the orders that may be made in IA No. 1000 regarding Jamua Ramgarh Sanctuary);"

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It would, thus, be clear that this Court was of the opinion that grant of temporary working permits should not result in any mining activities within the safety zones around a national park or wildlife sanctuary and as an interim measure, one kilometre safety zone was to be maintained subject to the orders that may be made in IA No. 1000 in Jamua Ramgarh Sanctuary. This order dated 4-8-2006[14] has not been varied subsequently nor any orders made in IA No. 1000 regarding Jamua Ramgarh Sanctuary saying that temporary working permits can be granted within one kilometre safety zone beyond the boundaries of a national park or wildlife sanctuary. The result is that the order passed by this Court saying that there will be no mining activity within one kilometre safety zone around national park or wildlife sanctuary has to be enforced and there can be no mining activities within this area of one kilometre from the boundaries of national parks and wildlife sanctuaries in the State of Goa.

50. When, however, we read the order dated 4-12-2006 of this Court in *Goa Foundation* v. *Union of India*[13], we find that the Court has not prohibited any mining activity within 10 kilometre distance from the boundaries of the

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national parks or wildlife sanctuaries. The relevant portion of the order dated 4-12-2006[13] is quoted hereinbelow: (SCC pp. 792-93, paras 4-5)

> "*4.* The Ministry is directed to give a final opportunity to all States/Union Territories to respond to its Letter dated 27-5-2005. The State of Goa also is permitted to give appropriate proposal in addition to what is said to have already been sent to the Central Government. The communication sent to the States/Union Territories shall make it clear that if the proposals are not sent even now within a period of four weeks of receipt of the communication from the Ministry, this Court may have to consider passing orders for implementation of the decision that was taken on 21-1-2002, namely, notification of the areas within 10 km of the boundaries of the sanctuaries and national parks as eco-sensitive areas with a view to conserve the forest, wildlife and environment and having regard to the precautionary principles. If the States/Union Territories now fail to respond, they would do so at their own risk and peril.
>
> *5.* MoEF would also refer to the Standing Committee of the National Board for Wildlife, under Sections 5-B and 5-C(2) of the Wild Life (Protection) Act, the cases where environment clearance has already been granted where activities are within 10 km zone."

It will be clear from the order dated 4-12-2006[13] of this Court that this Court has not passed any orders for implementation of the decision taken on 21-1-2002 to notify areas within 10 km of the boundaries of national parks or wildlife sanctuaries as eco-sensitive areas with a view to conserve the forest, wildlife and environment. By the order dated 4-12-2006[13] of this Court, however, the Ministry of Environment and Forests, Government of India, was directed to give a final opportunity to all States/Union Territories to respond to the proposal and also to refer to the Standing Committee of the National Board for Wildlife the cases in which environment clearance has already been granted in respect of activities within the 10 km zone from the boundaries of the wildlife sanctuaries and national parks. There is, therefore, no direction, interim or final, of this Court prohibiting mining activities within 10 km of the boundaries of national parks or wildlife sanctuaries.

51. Apart from the powers of the Court to give a direction prohibiting mining activities up to a certain distance from the boundaries of national parks or wildlife sanctuaries, the Central Government has powers under Rule 5 of the Environment (Protection) Rules, 1986 to prohibit carrying on of mining operations in areas which are proximate to a wildlife sanctuary or a national park. Rule 5 of the Environment (Protection) Rules, 1986 is extracted hereinunder:

> "**5. *Prohibitions and restrictions on the location of industries and the***

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carrying on processes and operations in different areas.—(1) The Central Government may take into consideration the following factors while prohibiting or restricting the location of industries and carrying on of processes and operations in different areas—

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(*i*) Standards for quality of environment in its various aspects laid down for an area.

(*ii*) The maximum allowable limits of concentration of various environment pollutants (including noise) for an area.

(*iii*) The likely emission or discharge of environmental pollutants from an industry, process or operation proposed to be prohibited or restricted.

(*iv*) The topographic and climatic features of an area.

(*v*) The biological diversity of the area which, in the opinion of the Central Government, needs to be preserved.

(*vi*) Environmentally compatible land use.

(*vii*) Net adverse environmental impact likely to be caused by an industry, process or operation proposed to be prohibited or restricted.

(*viii*) Proximity to a protected area under the Ancient Monuments and Archaeological Sites and Remains Act, 1958 or a sanctuary, national park, game reserve or closed area notified as such under the Wild Life (Protection) Act, 1972, or places protected under any treaty, agreement or convention with any other country or countries or in pursuance of any decision made in any international conference, association or other body.

(*ix*) Proximity to human settlements.

(*x*) Any other factors as may be considered by the Central Government to be relevant to the protection of the environment in an area.

(2) While prohibiting or restricting the location of industries and carrying on of processes and operations in an area, the Central Government shall follow the procedure hereinafter laid down.

(3)(*a*) Whenever it appears to the Central Government that it is expedient to impose prohibition or restrictions on the location of an industry or the carrying on of processes and operations in an area, it may by notification in the Official Gazette and in such other manner as the Central Government may deem necessary from time to time, give notice of its intention to do so.

(*b*) Every notification under clause (*a*) shall give a brief description of the area, the industries, operations, processes in that area about which such notification pertains and also specify the reasons for the imposition of prohibition or restrictions on the location of the industries and carrying on of processes or operations in that area.

(*c*) Any person interested in filing an objection against the imposition of prohibition or restriction on carrying on of processes or operations as notified under clause (*a*) may do so in writing to the Central Government within sixty days from the date of publication of the notification in the Official Gazette.

(*d*) The Central Government shall, within a period of one hundred and twenty days from the date of publication of the notification in the Official Gazette, consider all the objections received against such notification and may within one hundred and eighty days from such day of publication impose prohibition or restrictions on location of such industries and the carrying on of any process or operation in an area.

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(4) Notwithstanding anything contained in sub-rule (3), whenever it appears to the Central Government that it is in public interest to do so, it may dispense with the requirement of notice under clause (*a*) of sub-rule (3)."

52. Sub-rule (1) of Rule 5 lists the number of factors, which the Central Government has to take into consideration while prohibiting or restricting the carrying on of processes and operations in different areas. Sub-rule (2) of Rule 5 provides that before prohibiting the processes and operations in the area the Central Government has to follow the procedure laid down in sub-rule (3). The procedure in sub-rule (3) of Rule 5 of the Environment (Protection) Rules, 1986 includes giving notice of the intention of the Central Government to prohibit the carrying on of processes and operations in the reserved area, giving brief description of the area, the operations and processes in that area relating to which the notification pertains and also specifying the reasons for the imposition of the prohibition on carrying on of the processes or operations in that area, and an opportunity to the persons interested in filing an objection against the imposition of such prohibition on carrying on of processes or operations by the Central Government. These procedural checks have been made in Rule 5 because a notification issued by the Central Government prohibiting an operation or a process will have serious consequences on the rights of different persons. For example, persons who are carrying on the process or operation and those who are directly or indirectly employed in the process or the operation may be affected by the proposed prohibition of the process or the operation in the entire area. Therefore until the Central Government takes into account various factors mentioned in sub-rule (1), follows the procedure laid down in sub-rule (3) and issues a notification under Rule 5 prohibiting mining operations in a certain area, there can be no prohibition under law to carry on mining activity beyond 1 km of the boundaries of national parks or wildlife sanctuaries.

53. In fact, we find that the process of issuing a notification under Rule 5 of the Environment (Protection) Rules, 1986 prohibiting mining activities in eco-sensitive zones around the national parks or wildlife sanctuaries in the State of Goa has now been initiated. The Government of Goa vide Letter dated 2-5-2013 submitted the following six proposals for declaration of eco-sensitive zones around protected areas in the State of Goa to the Ministry: (*i*) Cotigao Wildlife Sanctuary; (*ii*) Netravali Wildlife Sanctuary; (*iii*) Bhagwan Mahaveer Wildlife Sanctuary and Bhagwan Mahaveer National Park; (*iv*) Madei Wildlife Sanctuary; (*v*) Bondla Wildlife Sanctuary; and (*vi*) Dr Salim Ali Bird Sanctuary. These six proposals were referred to a committee constituted under the chairmanship of Dr Rajesh Gopal, Additional Director General of Forests and Member-Secretary of National Tiger Conservation Authority, with specified terms of reference and the Committee gave its findings and the Ministry of Environment and Forests, Government of India by the Office Memorandum dated 24-10-2013 have accepted the findings of the Committee and rejected the proposals of the Government of Goa. It is also stated in the Office Memorandum dated 24-10-2013 of the Ministry of

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Environment and Forests, Government of India that a draft notification defining eco-sensitive zones around each protected area is being issued for stakeholder consultations. This notification will have to be issued under sub-rule (3) of Rule 5 of the Environment (Protection) Rules, 1986, and after objections are received, the Central Government will have to consider the same and thereafter take the decision regarding imposition of prohibition of mining activities in the eco-sensitive areas within the period stipulated in

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sub-rule 3(*b*) of Rule 5 of the Environment (Protection) Rules, 1986. At this stage, we can only direct the Ministry of Environment and Forests to follow the procedure and issue the notification of eco-sensitive zones under Rule 5 of the Environment (Protection) Rules, 1986 within six months.

Whether there has been a violation of Rules 37 and 38 of the MC Rules by the mining lessees in the State of Goa?

54. The Justice Shah Commission has found in its Report that in the State of Goa, 16 companies/firms/individuals are carrying out mining operations under different leases granted to them as a single unit as if the leases are amalgamated. The Shah Commission has referred to Rule 38 of the MC Rules which provides that the State Government may, in the interest of mineral development and with reasons to be recorded in writing, permit amalgamation of two or more adjoining leases held by a lessee provided that the period of amalgamated leases shall be co-terminus with the lease whose period will expire first. The Justice Shah Commission is of the opinion that as amalgamation of two leases can only be permitted by the State Government for reasons to be recorded in writing, and no such permission has been taken from the State Government for the amalgamation of different leases as a single unit, the lessees who are operating different leases as a single unit have violated Rule 38 of the MC Rules.

55. CEC in its report, however, has not stated about any violation of Rule 38 of the MC Rules and has instead stated that Rule 37 of the MC Rules which provides that the lessee shall not, without the previous consent in writing of the State Government assign, sub-let, mortgage, or in any other manner, transfer the mining lease, or any right, title or interest therein, has been violated by several lessees. CEC has reported that there are several complaints received by the State Government that the leases have been operated by the persons other than the lessees. CEC has observed in its report that Rule 37 itself provides that in such cases of violation of Rule 37, the State Government may determine the mining lease, but the State Government has taken no action and has taken a stand that working of the mining leases by a person other than lease-holder is a prevailing mining practice in Goa and these facts are in the knowledge of the Government. Mr Prashant Bhushan, learned counsel for Goa Foundation, submitted that in all these cases the violation should be identified by a committee headed by the Chief Secretary, Goa, and those lessees who have been found to have violated Rule 37 of the MC Rules, should be penalised by determination of the leases.

56. Rules 37 and 38 of the MC Rules are extracted hereinbelow:

"**37.** ***Transfer of lease.***—(1) The lessee shall not, without the previous consent in writing of the State Government and in the case of mining lease in respect of any mineral specified in Part A and Part B of the First Schedule to the Act, without the previous approval of the Central Government:

(*a*) assign, sub-let, mortgage, or in any other manner, transfer the mining lease, or any right, title or interest therein, or

(*b*) enter into or make any bona fide arrangement, contract, or understanding whereby the lessee will or may be directly or indirectly financed to a substantial extent by, or under which the lessee's operations or undertakings will or may be substantially controlled by, any person or body of persons other than the lessee:

Provided further that where the mortgagee is an institution or a Bank or a Corporation specified in Schedule V, it shall not be necessary for the lessee to obtain any such consent of the State Government.

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(1-A) The State Government shall not give its consent to transfer of mining lease unless the transferee has accepted all the conditions and liabilities which the transferor was having in respect of such mining lease.

(2) Without prejudice to the provisions of sub-rule (1) the lessee may, subject to the conditions specified in the proviso to Rule 35, transfer his lease or any right, title or interest therein to a person who has filed an affidavit stating that he has filed an up-to-date income tax return, paid the income tax assessed on him and paid the income tax on the basis of self-assessment as provided in the Income Tax Act, 1961 (43 of 1961), on payment of a fee of five hundred rupees to the State Government:

Provided that the lessee shall make available to the transferee the original or certified copies of all plans of abandoned workings in the area and in a belt 65 metres wide surrounding it:

Provided further that where the mortgagee is an institution or a Bank or a Corporation specified in Schedule V, it shall not be necessary for any such institution or Bank or Corporation to meet with the requirement relating to income tax:

Provided further that the lessee shall not charge or accept from the transferee any premium in addition to the sum spent by him, in obtaining the lease, and for conducting all or any of the operations referred to in Rule 30 in or over the land leased to him;

(3) The State Government may, by order in writing determine any lease at any time if the lessee has, in the opinion of the State Government, committed a breach of any of the provisions of sub-rule (1) or sub-rule (1-A) or has transferred any lease or any right, title, or interest therein otherwise than in accordance with sub-rule (2):

Provided that no such order shall be made without giving the lessee a reasonable opportunity of stating his case.

38. ***Amalgamation of leases***.—The State Government may, in the interest of mineral development and with reasons to be recorded in writing, permit amalgamation of two or more adjoining leases held by a lessee:

Provided that the period of amalgamated leases shall be co-terminus with the lease whose period will expire first:

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Provided further that prior approval of the Central Government shall be required for such amalgamation in respect of leases for minerals specified in Part A and Part B of the First Schedule to the Act."

57. It will be clear from sub-rule (1)(*a*) of Rule 37 that the lessee cannot assign, sub-let, mortgage, or in any other manner, transfer the mining lease, or any right, title or interest therein, without the previous consent in writing of the State Government in the case of those minerals which are not specified in Part A and Part B of the First Schedule to the Act. Since iron ore is specified in Part C of the First Schedule to the Act, the previous consent in writing of the State Government is necessary before any such transfer is made by a mining lessee. Sub-rule (1-A) of Rule 37 further states that the State Government shall not give its consent to transfer of a mining lease unless the transferee has accepted all the conditions and liabilities which the transferor was having in respect of such mining lease. Sub-rule (3) of Rule 37 further provides that the State Government may, by order in writing determine any lease at any time if the lessee has, in the opinion of the State Government committed a breach of any of the provisions of sub-rule (1) or sub-rule (1-A) of Rule 37 of the MC Rules. These provisions have been made in Rule 37 to ensure that all the conditions and liabilities to which a lessee is subjected to under a mining lease are also accepted by the transferee.

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58. Sub-rule (2) of Rule 37 further provides that without prejudice to the provisions of sub-rule (1), the lessee may transfer his lease or any right, title or interest therein to a person who has filed an affidavit stating that he has filed up-to-date income tax returns, paid the income tax assessed on him and paid the income tax on the basis of self-assessment as provided in the Income Tax Act, 1961. This provision is meant to ensure that the transferee of a mining lease is an income tax assessee and is paying his income tax assessed on him and due from him on the basis of self-assessment.

59. Sub-rule (3) of Rule 37 empowers the State Government to determine any lease at any time if the lessee has, in the opinion of the State Government, committed a breach of any of the provisions of sub-rule (1) or sub-rule (1-A) or has transferred any lease or any right, title, or interest therein otherwise than in accordance with sub-rule (2) after giving the lessee a reasonable opportunity of stating his case.

60. The intent of the rule-making authority in making these provisions in Rule 37 is that the liabilities and conditions in a mining lease are also enforceable against the transferee and that the transferee pays his dues towards income tax regularly. Rule 37, therefore, cannot be allowed to be violated by the lessees with impunity and the State Government cannot overlook transfers by saying that the transfers of the mining leases are part of the mining practice in the State of Goa. In our view, if these violations of Rule 37 are allowed, there shall be substantial leakage of revenue and mining operations cannot be effectively regulated and controlled by the State Government. The State Government, therefore, must initiate action against those mining leases who violate Rule 37 of the Rules.

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61. Rule 38 of the MC Rules provides that the State Government may, in the interest of mineral development and with reasons to be recorded in writing, permit amalgamation of two or more adjoining leases held by a lessee, provided that the period of amalgamated leases shall be co-terminus with the lease whose period will expire first. If the State Government has not permitted amalgamation of adjoining leases in the interest of mineral development and has not recorded the reasons for such permission, the State Government cannot allow the amalgamation of the leases.

Was there a complete lack of control on production and transportation of mineral from the mining leases in the State of Goa?

62. CEC in its report has stated that in the State of Goa, there is no system of periodic verification of the quantity of iron ore produced in the mining leases, the payments of royalty, the permits issued for transportation of mineral by the Mining Department, the transit permits issued by the Forest Department nor any reconciliation of the quantity of the mineral stated to have been produced in the mining lease with the quantity of the mineral for which royalty has been paid and transit permits have been issued, and there is no verification of the transit permits at the check posts and no verification of the quantity of the mineral exported/domestically used vis-à-vis the quantity legally produced. According to CEC, in the absence of such checks/verifications/controls, illegal mining can easily be undertaken and the actual quantity of iron ore produced and transported from the mining leases may not be accounted for by the State of Goa or by the lessees, resulting in leakage of revenue. CEC in its report has given a chart to show the difference of figures in the iron ore exported as provided by the Goan Mineral Ore Exporters' Association and the total iron ore produced in the State of Goa as per reports compiled by the Indian Bureau of Mines, which is extracted hereinbelow:

Year	*Goan Iron Ore Exports*	*Total production*	*(in lakh MT) Excess of exports*

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			over production
2006-2007	308.940	277.931	31.009
2007-2008	334.334	300.091	34.253
2008-2009	380.752	315.994	64.758
2009-2010	456.869	331.649	125.22
2010-2011	468.464	328.059	140.405
Total	*1949.359*	*1553.724*	*395.645*

According to CEC, there is every reason to believe that the excess quantity of 395.645 lakh MT, as shown in the aforesaid chart, is illegally mined ore.

63. We entirely agree with the CEC report that in the absence of proper checks, verifications and controls, there is bound to be illegal mining, storage and transportation of minerals, but we find that after the CEC report, the Goa (Prevention of Illegal Mining, Storage and Transportation of Minerals) Rules,

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2013 have been framed by the State Government under Section 23-C of the MMDR Act. A reading of these Rules shows that several provisions have been made in these Rules to prevent illegal mining and to regulate the sale, export and transit of ore, storage of mineral and transportation and winning of mineral. The Rules also provide for establishment of check posts, barriers and weighbridges and inspection of minerals in transit. Moreover, these Rules empower any person authorised by the Government to enter, inspect, search and seize articles. These Rules will have to be strictly enforced by the State Government and we hope that by such strict enforcement of these Rules, the mining, storage and transportation of minerals in the State of Goa will get controlled and regulated and the leakages and evasion of revenue will, to a large extent, be prevented.

To what extent mining has damaged the environment in Goa and what measures are to be taken to ensure intergenerational equity and sustainable development?

64. Mr Prashant Bhushan, learned Senior Counsel appearing for Goa Foundation, relying on the Report of the Justice Shah Commission, submitted that substantial damage has been caused to the eco-sensitive zone in Goa by excavating large quantities of iron ore through mining and as suggested by the Justice Shah Commission action should be taken in this regard. He submitted that the conditions stipulated in the EIA clearances imposed by the Chief Wildlife Warden, Goa, have not been implemented. He submitted that the environmental clearance system has actually collapsed resulting in amassing of wealth by certain individuals and companies at the cost of the environment and the ecosystem. He submitted that principles of sustainable development and intergenerational equity which were part of the fundamental right under Article 21 of the Constitution, require that a cap should be put on the annual excavation of iron ore from different mines in the State of Goa, after taking into account the need to conserve iron ore resources for future generations and the carrying capacity of the State of Goa for mining and transportation of mineral ores.

65. The learned counsel appearing for the lessees, on the other hand, submitted that there are adequate provisions in the MCD Rules for preventing damage to the environment and for restoration of the environment. They referred to Rules 23-A, 23-B, 23-D and 23-E of the MCD Rules which relate to the mine closure plan which must provide for protective measures including reclamation and rehabilitation work. They submitted that the holder of the mining lease, therefore, has to take all the protective measures including reclamation and rehabilitation work before abandoning the mine. They submitted that Chapter V of the MCD Rules also contains various provisions which a holder of mining lease has to comply and these provisions include precautions for protection of environment and controlling of

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pollution while conducting mining operations in the area.

66. In reply to the submissions of Mr Bhushan that there should be a cap on the annual excavation of mineral ore in the State of Goa to ensure that

future generations are not denied the mineral resources, Mr Mukul Rohatgi, learned Senior Counsel appearing for Sesa Goa Ltd., relied on a publication of the British Geological Survey and submitted that there would never be any scarcity of mineral resources and there would be enough for the future generations. He submitted that Sesa Goa Ltd. has also taken steps to reclaim the land which was damaged through mining operation and produced photographs to show how reclamation and rehabilitation work has been done after mining was over in any area.

67. Mr N.S. Nadakarni, learned Advocate General for the State of Goa, submitted that in the Goa Mineral Policy of 2013, the State Government has proposed a capping of the mineral ores to be excavated annually in the State of Goa based on the carrying capacity of public roads and the need to protect intergenerational equity. He submitted that as per the Goa Mineral Policy of 2013, until the road capacity in Goa improves, there should be a gross capping at 45 MT per annum.

68. After considering the aforesaid submissions of the learned counsel for the parties, we took the view that a Committee of Experts must conduct a macro-EIA study and propose ceiling of the annual excavation of iron ore from the State of Goa, considering its iron ore resources and its carrying capacity and keeping in mind the principles of sustainable development and intergenerational equity and all other relevant factors. Accordingly, by orders dated 11-11-2013[5] and 18-11-2013[12], we constituted an Expert Committee comprising Prof. C.R. Babu (Ecologist), Dr S.C. Dhiman (Geologist/

Hydrogeologist), Prof. B.K. Mishra (Mineralogist), Prof. S. Parameswarappa (Forestry), Shri Parimal Rai (nominee of the Ministry of Environment and Forests, Government of India). This Expert Committee has submitted an interim report dated 14-3-2014. In this report, the Expert Committee has indicated that the economy of Goa depends on tourism and iron ore mining, besides agriculture, horticulture and minor industries, but in recent years, while there has been increase in the growth rate in tourism and mining, there has been a decline in the growth rate of agriculture and fishing.

69. The Expert Committee has in particular highlighted the damage that has been done by increase in the production of iron ore through mining to the environment in Goa in the following words:

> "The production of iron ore has jumped from 14.6 million tons in 1941 to 41.17 million tons in 2010-2011. In 1980s the production was about 10 MT per annum. The quantum jump in iron ore production in Goa was essentially due to steep rise in exports of fines and other low grade ore of 42% Fe content to China. This has led to massive negative impacts on all ecosystems leading to enhanced air, water, and soil pollution affecting quality of life across Goa. This is evident by three important reports i.e. (*i*) Areawise Environmental Quality Management (AEQM) Plan for the Mining belt of Goa by Tata Energy Research Institute, New Delhi and Goa (1997) and it was submitted to the Directorate of Planning, Statistics, and Evaluation, Government of Goa, (*ii*) Environmental and Social Performance Indicators and Sustainability Markers in Minerals Development Reporting Progress towards Improved Ecosystem Health and Human Well-being, Phase III by TERI and International Development Research Centre, Ottawa,

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Canada (2006) and (*iii*) the Regional Environmental Impact Study of Iron Ore Mining in Goa region sponsored by MoEF, New Delhi (2014) by Indian School of Mines. Besides the above three main reports, a number of scientific research papers on the impact of iron ore mining on the environment and ecology of diverse ecosystems were published by scientists working at Goa University and NIO.

These reports and publications substantiate that the mining, particularly the enhanced level of annual production contributed to adverse impacts on the ecological systems, socio-economics of Goa and health of people of Goa leading to loss of ecological integrity. This is due to enhanced levels of pollutants, particularly RSPM and SPM, sedimentation of materials from dumps and iron ore in rivers, estuaries and shallow depth (20 m) of sea water, agricultural fields, high concentration of Fe and Mn in surface waters and their bioaccumulation."

The Expert Committee has also studied the sustainability of iron ore mining in Goa and after analysing the existing data from TERI Report, 1997, ISM, Dhanbad Report, 2013, Pollution Control Board, Goa (Annual Report) and relevant literature relating to sustainability and after adopting the Folchi method has given the opinion that mining at the rate of 20 to 27.5 million

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tons per annum appears sustainable in the State of Goa. However, in its summary of recommendations, the Expert Committee has made these recommendations:

"*10*. To eliminate the element of subjectivity, due to the time constraints and limitation of available authentic time series data relating to mineral resources and environmental impact of mining in the State of Goa, this Committee suggests that mining be permitted to be carried out at the level of 20 million tons per annum with adequate monitoring of impacts on different ecological and environmental parameters, which will also help this Committee in its future appraisal.

11. Till the scientific study by this Committee is completed, which may take about 12 months more, the mining activity at levels as directed by the Hon'ble Supreme Court, be strictly monitored and regulated by the Department of Mines and Geology and the State Pollution Control Board of the State of Goa, in consultation with other statutory bodies such as Indian Bureau of Mines, Ministry of Environment and Forests (Government of India) and others."

It, thus, appears that the Expert Committee has suggested that for the time being annual excavation of 20 million tons of iron ore may be permitted in Goa with adequate monitoring impacts on different ecological and environmental parameters, which will also help the Expert Committee in its future appraisal. Regarding the authorities or agencies which should strictly monitor and regulate the mining activities in Goa, the Expert Committee has recommended that the Department of Mines and Geology of Government of Goa and the Goa State Pollution Control Board in consultation with other statutory bodies such as Indian Bureau of Mines, Ministry of Environment and Forests (Government of India) should carry on such monitoring and regulation strictly. The Expert Committee, however, has said nothing about how the mining dumps inside or outside the leased areas noticed by the Justice Shah Commission are to be dealt with presumably because in our order dated 11-11-2013[5] we had not issued any direction in this regard. We think that we should seek the opinion of the Expert Committee in this regard.

70. We find that the State Government has also engaged the services of NEERI for macro-level EIA study for clusters of iron ore mines in the State of Goa, but NEERI in its preliminary report has not recommended as to what should be the total quantum of annual production of iron ore in Goa in future. We also find that the Ministry of Environment and Forests, Government of India had entrusted the Indian School of Mines (ISM), Dhanbad to carry out a regional environment impact assessment study of mining in

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Goa region and ISM, Dhanbad has submitted its report proposing a cap of 24.995 MT per annum on the basis of the carrying capacity of the existing infrastructure of

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Goa. The relevant portion of the report of ISM, Dhanbad, is extracted hereinbelow:

"***20.7.4.7: Cluster-wise capping on transport***

The cap of 24.995 MTPA proposed in the aforementioned section is dependent primarily on the existing infrastructure and must be followed based on the spatial variations. To present an overall capacity of mining in North Goa and South Goa, the road capacity has been taken as a parameter. The capacity was arrived at 13.685 MTPA for North Goa and 11.31 MTPA for South Goa. The cap proposed will not include the mines lying within the buffer zones as these have imposed restriction of phasing out in time-bound period. Further, this cap can be represented into a cluster-wise scenario to decipher how much each cluster will be able to transport under the existing transport facilities. The values are presented in table below.

20.7.19: Cluster-wise capping on transport based on existing transport facilities

Cluster	*Routes*	*Capacity of the routes (MTPA)*	*Capacity of the cluster (MTPA)*
Adwalpal-Bicholim	Adwalpale to Sirsai Jetty	0.81	5.875
	Shrigao to Sirsai Jetty	1.26	
	Shrigao to Kalvin Jetty	1.16	
	Dahbdhaba to Sarmanas Jetty	2.645	
Velguem-Pissurlem	Sonshi to Amona Jetty	2.11	7.9
	Sanquelim to Amona Jetty	0.52	
	Honda to Navelim (Maina)	1.32	
	Sonshi to Khazan Jetty	1.32	
	Ambesi to Cotambi Jetty	1.29	
	Digneum to Surla Jetty	1.34	
Codli-Costi	Codli to Amona Jetty	1.94	4.69
	Codli to Capxem Jetty	1.24	
	Costi to Sanvordem	1.51	
Collem	Collem to Amona Jetty	1.94	2.76
	Shigao to Sanvordem	0.82	
Tollem	Tollem to Shelvona Jetty	1.71	1.71
Maina-Sulcorna	Sulcorna to Shelvona Jetty	1.02	2.06

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	Maina to Shelvona	1.04	
Total capacity of the region			24.995

Thus, the cumulative ore transportation capacity of the existing road networks is 24.995 MTPA."

71. We, therefore, find that the Expert Committee as well as ISM, Dhanbad, after considering the available data and after considering the adverse impact on environment and the limited carrying capacity of the transport system in Goa, are of the opinion that a cap between 20 to 27.5 million tons per annum should be fixed for excavation of iron ore in the State of Goa. In its recommendations, however, the Expert Committee has suggested that till the scientific study by the Expert Committee is completed in about 12 months or so, and more of data including impacts on different ecological environmental parameters is available through monitoring of the impacts by different agencies including the Goa State Pollution Control Board, 20 million tons per annum should be fixed as the annual excavation of iron ore in Goa. Even this mining of 20 million tons per annum in the State of Goa, according to the Expert Committee, has to be strictly monitored and regulated by the Department of Mines and Geology, Government of Goa and the Goa State Pollution Control Board in consultation with other statutory bodies such as the Indian Bureau of Mines, the Ministry of Environment and Forests (Government of India) and others. It was the responsibility of the Government of Goa, Department of Mines, to enforce the provisions of the MMDR Act, the MC Rules and the MCD Rules, but as we have already noticed, this responsibility was not properly discharged. We hope that in future, it will enforce the provisions of the MMDR Act, the MC Rules, the MCD Rules and the Goa (Prevention of Illegal Mining, Storage and Transportation of Minerals) Rules, 2013.

72. The Goa State Pollution Control Board has immense powers under the Water (Prevention and Control of Pollution) Act, 1974 (for short "the 1974 Act") to prevent pollution of water. Section 33-A of the 1974 Act which confers on the State Pollution Control Board the power to give directions is quoted hereinbelow:

> "**33-A.** ***Power to give directions***.—Notwithstanding anything contained in any other law, but subject to the provisions of this Act, and to any directions that the Central Government may give in this behalf, a Board may, in the exercise of its powers and performance of its functions under this Act, issue any directions in writing to any person, officer or authority, and such person, officer or authority shall be bound to comply with such directions.
>
> *Explanation*.—For the avoidance of doubts, it is hereby declared that the power to issue directions under this section includes the power to direct—
>
> (*a*) the closure, prohibition or regulation of any industry, operation or process; or
>
> (*b*) the stoppage or regulation of supply of electricity, water or any other service."

73. Similarly, the Air (Prevention and Control of Pollution) Act, 1981 (for short "the 1981 Act") confers immense powers on the State Pollution Control Board to prevent air pollution. Section 31-A of the 1981 Act which

confers powers on the State Pollution Control Board to give directions is quoted hereinbelow:

> "**31-A.** ***Power to give directions***.—Notwithstanding anything contained in any

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other law, but subject to the provisions of this Act, and to any directions that the Central Government may give in this behalf a Board may, in the exercise of its powers and performance of its functions under this Act, issue any directions in writing to any person, officer or authority, and such person, officer or authority shall be bound to comply with such directions.

Explanation.—For the avoidance of doubts, it is hereby declared that the power to issue directions under this section includes the power to direct—

(*a*) the closure, prohibition or regulation of any industry, operation or process; or

(*b*) the stoppage or regulation of supply of electricity, water or any other service."

74. It will be clear from the aforesaid provisions of Section 33-A of the 1974 Act and Section 31-A of the 1981 Act that the Goa State Pollution Control Board had powers to issue any direction including the power to close, prohibit or regulate mining operations or even to stop or regulate supply of electricity, water or any other service with a view to prevent water pollution or air pollution. Yet, from the report of the Expert Committee as well as the reports of ISM, Dhanbad and NEERI, it is clear that iron ore production in Goa has led to massive negative impacts on all ecosystems leading to enhanced air, water and soil pollution affecting quality of life across Goa. The Goa State Pollution Control Board in its note filed in Writ Petition (C) No. 435 of 2012, however, states:

"*Details of monitoring of water quality (with regards to mining leases) from 2007 to 2012* — The Board conducts inspections during the monsoon and other seasons also to verify the discharge of surface runoff/discharge from the pit outside the mining lease and also collects samples for analysing in the Board Laboratory. Wherever the parameters exceed the prescribed limits necessary directions are issued to the mining units to take remedial measures for controlling the waste water being discharged into the water bodies/fields without treatment. Directions are also issued to provide settling ponds, arrestor walls, filter beds so as to ensure that no untreated waste water is discharged into the water bodies/fields.

Details of monitoring of air quality (with regards to mining leases) from 2007 to 2012 — The Board is presently carrying out the periodic monitoring of Air Quality in pre-selected areas throughout the State to comply with one of the mandates of the Central Pollution Control Board (CPCB) under National Ambient Monitoring Programme (NAMP) at 16 stations."

75. We do not agree with Mr Arvind Datar, learned Senior Counsel for the Goa State Pollution Control Board, that sincere efforts were made by the

Pollution Control Board to monitor the water quality and air quality in the mining areas. Rather, it appears that the Goa State Pollution Control Board, though conferred with immense statutory powers, has failed to discharge its statutory functions and duties. We hope that in future the Goa State Pollution Control Board exercises strict vigil and monitors the water quality and air quality in accordance with the provisions of the two Acts and if necessary, exercises the powers conferred on it to close down mining operation of a lessee, if the lessee does not conform to the air emission and water discharge standards while carrying on mining operations and does not take other preventive measures as directed by the State Pollution Control Board.

76. Regarding the regulation by the Ministry of Environment and Forests, in our order dated 6-1-2014 passed in *T.N. Godavarman Thirumulpad* v. *Union of India*[18], we have already directed the Union of India to appoint a Regulator with offices in as many States as possible under sub-section (3) of Section 3 of the Environment (Protection) Act, 1986 as directed in the order in *Lafarge Umiam Mining (P) Ltd.*[19] As and when the Union of India appoints a Regulator under sub-section (3) of Section 3 of the Environment (Protection)

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Act, 1986 with an office for Goa in compliance with the aforesaid direction of this Court, the Regulator so appointed will carry out its functions in accordance with the order passed under sub-section (3) of Section 3 of the Environment (Protection) Act, 1986.

77. The regulatory and monitoring measures enforced by the Departments of Mines and Geology, the Goa State Pollution Control Board and the Regulator appointed by the Central Government under sub-section (3) of Section 3 of the Environment (Protection) Act, 1986 cannot, however, restore entirely the environment that is damaged in course of mining operations. The Expert Committee has, therefore, recommended that a permanent fund for intergenerational equity and sustainability of mining for all times to come named as "Goan Iron Ore Permanent Fund" be created and an expert group may be constituted by the State for working out the details of this fund. Mr Harish Salve, learned Amicus Curiae, submitted that as the lessees of mining leases earn out of the sale proceeds of the iron ore excavated by them, they should be directed to contribute 10% of the sale proceeds of all iron ore excavated in the State of Goa and sold by them towards the Goan Iron Ore Permanent Fund. He cited the judgment of this Court in *Samaj Parivartana Samudaya* v. *State of Karnataka*[11] in which this Court has similarly directed for creation of a Special Purpose Vehicle out of 10% of the sale proceeds of the ore sold by e-auction. There is a lot of force in the aforesaid submission of Mr Salve.

78. We find from the report of the Expert Committee that the State of Goa heavily depends on iron ore mining for revenue as well as employment.

The legislative policy behind the MMDR Act made by Parliament is mineral development through mining. The State Government of Goa has also adopted the executive policy to encourage mining of minerals in Goa. Moreover, as Mr Ravi Shankar Prasad, learned Senior Counsel appearing for 33 Panchayats, has submitted about 1.5 lakh people are directly employed in mining in Goa and large number of persons have taken bank loans and purchased trucks for transportation of iron ore. Hence, people who earn their livelihood through work in connection with mining will be seriously affected if mining is totally banned to protect the environment. We cannot, therefore, prohibit mining altogether, but if mining has to continue, the lessees who benefit the most from mining, must contribute from their sale proceeds to the Goan Iron Ore Permanent Fund for sustainable mining. Accordingly, in exercise of our powers under Article 32 read with Article 21 of the Constitution, we direct that henceforth 10% of the sale proceeds of iron ore excavated in the State of Goa and sold by the lessees must be appropriated towards the Goan Iron Ore Permanent Fund for the purpose of sustainable development and intergenerational equity and the State of Goa in consultation with CEC will frame a comprehensive scheme in this regard and submit the same to this Court within six months.

Whether in future the mining leases are to be auctioned or have to be granted in accordance with the policy of the State and the provisions of the MMDR Act and the MC Rules?

79. Mr Prashant Bhushan, learned counsel for Goa Foundation, submitted that in Article 39(*b*) of the Constitution, it is provided that the ownership and control of the material resources of the community should be so distributed so as to best subserve the common good and, therefore, the State cannot distribute the material resource of the community in any way it likes. He submitted that in *Centre for Public Interest Litigation* v. *Union of India*[20], a two-Judge Bench of this Court has held relying on Article 39(*b*) of the Constitution that the State is the legal owner of the natural resources as a trustee of the people and although it is empowered to distribute the same, the process of distribution must be guided by the constitutional principles including the doctrine of equality and larger public good. He submitted that in the aforesaid case, the two-Judge Bench has further held that a duly publicised auction conducted fairly and impartially is perhaps the

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best method for discharging this burden and methods like "first-come-first-served" when used for alienation of natural resources/public property are likely to be misused by unscrupulous people who are only interested in garnering maximum financial benefit and have no respect for the constitutional ethos and values. He relied on the conclusion of the two-Judge Bench of this Court in the aforesaid case that while transferring or alienating the natural resources, the State is duty-bound to adopt the method of auction

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by giving wide publicity so that all eligible persons can participate in the process. He submitted that as the MMDR Act does not prohibit the State from holding auction of the mining leases, this Court should direct that in future the mining leases must be auctioned by the State Government.

80. The learned counsel for the lessees and the learned Advocate General, on the other hand, submitted that the MMDR Act and the MC Rules have made specific provisions regarding the manner in which the State is to grant mining leases and it is for the State to take decisions on grant of mining leases in accordance with the policy and the provisions of the MMDR Act and the MC Rules. They cited the opinion of the Constitution Bench of this Court in *Natural Resources Allocation, In re, Special Reference No. 1 of 2012*[21] that auction despite being a more preferable method of alienation/allotment of natural resources, cannot be held to be a constitutional requirement or limitation for alienation of all natural resources and, therefore, every method other than auction cannot be struck down as ultra vires the constitutional mandate.

81. We are of the considered opinion that it is for the State Government to decide as a matter of policy in what manner the leases of these mineral resources would be granted, but this decision has to be taken in accordance with the provisions of the MMDR Act and the Rules made thereunder and in consonance with the constitutional provisions and the decision taken by the State of Goa to grant a mining lease in a particular manner or to a particular party can be examined by way of judicial review by the Court. To quote the opinion of four Judges out of five Judges expressed by D.K. Jain, J. in *Natural Resources Allocation, In re, Special Reference No. 1 of 2012*[21]: (SCC pp. 98-99, para 149)

> "*149*. ... Alienation of natural resources is a policy decision, and the means adopted for the same are thus, executive prerogatives. However, when such a policy decision is not backed by a social or welfare purpose, and precious and scarce natural resources are alienated for commercial pursuits of profit maximising private entrepreneurs, adoption of means other than those that are competitive and maximise revenue may be arbitrary and face the wrath of Article 14 of the Constitution. Hence, rather than prescribing or proscribing a method, we believe, a judicial scrutiny of methods of disposal of natural resources should depend on the facts and circumstances of each case, in consonance with the principles which we have culled out above. Failing which, the Court, in exercise of power of judicial review, shall term the executive action as arbitrary, unfair, unreasonable and capricious due to its antimony with Article 14 of the Constitution."

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Whether suspension of mining operations in the State of Goa by Order dated 10-9-2012 of the Government of Goa and the suspension of the environmental clearances granted to the mines in the State of Goa by Order dated 14-9-2012 were legal and valid?

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82. As we have held that the deemed mining leases of the lessees in Goa expired on 22-11-1987 and the maximum period (20 years) of renewal of the deemed mining leases in Goa has also expired on 22-11-2007, mining by the lessees in Goa after 22-11-2007 was illegal. Hence, the Order dated 10-9-2012 of the Government of Goa suspending mining operations in the State of Goa and the Order dated 14-9-2012 of MoEF, Government of India, suspending the environmental clearances granted to the mines in the State of Goa, which have been impugned in the writ petitions in the Bombay High Court, Goa Bench (transferred to this Court and registered as transferred cases) cannot be quashed by this Court. The Order dated 10-9-2012 of the Government of Goa and the Order dated 14-9-2012 of MoEF will have to continue till decisions are taken by the State Government to grant fresh leases and decisions are taken by MoEF to grant fresh environmental clearances for mining projects.

83. On 5-10-2012, this Court while issuing notice in *Goa Foundation* v. *Union of India*[4] also passed orders that all mining operations in the leases identified in the report of the Justice Shah Commission and transportation of iron ore and manganese ore from those leases, whether lying at the mine-head or stockyards, shall remain suspended. Thereafter on 11-11-2013[2], this Court passed an order that the inventory of the excavated mineral ores lying in different mines/stockyards/jetties/ports in the State of Goa made by the Department of Mines and Geology of the Government of Goa be verified and thereafter the whole of the inventoried mineral ores be sold by e-auction and the sale proceeds (less taxes and royalty) be retained in separate fixed deposits (leasewise) by the State of Goa till this Court delivers judgment in these matters on the legality of the leases from which the mineral ores were extracted. In our order passed on 11-11-2013[5], we had also directed that this entire process of verification of the inventory, e-auction and deposit of sale proceeds be monitored by a Monitoring Committee appointed by the Court. The Monitoring Committee comprising Dr U.V. Singh (Additional Principal Chief Conservator of Forests, Karnataka), Shri Shaikh Naimuddin (former Member of Central Board of Direct Taxes) and Parimal Rai (nominee of Government of Goa) have in the meanwhile monitored the e-auction.

84. We extract hereinbelow the relevant portion of the interim report dated 12-3-2014 of the Monitoring Committee:

> "After the two e-auctions, the total ore auctioned is about 1.62 million MT and the total value realised is Rs 260.68 crores approximately. As directed by this Hon'ble Court, the State Government

has been requested to maintain separate accounts, leasewise, and keep the sale proceeds as fixed deposits in nationalised banks.

> The process of transportation of ore for export has not yet been initiated because of the storage charges being demanded from the successful bidder by the Marmagao Port Trust (MPT). As a result, the process of e-auction is likely to slow down. The extent of storage charges demanded is as per Annexure MC III."

85. As we have held that renewal of all the deemed mining leases in the State of Goa had expired on 22-11-2007, the mining lessees will not be entitled to the sale value of the ores sold in e-auction but they will be entitled to the approximate cost (not actual cost) of the extraction of the ores. On account of suspension of mining operations in the State of Goa, the workers who were employed by the lessees claim that they have not been paid their wages. Under Section 25-C of the Industrial Disputes Act, 1947, when a workman whose name is borne on the muster rolls of an industrial establishment and who has completed not less than one year of continuous service under an employer is laid off, he is entitled to be paid by the employer for all the days which he is so laid off, except for such weekly holidays as may intervene, compensation which shall be equal to 50% of the total

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of the basic wages and dearness allowance that would have been payable to him had he not been so laid-off. Following this principle of lay-off compensation, we hold that workers who could not be paid wages by the lessees will have to be paid compensation at the rate of 50% of their basic wages and dearness allowance during the period of non-employment on account of suspension of mining operations. Moreover, Marmagao Port Trust will have to be paid 50% of their charges for storage of the mineral ores after 5-10-2012.

86. The entire sale value of the stock of mineral ores sold by e-auction, less the average cost of excavation, 50% of the wages and allowances and 50% of the storage charges to be paid to Marmagao Port Trust is thus due to the State Government which is the owner of the mineral ores which have been sold by e-auction. The State Government will set aside 10% of this balance amount for the Goan Iron Ore Permanent Fund for the purpose of sustainable development and intergenerational equity. This entire exercise of calculating the average cost of extraction of ores to be paid to the mining lessees, 50% of the basic wages and dearness allowance to be paid to the workers, 10% of the balance amount towards the Goan Iron Ore Permanent Fund and the balance amount to be appropriated by the State Government will be done by the Director of Mines and Geology, Government of Goa, under the supervision of the Monitoring Committee. Till this exercise is over and the report of the Monitoring Committee is filed, the Monitoring Committee will continue and their members will be paid their remuneration allowances as directed in the order dated 11-11-2013[5].

87. In the result, we declare that:

87.1. The deemed mining leases of the lessees in Goa expired on 22-11-1987 and the maximum of 20 years renewal period of the deemed mining leases in Goa expired on 22-11-2007 and consequently mining by the lessees after 22-11-2007 was illegal and hence the impugned Order dated 10-9-2012 of Government of Goa and the impugned Order dated 14-9-2012 of MoEF, Government of India are not liable to be quashed.

87.2. Dumping of minerals outside the leased area of the mining lessees is not permissible under the MMDR Act and the Rules made thereunder.

87.3. Until the order dated 4-8-2006[14] of this Court is modified by this Court in IA No. 1000 in *T.N. Godavarman Thirumulpad* v. *Union of India*, there can be no mining activities within one kilometre from the boundaries of national parks and sanctuaries in Goa.

87.4. By the order dated 4-12-2006 in *Goa Foundation* v. *Union of India*[13], this Court has not prohibited mining activities within 10 kilometres' distance from the boundaries of the national parks or wildlife sanctuaries.

87.5. It is for the State Government to decide as a matter of policy in what manner mining leases are to be granted in future but the constitutionality or legality of the decision of the State Government can be examined by the Court in exercise of its power of judicial review.

88. And we direct that:

88.1. MoEF will issue the notification of eco-sensitive zones around the national park and wildlife sanctuaries of Goa after following the procedure discussed in this judgment within a period of six months from today.

88.2. The State Government will initiate action against those mining lessees who violate Rules 37 and 38 of the MC Rules.

88.3. The State Government will strictly enforce the Goa (Prevention of Illegal Mining, Storage and Transportation of Minerals) Rules, 2013.

88.4. The State Government may grant mining leases of iron ore and other ores in Goa

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in accordance with its policy decision and in accordance with the MMDR Act and the Rules made thereunder in consonance with the constitutional provisions.

88.5. Until the final report is submitted by the Expert Committee, the State Government will, in the interests of sustainable development and intergenerational equity, permit a maximum annual excavation of 20 million MT from the mining leases in the State of Goa other than from dumps.

88.6. The Goa Pollution Control Board will strictly monitor the air and water pollution in the mining areas and exercise powers available to it under the 1974 Act and the 1981 Act including the powers under Section 33-A of

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the 1974 Act and Section 31-A of the 1981 Act and furnish all relevant data to the Expert Committee.

88.7. The entire sale value of the e-auction of the inventoried ores will be forthwith realised and out of the total sale value, the Director of Mines and Geology, Government of Goa, under the supervision of the Monitoring Committee will make the following payments:

(*a*) Average cost of excavation of iron ores to the mining lessees;

(*b*) 50% of the wages and dearness allowance to the workers in the muster rolls of the mining leases who have not been paid their wages during the period of suspension of mining operations;

(*c*) 50% of the claim towards storage charges of Marmagao Port Trust.

Out of the balance, 10% will be appropriated towards the Goan Iron Ore Permanent Fund and the remaining amount will be appropriated by the State Government as the owner of the ores.

88.8. The Monitoring Committee will submit its final report on the utilisation and appropriation of the sale proceeds of the inventoried ores in the manner directed in this judgment within six months from today.

88.9. Henceforth, the mining lessees of iron ore will have to pay 10% of the sale price of the iron ore sold by them to the Goan Iron Ore Permanent Fund.

88.10. The State Government will within six months from today frame a comprehensive scheme with regard to the Goan Iron Ore Permanent Fund in consultation with CEC for sustainable development and intergenerational equity and submit the same to this Court within six months from today; and

88.11. The Expert Committee will submit its report within six months from today on how the mining dumps in the State of Goa should be dealt with and will submit its final report within twelve months from today on the cap to be put on the annual excavation of iron ore in Goa.

89. With the aforesaid declarations and directions, Writ Petition (C) No. 435 of 2012 is allowed. The transferred cases and IA filed by Marmagao Port Trust as well as other IAs also stand disposed of. The interim order dated 5-10-2012[4] of this Court is vacated. These matters will be listed as and when the Monitoring Committee and the Expert Committee submit their final reports and the State Government submits the scheme for the Goan Iron Ore Permanent Fund. The parties shall bear their own costs.

———

[1] Under Article 32 of the Constitution of India

[2] (1985) 1 Bom CR 36

[3] *Shantilal Khushaldas and Bros. (P) Ltd.* v. *Union of India*, WP No. 177 of 1990, decided on 20-6-1997 (Bom)

[4] *Shantilal Khushaldas and Bros. (P) Ltd.* v. *Union of India*, SLP (C) No. 23827 of 1997, order dated 2-3-1998 (SC)

* *Goa Foundation* v. *Union of India*, WP (C) No. 435 of 2012, order dated 5-10-2012 (SC), wherein it was directed:

"1. Issue notice. Dasti service in addition.

2. The Central Empowered Committee (CEC) is directed to submit its report on this writ petition, which is essentially based on the report of Justice M.B. Shah (a former Judge of this Court), Chairman of the Commission of Enquiry for illegal mining of iron ore and manganese. The Secretaries of the Ministries of Mines and Forest and Environment, Union of India, and the Chief Secretary of the State of Goa are directed to furnish all information that CEC may require for making its report for the Court in light of the Shah Commission's Report.

3. A preliminary report from CEC should reach this Court within four weeks from today. Put up on receipt of the report from CEC. Till further orders, all mining operations in the leases identified in the Shah Commission's Report and transportation of iron ore and manganese ore from those leases, whether lying at the mine-head or stockyards, shall remain suspended, as recommended in the Commission's Report.

4. IAs Nos. 2580 and 2669 of 2009 in Writ Petition (Civil) No. 202 of 1995 may also be listed along with this writ petition."

[5] *Goa Foundation* v. *Union of India*, (2014) 6 SCC 738

[6] (1989) 1 SCC 494

[7] (2003) 8 SCC 361

[8] (1985) 3 SCC 398 : 1985 SCC (L&S) 672

[9] (2004) 1 SCC 1

[10] (1996) 9 SCC 709

[11] (2013) 8 SCC 154

[12] AIR 1960 SC 12

[13] *Goa Foundation* v. *Union of India*, (2011) 15 SCC 791

[14] *T.N. Godavarman Thirumulpad* v. *Union of India*, (2010) 13 SCC 740

[15] *T.N. Godavarman Thirumulpad* v. *Union of India*, (2002) 10 SCC 634

[16] (2011) 1 SCC 744

[17] *Goa Foundation* v. *Union of India*, WP (C) No. 435 of 2012, order dated 18-11-2013 (SC), wherein it was directed:

"These matters have been listed for the limited purpose of finalising the names of the Expert Committee which is to conduct the Macro Environmental Impact Assessment study as per the directions in our order dated 11-11-2013. The Expert Committee will consist of:

(*i*) Dr C.R. Babu, Head of the Centre for Environmental Management of Degraded Ecosystems, Delhi University—(Ecologist).

(*ii*) Dr S.C. Dhiman, Geologist/Hydrogeologist, Former Chairman of the Central Ground Water Board/Authority—(Geologist).

(*iii*) Prof. B.K. Mishra, Director of the Institute of Minerals and Materials Technology, a CSIR Institution formerly called the Regional Research Laboratory, Bhubaneshwar—(Mineralogist).

(*iv*) Prof. S. Parameswarappa, Former PCCF (Karnataka), Director ICFRE—(An expert on Forestry).

(*v*) A representative of Department of Mines, Government of Goa not less than the rank of Joint Secretary to be nominated by the Chief Secretary, Goa.

(*vi*) A representative of Ministry of Environment and Forests, Government of India not less than the rank of Joint Secretary to be nominated by the Secretary, Ministry of Environment and Forests, Government of India."

[18] (2014) 4 SCC 61

[19] *Lafarge Umiam Mining (P) Ltd.* v. *Union of India*, (2011) 7 SCC 338

[20] (2012) 3 SCC 1

[21] (2012) 10 SCC 1

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(2018) 4 Supreme Court Cases 218 : 2018 SCC OnLine SC 98

In the Supreme Court of India

(BEFORE MADAN B. LOKUR AND DEEPAK GUPTA, JJ.)

GOA FOUNDATION . . Petitioner;

Versus

SESA STERLITE LIMITED AND OTHERS . . Respondents.

SLP (C) No. 32138 of 2015[1] with Nos. 32699-727 of 2015, WPs (C) Nos. 711 and 720 of 2015, decided on February 7, 2018

A. **Mines and Minerals — Mines and Minerals (Development and Regulation) Act, 1957 — Ss. 8 (2), (3), 10-B and 11 — Mining leases declared to be illegal in *Goa Foundation*, (2014) 6 SCC 590 — Grant of second renewal — Impermissibility of — State of Goa should have granted fresh mining leases instead of granting a second renewal — Such second renewal, held, illegal in view of *Goa Foundation*, (2014) 6 SCC 590 — Second renewal of mining leases set aside — Consequential directions issued**

— Court in *Goa Foundation case* was aware and conscious of illegal and indiscriminate mining for which it did not interfere with State Government's Order dt. 10-9-2012 suspending said mining leases and MoEF's Order dt. 14-9-2012 keeping in abeyance environmental clearance — Thus Court never intended renewal of said illegal mining leases but instead intended that State should grant of fresh mining leases — When Court declared that State Government should decide in what manner mining leases are to be granted in future, it was explicit and related to grant of fresh mining leases and not a second renewal — Subsequent events like dismissal of IAs also confirm this intention — (Paras 37 to 46)

— Though renewal of lease is a fresh lease, the converse is not true — When Court directed grant of "fresh leases" in *Goa Foundation case*, it was a deliberate and conscious decision, distinct and different from granting a second renewal of expired mining leases — (Paras 57 and 59)

— Though State of Goa at first correctly understood judgment in *Goa Foundation case*, it was overtaken by erroneous interpretation of said judgment given in *Lithoferro*, 2014 SCC OnLine Bom 997 on 13-8-2014 — High Court in said judgment incorrectly understood judgment in *Goa Foundation case* — Decision in *Lithoferro case* set aside — (Paras 47 to 53, 153 and 153.5)

— Consequential directions in view of illegal grant of mining leases — Time given to mining leaseholders to stop mining by 16-3-2018 — Authorities directed to grant fresh mining leases and fresh environmental clearances

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— [Ed.: *See* Shortnotes *E* and *G* for illegality on account of lack of fresh environmental clearances] — Investigation reports should be given by various investigating teams entrusted with said task and State of Goa should implement said reports unless there are very good reasons for rejecting them — Government take steps for recovery of amounts due from mining leaseholders — Property Law — Transfer of Property Act, 1882 — Ss. 105 and 111 — Though renewal of lease is a fresh lease, the converse is not true — Public Accountability, Vigilance and Prevention of Corruption — Government Grants, Largesse, Public Property and Premises — Illegal mining

(Paras 37 to 60 and 154.1)

The Central Government on 2-11-2010 appointed Justice M.B Shah, a former Judge of the Supreme Court as Commission of Inquiry under Section 3, Commissions of Inquiry Act, 1952 to inquiry into large-scale illegal mining of iron ore and manganese ore. Pursuant to the reports of the said Commission, with respect to illegal mining in the State of Goa, the State Government of Goa, by order dated 10-9-2012, suspended all mining operations with effect from 11-9-2012. The Ministry of Environment and Forests (MoEF), by its order dated 14-9-2012, kept in abeyance the environmental clearances granted to 137

mining leases.

A PIL was filed in the Supreme Court for terminating the said mining leases. Several writ petitions were also filed in the High Court for quashing the two orders, that is, order dated 10-2-2012 suspending the mining leases and order dated 14-9-2012 keeping in abeyance the environmental clearances.

The Supreme Court in *Goa Foundation*, (2014) 6 SCC 590 declared the said mining leases to be illegal and further held that no second renewal of mining leases was permissible without express order in terms of Section 8(3), MMDR Act. And that only fresh mining leases as per law could be granted.

However, the High Court vide its order in *Lithoferro*, 2014 SCC OnLine Bom 997, wrongly interpreted the above order of the Supreme Court and held that renewal of a lease is also a fresh grant.

The Central Government contemplated introduction of Section 10-B, in the MMDR Act which provided that leases in respect of notified minerals could be granted only by way of e-auction by way of competitive bidding. The Ordinance relating to the above amendment was promulgated by the President of India on 12-1-2015. And the Goa Government in great haste also completed the process of second renewal of mining leases on same date, that is on 12-1-2015. To support its said illegal action, the Goa Government had also in great haste, formulated the Goa Grant of Mining Leases Policy, 2014. Thereafter the Goa Government requested the MoEF to lift the abeyance order dated 14-9-2012 in respect of 88 mining leases. MoEF by three orders dated 20-3-2015 lifted the said abeyance order with certain conditions (See paras 31 to 35 for the said conditions).

Thus the following three broad issues arise for consideration in the present case. Firstly, whether second renewal of mining leases was valid. Secondly, whether environmental clearances could have been given in present case. And thirdly, whether the impugned order in *Lithoferro case* was erroneous.

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Answering the first two issues in the negative and the third issue in the affirmative, the Supreme Court held as above and below.

There is no doubt that the renewal of a lease is virtually the same as the grant of a fresh lease but a converse direction to grant a mining lease cannot be understood to mean granting a renewal of a mining lease. Obviously, the grant of a fresh lease is not the same as the renewal of a lease and when the Court in *Goa Foundation case* required the State of Goa to grant a fresh lease, it did not require the State to renew the existing (expired) lease. The Court could have explicitly declared and directed the State of Goa to grant a second renewal of the mining leases rather than to say it in a roundabout manner that it should do so by granting a fresh lease equivalent to a renewal.

(Para 57)

When the Judges directed the grant of "fresh leases" in *Goa Foundation case* it was a deliberate and conscious decision, distinct and different from granting a second renewal of expired mining leases.

(Para 59)

Goa Foundation v. *Union of India*, (2014) 6 SCC 590; *Goa Foundation* v. *Union of India*, (2015) 1 SCC 153, *relied on*

DDA v. *Durga Chand Kaushish*, (1973) 2 SCC 825, *explained* and *distinguished*

Provash Chandra Dalui v. *Biswanath Banerjee*, 1989 Supp (1) SCC 487; *M.C. Mehta* v. *Union of India*, (2004) 12 SCC 118; *State of W.B.* v. *Calcutta Mineral Supply Co. (P) Ltd.*, (2015) 8 SCC 655 : (2015) 4 SCC (Civ) 395; *Common Cause* v. *Union of India*, (2014) 14 SCC 155, *distinguished*

Lithoferro v. *State of Goa*, 2014 SCC OnLine Bom 997 : (2015) 3 AIR Bom R 32, *reversed*

Goa Foundation v. *Union of India*, (2014) 6 SCC 738; *Goa Foundation* v. *Union of India*, (2014) 6 SCC 590 (footnote 17); *State of M.P.* v. *Krishnadas Tikaram*, 1995 Supp (1) SCC 587; *Goa Foundation* v. *Union of India*, (2014) 6 SCC 590 (footnote 4); *Gajraj Singh* v. *STAT*, (1997) 1 SCC 650, *referred to*

B. **Constitution of India — Arts. 14, 39(b), 298, 299 and Preamble — Mode of alienation of natural resource — Freedom available to executive in this regard and scope of judicial review — Principles reiterated**

— Alienation through competitive bidding or auction, reiterated, as per law laid down in *Natural Resources Allocation*, (2012) 10 SCC 1, though the preferable mode of allocation, is not mandatory or a constitutional obligation, other than cases of allocation of spectrum as held in *Centre for Public Interest Litigation*, (2012) 3 SCC 1 — There is no constitutional imperative in

economic policies — Art. 14 does not predefine any economic policy as a constitutional mandate — Alienation of natural resources is a policy decision, and means adopted for same executive prerogative

— Decision to not auction a natural resource is liable to challenge and subject to restricted and limited judicial review under Art. 14 of the Constitution

— In case of alienation to private party for commercial pursuit for maximising profits, auction is more preferable method — But decision to not auction a natural resource and sacrifice maximisation of revenues might be

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justifiable if decision is taken for social good or public good or common good such as when alienation is to provide affordable housing to members of SCs or STs or to implement housing schemes for Below the Poverty Line (BPL) families — If not for social good, public good or common good, it cannot be dissipated in favour of a private entrepreneur virtually free of cost or for a consideration not commensurate with its worth without attracting Arts. 14 and 39(b)

(Paras 61 to 80.5 and 154.2)

Natural Resources Allocation, In re, Special Reference No. 1 of 2012, (2012) 10 SCC 1; *Ajar Enterprises (P) Ltd.* v. *Satyanarayan Somani*, (2018) 12 SCC 756; *BALCO Employees' Union* v. *Union of India*, (2002) 2 SCC 333, *relied on*

Centre for Public Interest Litigation v. *Union of India*, (2012) 3 SCC 1, *held, clarified*

Manohar Lal Sharma v. *Union of India*, (2014) 9 SCC 516, *referred to*

Kasturi Lal Lakshmi Reddy v. *State of J&K*, (1980) 4 SCC 1, *cited*

C. **Constitution of India — Arts. 14, 39(b), 298, 299 and Preamble — Grant of mining leases concerned by State of Goa — Financial/economic necessity vis-à-vis sustainable development, environmental and ecological protection — Hasty decision to grant renewal of mining leases to benefit a few private persons and some royalty to State and said grants not conducive to interest of mineral development and against Goa Mineral Policy causing damage to environment and ecology and affecting health of people of Goa — Held, arbitrary and unjust — Second renewal of mining leases, set aside**

— Virtual chaos projected by State of Goa for suspension of mining leases could be an exaggeration but that is why issue of arbitrariness of policy decision is left open in present case — Nevertheless, decision of State of Goa to quickly renew mining leases while ostensibly complying with requirement of S. 8(3), MMDR Act and thereby jettisoning rule of law was unjustified — Second renewal of mining leases was unduly hasty, without considering relevant material and not in interests of mineral development — It only augmented revenues of State which is outside purview of S. 8(3), MMDR Act — Second renewal granted by State of Goa, set aside — (Paras 127, 128 and 154.3)

— Goa Grant of Mining Leases Policy, 2014 — Relevant that decision of State of Goa to not auction grant of mining leases was flawed in that it did not serve common or public or social good but primarily assisted in filling coffers of private entrepreneurs — It was extracted primarily for export to China and Japan without any value addition to domestic industry — (Paras 93 to 97)

— Decision of the Bombay High Court — It seemed as if High Court was not alive to possibility of auction of mining leases — It categorised mining leases on basis of those who had paid stamp duty and those who had not and granted relief on that basis — (Paras 89 to 92)

— Mines and Minerals — Mines and Minerals (Development and Regulation) Act, 1957, Ss. 8 (2) & (3), 10-B and 11

(Paras 82 to 97, 127, 128 and 154.3)

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D. **Constitution of India — Arts. 14, 39(b), 298, 299 and Preamble — Grant of mining leases**

concerned by State of Goa — Held, arbitrary and unjust — Sole beneficiaries of rapacious, chaotic, unregulated and illegal mining in Goa were mining leaseholders/private entities — Some others like barge owners, truck owners, etc. were also collateral beneficiaries — Surely, all this cannot be ignored or brushed aside particularly since exploitation of mineral resources for five years had no element of social or public purpose, no concern for society and no regard for the environment and laws

(Paras 82 to 85)

E. **Constitution of India — Arts. 14, 39(b), 298, 299 and Preamble — Grant of mining leases concerned by State of Goa — Complete disregard of environmental laws — Vishwanath Anand Expert Appraisal Committee report discussed — Said report highlights damage to environment and ecology by mining leaseholders and complete indifference by all concerned towards all environmental laws — Leases did not even get clearance from Central Ground Water Board for which there were serious consequences like groundwater got depleted at much faster rate than expected and its quality also deteriorated**

(Paras 86 to 88)

F. **Constitution of India — Arts. 14, 39(b), 298, 299 and Preamble — Grant of iron ore mining leases by State of Goa — Non-application of mind, undue haste and against interest of mineral development of State**

— During second renewal of mining leases concerned State of Goa ignored relevant factors and showed undue haste — All mining leaseholders had committed illegality — Instead of waiting for report of teams proving said illegality, State of Goa renewed their mining leases in violation of Grant of Mining Leases Policy — Undue haste was also showed by State of Goa to renew said mining leases so as to defeat Central Government's proposed policy of granting mining leases by way of competitive bidding through e-auction — Ordinance of Central Government in this regard was made known to public on 5-1-2015 and it was promulgated on 12-1-2015 — Within said seven days, State of Goa, granted second renewal to as many as 56 mining leases

— Concept of mineral development encompasses concept of captive mining — State Government should have applied its mind to requirement of different industries and principles of equitable distribution — Admittedly, iron ore is not extracted in Goa for import substitution or value addition but only as a last option, that is, export — Matters of interests of mineral development should be considered holistically and not in an isolationist manner — Therefore, while said miners contributed virtually nothing to domestic industry, they made considerable profits through exports — Though this might contribute to foreign exchange reserves, real-time damage to environment, ecology and health of Goan people is incalculable — Export benefits cannot be weighed against said damage — No social or public purpose attached to said mining operations — Only objective was profit maximization — This certainly cannot

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be described as being "in the interests of mineral development" — Mines and Minerals — Mines and Minerals (Development and Regulation) Act, 1957 — Ss. 8(2) & (3), 10-B and 11 — Mineral Concession Rules, 1960, Rr. 37 and 38

(Paras 108 to 121)

Natural Resources Allocation, In re, Special Reference No. 1 of 2012, (2012) 10 SCC 1, *relied on*

Sandur Manganese and Iron Ores Ltd. v. *State of Karnataka*, (2010) 13 SCC 1, *distinguished*

T.N. Godavarman Thirumulpad v. *Union of India*, (2010) 13 SCC 740; *Goa Foundation* v. *Union of India*, (2011) 15 SCC 791; *State of Assam* v. *Om Prakash Mehta*, (1973) 1 SCC 584; *Quarry Owners' Assn.* v. *State of Bihar*, (2000) 8 SCC 655; *CIT* v. *Anjum M.H. Ghaswala*, (2002) 1 SCC 633; *Sube Singh* v. *State (NCT of Delhi)*, (2004) 6 SCC 440; *State of U.P.* v. *Singhara Singh*, AIR 1964 SC 358 : (1964) 1 Cri LJ 263 (2) : (1964) 4 SCR 485; *Tisco Ltd.* v. *Union of India*, (1996) 9 SCC 709, *cited*

G. **Environment Law — Environmental Clearance/NOC/Environment Impact Assessment — Grant of/Quashment of/Irregularity in/Judicial review — Deemed environmental clearance (EC) — When invalid — MoEF granted deemed environmental clearance (EC) in 2014-2015 in violation of environmental law and against ruling in *Goa Foundation*, (2014) 6 SCC 590, set aside — Judicial review — Approach — Holistic approach is required for issues impacting society — Larger context of constitutionalism, rule of law, environmental jurisprudence as well as**

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fundamental right of people of Goa to have clean air and protection of fragile ecology must be considered — One or two violations here and there may be wished away as inconsequential, but multiple violations by several persons can result in serious problems — Governance dehors interests of people not proper — Uncomfortable decisions are inevitable for balancing rights and equities

— Some mining leaseholders had environmental clearances under EIA 1994 while others under EIA 2006 — Pursuant to requests made by State of Goa, MoEF granted EC to them notwithstanding that fresh leases could only have been permitted in view of ruling in *Goa Foundation case* and no renewals were permissible and thus fresh leases required fresh ECs

— Clarified, for renewal of mining leases in 2014-2015, lessees having valid environmental clearance (EC) under EIA 1994 also required fresh EC under 2006 EIA — Moreover EC under EIA 1994 is valid for 5 yrs and EC under EIA 2016 is valid for estimated project life or a maximum of 30 yrs — 37 mining leases which had EC under EIA 2006, thus though seemingly protected were actually not in view of ruling in *Goa Foundation case* that no second renewals were permissible, and only fresh renewals were permissible — Hence, fresh EC in terms of EIA 2006 was required

(Paras 129 to 150 and 154.4)

Goa Foundation v. *Union of India*, (2014) 6 SCC 590; *Goa Foundation* v. *Union of India*, (2014) 6 SCC 738; *Goa Foundation* v. *Union of India*, (2014) 6 SCC 590 (footnote 17); *M.C. Mehta* v. *Union of India*, (2004) 12 SCC 118; *Common Cause* v. *Union of India*, (2017) 9 SCC 499; *Ambica Quarry Works* v. *State of Gujarat*, (1987) 1 SCC 213; *Rural Litigation and Entitlement Kendra* v. *State of U.P.*, 1989 Supp (1) SCC 504; *State of M.P.* v. *Krishnadas Tikaram*, 1995 Supp (1) SCC 587, *relied on*

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S.N. Mohanty v. *Union of India*, 2012 SCC OnLine Del 4000, *distinguished*

H. **Constitution of India — Art. 145(3) — Request for reference to a Bench of nine Judges, rejected**

(Para 152)

Property Owners' Assn. v. *State of Maharashtra*, (2013) 7 SCC 522 : (2013) 3 SCC (Civ) 603, *referred to*

SS-D/59847/C

Advocates who appeared in this case :

Atmaram N.S. Nadkarni, Additional Solicitor General, Chander Uday Singh, Darius Khambata, Mukul Rohatgi and Huzefa Ahmadi, Senior Advocates [Prashant Bhushan, Pranav Sachdeva, O. Kuttan, Ms Neha Rathi, Sanjay Parikh, Ms Anitha Shenoy, Ms Mamta Saxena, Ms Srishti Agnihotri, Rohit Kr. Singh, Merusagar Samantaray, Salvador S. Rebello, Ms Viddushi, Ms Lhinghneviah, Ms Sneha S. Prabhu Tendulkar, Ms Nivedita Nair, Abhishek Bhardwaj, Divya Prakash Pandey, Devashish Bharuka, Ms Rukmani Bobde, G.S. Makker, Pratap Venugopal, Ms Surekha Raman, Naval Aggarwal, Anuj Sharma, Ms Niharika, Aman Shukla, Ms Kanika Kalaiyarasan (for M/s K.J. John & Co.), Sumit Goel, Tanuj Agarwal (for M/s Parekh & Co.), Yashraj Singh Deora, Ms Swati Kamat, Ms Parag Rao, Ms Asmita Singh, Ms Sanjana Saddy, Ms Ragya V. Singh, Ninad Laud, Ivo D'Costa, Jayant Mohan, Abhijit Gosavi, Rohan Sharma, Karan Mathur, Anjuman Tripathy, Nikhil Vaze, Ms Sujata Kurdukar, Rudresh Desai and P. Chaitanyashil, Advocates] for the appearing parties.

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18. (2010) 13 SCC 1, *Sandur Manganese and Iron Ores Ltd.* v. *State of Karnataka* 263e-f, 264f-g, 26

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25. (1996) 9 SCC 709, *TISCO Ltd.* v. *Union of India* 264d, 26

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32. (1973) 1 SCC 584, *State of Assam* v. *Om Prakash Mehta* 263g

33. AIR 1964 SC 358 : (1964) 1 Cri LJ 263 (2) : (1964) 4 SCR 485, *State of U.P.* v. *Singhara Singh* 26

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The Judgment of the Court was delivered by

MADAN B. LOKUR, J.— Rapacious and rampant exploitation of our natural resources is the hallmark of our iron ore mining sector coupled with a total lack of concern for the environment and the health and well-being of the denizens in the vicinity of the mines. The sole motive of mining leaseholders seems to be to make profits (no matter how) and the attitude seems to be that if the rule of law is required to be put on the backburner, so be it. Unfortunately, the State is unable to firmly stop violations of the law and other illegalities, perhaps with a view to maximise revenue, but without appreciating the long-term impact of this indifference. Another excuse generally put forth by the State is that of development, conveniently forgetting that development must be sustainable and equitable development and not otherwise.

2. Effective implementation and in some instances circumvention of the mining and environment related laws is a tragedy in itself. Laxity and sheer apathy to the rule of law gives mining leaseholders a field day, being the primary beneficiaries, with the State being left with some crumbs in the form of royalty. For the State to generate adequate revenue through the mining sector and yet have sustainable and equitable development, the implementation machinery needs a tremendous amount of strengthening while the law enforcement machinery needs strict vigilance. Unless the two marry, we will continue to be mute witnesses to the plunder of our natural resources and left wondering how to retrieve an irretrievable situation.

3. The Government of India appears to have received information of large-scale illegal mining of iron ore and manganese ore in different States in contravention of the provisions of the Mines and Minerals (Development and Regulation) Act, 1957 (the MMDR Act); the Forest (Conservation) Act, 1980; the Environment (Protection) Act, 1986 and other rules and guidelines issued on the subject from time to time.

4. Acting on this information, the Government of India appointed Justice M.B. Shah, a former Judge of this Court as a Commission of Inquiry under Section 3 of the Commissions of Inquiry Act, 1952 by a Notification dated 22-11-2010. The terms of reference of the Commission for the State of Goa were as follows:

> "2. The terms of reference of the Commission shall be—
>
> (*i*) to inquire into and determine the nature and extent of mining and trade and transportation, done illegally or without lawful authority, of iron ore and manganese ore, and the losses therefrom; and to identify, as far as possible, the persons, firms, companies and others that are engaged in such mining, trade and transportation of iron ore and manganese ore, done illegally or without lawful authority;
>
> (*ii*) to inquire into and determine the extent to which the management, regulatory

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and monitoring systems have failed to deter, prevent, detect and punish offences relating to mining, storage,

transportation, trade and export of such ore, done illegally or without lawful authority, and the persons responsible for the same;

(*iii*) to inquire into the tampering of official records, including records relating to land and boundaries, to facilitate illegal mining and identify, as far as possible, the persons responsible for such tampering; and

(*iv*) to inquire into the overall impact of such mining, trade, transportation and export, done illegally or without lawful authority, in terms of destruction of forest wealth, damage to the environment, prejudice to the livelihood and other rights of tribal people, forest dwellers and other persons in the mined areas, and the financial losses caused to the Central and State Governments.

3. The Commission shall also recommend remedial measures to prevent such mining, trade, transportation and export done illegally or without lawful authority."

5. Justice Shah visited Goa and after calling for and receiving information from the authorities concerned as well as the mining leaseholders, he submitted a report on 15-3-2012 and another on 25-4-2012 to the Ministry of Mines in the Government of India. The reports were tabled in Parliament on 7-9-2012 along with an Action-Taken Report and as a result, the Government of Goa passed an order dated 10-9-2012 suspending all mining operations in the State with effect from 11-9-2012. The Ministry of Environment and Forests (MoEF) of the Government of India acted similarly and kept in abeyance the environmental clearances granted to 139 mines (actually 137 mines—there is some duplication) in the State of Goa by an order dated 14-9-2012.

6. Subsequent to the reports given by Justice Shah, a writ petition was filed by Goa Foundation in this Court being WP (C) No. 435 of 2012. The writ petition was a public interest litigation praying, inter alia, for directions to the Union of India and the State of Goa to take steps to terminate the mining leases where mining was carried out in violation of various statutes.

7. Similarly, several mining leaseholders preferred writ petitions in the Bombay High Court for a declaration that the reports given by Justice Shah are illegal and also for quashing the orders dated 10-9-2012 and 14-9-2012 whereby mining operations were suspended and environmental clearances were kept in abeyance. The writ petitions filed in the High Court were transferred to this Court for hearing along with WP (C) No. 435 of 2012.

8. This Court heard all these matters and rendered its decision in *Goa Foundation* v. *Union of India*[1] on 21-4-2014. Among other conclusions arrived at, it was held by the Court that all the iron ore and manganese ore leases had expired on 22-11-2007. Consequently, any mining operation carried out by the mining leaseholders after that date was illegal. It was also held that all the mining leaseholders had enjoyed a first deemed renewal of the mining lease and for a second renewal an express order was required to be passed in view

of and in terms of Section 8(3) of the MMDR Act. For a second renewal of the mining lease, it was held that the State Government must apply its mind and record reasons for renewal being in the interest of mineral development and the necessity to renew the mining lease. Any decision taken by the State Government should also be in conformity with the

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constitutional provisions. The decision taken by the State of Goa to grant a mining lease in a particular manner or to a particular party could be examined by way of judicial review. It was also held that the orders dated 10-9-2012 and 14-9-2012 are not liable to be quashed and that they would continue till decisions are taken to grant fresh leases and fresh environmental clearances for mining projects.

Goa Mineral Policy, 2013

9. During the pendency of the proceedings before the Court, the State of Goa announced the draft Goa Mineral Policy on 21-8-2012. After suggestions, etc. were received, the Mineral Policy was finalised and gazetted on 28-9-2013.

10. A few salient features of the Mineral Policy may be mentioned. It is stated in the Preamble to the Mineral Policy:

> "The Goan economy is heavily dependent on the iron ore industry insofar as the major share of the regional income from the mineral industry and its allied activities like transport and trade is concerned."
>
> "However, during the period from 2006-2007 to 2011-2012, due to huge spurt in demand of low grade ore in international market followed by *illegalities and irregularities* in the previous regulatory regime, the State has witnessed the peak of *chaotic and unregulated mining* without any concern for fragile ecology and environment of the State or for the general well-being of an average Goan. It has resulted in massive export of unaccounted ore from unidentified sources like dumps and tailings. The *reckless exploitation* without any concern for sustainability that the State has witnessed in last five years has serious implications. Minerals are a finite and non-renewable natural resource and must be exploited wisely in the larger interest of the State.
>
> It is high time that the new Government that has received an unprecedented mandate from the people of Goa should take note that dependence on mining presents extreme externalities and *the State has to tread cautiously promoting a sustainable extraction regime to facilitate systematic, scientific and planned utilisation of mineral resources* and to streamline mineral based development of the State, keeping in view, protection of environment, health and safety of the people in and around the mining areas rather than race to bottom."
>
> (emphasis supplied)

11. Notwithstanding this serious indictment of the pre-existing "policy" for mining natural resources in Goa, the Mineral Policy did not address itself to the allocation or distribution of the natural resources in any of its 20 paragraphs and many sub-paragraphs. The topics dealt with in the Mineral Policy include objectives and parameters, sustainable mining and mineral conservation, mineral administration, regulation of mines and minerals, pollution and its social impact and policy highlights. Some of the other topics dealt with in the Mineral Policy include capping, based on carrying capacity of public roads and

to protect intergenerational equity, mines safety and rehabilitation of affected people, stakeholder participation (including corporate social responsibility), welfare and social responsibilities and establishment of the Goa Minerals Development Fund, etc.

12. However, what is of some significance is that Paras 1.4.4 and 1.4.5 of the Mineral Policy state that Goan iron ore is low grade, that is, having low iron (or Fe) content and that its extraction provides no or minimal domestic value addition. Almost all the iron ore extracted in Goa is exported and we were informed that only one mining leaseholder captively consumes Goan extracted iron ore. Paras 1.4.4 and 1.4.5 of the Mineral Policy

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read as follows:

"1.4.4. *No domestic value addition*.—The nature of Goan iron ore is such that value addition opportunities in the domestic market are minimal. The Chinese and Japanese use Goan iron ore for blending purposes to bring down the average cost of iron ore, whereas Indian steel producers have a wide range of high grade fines to choose from. *Despite the closure of mining operations in the neighbouring State of Karnataka, Goan iron ore is not used in Indian Steel Industry due to its low Fe content.*

1.4.5. *Low grade v/s high grade*.—Goan iron ore has always been of low grade Fe content in comparison with that of Odisha, Jharkhand and Karnataka. *The low grade of ore has been competitive in global markets, because of the non-reliance on railways and close distances of mines to ports thereby reducing the overall cost*. The high silica presence in Goan ore also is a favourable factor for preference for Goan ore over Australian and Brazilian low grade ore."

(emphasis supplied)

13. It appears from the above that the extraction of iron ore in Goa is geared only towards export and not for domestic purposes because of the low Fe content and high silica presence.

Vishwanath Anand Expert Appraisal Committee

14. During the pendency of the writ petition in the Court, the MoEF constituted an Expert Appraisal Committee (EAC) on 21-3-2013 with Shri Vishwanath Anand, former Secretary in the MoEF as the Chairman to specifically look into issues related to illegal mining in the State of Goa. The terms of reference of the EAC were as follows:

(*a*) To examine the information/documents submitted by each of the 139 project proponents in response to the aforesaid direction dated 14-9-2012 under the Environment (Protection) Act, 1986 for keeping environment clearance in abeyance and making case-by-case recommendations to the MoEF;[2]

(*b*) To evaluate status of compliance with respect to conditions stipulated as part of environment clearance;

(*c*) * * *

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(*d*) To examine the observations relating to MoEF in Justice Shah Commission Report on illegal mining of iron and manganese ore in the State of Goa and make appropriate recommendations.

15. The EAC gave its report sometime in October 2013 with regard to 137 mining leases. Very briefly, the EAC found that many of the mining leaseholders had: (*i*) no approval from the National Board of Wildlife; or (*ii*) indulged in excess mining; or (*iii*) indulged in dump mining; or (*iv*) intersected groundwater level; or (*v*) no clearance from the Central Ground Water Board to draw groundwater; or (*vi*) no forest clearance. We may also note that the EAC also recommended the revocation of environmental clearance granted to several mining leaseholders for a variety of reasons.

16. The Mineral Policy and the report of the EAC were perhaps placed before the Court in the writ petition filed by Goa Foundation and the transferred cases, but not dealt with, except for a brief mention of the Mineral Policy.

17. All the cases before the Court were heard quite extensively in September, October and November 2013. Judgment was reserved on 11-11-2013[3] and pronounced on 21-4-2014[1]. Some of the conclusions arrived at by the Court relevant for our discussions have already been mentioned above.

18. At this stage, it may be mentioned that on 11-11-2013[3] read with an order dated

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18-11-2013[4] this Court constituted an Expert Committee: (*Goa Foundation case*[1], SCC pp. 743-44, para 12)

"*12.* ... [to] conduct a macro EIA study on what should be the ceiling of annual excavation of iron ore from the State of Goa considering its iron ore resources and its carrying capacity keeping in mind the principles of sustainable development and intergenerational equity and all other relevant factors."

The members of the Expert Committee were:

1. Dr C.R. Babu (Ecologist),
2. Dr S.C. Dhiman (Geologist/Hydrogeologist),
3. Prof. B.K. Mishra (Mineralogist),
4. Prof. S. Parameswarappa (Forestry),
5. Shri Parimal Rai (nominee of the Ministry of Environment and Forests, Government of India).

19. The Expert Committee submitted an Interim Report dated 14-3-2014 to the Court after considering reports prepared by the Tata Energy Research Institute (TERI), New Delhi (1997); TERI and International Development Research Centre, Ottawa, Canada (2006); MoEF (2014); research papers prepared by the Goa University and the National Institute of Oceanography; Indian Institute of Technology (Indian School of Mines), Dhanbad (2013); Pollution Control Board, Goa (Annual Report) and other literature. It noted

large-scale degradation of the environment in Goa due to mining operations. A Final Report was also submitted by the Expert Committee to the Court on or about 12-4-2015—it was obviously not available to the Court.

Other proceedings in the High Court

20. Quite independent of the cases pending in this Court, writ petitions were filed by several mining leaseholders in the Bombay High Court praying either for consideration of their application for a second renewal of the mining lease or for the grant of a mining lease on second renewal. The High Court heard those writ petitions and delivered its judgment on 13-8-2014[5]. In the course of its judgment, the High Court referred to the Mineral Policy and observed: (*Lithoferro case*[5], SCC OnLine Bom para 3)

"The State Government also framed Goa Mineral Policy, 2013, which was duly gazetted on 28-9-2013 and was placed on record before the Supreme Court in Writ Petition (C) No. 435 of 2012. The State Government, in terms of this policy, in principle, agreed to renew 28 leases. These leaseholders were also asked to pay stamp duty. In some cases, after payment of the stamp duty, decision under Section 8(3) of the MMDR Act was taken to renew the leases and that decision is also gazetted. Thus, the petitions are classified in three categories mentioned hereinbelow:

(A) Where there is notification issued in the Official Gazette after taking a decision for renewal;

(B) Where there is a decision for renewal and there is stamp duty collected; and

(C) Where there are renewal applications made and are still pending.

All the petitioners initially sought directions to the State Government to decide their applications for renewal filed in the year 2007. However, the petitions which fell in the first two categories were subsequently amended and directions were sought against the Government to execute second renewal lease deeds."

21. In its decision, the High Court held:

(*i*) The decision of this Court (in *Goa Foundation*[1]) is not an impediment on the State of Goa in considering the applications filed by the petitioners before the High Court for a

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second renewal of the mining lease. On the contrary, the decision casts an obligation on the Government of Goa to consider all the applications for renewal under Section 8(3) of the MMDR Act;

(*ii*) Consideration of the applications should be in accordance with the Mineral Policy, the provisions of the MMDR Act and the Rules made thereunder and in accordance with constitutional provisions;

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(*iii*) The expression "fresh leases" occurring in para 67(82) of the decision of this Court (in *Goa Foundation*[4]) is an affirmation of the law that the renewal of a lease is also a fresh grant.

For arriving at this conclusion, the High Court placed reliance on *State of M.P.* v. *Krishnadas Tikaram*[6].

22. The High Court finally held: (*Lithoferro case*[5], SCC OnLine Bom para 16)

"*16*. In the case in hand, admittedly, all the petitioners have made applications for second renewal within the time-limit i.e. before expiry of the term of first renewal of the mining leases. The mining plans for the second renewal, thereafter, came to be approved by the IBM. The IBM also recorded its subjective satisfaction that the same is in the interest of mineral development. Thus, there is enough material on record to show that the Government agreed to grant the second renewal of mining leases under Section 8(3) of the MMDR Act and thereafter amended the Stamp Act and directed some of the petitioners to pay the stamp duty and even accepted the same. Thus, the Government gave promise that the mining leases would be executed under Section 8 (3) and pursuant to the promise, the petitioners altered their position by depositing the huge stamp duty. Therefore, it is now not open for the Government to resile from the promise as it is estopped by the doctrine of promissory estoppel from doing so. The petitioners legitimately expected that after payment of the stamp duty, the Government would execute the second leases under Section 8(3) of the MMDR Act. In our considered opinion, the principle of promissory estoppel is squarely applicable to the facts of the present case. The Government is reluctant to execute the lease deeds under Section 8(3) only on the ground that it is not open for it to do so in the light of the Apex Court judgment[4] in Writ Petition (C) No. 435 of 2012. We have already held that the Supreme Court judgment[4] in Writ Petition (C) No. 435 of 2012 is not an impediment in the Government's way in executing the leases in terms of Section 8(3) of the MMDR Act."

23. In view of the above conclusions, the High Court passed the following orders: (*Lithoferro case*[5], SCC OnLine Bom para 18)

"(I) The respondent State of Goa is directed to execute the lease deeds under Section 8(3) of the MMDR Act in favour of the petitioners leaseholders who/which have already paid the stamp duty pursuant to the orders of the Government, in accordance with the Goa Mineral Policy, 2013 placed before the Supreme Court in Writ Petition (Civil) No. 435 of 2012 and subject to the conditions laid down by the Apex Court in the said writ petition.

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(II) So far as the petitioners leaseholders who/which have not paid the stamp duty

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are concerned, the respondent State of Goa is directed to decide their renewal applications under Section 8(3), as expeditiously as possible, and preferably within a period of three months from the date of receipt of copy of this order."

24. Two petitions for special leave have been filed directed against the judgment and order passed by the High Court on 13-8-2014[5] being SLP (C) No. 32138 of 2015 and SLPs (C) Nos. 32699-727 of 2015 and these are also before us.

Goa Grant of Mining Leases Policy, 2014

25. Keeping in mind the orders and directions passed by this Court and the High Court, the State of Goa formulated the Goa Grant of Mining Leases Policy, 2014. We were informed by the learned Additional Solicitor General that the Grant of Mining Leases Policy was approved by the Council of Ministers of the Goa State Cabinet on 1-10-2014. It was issued on 4-11-2014 and placed on the website of the Directorate of Mines and Geology of the Government of Goa on the same day. However, it was gazetted on 20-1-2015 with two paragraphs deleted from the document issued on 4-11-2014. The two deleted paragraphs are indicated below.

26. The Grant of Mining Leases Policy makes for some very important and interesting reading and includes an impassioned plea for rejecting the process of competitive bidding of mining leases *for the time being*. It also contains the statement made by the Chief Minister on the floor of the Goa State Legislative Assembly. While the Grant of Mining Leases Policy is a large document, it is necessary to read relevant extracts from it since it indicates the factors that went into taking the policy decision and also to appreciate if there was any violation of Article 14 of the Constitution. The relevant extracts read as under:

"*Background.*—In accordance with the directions contained in the judgment and order of the Hon'ble Supreme Court dated 21-4-2014[1] in Writ Petition (Civil) No. 435 of 2012, the Hon'ble Supreme Court has declared that all the mining leases in the State of Goa have expired on 22-11-2007. ...

It has further been directed by the Hon'ble Supreme Court that it is for the *State Government to decide as a matter of Policy, in what manner mining leases are to be granted in the future.* ...

The Hon'ble Supreme Court has in its judgment and order dated 21-4-2014[1] clearly held that the action of allowing the mines to be run on deemed extension basis from the years 2007 to 2012 was completely illegal and has further declared that the so-called deemed mining leases in the State of Goa have expired in the year 2007. ...

Few things emerge out of the Hon'ble Supreme Court's order. In the first place, the mining leases have been held to have expired in the year 2007. *In the second place, the State Government has been directed, in accordance with its policy to grant fresh leases in the State.*

With these, the options available with the State Government are as follows—

The State Government can directly auction the leases in order to secure the best returns for the grant of leases by way of a competitive bidding process,

(*a*) The State Government can also form a State Corporation and undertake the mining activities through the State Mineral Development Corporation.

(*b*) The State Government could also proceed to grant fresh leases, in terms of the MMRD Act by the following the process of preferential grant of leases to certain persons as specified in the MMRD Act.

(*c*) Yet another option available to the State Government was to decide the renewal applications which were pending since the year 2006 and which had

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remained without any disposal.

Each of the aforesaid modes has its own merits and demerits. ...

While the State Government was in the process of deliberating on all these issues at various levels, the judgment and order of the Hon'ble High Court in writ petition filed by certain leaseholders came to be delivered on 13-8-2014[5] whereby the Hon'ble High Court has directed the execution of the lease deeds under Section 8(3) of the MMRD Act in favour of the leaseholders who have already paid the stamp duty pursuant to Orders of the State Government in accordance with the Goa Mineral Policy, 2013, placed before the Hon'ble Supreme Court and subject to the conditions. ...

This judgment and order of the Hon'ble High Court virtually leaves no choice to the State Government, thereby to completely abandon the process of competitive bedding [bidding] for earning the best revenue to the State Government. While this was the position taken by the State Government in the Goa Mineral Policy, 2013, and the Hon'ble High Court has interpreted the Order[1] of the Hon'ble Supreme Court in Writ Petition (Civil) No. 435 of 2012, *the State Government in view of Hon'ble High Court order, has for the present ruled out the process of going for competitive bidding*. The State Government is considering actively, within its constitutional powers and functions, to come out with regulatory and controlling measures and levy and collect appropriate returns having regard to the fact that the soil comprising the land belongs to the State. ... The State Government has also commenced the inquiry and investigation into the violations of matters

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under Rules 37 and 38 of the Mineral Concession Rules, 1960 as directed by the Hon'ble Supreme Court. ...

As is seen from the aforesaid, the judgment and order of the Hon'ble High Court is an intervening circumstance inasmuch as it directs the execution of lease deeds in 28 cases and consideration of the application under Section 8(3) by the State Government in the other cases. ...

In the considered opinion of the State Government, it would be futile to challenge the judgment of the Hon'ble High Court before the Hon'ble Apex Court as that would once again delay the commencement of the mining operations. As a matter of fact, a substantial portion of the State's Revenue comes from the mining sector. The State has been virtually starved of funds for undertaking many activities including Infrastructural Projects; and on account of the stopping of the mining operation, the State had to walk a tight-rope as there has been no Revenue coming from one of the major source of Revenue. ...

Having regard to the aforesaid, the State Government thought it proper to act in accordance with the directions of the Hon'ble Supreme Court *by balancing the equities, needs; as also to subserve the public interest and by having sustainable development by protecting the ecological and all other factors*.

Policy Framework.—The State Government has been considering and deliberating the entire matter, and thought it proper having regard to the facts that:

(*a*) The mining leaseholders had applied for the second renewal well within time.

(*b*) The fact that the applications of the mining leaseholders for the second renewal were not disposed of by the then State Government and for which the leaseholders cannot be blamed.

(*c*) Having further regard to the fact that 27 mining leaseholders despite the closure of the mining operations, when called by the State to do so within the period, have paid the stamp duty; as also, other levies.

(*d*) Such payments helped the State Government to override the financial crisis at

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that point of time.

(*e*) Having regard to the fact that a large number of labour staff employed with these leaseholders.

(*f*) That mining leaseholders concerned have invested heavily into the development of mines; as also, into the machinery such as ripper dozers, cranes, wheel loader, beneficiation plants, etc.

(*g*) Other methods are not as suitable as this method for various reasons listed [in] Hon'ble Chief Minister statement to the House listed above.

The State Government after having considered the matter from every possible angle, has decided to exercise its power under Section 8(3) of the Mines and Minerals (Development and Regulations) Act, 1957, and *to*

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consider each of the cases on their own merits and subject to compliance with the conditions which may be laid down by the State Government including for strict pollution control measures, and thereafter take a decision on the renewal in terms of Section 8(3) of the MMRD Act, 1957, complying fully with the procedure laid down therein.

Though the State Government has in principle decided to follow the route of the renewal of lease under Section 8(3) of the MMRD Act, it shall be subject to the following—

Unless and until the inquiry initiated pursuant to the judgment and order of the Hon'ble Supreme Court of India against those mine leaseholders found to be violating either Rule 37 or Rule 38 of the Mineral Concession Rules, 1960, or otherwise indicted in the Report of the Justice Shah Commission/PAC report or found to be engaged in, any kind of illegality of whatsoever nature such as illegal sale of ore, sale of royalty challan without ore, encroachment of adjoining areas outside the lease overproduction in excess of the limit specified in the environmental clearance; those which have undertaken unscientific mining operations; those who have violated or have not paid the royalty amount; those who have reused old royalty challans for defrauding; and those involved in illegal mining activities *shall not be considered for renewal of the mining leases*.

For this purpose, *presently the inquiries are in progress* at various levels and fora including the investigation by the SIT Team, by the Team of Chartered Accountants which have been set up by the State Government and after the inquiry is complete or during the course of the inquiry where it is found that any violations have taken place, *such persons shall not be considered for grant/renewal of the leases*. ...

Those mining leaseholders who have paid stamp duty, in which there are no violations found in terms of Mr Justice Shah Inquiry/Public Accounts Committee Report, shall be considered for renewal. (Deleted from the Gazetted Policy).

The formation of the entire Policy is aimed that it is required to balance various interests having regard to the Principle of Sustainable Development; but by keeping in mind the commercial interest of the present State of economy, the interest of the labour class, the interest of the working class including other staff, the interest of the market in the mining localities, the interest of the public sector, the interest of the existing mining leaseholders and the overall welfare needs of the State; and require all urgent infrastructural development. By balancing all these interests the present Policy has been formulated by the State Government.

The above Policy is in principle decision of the State Government and will be vetted for exact legal requirements from specific necessities as also from financial viewpoints and notified thereafter."[2] (Deleted from the Gazetted Policy.)

(emphasis supplied)

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27. Around this time, and pursuant to the Budget Speech given by the Hon'ble Minister of Finance of the Government of India on 10-7-2014 it appears that steps were being taken by the Ministry concerned in the Government of India to amend the MMDR Act.[a] In fact a draft Mines and Minerals (Development and Regulation) Act, 2014 was prepared on or about 16-11-2014 and uploaded on the website of the Ministry of Mines on 17-11-2014. This information was placed before us from the response given by the Hon'ble Minister of Mines to Unstarred Question No. 2485 to be answered in the Lok Sabha on 8-12-2014. The question was:

(*a*) whether the Government proposes to formulate a new policy on grant of mining leases for various minerals by amending the Mines and Minerals (Development and Regulation) Act, 1957;

(*b*) if so, the details thereof along with the time by which the new policy is likely to be implemented;

And the answer was:

(*a*) & (*b*): Yes Madam. The Ministry has drafted the Mines and Minerals (Development and Regulation) (MMDR) (Amendment) Bill, 2014, which has been uploaded on the website of the Ministry on 17-11-2014, calling for comments/suggestions on the draft Bill. The last date for receipt of the comments/suggestions is 10-12-2014. Based on the comments/suggestions received the draft Bill will be finalised and taken forward for introduction in Parliament.

The Bill is designed to put in place mechanisms for: (*i*) improved transparency in the allocation of mineral resources; (*ii*) obtaining for the Government its fair share of the value of such resources; (*iii*) attracting private investment and the latest technology; and (*iv*) eliminating delay in administration, so as to enable expeditious and optimum development of the mineral resources of the country.

28. What was the nature of the proposed amendments? As far as we are concerned, the introduction of Section 10-B in the MMDR Act (relating to competitive bidding) is significant and this reads:

"**10-B.** ***Mining leases for notified minerals.***—(1) Notwithstanding anything contained elsewhere in this Act, but subject to the provisions of Section 10-A and Section 17-A, the procedure for obtaining a mining lease for notified minerals in respect of land in which the minerals vest in the Government shall be as laid down in this section.

(2)-(3) * * *

(4) For the purpose of granting a mining lease in respect of any notified mineral in such notified area, the State Government shall select, through

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auction by a method of competitive bidding, including e-auction, an applicant who satisfies the eligibility conditions.

(5) The Central Government shall prescribe the terms and conditions, and procedure, subject to which the auction will be conducted, including the bidding parameters for the selection, which could include a share in the production of the mineral, or any payment linked to the royalty payable, or any other relevant parameter, or any combination or modification of them.

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(6)-(7) * * *"

[Iron ore was proposed as a notified mineral in the draft statute.]

29. Immediately after 4-11-2014 (the date on which the Grant of Mining Leases Policy was uploaded on the website of the Government of Goa) the State Government commenced granting a second renewal of the mining leases from 5-11-2014 onwards and that process was completed on 12-1-2015. The following table gives the dates of second renewal of 88 mining leases granted by the State Government on or before 12-1-2015:

Sl. No.	*Date of renewal order*	*Number of renewal orders passed*
1.	5-11-2014	5
2.	6-11-2014	5
3.	7-11-2014	3
4.	10-12-2014	3
5.	24-12-2014	10
6.	1-1-2015	3
7.	2-1-2015	3
8.	5-1-2015	2
9.	6-1-2015	22
10.	9-1-2015	1
11.	12-1-2015	31
Total = 88		

30. The date of 12-1-2015 is significant since on that date the President promulgated the Mines and Minerals (Development and Regulation) Amendment Ordinance, 2015 (which was later enacted by Parliament) whereby the grant of mining leases for notified minerals was through competitive bidding or the auction process. It is important to mention here that the approval of the Ordinance by the Cabinet of the Government of India became public knowledge on 5-1-2015[2] and it is within a week from that date that the Government of Goa granted a second renewal to 25 mining leases and to make

matters worse, a second renewal was granted to 31 mining leases on 12-1-2015, the day the Ordinance came into force making a total of 56 renewals of mining leases.

Environmental clearance and orders dated 20-3-2015

31. Following the renewal of 88 mining leases, the State of Goa requested the MoEF by Letters dated 7-1-2015 and 5-2-2015 to lift the abeyance order of 14-9-2012 on the environmental clearances. Consequently, the MoEF passed three orders on 20-3-2015 (the actual sequence of the orders is not very clear).

32. The first order of 20-3-2015 was in the form of a letter addressed to the Principal Secretary, Environment, Government of Goa and it recorded that MoEF had considered all the 139 cases in which the abeyance order has been passed and had taken into account the request of the State Government, the recommendation of the EAC and the directions of this Court. It was noted that the EAC had observed that there were violations of the following nature:

(*i*) no clearance from the National Board of Wildlife and non-compliance with orders of this Court on the subject;

(*ii*) excess production;

(*iii*) dump mining;

(*iv*) intersecting groundwater table and drawal of groundwater without permission of the Central Ground Water Board;

(*v*) No forest clearance obtained where required;

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(*vi*) Encroachment and false information/concealment of fact.

It was stated that the MoEF had decided to refer the cases to the appropriate authorities (including the State Government) for taking action on the violations. Accordingly, a request was made to examine the report of the EAC and take appropriate action against the lessees concerned.

33. The second order passed on 20-3-2015 was an Office Memorandum to the effect that if a project proponent has a valid and subsisting environmental clearance for a mining project under the Environment Impact Assessment Notification of 27-1-1994 (EIA 1994) or Environment Impact Assessment Notification of 14-9-2006 (EIA 2006), it will not be required to obtain a fresh environmental clearance at the time of renewal of the mining lease. This was subject to the maximum period of validity of 30 years for the environmental clearance for a mining lease.

34. The third order passed on 20-3-2015 related to lifting the abeyance order dated 14-9-2012 on the environmental clearance of the mining leases for iron ore and manganese ore. The cases of all 139 mining leases in which the abeyance order was passed were considered and the abeyance order lifted in respect of 72 cases. The details in this regard are given in the table below:

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Number	*Remarks*	*Remaining*
Total mines = 139		
2	Inadvertent repetitions	137
2	Already withdrawn	135
12	Fully located in protected area (abeyance order cannot be lifted)	123
6	Partly located in protected area (abeyance order cannot be lifted)	117
23	Within 1 km of protected area (awaiting modification of order dated 4-8-2006[10] passed by this Court)	94
22	Not having any forest clearance and will be considered only after clearance is obtained	72
35	Environmental clearance already granted under EIA Notification of 27-1-1994 and no fresh clearance is required in view of Office Memorandum dated 20-3-2015. Abeyance order lifted.	37
37	Environmental clearance already granted under EIA Notification of 14-9-2006. Abeyance order lifted.	0
Abeyance order lifted on 20-3-2015 for 72 mines out of 139		

35. The third order of 20-3-2015 also placed certain additional specific conditions while lifting the abeyance order. These additional conditions were:

1. The State Government of Goa shall develop and implement a credible mechanism to regularly monitor and ensure that capping of 20 MTPA on the mining leases in the State of Goa is implemented as per the directions of the Hon'ble Supreme Court in its order dated 21-4-2014[11] and any further order in the matter of *Goa Foundation* v. *Union of India*, in WP No. 435 of 2012.

2. No mining shall be allowed in the forest land for which FC [forest clearance] is not

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available.

3. The mining of dumps is not permitted unless mentioned in approved mine plan and environmental clearance letter.

4. Dumping of material outside the mine lease is not permitted unless mentioned in approved mine plan and environmental clearance letter.

5. Prior permission be obtained from Central Ground Water Board for drawal of groundwater and intersection of groundwater table as applicable.

6. Violations will be dealt as per the existing law and lifting of abeyance of EC will not in any manner affect that.

7. If any violation is observed in future the environmental clearance will be cancelled as per rules.

8. The State Government will take action in cases of violation under Sections 15/19 of the Environment (Protection) Act, 1986 as noted and recommended in EAC Report.

9. Project proponent will file six monthly compliance to the Regional Officer, MoEFCC and the State Pollution Control Board.

Questions for consideration

36. Broadly speaking, on the basis of the submissions and documents placed before us, the questions raised by the Goa Foundation, the State of Goa, the Union of India and the mining leaseholders are threefold:

36.1. (*a*) *Relatable to the second renewal of the mining leases*: (*i*) In view of the decision in *Goa Foundation*[1] only fresh leases were to be granted by the State of Goa and not second renewals. (*ii*) For granting fresh leases, the State of Goa should have introduced competitive bidding or the auction process. (*iii*) Assuming the decision to grant a second renewal to the mining leaseholders was valid, the second renewals were not in accordance with law and should be set aside.

36.2. (*b*) *Relatable to the grant of environmental clearances*: In view of the decision in *Goa Foundation*[1] fresh environmental clearances were required to be obtained by the mining leaseholders.

36.3. (*c*) The impugned judgment and order passed by the High Court in *Lithoferro*[5] on 13-8-2014 was erroneous and deserves to be set aside.

Whether fresh mining leases were required to be granted?

37. The controversy in this regard has arisen in view of what is stated in para 82 of the decision in *Goa Foundation*[1]. It was stated as follows: (SCC p. 635)

> "*82*. As we have held that the deemed mining leases of the lessees in Goa expired on 22-11-1987 and the maximum period (20 years) of renewal of the deemed mining leases in Goa has also expired on 22-11-2007, mining by the lessees in Goa after 22-11-2007 was illegal. Hence, the Order dated 10-9-2012 of the Government of Goa suspending mining operations in the State of Goa and the Order dated 14-9-2012 of MoEF, Government of India, suspending the environmental clearances granted to the mines in the State of Goa, which have been impugned[5] in the writ petitions in the Bombay High Court, Goa Bench (transferred to this Court and registered as transferred cases) cannot be quashed by this Court. *The Order dated 10-9-2012 of the Government of Goa and the Order dated 14-9-2012 of MoEF will have to continue till decisions are taken by the State Government to grant fresh leases and decisions are taken by MoEF to grant fresh environmental clearances for mining projects.*"
>
> (emphasis supplied)

38. The issue that arose for discussion before us was the meaning and intention of the

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Court in the context of grant of "fresh leases" for mining

projects. Did the Court literally mean that a fresh mining lease was required to be granted or was a second renewal sufficient compliance?

39. As the abovequoted paragraph indicates, the Court was aware and conscious of the fact that the mining leases had expired on 22-11-2007 and the mining operations thereafter carried out by the mining leaseholders was illegal. For this reason, the Court held that the suspension order passed by the State of Goa on 10-9-2012 and the abeyance order passed by the MoEF on 14-9-2012 did not require any interference.

40. Since the mining operations carried out after 22-11-2007 were illegal, the Court, in subsequent paragraphs of the judgment noted (as a follow up) that an order was passed on 5-10-2012[11] suspending transportation of iron ore and manganese ore from those leases identified by the Justice Shah Commission. Thereafter on 11-11-2013[2] it was directed that an inventory be made of the excavated mineral ores and the inventoried mineral ores be sold by e-auction under the supervision of a Monitoring Committee.

41. Further, it was held by the Court on 21-4-2014[1] that from the e-auction-sale of the mineral ores, the mining leaseholders would be entitled to the average cost (not the actual cost) of extraction, the workers would be entitled to 50% wages and allowances on the principle of laid-off compensation and the Marmagao Port Trust would be entitled to 50% of the storage charges. Out of the balance amount, 10% would be appropriated to the Goan Iron Ore Permanent Fund for the purpose of sustainable development and intergenerational equity and the remaining amount would be appropriated by the State who is the owner of the mineral ores illegally excavated by the mining leaseholders and sold by e-auction.

42. With this in mind, the Court declared in para 87.5 of the Report: (*Goa Foundation case*[1], SCC p. 637)

> "*87.5. It is for the State Government to decide as a matter of policy in what manner mining leases are to be granted in future* but the constitutionality or legality of the decision of the State Government can be examined by the Court in exercise of its power of judicial review."
>
> (emphasis supplied)

It was then directed by the Court in para 88.4 of the Report as follows: (*Goa Foundation case*[1], SCC p. 637)

> "*88.4.* The State Government *may grant mining leases* of iron ore and other ores in Goa in accordance with its policy decision and in accordance with the MMDR Act and the Rules made thereunder in consonance with the constitutional provisions."
>
> (emphasis supplied)

43. The Court was quite obviously aware that it was concerned, inter alia, with the second renewal of mining leases and yet it chose to recount the factual situation, make a declaration and pass a direction without adverting to the possibility of a second renewal of a mining lease. The Court was also conscious that the mining leaseholders had carried out indiscriminate and illegal mining for about five years (from November 2007 to September 2012) and had made profits out of the illegal mining. The Court, in our opinion, was rather charitable in not penalising the mining leaseholders for the illegal mining carried out by

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them. But be that as it may, quite clearly, the sequence of events from September 2012 onwards, the appointment of a Monitoring Committee to dispose of the illegally mined ore, the declaration and direction unmistakably point to the intention of the Court to end the sordid chapter of illegal mining by the leaseholders and start on a clean slate. Viewed in this perspective, we have no doubt that the Court really did intend the State of Goa to consider the grant of fresh leases in accordance with law.

44. In this context, the declaration of the Court in *Goa Foundation*[1] in para 87.5 of Report is also quite clear, namely: (SCC p. 637)

> "*87.5*. It is for the State Government to decide as a matter of policy in what manner mining leases are to be granted in future...."

The declaration was explicit and related to the grant of mining leases and not a second renewal.

45. Similarly, the direction given in para 88.4 of the Report is that: (SCC p. 637)

> "*88.4*. The State Government may grant mining leases of iron ore and other ores in Goa in accordance with its policy decision...."

was equally explicit and related to the grant of mining leases and not a second renewal.

46. Subsequent events confirm our impression and view. The decision of the Court to e-auction the mined mineral ore was sought to be recalled through IA No. 86 of 2014 filed by M/s Bandekar Brothers Private Ltd. The applicant prayed for a direction to restrain the authorities from e-auctioning the iron ore mined by it prior to 22-11-2007 and that the mined ore should be released to the applicant with the right to dispose of the same. A Bench of three learned Judges (other than those that decided *Goa Foundation*[1]) noted[1,2] that: (*Goa Foundation case*[1,2], SCC pp. 158-59, para 9)

> "9. The submissions advanced on behalf of the applicant were premised merely on the assertion, that the mineral ore which the applicant was claiming a right over, had been legitimately mined before 22-11-2007, and therefore, the applicant had an absolute and legitimate ownership over the

same. We may note, that the above position was emphasised, stressed and persistently reiterated to make the stand absolutely crystal clear."

The learned Judges considered the submissions and held by an order dated 14-10-2014[1,2] that the direction in *Goa Foundation*[1] was clear and categorical that the iron ore vested in the State Government and therefore the application deserved dismissal. In other words, the mining leaseholders deserved no latitude for the illegal mining and all issues needed to be dealt with strictly.

47. There is additional material to support the view that the Court had intended the State of Goa to grant fresh mining leases rather than grant a second renewal.

48. From a reading of the decision rendered by the Bombay High Court in *Lithoferro*[3] [subject-matter of SLP (C) No. 32138 of 2015 and SLPs (C) Nos. 32699-727 of 2015] it is evident that the State of Goa understood the decision of this Court in *Goa Foundation*[1] to mean that fresh mining leases were required to be granted on the basis of a policy yet to be framed by the State of Goa and the issue of second renewals did not survive consideration. The contention of the learned Advocate General of the State of Goa in this regard is recorded by the High Court in the following words: (*Lithoferro case*[3], SCC OnLine Bom para 5)

> "*5*. ... The learned Advocate General [of the State of Goa] took us through the judgment[1] of the Apex Court in Writ Petition (C) No. 435 of 2012 and relied upon the observations of the Supreme Court in paras 67, 68, 69 and 70. The learned Advocate General submitted that the Hon'ble Supreme Court has held that the deemed mining leases of the lessees in Goa expired on 22-11-1987 and the maximum of 20 years' renewal period of the deemed mining leases in Goa as provided under sub-section (2)

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of Section 8 of the MMDR Act, read with sub-rules 8 and 9 of Rule 24-A of the MC Rules expired on 22-11-2007. *The learned Advocate General submitted that in view of these findings of the Supreme Court, there is no question of renewal of the mining leases. The learned Advocate General submitted that in terms of the Supreme Court decision, it is for the State Government to grant fresh leases in accordance with the policy which is yet to be framed.* The learned Advocate General submitted that the Supreme Court has kept Writ Petition (C) No. 435 of 2012 pending and, therefore, it is for the petitioners to approach the Supreme Court and seek appropriate orders. *The learned Advocate General submitted that the orders on which the petitioners rely, at the most show that the Government in principle has agreed for renewal of the leases for a further period of 20 years and the same was not a final decision. He submitted that in terms of the said*

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decision of the Apex Court, it is for the State Government to frame a fresh mining policy and after framing the same, to decide granting of fresh mining leases."

(emphasis supplied)

49. While considering the submissions of the learned Advocate General and the learned counsel, the High Court noted that this Court was alive to the fact that the State of Goa had granted in-principle second renewal to 28 mining leases and had collected renewal fees or stamp duty from 27 mining leases (presumably out of the 28 mining leases) as stated in the brief resume filed by the State of Goa in this Court. The High Court noted: (*Lithoferro case*[5], SCC OnLine Bom para 7)

> "7. ... (II) In the brief resume presented by the State of Goa and placed on record of the Supreme Court, in Writ Petition (C) No. 435 of 2012, it is inter alia, mentioned thus:
>
> '... Presently in the State of Goa, it is found that the applications for renewal were filed well within time as contemplated by Rule 24-A of the Mineral Concession Rules, 1960. Presently, the State has ordered renewal of 28 mining leases, granted in-principle approvals and has collected renewal fees/stamp duty from 27 mining leases.' "

50. In other words, notwithstanding the in-principle grant of second renewal of 28 mining leases and collection of renewal fees or stamp duty, this Court in *Goa Foundation*[1] consciously required the State of Goa to grant fresh leases. What is equally significant is that the State of Goa also understood the decision of the Court in the same manner and intended to act on that basis.

51. Unfortunately, the State of Goa was overtaken by the events in that the High Court delivered its judgment in *Lithoferro*[5] on 13-8-2014 and while doing so, it misunderstood or incorrectly appreciated the decision of this Court in *Goa Foundation*[1] and disagreed with the view of the State of Goa. While this Court had required the State of Goa to grant fresh mining leases and the State of Goa was willing to comply with this direction, the High Court instead directed it to execute mining leases under Section 8(3) of the MMDR Act in respect of those who had paid the renewal fees or stamp duty. The High Court also directed the State of Goa to decide their pending second renewal applications within a period of three months keeping in mind the provisions of Section 8(3) of the MMDR Act (presumably after paying the renewal fees or stamp duty in terms of the Government Order of 21-2-2013). The understanding by the High Court of the decision of this Court in *Goa Foundation*[1] is totally incorrect.

52. It appears from the contents of the Grant of Mining Leases Policy that in view of the decision of this Court in *Goa Foundation*[1] the State was actively considering a policy for granting fresh mining leases by considering several

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factors. However, the decision and directions of the High Court supervened leaving no choice, according to the State, but to completely abandon the process of grant of fresh mining leases through the process of competitive bidding for earning revenue and justify the abandonment.

53. As per the Grant of Mining Leases Policy, the State of Goa therefore had two realistic options before it: (*i*) To implement the judgment and order of this Court in *Goa Foundation*[1] (as understood by the State of Goa) and grant fresh mining leases in the manner felt appropriate and in accordance with law; (*ii*) To abide by the judgment of the High Court (and its understanding of the judgment of this Court in *Goa Foundation*[1] while rejecting its understanding by the State of Goa) and grant second renewal to the mining leases in terms of Section 8(3) of the MMDR Act. The State of Goa appears to have taken the view that challenging the decision of the High Court (and therefore abiding by the decision of this Court) would delay the commencement of mining operations. The State took into consideration that a substantial portion of its revenue comes from the mining sector and that the State had been virtually starved of funds on account of stoppage of mining operations. Therefore, the State decided to grant a second renewal to the mining leases and not grant fresh leases. This is quite apparent from the contents of the Grant of Mining Leases Policy wherein the above facts and conclusions have been stated in greater detail. Was this decision correct?

54. The learned counsel for the mining leaseholders submitted that the renewal of a mining lease is equivalent to or amounts to the grant of a fresh lease and therefore when the mining leases were renewed, it amounted to the grant of a fresh lease in compliance with the directions of this Court. Reliance was placed upon *DDA* v. *Durga Chand Kaushish*[13] wherein this Court held: (SCC p. 829, para 7)

> "*7.* ... A renewal of a lease is really the grant of a fresh lease. It is called a "renewal" simply because it postulates the existence of a prior lease which generally provides for renewals as of right. In all other respects, it is really a fresh lease."

55. Reference was also made to *Provash Chandra Dalui* v. *Biswanath Banerjee*[14] in which it was held in para 14 of the Report that there is a distinction between extension of a lease and renewal of a lease. We do not find any relevance of this to our discussion. Reference was also made to the view expressed in *M.C. Mehta* v. *Union of India*[15] wherein this Court noted that it is settled law that grant of renewal is a fresh grant and must be consistent with law.

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56. Finally reliance was placed on *State of W.B.* v. *Calcutta Mineral Supply Co. (P) Ltd.*[16] in which decision it was noted in para 31 of the Report that the renewal of a lease is a fresh grant. This decision also refers to *Gajraj Singh* v. *STAT*[17] wherein this Court observed in para 38 of the Report that the grant of renewal is a fresh grant though it breathes life into the operation of the previous lease or licence granted.

57. There is no doubt that the renewal of a lease is virtually the same as the grant of a fresh lease but a converse direction to grant a mining lease cannot be understood to mean granting a renewal of a mining lease. Obviously, the grant of a fresh lease is not the same as the renewal of a lease and when the Court in *Goa Foundation*[1] required the State of Goa to grant a fresh lease, it did not require the State to renew the existing (expired) lease. The Court could have explicitly declared and directed the State of Goa to grant a second renewal of the mining leases rather than to say it in a roundabout manner that it should

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do so by granting a fresh lease equivalent to a renewal. We simply cannot accept the submissions made by the learned counsel for the mining leaseholders in this regard.

58. That apart, as we have already noted above, the context and material on record disabuse the thought that the Court in *Goa Foundation*[1] did not mandate the grant of fresh mining leases in accordance with law.

59. The learned counsel for the mining leaseholders contended that the very same learned Judges that decided *Goa Foundation*[1] permitted the State Government in *Common Cause* v. *Union of India*[18] to consider granting a second renewal of mining leases under Section 8(3) of the MMDR Act. Therefore the requirement in *Goa Foundation*[1] for the grant of "fresh leases" must be understood in a manner similar to what was directed in *Common Cause*[18]. We are unable to accept this contention. The direction given in *Common Cause*[18] was an interim direction and not a final direction as in *Goa Foundation*[1]. Moreover, the facts in both cases are not at all similar so as to warrant a similar order being passed or understood. Finally, the fact that the same set of learned Judges thought it fit to direct the grant of "fresh leases" in one set of cases and thought it fit to direct consideration of a "second renewal" in another set of cases indicates that the learned Judges were aware of the difference in directions. Therefore when the learned Judges directed the grant of "fresh leases" in *Goa Foundation*[1] it was a deliberate and conscious decision distinct and different from granting a second renewal of expired mining leases.

60. In our opinion, the direction in *Goa Foundation*[1] is quite clear and instead of considering the grant of a second renewal of the mining leases, the State of Goa was required to consider the grant of fresh mining leases. Therefore the decision of the State of Goa to grant a second renewal of the mining leases is erroneous, contrary to the decision in *Goa Foundation*[1] and must be and is quashed.

Whether the State of Goa should have auctioned the mining leases?

61. As mentioned in the Grant of Mining Leases Policy there were several options available to the State of Goa. It took the view that all its options were foreclosed post the decision of the High Court and it was obliged to grant a second renewal of the mining leases. We have already held that this was not so and that the decision to grant a second renewal of the mining leases was erroneous and fresh leases were required to be granted in accordance with the decision in *Goa Foundation*[1]. In view of our conclusion, the discussion on whether the State of Goa should have auctioned the mining leases through a process of competitive bidding is now rendered academic. However, since detailed submissions were made by the learned counsel on both sides, including by the learned Additional Solicitor General, we propose to express our views on the subject.

62. The discussion on the question of auction being the only method of allocation or disposal of natural resources arose due to the view expressed by this Court in *Centre for Public Interest Litigation* v. *Union of India*[19]. In that decision (hereafter referred to as *CPIL*—although this case is generally referred to as the *2G scam case*) the Court dealt with the question of following a non-discriminatory policy for alienation of natural resources. While doing so it was observed that an auction is "perhaps the best method for discharging this burden" and concluded by holding that "while transferring or alienating the natural resources, the State is duty-bound to adopt the method of auction by giving wide publicity so that all eligible persons can participate in the process". This led to the belief that the view of this Court was that natural resources should be alienated or disposed of only by auction and by no other method. The Court held in paras 95 and 96 of the Report as follows: (*Centre for Public Interest case*[19], SCC pp. 59-60)

"95. This Court has repeatedly held that wherever a contract is to be awarded or a

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licence is to be given, the public authority must adopt a transparent and fair method for making selections so that all eligible persons get a fair opportunity of competition. To put it differently, the State and its agencies/instrumentalities must always adopt a rational method for disposal of public property and no attempt should be made to scuttle the claim of worthy applicants. When it comes to alienation of scarce natural

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resources like spectrum, etc. it is the burden of the State to ensure that a non-discriminatory method is adopted for distribution and alienation, which would necessarily result in protection of national/public interest.

96. In our view, a duly publicised auction conducted fairly and impartially is perhaps the best method for discharging this burden and the methods like first-come-first-served when used for alienation of natural resources/public property are likely to be misused by unscrupulous people who are only interested in garnering maximum financial benefit and have no respect for the constitutional ethos and values. *In other words, while transferring or alienating the natural resources, the State is duty-bound to adopt the method of auction by giving wide publicity so that all eligible persons can participate in the process.*"

(emphasis supplied)

63. In *Manohar Lal Sharma* v. *Union of India*[20] a Bench of three Judges of this Court paraphrased the above passages and observed that the view expressed in *CPIL*[19] necessitated a reference by the President of India to this Court under Article 143(1) of the Constitution being *Natural Resources Allocation, In re, Special Reference No. 1 of 2012*[21].

64. What was the advisory opinion given by this Court in *Natural Resources Allocation*[21]? Among the questions referred for opinion were the following: (SCC p. 41, para 1)

Question 1. Whether the only permissible method for disposal of all natural resources across all sectors and in all circumstances is by the conduct of auctions?

Question 2. Whether a broad proposition of law that only the route of auctions can be resorted to for disposal of natural resources does not run contrary to several judgments of the Supreme Court including those of the larger Benches?

65. In the Reference, it was submitted before the Constitution Bench that paras 94 to 96 in *CPIL*[19] laid down the ratio vis-à-vis disposal of natural resources. It was argued that "these paragraphs lay down, as a proposition of law, that all natural resources across all sectors, and in all circumstances are to be disposed of by way of public auction, and on the other [hand], it was urged that the observations therein were made only qua spectrum".

66. The submissions made by the learned counsel were then discussed and thereafter this Court recorded its conclusions between paras 82 and 84 of *Natural Resources Allocation*[21]. In para 84, it was held: (SCC p. 72)

"*84*. Thus, having come to the conclusion *that 2G case*[19] *does not deal with modes of allocation for natural resources, other than spectrum*, we shall now proceed to answer the first question of the Reference pertaining to

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other natural resources, as the question subsumes the essence of the entire reference, particularly the set of first five questions."

(emphasis supplied)

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67. Thereafter, while answering the first question in the Reference, the Court considered the issue from various perspectives. It first dealt with the issue in the context of Article 14 and Article 39(*b*) of the Constitution and concluded in para 120 of the Report that the disposal of natural resources for revenue maximisation through auctions is not a constitutional mandate. It was held: (*Natural Resources Allocation case*[21], SCC p. 88)

> "*120*. Therefore, in conclusion, the submission that the mandate of Article 14 is that any disposal of a natural resource for commercial use must be for revenue maximisation, and thus by auction, is based neither on law nor on logic. *There is no constitutional imperative in the matter of economic policies—Article 14 does not predefine any economic policy as a constitutional mandate.* Even the mandate of Article 39(*b*) imposes no restrictions on the means adopted to subserve the public good and uses the broad term "distribution", suggesting that the methodology of distribution is not fixed. Economic logic establishes that alienation/allocation of natural resources to the highest bidder may not necessarily be the only way to subserve the common good, and at times, may run counter to public good. Hence, it needs little emphasis that disposal of all natural resources through auctions is clearly not a constitutional mandate."
>
> (emphasis supplied)

68. The issue was then considered from the standpoint of legitimate deviations from an auction. After adverting to several decisions of this Court where auctions were not the favoured method of allocation of natural resources, it was held between paras 129 and 131 of the Report as follows: (*Natural Resources Allocation case*[21], SCC p. 92)

> "*129*. Hence, it is manifest that there is no constitutional mandate in favour of auction under Article 14. The Government has repeatedly deviated from the course of auction and this Court has repeatedly upheld such actions. The judiciary tests such deviations on the limited scope of arbitrariness and fairness under Article 14 and its role is limited to that extent. *Essentially, whenever the object of policy is anything but revenue maximisation, the executive is seen to adopt methods other than auction.*
>
> *130*. A fortiori, besides legal logic, mandatory auction may be contrary to economic logic as well. Different resources may require different treatment. Very often, exploration and exploitation contracts are bundled together due to the requirement of heavy capital in the discovery of natural resources. *A concern would risk undertaking such exploration and incur heavy costs only if it was assured utilisation of the resource discovered: a prudent business venture would not like to incur the high costs involved in exploration activities and then compete for that resource in an open auction*. The logic is similar to that applied in patents. Firms are given incentives to invest in research and development with the promise of

exclusive access to the market for the sale of that invention. Such an approach is economically and legally sound and sometimes necessary to spur research and development. Similarly, bundling exploration and exploitation contracts may be necessary to spur growth in a specific industry.

> *131*. Similar deviation from auction cannot be ruled out when the object of a State policy is to promote domestic development of an industry, like in *Kasturi Lal case*[22] discussed above. However, these examples are purely illustrative in order to demonstrate that *auction cannot be the sole criterion for alienation of all natural resources*."
>
> (emphasis supplied)

69. Finally, the issue was considered from the point of view of the potential of abuse in allocation of natural resources other than through auction and in this context it was held in

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para 135 of the Report: (*Natural Resources Allocation case*[21], SCC pp. 93-94)

> "*135.* Therefore, a potential for abuse cannot be the basis for striking down a method as ultra vires the Constitution. *It is the actual abuse itself that must be brought before the court for being tested on the anvil of constitutional provisions.* In fact, it may be said that even auction has a potential of abuse, like any other method of allocation, but that cannot be the basis of declaring it as an unconstitutional methodology either. These drawbacks include cartelisation, the "winner's curse" (the phenomenon by which a bidder bids a higher, unrealistic and unexecutable price just to surpass the competition; or where a bidder, in case of multiple auctions, bids for all the resources and ends up winning licences for exploitation of more resources than he can pragmatically execute), etc. However, all the same, auction cannot be called ultra vires for the said reasons and continues to be an attractive and preferred means of disposal of natural resources especially when revenue maximisation is a priority. Therefore, *neither auction, nor any other method of disposal can be held ultra vires the Constitution, merely because of a potential abuse.*"

(emphasis supplied)

70. The conclusion arrived at by the Constitution Bench was then recorded between paras 148 and 150 of the Report in the following words: (*Natural Resources Allocation case*[21], SCC pp. 98-99)

> "*148.* In our opinion, *auction despite being a more preferable method of alienation/allotment of natural resources*, cannot be held to be a constitutional requirement or limitation for alienation of all natural resources and therefore, every method other than auction cannot be struck down as ultra vires the constitutional mandate.
>
> *149.* Regard being had to the aforesaid precepts, we have opined that auction as a mode cannot be conferred the status of a constitutional principle. *Alienation of natural resources is a policy decision, and the means adopted for the same are thus, executive prerogatives. However,*

when such a policy decision is not backed by a social or welfare purpose, and precious and scarce natural resources are alienated for commercial pursuits of profit maximising private entrepreneurs, adoption of means other than those that are competitive and maximise revenue may be arbitrary and face the wrath of Article 14 of the Constitution. Hence, rather than prescribing or proscribing a method, we believe, a judicial scrutiny of methods of disposal of natural resources should depend on the facts and circumstances of each case, in consonance with the principles which we have culled out above. Failing which, the Court, in exercise of power of judicial review, shall term the executive action as arbitrary, unfair, unreasonable and capricious due to its antimony with Article 14 of the Constitution.

> *150. In conclusion, our answer to the first set of five questions is that auctions are not the only permissible method for disposal of all natural resources across all sectors and in all circumstances.*"

(emphasis supplied)

71. It is therefore more than explicit that there is no constitutional requirement (let alone a mandate) for allocation of natural resources through the auction method (other than spectrum) but at the same time the auction process should not be given a go-by without any justification—the decision to give a go-by is judicially reviewable though the scope of judicial review might be rather restricted. The melting pot of allocation of a natural resource, a social or welfare purpose and adherence to the requirements of Articles 14 and 39(*b*) of the Constitution in matters of policy was a great leap forward fashioned by the Constitution Bench. Consequently, while there is no mandate, constitutional or

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otherwise, that natural resource allocation must be only by auction, it is certainly "a more preferable method". There are exceptions, such as when the natural resource allocation is for a "social or welfare purpose". On the other hand if the natural resource allocation is "for commercial pursuits of profit maximising private entrepreneurs" dehors any social or welfare purpose, then judicial review would be permissible and Article 14 of the Constitution would be attracted and if the executive action is found to be arbitrary, it would be struck down. Therefore, when it comes to natural resource allocation, the executive has a somewhat limited elbow room.

72. In his concurring opinion, Khehar, J. took the view (in para 186 of the Report) that: (*Natural Resources Allocation case*[21], SCC p. 137)

> "*186.* ... when natural resources are made available by the State to private persons for commercial exploitation exclusively for their individual gains, *the State's endeavour must be towards maximisation of revenue returns.*"
>
> (emphasis supplied)

The learned Judge concluded his opinion by agreeing that an auction is one of the price recovery mechanisms, but not the only one for allocation of natural resources. "That should not be understood to mean that it can never be a

valid method for disposal of natural resources." (SCC p. 144, para 199) It was further held that natural resources cannot be alienated by way of largesse—there must be a reciprocal consideration either in the form of earning revenue or subserving the common good or both. The learned Judge had this to say: (*Natural Resources Allocation case*[21], SCC pp. 143-44)

> "*199.* The policy of allocation of natural resources for public good can be defined by the legislature, as has been discussed in the foregoing paragraphs. Likewise, policy for allocation of natural resources may also be determined by the executive. The parameters for determining the legality and constitutionality of the two are exactly the same. In the aforesaid view of the matter, there can be no doubt about the conclusion recorded in the main opinion that auction which is just one of the several price recovery mechanisms, cannot be held to be the only constitutionally recognised method for alienation of natural resources. That should not be understood to mean that it can never be a valid method for disposal of natural resources (refer to paras 186 to 188 of my instant opinion).
>
> *200.* I would, therefore, conclude by stating that *no part of the natural resource can be dissipated as a matter of largesse, charity, donation or endowment, for private exploitation. Each bit of natural resource expended must bring back a reciprocal consideration. The consideration may be in the nature of earning revenue or may be to "best subserve the common good". It may well be the amalgam of the two. There cannot be a dissipation of material resources free of cost or at a consideration lower than their actual worth.* One set of citizens cannot prosper at the cost of another set of citizens, for that would not be fair or reasonable."
>
> (emphasis supplied)

73. This issue was considered in *Goa Foundation*[1] as well. The Court adverted to *Natural Resources Allocation*[21] in para 81 of the Report and pithily expressed its view that the manner of granting a mining lease is a policy decision of the State Government, but the decision can be examined by way of judicial review. It was held: (*Goa Foundation case*[1], SCC p. 634)

> "*81.* We are of the considered opinion that it is for the State Government to decide as a matter of policy in what manner the leases of these mineral resources would be granted, but this decision has to be taken in accordance with the provisions of the

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MMDR Act and the Rules made thereunder and in consonance with the constitutional provisions and the decision taken by the State of Goa to grant a mining lease in a particular manner or to a particular party can be examined by way of judicial review by the Court."

(emphasis supplied)

It was then declared in para 87.5 of the Report that: (SCC p. 637)

"*87.5*. It is for the State Government to decide as a matter of policy in what manner mining leases are to be granted in future *but*

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the constitutionality or legality of the decision of the State Government can be examined by the Court in exercise of its power of judicial review."

(emphasis supplied)

74. Similarly, in *Manohar Lal Sharma*[20] this Court adverted to the issue and noted the following in para 98 of the Report: (SCC p. 563)

"*98*. The Constitution Bench [*Natural Resources Allocation*[21]] clarified that the statement of law in *2G case*[19] [*CPIL*] that while transferring or alienating the natural resources, the State is duty-bound to adopt the method of auction was confined to the specific case of spectrum and not for dispensation of all natural resources. The Constitution Bench said that findings of this Court in *2G case*[19] were limited to the case of spectrum and not beyond that and that it did not deal with the modes of allocation for natural resources other than spectrum."

75. The Court in *Manohar Lal Sharma*[20] also referred to the views expressed by Khehar, J. and held, in para 104 of the Report: (SCC p. 568)

"*104*. In light of the above legal position, the argument that auction is the best way to select private parties as per Article 39(*b*) does not merit acceptance."

76. This Court then exercised its power of judicial review and considered the merits of the explanation given by the Central Government for not adopting the competitive bidding route for the allocation of coal blocks. The various submissions made, the various hurdles faced (including objections of the State Governments) as well as the impracticality of opening up the allocation of coal blocks to competitive bidding were considered and then it was held (after opening the window of Article 14 of the Constitution) in para 110 of the Report: (*Manohar Lal Sharma case*[20], SCC pp. 570-71)

"*110*. The above facts show that it took almost 8 years in putting in place allocation of captive coal blocks through competitive bidding. During this period, many coal blocks were allocated giving rise to present controversy, which was avoidable because competitive bidding would have brought in transparency, objectivity and very importantly given a level playing field to all applicants of coal and lowered the difference between the market price of coal and the cost of coal for the allottee by way of premium which would have accrued to the Government. Be that as it may, once it is laid down by the Constitution Bench of this Court in *Natural Resources Allocation*[21] that the Court cannot conduct a comparative study of various methods of distribution of natural resources and cannot mandate one method to be followed in all facts and circumstances, then if the grave situation of shortage of power prevailing at that time necessitated private

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participation and the Government felt that it would have been impractical and unrealistic to allocate coal blocks through auction and later on in 2004 or so there was serious

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opposition by many State Governments to bidding system, and the Government did not pursue competitive bidding/public auction route, then in our view, the administrative decision of the Government not to pursue competitive bidding cannot be said to be so arbitrary or unreasonable warranting judicial interference. It is not the domain of the Court to evaluate the advantages of competitive bidding vis-à-vis other methods of distribution/disposal of natural resources. *However, if the allocation of subject coal blocks is inconsistent with Article 14 of the Constitution and the procedure that has been followed in such allocation is found to be unfair, unreasonable, discriminatory, non-transparent, capricious or suffers from favouritism or nepotism and violative of the mandate of Article 14 of the Constitution, the consequences of such unconstitutional or illegal allocation must follow.*"

(emphasis supplied)

77. More recently in *Ajar Enterprises (P) Ltd.* v. *Satyanarayan Somani*[23] this Court once again examined the issue of distribution of natural resources and held: (SCC p. 785, para 49)

"*49.* Undoubtedly, disposal of natural resources by auction is not a mandatory principle for, as the Constitution Bench held[24], individual statutes may provide for modalities of transfer by alternate modes which subserve public interest. ... The choice of methods is not left to the unbridled discretion of a public authority. Where a public authority exercises an executive prerogative, it must nonetheless act in a manner which would *subserve public interest and facilitate the distribution of scarce natural resources in a manner that would achieve public good*. Where a public authority implements a policy, which is backed by a constitutionally recognised social purpose intended to achieve the welfare of the community, the considerations which would govern would be different from those when it alienates natural resources for commercial exploitation. When a public body is actuated by a constitutional purpose embodied in the Directive Principles, the considerations which weigh with it in determining the mode of alienation should be such as would achieve the underlying object. *In certain cases, the dominant consideration is not to maximize revenues but to achieve social good such as when the alienation is to provide affordable housing to members of the Scheduled Castes or Tribes or to implement housing schemes for Below the poverty line (BPL) families. In other cases where natural resources are alienated for commercial exploitation, a public authority cannot allow them to be dissipated at its unbridled discretion at the cost of public interest.*"

(emphasis supplied)

The window is now more than ajar.

78. Till fairly recently, policy matters particularly of economic policy were hands-off as far as the courts were concerned.[25] But the recent decisions of this Court, including by the Constitution Bench in its advisory jurisdiction, have partially modified this theory and kept open the window to judicially review such a policy if it does not serve the common good as understood in Article 39(*b*) of the Constitution, if it violates Article 14 of the Constitution and alienates natural resources for maximising profits of private entrepreneurs while sidelining Article 39(*b*) of the Constitution. "The legislature and the executive are answerable to the Constitution and it is there where the judiciary, the guardian of the Constitution, must find the contours to the powers of disposal of natural resources, especially Article 14 and Article 39(*b*) [of the Constitution].[26] (SCC p. 77)"

79. Notwithstanding this, a court must exercise restraint and not set aside Government Policy only because it disagrees with it or because a better policy could be framed or

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simply because it has the power to set aside the policy. Policies framed by the State, after due consideration, must be respected and given enough elbow room and flexibility for implementation. Of course, there would be occasions when the implementation of a policy has teething problems or some lacuna is discovered at a slightly later stage, but that does not mean that policy itself is defective. Therefore, courts must be very cautious and circumspect in diluting or setting aside a policy and must do so only if it is constitutionally unavoidable, otherwise good governance could be a casualty.

80. The conclusions that could be drawn from all these decisions are:

80.1. It is not obligatory, constitutionally or otherwise, that a natural resource (other than spectrum) must be disposed of or alienated or allocated only through an auction or through competitive bidding;

80.2. Where the distribution, allocation, alienation or disposal of a natural resource is to a private party for a commercial pursuit of maximising profits, then an auction is a more preferable method of such allotment;

80.3. A decision to not auction a natural resource is liable to challenge and subject to restricted and limited judicial review under Article 14 of the Constitution;

80.4. A decision to not auction a natural resource and sacrifice maximisation of revenues might be justifiable if the decision is taken, inter alia, for the social good or the public good or the common good;

80.5. Unless the alienation or disposal of a natural resource is for the common good or a social or welfare purpose, it cannot be dissipated in favour of a private entrepreneur virtually free of cost or for a consideration not commensurate with its worth without attracting Article 14 and Article 39(*b*) of the Constitution.

Whether the decision of the State of Goa forsaking the auction route is arbitrary?

81. Keeping in mind the broad principles identified above, the question that arises for our consideration is whether the State of Goa was justified in not adopting the auction route for the grant of mining leases and simply granting a second renewal. For a better understanding of this issue, it would be worthwhile to again refer to the Goa Mineral Policy, the report of the EAC, the Grant of Mining Leases Policy and the decision of the Bombay High Court, which documents were relied upon by the learned Additional Solicitor General.

(i) Goa Mineral Policy

82. The Mineral Policy makes it very clear that during the period from about 2006 till about 2012 (for about 5 years) extraction of iron ore in Goa was nothing but a free-for-all situation. Illegalities and irregularities were committed in abundance by all concerned, particularly the mining leaseholders. The Mineral Policy records that the State witnessed the peak of chaotic and unregulated mining. The thought of protecting and preserving the environment, concern for the fragile ecology of Goa was far from the thoughts of the stakeholders—even the well-being of the average Goan was not taken into consideration by the stakeholders. A reading of the initial paragraphs of the Mineral Policy suggests that nothing short of rapacious mining was going on in Goa. Who were the beneficiaries of all this rapaciousness? Could all this be ignored?

83. The Mineral Policy informs us that the beneficiaries of the rapacious-ness were not the domestic industry and certainly not the average Goan. The reason for this is spelt out in the Mineral Policy itself. Iron ore from Goa is not suitable for the Indian industry due to the low Fe content and the high silica presence. Therefore, there is no value addition to the Indian industry and the iron ore was mined only for export — mainly to China and also to Japan. With a port in the vicinity, Goan iron ore was an attractive buy for the global

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market and the spin-offs benefited those in the port, transporters and barge owners, etc. The primary beneficiary of this was, of course, the mining leaseholder, a private entity, and the price was paid by the average Goan who had to suffer a polluted environment and witness the damage to the State's ecology.

84. If the issues mentioned in the Mineral Policy are objectively considered in strict monetary terms, the only conclusion that can be drawn is that the extraction of iron ore was for commercial purposes and maximising the revenues of private entrepreneurs and not necessarily the State of Goa. The natural resource was exploited by some mining leaseholders for making profits and nothing else. There were some collateral beneficiaries as well, and they too were commercially driven entities such as barge owners, truck owners, etc. Under these circumstances, the question that arises is whether the mining leaseholders should have been given a second renewal of the mining lease virtually for a song, that is, payment only of royalty, when they were driven only by a profit motive or whether the mining leases ought to have been

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auctioned? Unfortunately, the Mineral Policy did not advert to or even consider any solution that would break from the past.

85. As far as the environment, the fragile ecology of Goa and the well-being of the average Goan and the rule of law is concerned, the Mineral Policy categorically states that the State had witnessed, from 2006-2007 till 2011-2012 the peak of chaotic and unregulated mining without any concern for the fragile ecology and environment of the State or for the general well-being of an average Goan. Surely, all this cannot be ignored or brushed aside particularly since the exploitation of mineral resources for five years had no element of social or public purpose, no concern for society and no regard for the environment and the laws.

(ii) Vishwanath Anand Expert Appraisal Committee

86. A reading of the report of the EAC is disturbing and acutely highlights the damage to the environment and ecology by the mining leaseholders. The complete indifference by all concerned is evident from a careful reading of the report. We propose to refer to and quote in extenso the "summary of observations" and the "concluding remarks" from the report of the EAC since they are self-explanatory:

"Summary of Observations

I. The absence of specific conditions highlighting the mandatory requirement to obtain prior approval of the Standing Committee of the NBWL [National Board for Wild Life] in the EC [Environmental Clearance] has led to misinterpretation of the legal requirement. There has been an inordinate delay of more than 5 years before effective action against defaulting units were initiated by the Ministry for non-compliance of the Hon'ble Supreme Court order dated 4-12-2006[26].

II. Out of 137 ECs, the requirement of obtaining approval of the Standing Committee of the NBWL under the WL (P) Act, 1972 [Wild Life (Protection) Act] has not been complied with in 123 cases where the distances are less than 10 km from the nearest PA [protected area].

III. In respect of 10 cases approval of the Standing Committee of the NBWL is not mandatory as the mine leases are located beyond 10 km from nearest PA.

IV. Contrary to the directions of the Hon'ble Supreme Court dated 4-8-2006[10] in Writ Petition (Civil) No. 202 of 1995; ECs have been accorded to 41 mines located within 1 km from the nearest PA.

V. In respect of 20 cases mine leases were renewed under the MMDR Act, 1957 prior to grant of FCs [Forest Clearance].

VI. In 29 cases, project proponents have furnished wrong information about distance

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from the nearest PAs.

VII. Non-compliance of various EC conditions such as excess production/unauthorised dump mining/drawal of groundwater without prior approval of CGWB/encroachment; have also been reported in respect of working mines.

Concluding Remarks

A reading of our observations and recommendations would show that *without exception, every proponent to whom an environment clearance was issued has either violated its conditions or has furnished information in the application which has been distant from the truth*. There are basically two types of violations; one that cannot be legally condoned and those that can be rectified with remedial measures. This is the reason why the Committee has recommended that all ECs for mines located within one km from PAs should be revoked and in cases where untruthful information was furnished in the application for EC, such mines should not be allowed to reopen. In the case of those mines which have been closed for more than five years, their reopening has not been recommended without their applying de novo for a fresh environmental clearance as micro environmental conditions on the ground would have changed during the period they remained closed. However, when one looks at the manner in which the directives dated 4-8-2006[10] and 4-12-2006[26] of the Supreme Court have been implemented one cannot help but feel that there is the absence of a bridge mechanism within the Ministry to ensure and oversee that directives of the courts are complied with due diligence and seriousness.

There are two factors which stand out; in some ECs as mentioned in this report, the condition was inserted that the project proponent should seek approval of the CWLW [Chief Wild Life Warden], in others it was stated that approval of the competent authority/Standing Committee of the NBWL should be obtained and in a third category no condition at all was imposed, even though some of these ECs pertain to the same meeting and timelines between 2005 and 2007. It is strange that officials concerned in the MoEF were not aware that other than the Standing Committee of the NBWL no other person was authorised to grant the permission envisaged by the order dated 4-12-2006[26] of the Supreme Court. This is not to state that any discrepancy in the EC letter would absolve the project proponent from complying with the law of the land. This has resulted in creating ambiguity amongst many of the project proponents and it was not until 1-1-2009, that the MoEF issued a public notice clarifying the position.

Considering that some of the project proponents may have been misguided by the ambivalence of the MoEF in not clearly delineating the legal position, it is suggested that in the case of those project proponents who did not conceal facts in their applications but did not apply for permission to the Standing Committee of the NBWL, their applications may be considered for being placed before the Standing Committee of the

NBWL. However this can in no way be construed as a justification on the part of the project proponents for not complying with the requirements of the law. It must be noted for example that in those cases where mining has intersected the groundwater, approval of the CGWB [Central Ground Water Board] had not been taken by the project proponents as was required by the EC. Similarly, there are cases where mining operations have taken

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place without obtaining an FC.

* * *

As regards violations of the conditions of the ECs and where environmental damage has been caused, the proponents concerned should be made accountable and the MoEF should examine as to how some monetary damages can be levied through due legal process based on the polluter must pay principle, the proceeds of which could be used for environmental rehabilitation.

There are concerns about the carrying capacity of the area with regard to its ability to sustain the extent and quantum of mining that has taken place there. It is recommended that a carrying capacity study should be commissioned for the area, or if another study by a nationally recognised institution is coming to fruition the result of that should be acted upon. Such a study should also take into account the impact of mining on the hydrology of the region and the extent of pollution caused to surface and groundwater. This study should be compared to the earlier 10 years' baseline data to determine the impact of mining on the biodiversity and hydrology of the area in the last decade. Based on the finding of this, a specific policy for mining of iron ore in the region may be developed. Such a policy along with a proper control and monitoring mechanism is necessary in order to avoid a situation such as the one under question. It would hopefully also ensure that mining in this region is carried out in accordance with best sectoral practices using appropriately clean technologies."

(emphasis supplied)

87. The report of the EAC reveals that there is not a single environment-related or mining-related law or legal requirement that was not violated by one or the other mining leaseholder. Quite clearly, the rule of environmental law in Goa had gone with the wind.

88. There was one extremely important requirement relating to extraction of groundwater—that is, clearance from the Central Ground Water Board—but even that was ignored. During the course of submissions, we were informed that there is plenty of groundwater available in Goa. However, what seems to have been overlooked is that with the intersection of groundwater levels with mining operations, the groundwater would get depleted much faster than expected or the quality of the groundwater would deteriorate. It is for this reason that MoEF insisted that clearance for drawal of groundwater must be taken from the Central Ground Water Board and care taken in respect of the intersection of groundwater level with mining operations (this happened in 46 cases). Unfortunately, no heed was paid to these requirements by the State of Goa or any of the mining leaseholders and not one mining leaseholder has any

clearance (where required) from the Central Ground Water Board, or at least none was brought to our notice.

(iii) Decision of the Bombay High Court

89. The High Court essentially created two classes of applicants for the grant of a mining lease — those in whose favour an in-principle decision had been taken for a second renewal of the mining lease and who had paid the necessary stamp duty in terms of the government order of 21-2-2013 and those who had not yet paid the requisite stamp duty.

90. As regards the first category, the High Court directed execution of the mining lease in their favour in accordance with the provisions of Section 8(3) of the MMDR Act. This was on the belief that the applicants had applied for the second renewal within the prescribed time period; the Indian Bureau of Mines had approved the mining plans of these applicants; the Indian Bureau of Mines was subjectively satisfied that the second renewal was in the interest of mineral development; and that in view of the principles of

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promissory estoppel these applicants were entitled to a second renewal of their mining lease since they had altered their position to their detriment by paying the stamp duty demanded.

91. As regards the second category (those who had not paid the stamp duty), the High Court directed the State of Goa to decide their second renewal application within a period of three months keeping in mind the provisions of Section 8(3) of the MMDR Act (and the requirement to pay the stamp duty).

92. The decision of the High Court does not at all discuss the options available to the State of Goa, namely, second renewal of the mining leases versus auction of a natural resource. In fact it appears that the High Court was not at all alive to the possibility of an auction of the mining leases, notwithstanding the view canvassed by the learned Advocate General of the State of Goa.

(iv) Goa Grant of Mining Leases Policy, 2014

93. The Grant of Mining Leases Policy announced and issued on 4-11-2014 is perhaps the most important document in the entire scheme of things and that is the reason it was read out extensively by the learned Additional Solicitor General and that is why we have chosen to quote it extensively.

94. A consideration of the contemporaneous facts beginning with the Budget Speech given by the Hon'ble Minister of Finance of the Government of India on 10-7-2014 makes it clear that an amendment to the MMDR Act was to be effected sooner than later. The Grant of Mining Leases Policy overlooks that and proceeds on the basis that the judgment of the High Court delivered on 13-8-2014[5] left the Government of Goa with no choice but to abandon the grant of mining leases through competitive bidding, even though that might be the most appropriate method of obtaining the best revenue for the public good. The Government of Goa had therefore "for the present" ruled out the process of going in for competitive bidding keeping also in mind that the

State was virtually starved of funds and had to balance the equities and needs of all, including the labour class, working class and other staff, markets in mining localities, public sector, mining leaseholders, welfare needs of the State, environment and fragile ecology of the State and general well-being of the average Goan.

95. The State of Goa was also alive to the fact that many (if not all) mining leaseholders had violated the terms of the mining lease or some statutory obligation. Therefore, it was decided to categorise the offenders as follows:

Category I — Will be those mining leases which have no violations or very minimal violation of any provision/condition of applicable laws/rules, orders/permissions, etc. or those which cannot otherwise be referred to as "violations".

Category II — Are those mining leases which have been found to have violated the Provisions of the Mineral Concession Rules including Rules 37 and 38 and other matters as mentioned in the Public Accounts Committee Report/Justice Shah Commission Report. In this category, the State Government will consider each of the cases on its own merits; and wherever the violations are noticed subject to the same being remedied by paying appropriate penalty/fines including those of forfeiture, the State Government shall pass appropriate orders in accordance with law.

Category III — Mining leases will be those which are found to have violated substantially any provision/condition of applicable laws/rules/orders/permissions, etc. and in which cases the State Government shall determine the lease/reject their "Application for the Second Renewal".

96. The offences ranged, amongst others, from illegal sale of ore, sale of royalty challan without ore, encroachment of adjoining areas outside the lease, overproduction in excess

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of the limit specified in the environmental clearance, unscientific mining operations, violations with respect to payment of royalty amount, re-use of old royalty challans for defrauding, illegal mining activities, etc. etc. None of these are "minimal" violations. However, and this is important, the Grant of Mining Leases Policy made it clear that the following shall not be considered for renewal of mining leases:

(*i*) Those facing an inquiry initiated pursuant to the orders of this Court in para 88.2 of *Goa Foundation*[1] for the violation of Rules 37 and 38 of the Mineral Concession Rules, 1960;

(*ii*) Those indicted by the Justice M.B. Shah Commission; and

(*iii*) Those indicted by the Public Accounts Committee.

The Grant of Mining Leases Policy stated that inquiries are already in progress "at various levels and fora" including a Special Investigating Team and a team of Chartered Accountants. We dare say that violations pointed out by the EAC ought also to have been taken into consideration.

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97. Be that as it may, there is no doubt that iron ore mining in Goa was solely for commercial purposes — it was extracted primarily for export to China and Japan without any value addition to the domestic industry. True, this brought in considerable foreign exchange — nevertheless iron ore extraction gave insignificant value addition (if at all) to Indian industry. The only advantage that iron ore extraction gave to the State was in terms of royalty, but the larger benefit accrued to the private mining leaseholder who could obtain a mining lease on renewal virtually free and without any social or welfare purpose. In other words, the State sacrificed maximising revenue for no apparent positive reason, virtually surrendering itself to the commercial and profit-making motives of private entrepreneurs and ignoring the interests of Goan society in general. Therefore, in principle, the decision of the State of Goa to not auction the grant of mining leases was flawed in that it did not serve the common or public or social good but primarily assisted in filling the coffers of private entrepreneurs. We are not inclined to go so far as to describe the decision as arbitrary since it is not necessary to do so.

98. However, we make it clear that we have dealt with this issue because it was canvassed before us. We are not inclined to quash the decision of the State of Goa of not going in for competitive bidding for the grant of fresh mining leases since it is not necessary in view of our conclusion that fresh mining leases were required to be granted by the State of Goa.

99. At this stage we must refer to a submission made by Mr C.U. Singh learned counsel appearing for some of the mining leaseholders. He submitted that prior to 12-1-2015 the MMDR Act did not permit the auction of mining leases. Therefore, even if the State of Goa was desirous of introducing competitive bidding for grant of fresh mining leases it could not have done so. He drew our attention to Section 11 of the MMDR Act (as it stood prior to its amendment in 2015) which provided a preferential right for obtaining a prospecting licence or mining lease to the holder of a reconnaissance permit or prospecting licence. He submitted, placing reliance on *Sandur Manganese and Iron Ores Ltd.* v. *State of Karnataka*[27] that since the MMDR Act is a complete code in itself, the method or procedure for grant of a lease cannot travel outside the confines of the statute and the Mineral Concession Rules, 1960 framed thereunder. Reference was made to paras 40 to 43 of the judgment: (SCC pp. 25-26, paras 40-43)

"*40*. In view of the specific parliamentary declaration as discussed and explained by this Court in various decisions, there is no question of the State having any power to frame a policy dehors the MMDR Act and the Rules.

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41. In *State of Assam* v. *Om Prakash Mehta*[28] this Court in SCC para 12 held that the MMDR Act, 1957 and the MC Rules, 1960 contain a complete code in respect of the grant and renewal of prospecting licences as well

as mining leases in lands belonging to the Government as well as lands belonging to private persons.

42. Again this Court in *Quarry Owners' Assn.* v. *State of Bihar*[29] held that both the Central and the State Government act as mere delegates of Parliament while exercising powers under the MMDR Act and the MC Rules.

43. It is not open to the State Government to justify grant based on criteria that are dehors the MMDR Act and the MC Rules. The exercise has to be done strictly in accordance with the statutory provisions and if there is any deviation, the same cannot be sustained. It is the normal rule of construction that when a statute vests certain power in an authority to be exercised in a particular manner then the said authority has to exercise it only in the manner provided in the statute itself. This principle has been reiterated in *CIT* v. *Anjum M.H. Ghaswala*[30] SCC at p. 644; *Sube Singh* v. *State (NCT of Delhi)*[31] and *State of U.P.* v. *Singhara Singh*[32]."

(emphasis supplied)

Reference may also be made to para 44 of the Report that reads thus: (SCC p. 26)

"*44.* Mr Harish N. Salve and Mr Dushyant Dave, by drawing our attention to the decision of this Court in *TISCO Ltd.* v. *Union of India*[33], submitted that inasmuch as this Court had upheld the grants based on "captive consumption", there is no flaw or error in the recommendation of the State Government dated 6-12-2004. A perusal of the above decision clearly shows that it concerned with Section 8(3) of the MMDR Act which requires consideration of the extremely general criterion of the interests of mineral development before granting second renewal of a mining lease. Unlike in Section 11(3), no further criteria were specified and it was in this background, this Court upheld on the facts of that case that relevant material taken into account by the Committee set up by the Central Government rightly included "captive consumption". In view of the factual situation, the said decision can have no bearing on initial grants of mining lease where the only permissible criteria are the matters set out in Section 11(3) of the MMDR Act."

100. The controversy in *Sandur Manganese*[27] related to the grant of mining leases contrary to the provisions of Section 11 of the MMDR Act in that a non-statutory criterion was taken into consideration dehors Section 11 of the MMDR Act for evaluating the applications and seeking approval of the Central Government for granting a mining lease. This was held to be impermissible and

it may be so. In any event, para 44 of the Report makes it clear that there is a distinction between the requirements of Section 11(3) of the MMDR Act and Section 8(3) of the MMDR Act. *Sandur Manganese*[27] is not applicable to the facts of the present case.

101. Similarly, reference was made to the Statement of Objects and Reasons for the Bill introduced in 2015 to amend the MMDR Act. It was stated therein that:

"The present legal framework of the MMDR Act, 1957, does not permit the auctioning of mineral concessions."

102. This submission need not detain us since we are not required to adjudicate

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whether the State of Goa should have auctioned the mining leases or not. The State of Goa decided to renew the mining leases and we are only called upon to decide: (*i*) Whether the policy decision not to auction the grant of mining leases was arbitrary (we have already held that we are not required to express a final opinion on this). We may, however, recall *en passant* that the Goa Grant of Mining Leases Policy proceeded on the basis that the auction of mining leases was permissible and that had the sanction of the Court in *Goa Foundation*[1]. It may be added that the MMDR Act did not prohibit the auction of mining leases. (*ii*) Whether the second renewals were in accordance with law and the constitutional principles.

103. We may also note that the Constitution Bench in *Natural Resources Allocation*[21] referred to the submission that if auction were the only method of allocating natural resources (as it appears from *CPIL*[19]) then the mandate would create a conflict with some statutes including the MMDR Act. The Constitution Bench dealt with this submission in para 83 of the Report by observing: (SCC p. 72)

> "*83.* Moreover, if the judgment in *2G case*[19] is to be read as holding auction as the only permissible means of disposal of all natural resources, it would lead to the quashing of a large number of laws that prescribe methods other than auction e.g. the MMDR Act."

However, the Constitution Bench did not advert to the consequence vis-à-vis the MMDR Act of holding that auction was not mandated as the only method of allocating a natural resource. Since the question does not arise in these cases, we decline to go into this issue—we need not finally adjudicate whether the State of Goa should have auctioned the mining leases but we are called upon to decide whether the grant of second renewals was valid in law.

Judicial review of renewals

104. In view of decisions of this Court, including in *Natural Resources Allocation*[21] it is permissible for this Court to judicially review, to a limited and restricted extent, the Grant of Mining Leases Policy, among other things, if it falls foul of Article 14 read with Article 39 (*b*) of the Constitution and if it ignores the common or public or social good but benefits private entrepreneurs, particularly when it involves the natural resources, by sacrificing the maximisation of revenue for the State.

105. In *Natural Resources Allocation*[21] the Constitution Bench observed that: (SCC pp. 98-99, para 149)

> "*149.* ... Alienation of natural resources is a policy decision, and the means adopted for the same are thus, executive prerogatives. However, when such a policy decision is not backed by a social or welfare purpose, and precious and scarce natural resources are alienated for commercial pursuits of profit maximising private entrepreneurs, adoption of means other than those that are competitive and maximise revenue may be arbitrary and face the wrath of Article 14 of the Constitution."

106. Similarly in *Goa Foundation*[1] this Court declared that: (SCC p. 637, para 87.5)

> "*87.5.* It is for the State Government to decide as a matter of policy in what manner mining leases are to be granted in future but the constitutionality or legality of the decision of the State Government can be examined by the Court in exercise of its power of judicial review."

107. Despite the dicta of the Constitution Bench and the declaration made by this Court in *Goa Foundation*[1] we do not propose to judicially review the Grant of Mining Leases Policy but to consider on merits whether the grant of second renewal to the mining leases was in accordance with the Grant of Mining Leases Policy and the law.

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108. In our opinion, in renewing the mining leases, the State of Goa completely ignored several relevant and important and significant factors giving the impression that the renewals were not quite fair or reasonable.

109. For one, the State ignored the fact that every single mining leaseholder had committed some illegality or the other in varying degrees. To identify these illegalities (although they had already been identified by the Justice Shah Commission and by the EAC), a Special Investigating Team had been set up as also a team of Chartered Accountants. Instead of waiting for a report from any one of these teams, the State acted in violation of the Grant of Mining Leases Policy and renewed the mining leases. Why was the report from the Special Investigating Team not awaited or called for and examined? In the Grant of Mining Leases Policy it was clearly and explicitly stated (as mentioned above) as follows:

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> "Unless and until the inquiry initiated pursuant to the judgment and order of the Hon'ble Supreme Court of India against those mine leaseholders found to be violating either Rule 37 or Rule 38 of the Mineral Concession Rules, 1960, or otherwise indicated in the Report of the Justice Shah Commission/PAC Report or found to be engaged in, any kind of illegality of whatsoever nature such as illegal sale of ore, sale of royalty challan without ore, encroachment of adjoining areas outside the lease overproduction in excess of the limit specified in the environmental clearance; those which have undertaken unscientific mining operations; those who have violated or have not paid the royalty amount; those who have reused old royalty challans for defrauding; and those involved in illegal mining activities *shall not be considered for renewal of the mining leases*.
>
> For this purpose, presently the inquiries are in progress at various levels and fora including the investigation by the SIT Team, by the Team of Chartered Accountants which has been set up by the State Government and *after the inquiry is complete or during the course of the inquiry where it is found that any violations have taken place, such persons shall not be considered for grant/renewal of the leases*."
>
> (emphasis supplied)

110. Unfortunately, the undue haste in which the State acted gives the impression that it was willing to sacrifice the rule of law for the benefit of the mining leaseholders and the explanation of satisfying the needs of some sections of society for their livelihood (after keeping them in the lurch for more than two years) was a mere fig leaf. The real intention of the second renewal was to satisfy the avariciousness of the mining leaseholders who were motivated by profits to be made through the exploitation of natural resources.

111. The undue haste also needs to be looked at in the context of the statement made in the final paragraph of the Grant of Mining Leases Policy to the effect that this Policy is an in-principle decision and would be notified after it is vetted for legal requirements "from specific necessities as also from financial viewpoints". In other words, the Grant of Mining Leases Policy as published on 4-11-2014 was not a final policy statement but only an intent that would take final shape after due vetting. The Grant of Mining Leases Policy was eventually published on 20-1-2015 but it was acted upon even before it was gazetted.

112. A partial explanation for this hurry, if we may venture to suggest, is that the State of Goa was aware (like everybody else) on 17-11-2014 if not earlier, of the policy of the Government of India to auction the grant of mining leases which policy was made available in the public domain on that date and suggestions invited. It is on 17-11-2014 that the draft Mines and Minerals (Development and Regulation) Act, 2014 was published on the website of the Ministry of Mines of the Government of India. The policy of the

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Government of India proposed to introduce Section 10-B by way of an amendment to the MMDR Act and the proposed amendment made it very clear that if it were to be accepted, auction of mining leases in respect of notified minerals (including iron ore) would become a reality if not an obligation. It appears that to circumvent this rather uncomfortable policy, the State pressed the accelerator on the renewal of mining leases from December 2014 onward to

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benefit mining leaseholders. So much so that in respect of 5 mining leases, the State overstepped the law and granted a second renewal in early January 2015 to some entities without even waiting for any approval or deemed approval of the mining plan from the Indian Bureau of Mines or any other authority.

113. This sequence of events acquires further significance when it is recalled that an Ordinance to amend the MMDR Act was made known to the general public on 5-1-2015 and promulgated by the President on 12-1-2015 thereby mandating competitive bidding or auction for the grant of mining leases. The State of Goa perhaps anticipated this in view of the publication of the draft Mines and Minerals (Development and Regulation) Act, 2014 and therefore hurried into the second renewal of mining leases (notwithstanding the Grant of Mining Leases Policy) to defeat the introduction of the auction process. In fact in the period from 5-1-2015 to 12-1-2015 the Government of Goa granted a second renewal to as many as 56 mining leases and from 17-11-2014 the State of Goa granted a second renewal to as many as 75 mining leases. The sudden spurt of renewal of mining leases is beyond comprehension. The judgment and order of the High Court in *Lithoferro*[5] cannot be used as a shield for explaining the haste.

114. These facts must also be appreciated in the context that mining operations were suspended in Goa with effect from 10-9-2012 due to an order passed by the State of Goa. Therefore, mining operations having been suspended for more than two years, the State could have certainly waited for a few weeks more and taken an informed and reasoned decision on granting a second renewal to mining leases — but waiting for a few weeks could have led to an uncomfortable situation that would have compelled the State of Goa to auction the mining leases, hence the haste.

115. This Court held in *TISCO Ltd.* v. *Union of India*[33] that for the purposes of Section 8 (3) of the MMDR Act[34] the concept of "mineral development" encompasses the concept of captive mining, an assessment of its requirement

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by different industries as well as the principle of equitable distribution [under Article 39(*b*) of the Constitution]. It is not at all clear from the records before us that the State had applied its mind to these and other factors including the report of Justice Shah, the report of the EAC, the absence of any value addition to the domestic industry and the degradation of the environment as noted by the Expert Committee appointed by this Court in concluding that a second renewal was "in the interests of mineral development". Mere reliance on the acceptance or deemed acceptance of the Indian Bureau of Mines is not enough, as imagined by the State of Goa. The matter of "interests of mineral development" has to be considered holistically and not in an isolationist manner.

116. In this context, it is also necessary to point out that the National Mineral Policy, 2008 provided that: "To maximise gains from the comparative advantage which the country enjoys intra se mineral development will be prioritised in terms of import substitution, value addition and export, in that order." Admittedly, iron ore is not

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extracted in Goa for import substitution, or value addition for domestic industry, but only for the last option, that is, export. Can it reasonably be said that the export of iron ore is in the interest of mineral development? We were informed that only one of the mining leaseholders captively consumes the extracted iron ore and it is evident from the Mineral Policy that despite mining operations having closed down for some period in other States, iron ore from Goa was not used in the domestic steel industry. Therefore, it is not at all clear who, other than the mining leaseholders making exports, was benefited by resumption of mining operations in Goa through a second renewal.

117. The Mineral Policy clearly suggests that for a period of five years between 2006 and 2012 the mining leaseholders committed various illegalities and irregularities in the mining process. This is an indication of their exploitative and rapacious attitude having little or no concern for the environment, the fragile ecology of Goa or even the health and well-being of the average Goan. This irreparable damage was being caused by the mining leaseholders without any benefit to the domestic industry. Therefore, while the mining leaseholders may have contributed virtually nothing to the domestic industry, they might have made considerable profits through exports and might have also benefited the foreign exchange reserves of the country, but the real-time damage to the quality of health and life of the average Goan and damage to the environment and ecology of Goa is nevertheless incalculable or at least considerable — and export benefits cannot be weighed against health or the environment.

118. What is unfortunate about the entire commercial activity of the mining leaseholders is that there was no social or public purpose attached to the mining operations. There was one and only one objective behind the mining activity and that was profit maximisation. The renewal of the mining leases would give considerable profits to the mining leaseholders well beyond the benefits that could accrue to the State or to the average resident of Goa. It was observed

by Khehar, J. in *Natural Resources Allocation*[21] that material resources of the country should not be dissipated free of cost or at a consideration lower than their actual worth. This was not kept in mind and mining leases were renewed for a small payment of stamp duty and royalty. It is therefore clear that the considerations that weighed with the State were not for the people of Goa but were for the mining leaseholders. This certainly cannot be described as being "in the interests of mineral development".

119. With the mining leaseholders violating virtually every applicable law or legal requirement, it is clear that the rule of law was not their concern. The list of violations and their variety was documented by the EAC and it makes for some very sad reading. To make matters worse, it was clearly mentioned in the Grant of Mining Leases Policy that a Special Investigating Team and a team of Chartered Accountants would look into all the violations but the State chose not to wait for any of the reports. There is no explanation for this.

120. In this background, there is little to suggest that the State considered the requirements of Section 8(3) of the MMDR Act in that the interests of mineral development were secondary while granting the second renewal of mining leases. The entire exercise undertaken by the State was a hasty charade, regardless of violations of the law by the mining leaseholders, without any benefit to the Indian industry and without any concern for the health of the average Goan.

121. The undue haste with which the State granted the second renewal of mining leases particularly after the amendments proposed to the MMDR Act were placed in the public domain by the Government of India (relating to the auction of mining leases) is a clear indication that the decision of the State was not based on relevant material and not necessarily triggered by the interests of mineral development. The very large number of

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renewals granted over a comparatively brief period is a clear indication that the State did not have "mineral development" in mind but had some other non-statutory interests while taking its decision to grant a second renewal to the mining leases. The haste with which the State took its decision also needs to be understood in the background of the fact that mining had been suspended by the State in September 2012 that is more than two years prior to the grant of second renewals. The urgency suddenly exhibited by the State therefore seems to be make-believe and motivated rather than genuine.

122. Facts from the record also disclose some interesting information regarding the second renewal of mining leases. The Table below indicates that except 13 mining leases, all the others were renewed after publication of the draft Mines and Minerals (Development and Regulation) Act, 2014 on 17-11-2014. The Table is given below and is self-explanatory:

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Period	*Mining leases renewed*
Between 5-11-2014 and 17-11-2014	13
Between 10-12-2014 and 2-1-2015	19
Between 5-1-2015 and 12-1-2015	56
Total	88
On 12-1-2015	31

123. Of the 13 mining leases renewed in November 2014, it is found that according to the State of Goa all of them are Category I violators (except Geetabala M.N. Parulekar who is a Category II violator). However, it was pointed out by the learned counsel appearing on behalf of Goa Foundation that the report of the Vishwanath Anand EAC indicates that a recommendation was made to revoke the environmental clearance in respect of 6 mining leaseholders; additionally, none of the mining leaseholders had approval from the National Board for Wild Life (where required); all of them (except 2) had mined in excess of the permissible limit under the environmental clearance; all of them had indulged in dump mining; some of them were guilty of encroachments; in almost every case the mining activity intersected groundwater level and none of the mining leaseholders had permission for groundwater withdrawal. These cannot be described as minor violations but were actually multiple violations in almost all cases. How could the State of Goa and MoEF overlook these recommendations and multiple violations?

124. It may be recalled that the Mines and Minerals (Development and Regulation) Amendment Ordinance, 2015 came into force on 12-1-2015 and on that day as many as 31 mining leases were renewed. In respect of 5 mining leases renewed in January 2015 the report from the Indian Bureau of Mines was called for in January 2015 itself and the mining leases were renewed without receipt of the report from the Indian Bureau of Mines and before expiry of the mandatory period for submitting the report in terms of the second proviso to Rule 24-A(3) of the Mineral Concession Rules, 1960. In other words, without even receipt of any report from the Indian Bureau of Mines and even before the expiry of the statutory waiting period, the State of Goa renewed some mining leases. This is patently illegal.

125. We were informed by the learned Additional Solicitor General that of the 88 mining leases that were renewed, 38 of them are not working for a variety of reasons—making their renewal an empty exercise.

126. These facts are mentioned in the context of the undue haste shown by the State of Goa in granting a second renewal to the mining leases keeping the following dates in mind:

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17-11-2014 — The draft Mines and Minerals (Development and Regulation) Act, 2014 was uploaded on the website of the Ministry of Mines of the Government of India.

5-1-2015 — Approval of the Mines and Minerals (Development and Regulation) Amendment Ordinance, 2015 by the Cabinet of the Government of India became public knowledge.

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12-1-2015 — President of India promulgated the Mines and Minerals (Development and Regulation) Amendment Ordinance, 2015.

127. It is possible that the State did have some serious governance issues to contend with as mentioned in the Grant of Mining Leases Policy, namely, since iron ore mining had been suspended for more than two years, the State faced a lack of funds resulting in its having difficulty in undertaking infrastructure projects and other activities. The State had also to contend with the adverse effects faced by a large population that was directly or indirectly dependent on the mining sector. Additionally, the transport sector was affected as well as barges used for transport through rivers from jetties. The stoppage of mining operations therefore affected several categories of stakeholders including small business or small commercial ventures and workers/labour. The Grant of Mining Leases Policy also noted that there was a tremendous loss of foreign exchange of about $8 billion through exports and more than Rs 850 crores towards loans/advances on the mining sector for a variety of activities as well as about Rs 1000 crores towards housing, business and other loans. Overall there was a slump in economic activity which also had an impact on the education sector, etc.

128. The State has projected virtual chaos (which could be an exaggeration) but that is why we have left open the issue of arbitrariness of the policy decision. Nevertheless the State is bound by the law, however uncomfortable it might be in granting a second renewal in terms of Section 8(3) of the MMDR Act. Therefore, on an overall consideration of all aspects of the case, we are of the opinion that the decision of the State of Goa to quickly renew the mining leases while ostensibly complying with the requirements of Section 8(3) of the MMDR Act and thereby jettisoning the rule of law was unjustified.

Whether fresh environmental clearances were required to be obtained by the mining leaseholders?

129. The question whether the mining leaseholders required fresh environmental clearances arises in the context of para 82 of the decision rendered in *Goa Foundation*[1] quoted above. It must be stated that some mining leaseholders had environmental clearances under EIA 1994 while others under EIA 2006. Notwithstanding this, since we have held that fresh mining leases were required to be granted, it follows that fresh environmental clearance is required to be obtained by those who are granted a fresh mining lease.

130. That apart, the materials before the Court while deciding *Goa Foundation*[1] included the report of the Justice Shah Commission, the report of the EAC and the report of the Expert Committee constituted by the Court by orders dated 11-11-2013[1] and 18-11-2013[4]. On a combined reading of the material before it, the Court took a broad view that large-scale mining of iron ore led to several adverse impacts including those related to the environment,

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ecology and health of the people of Goa and that these illegalities and irregularities were

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committed by almost all (if not all) mining leaseholders as reported by the EAC. The Court also accepted the view of the Expert Committee that the ecology of Goa was being degraded through indiscriminate mining and placed a cap on the annual excavation of iron ore. It was noted that mining by the lessees in Goa after 22-11-2007 was illegal and that mining operations were suspended by the State of Goa on 10-9-2012 and environmental clearances granted to the mines were kept in abeyance by the MoEF on 14-9-2012. Considering all this, as well as the law laid down in *Goa Foundation*[1] to the effect that there is no automatic second renewal of a mining lease but that a second renewal must be granted in accordance with the provisions of Section 8(3) of the MMDR Act, the Court used the expression "grant fresh environmental clearances for mining projects" in the passage referred to above.

131. We have already adverted to the report of the EAC. As far as the Expert Committee set up by the Court is concerned, it had furnished an Interim Report dated 14-3-2014 in which it noted large-scale degradation of the environment and recommended placing an annual cap between 20 and 27.5 million tonnes on the extraction of iron ore in Goa. The Expert Committee noted the following (which makes for some very depressing reading):

> "The production of iron ore has jumped from 14.6 million tons in 1941 to 41.17 million tons in 2010-2011. In 1980s the production was about 10 MT/annum. *The quantum jump in iron ore production in Goa was essentially due to steep rise in exports of fines and other low grade ore of 42% Fe content to China. This has led to massive negative impacts on all ecosystems leading to enhanced air, water, and soil pollution affecting quality of life across Goa*. This is evident by three important reports i.e. (*i*) Areawise Environmental Quality Management (AEQM) Plan for the Mining belt of Goa by Tata Energy Research Institute, New Delhi and Goa (1997) and it was submitted to the Directorate of Planning, Statistics, and Evaluation, Government of Goa, (*ii*) Environmental and Social Performance Indicators and Sustainability Markers in Minerals Development Reporting Progress towards Improved Ecosystem Health and Human Well-being, Phase III by TERI and International Development Research Centre, Ottawa, Canada (2006), and (*iii*) the Regional Environmental Impact Study of Iron Ore Mining in Goa region sponsored by MoEF, New Delhi (2014) by Indian School of Mines. Besides the above three main reports, a number of scientific research papers on the impact of iron ore mining on the environment and ecology of diverse ecosystems were published by scientists working at Goa University and NIO.
>
> *These reports and publications substantiate that the mining, particularly the enhanced level of annual production contributed to adverse impacts on the ecological systems, socioeconomics of Goa and health of people of Goa leading to loss of ecological integrity*. This is due to

enhanced levels of pollutants, particularly RSPM and SPM, sedimentation of materials from dumps and iron ore in rivers, estuaries and shallow depth (20 m) of sea water, agricultural fields, high concentration of Fe and Mn in surface waters and their bioaccumulation."

(emphasis supplied)

132. Faced with this material evidence before it, the Court took the view in *Goa Foundation*[1] that fresh environmental clearances must be obtained. Unfortunately however, the State of Goa was more concerned with earning revenue rather than the health of the people of Goa or enforcing the rule of law and therefore gave a complete go-by to the directions of this Court and to the concerns of the citizens of Goa and requested the MoEF to lift the abeyance on the environmental clearances.

133. Acting on the request made by the State of Goa by Letters dated 7-1-2015 and 5-

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2-2015, the MoEF passed three orders on 20-3-2015. We have already adverted to the contents of the orders passed on 20-3-2015.

134. The first order of 20-3-2015 is essentially a communication documenting the variety of illegalities and irregularities committed by the mining leaseholders and that the Government of India would be referring the cases for appropriate action and also requesting the Principal Secretary, Environment in the Government of Goa to take necessary action.

135. The second order of 20-3-2015 is an office memorandum to the effect that a project proponent will not be required to obtain a fresh environmental clearance at the time of renewal of the mining lease. This is misleading information and contrary to the decision of this Court in *M.C. Mehta* v. *Union of India*[15] as well as the decision rendered in *Common Cause* v. *Union of India*[35].

136. It was held in *Ambica Quarry Works* v. *State of Gujarat*[36], *Rural Litigation and Entitlement Kendra* v. *State of U.P.*[37] and *State of M.P.* v. *Krishnadas Tikaram*[8] (which decisions were followed in *M.C. Mehta*[15]) that the renewal of a lease, whether under the provisions of the Forest (Conservation) Act, 1980 or otherwise cannot be granted without the leaseholder complying with the necessary statutory requirements particularly since the grant of renewal is a fresh grant and must be consistent with law. The principle of compliance with statutory provisions at the stage of renewal of a lease was re-affirmed in *Common Cause*[35] in paras 105 and 106 of the Report. In para 188(2) of the Report it was categorically held as follows: (SCC p. 569)

> "*188.* ... (2) The renewal of a mining lease after 27-1-1994 will require an EC even if there is no expansion or modernisation activity or any increase in the pollution load."

137. The third order of 20-3-2015 is extremely cryptic in the matter of lifting the abeyance order of 14-9-2012 on environmental clearances. While dealing with 35 mining leases for which environmental clearance had been granted under EIA 1994 and 37 mining leases for which environmental clearance had been granted under EIA 2006, the following is stated:

> "It has been decided in the Ministry that the EC issued under 1994 Notification in case they are valid and subsisting *would not require fresh EC at the time of renewal* [O.M. L-11011/15/2012-IA-II (M) dated 20-3-2015]. Therefore it has been decided to lift abeyance on the 72 cases of which 35 cases had been granted EC under the provisions of EIA Notification 1994 and 37 cases had been granted EC under EIA Notification 2006."

(emphasis supplied)

138. As mentioned above and as held in *M.C. Mehta*[15] and *Common Cause*[35], the renewal of a lease after 27-1-1994 would require an environmental clearance. Therefore, a mining leaseholder having a valid environmental clearance obtained under the EIA 1994 would still require a fresh environmental clearance for renewal of the mining lease in 2014 -2015 as the case may be. That being so there is no doubt at all that the 35 cases referred to in the third order of 20-3-2015 who had an environmental clearance under EIA 1994 did require a fresh environmental clearance at the time of renewal of the mining lease. Since they did not have such a fresh environmental clearance the renewal of these 35 mining leases is clearly bad in law. Moreover, as held in *M.C. Mehta*[15] and *Common Cause*[35] the validity of an environmental clearance granted under EIA 1994 is only for five years. Therefore all environmental clearances granted under EIA 1994 had lost their validity before 2015, EIA 1994 having been replaced by EIA 2006.

139. As regards the 37 mining leases that had obtained environmental clearance under

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EIA 2006, since the validity of the environmental clearance is for the estimated project life or a maximum of 30 years in terms of Para 9 of EIA 2006 therefore no violation can be found on the ground of validity for the time period. To this limited extent, no interference is necessary at this stage in respect of these 37 mining leases. We make it clear, however, that this is subject to our conclusion that fresh mining leases were required to be granted by the State of Goa. Consequently, a mining leaseholder obtaining a fresh mining lease would require a fresh environmental clearance in terms of EIA 2006.

140. What is disturbing is that notwithstanding several and various violations, the MoEF granted environmental clearance to 72 mining leases. It seems to us that the MoEF acted without any application of mind in lifting the order placing all the environmental clearances in abeyance. Since the entire exercise carried out by the MoEF on 20-3-2015 was mechanical, at the behest of the State of Goa, without due application of mind, without considering the multiple illegalities and irregularities committed by the mining leaseholders

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or passing on the buck to the State of Goa and without considering relevant material such as the report of the EAC and the Expert Committee appointed by this Court, the exercise of lifting the abeyance order on 20-3-2015 by the MoEF must be held void and as directed by the Court in *Goa Foundation*[1] all the mining leaseholders must obtain fresh environmental clearance for their mining project.

141. We were informed by the learned Additional Solicitor General that show-cause notices have now been issued to some mining leaseholders demanding huge amounts—some running into hundreds of crores of rupees towards value of *ore extracted in excess of the environmental clearance*. We were handed over some sample show-cause notices (about 12) issued in September and October 2017 and the figures are quite staggering—the demand raised being about Rs 1500 crores! Similarly, from the Summary of Mining Audit Report submitted by the auditors (and handed over to us by the learned Additional Solicitor General—for the period July 2016 to December 2016) the amount demanded (including interest) by the State of Goa from the mining leaseholders through show-cause notices issued is about Rs 1500 crores! And without making any serious attempt to recover such huge amounts, the State of Goa has granted second renewal of mining leases and the MoEF played ball by lifting the abeyance order in respect of the environmental clearances. The inferences that can be drawn are quite obvious.

142. We must emphasise that issues impacting society are required to be looked at holistically and not in a disaggregated manner. An overall perspective is necessary on such issues including issues that impact on the environment and the people of a community or a region or the State. It is for this reason that it is necessary to look at them broadly otherwise if that broader perspective is lost, everyone will be a loser and no one will be a real beneficiary. One or two violations here and there may be wished away as inconsequential, but multiple violations by several persons can result in serious problems. As the novelist and philosopher Ayn Rand had said: We can evade reality, but we cannot evade the consequences of evading reality. Therefore, there is no doubt that the Mineral Policy, the Grant of Mining Leases Policy, the amendment to the MMDR Act, the report of the EAC and the report of the Expert Committee must be considered in the larger context of constitutionalism, the rule of law, environmental jurisprudence as well as the fundamental right of the people of Goa to have clean air and protection of the fragile ecology. Governance cannot and should not be carried out dehors the interests of the people and some uncomfortable decisions may be inevitable for balancing the equities.

143. Finally, a controversy (wholly unnecessary in our view) was raised with regard to the period of validity of the environmental clearance granted under EIA 1994. Firstly, in the view that we have taken, the validity period of an environmental clearance under EIA

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1994 is academic since a fresh environmental clearance was necessary at the time of renewal of a lease. Secondly, the period of validity of an environmental clearance was considered

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in *M.C. Mehta*[15] and it was clearly held that it is valid for 5 years only. In para 77 of the Report it was observed: (SCC p. 180)

> "*77.* We are unable to accept the contention that the Notification dated 27-1-1994 would not apply to leases which come up for consideration for renewal after issue of the notification. The notification mandates that the mining operation shall not be undertaken in any part of India unless environmental clearance by the Central Government has been accorded. *The clearance under the notification is valid for a period of five years.* In none of the leases the requirements of the notification were complied with either at the stage of initial grant of the mining lease or at the stage of renewal. Some of the leases were fresh leases granted after issue of the notification. Some were cases of renewal. No mining operation can commence without obtaining environmental impact assessment in terms of the notification."
>
> (emphasis supplied)

144. A similar view was expressed in para 87 in *Common Cause*[15]. Any contrary view expressed in any notification issued by MoEF (including the Notification of 15-1-2016) cannot overrule the decisions of this Court and is void to the extent that it does so.

145. It was submitted that all relevant notifications on the subject had not been placed before the Court and hence an erroneous conclusion was arrived at with respect to EIA 1994. We propose to deal with the notifications placed before us.

146. The Notification of 27-1-1994 (EIA 1994) deals with site clearance in Para 2.II(*d*). This provides, inter alia, that site clearance will be granted for a mining operation by the Central Government and that site clearance will be valid for a period of five years for commencing the operation or mining. Paras 2.III(*a*) and 2.III(*c*) of the Notification deal with the procedure for obtaining environmental clearance, but do not provide for the validity period of the environmental clearance.

147. A Notification of 4-5-1994 refers to the Notification of 27-1-1994 and substitutes Para 2.III(*c*) therein and provides that the environmental clearance "shall be valid for a period of five years from commencement of the construction or operation". What this provides, therefore, is that if environmental clearance is granted on a particular date and the mining operation starts on a later date, then the validity of the environmental clearance commences from the later date and is valid for five years from that date. This was reiterated in the Notification of 10-4-1997.

148. The validity of an environmental clearance is specifically provided for in EIA 2006 in Para 9 thereof. As far as we are concerned, it provides that in respect of mining operations, the environmental clearance would be valid for the "project life as estimated by Expert Appraisal Committee or State Level

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Expert Appraisal Committee subject to a maximum of thirty years for mining projects...".

149. For no apparent reason and after EIA 2006, the issue of the validity of an environmental clearance granted under EIA 1994 was raked up and a notification was issued by the MoEF on 21-8-2013 in which it was noted that the Notification of 4-5-1994 provided that "the clearance granted shall be valid for a period of five years from

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commencement of the construction or operation". Another Notification of 21-8-2013 goes on to say that the intent of the Central Government has been and has always been that the validity of the environmental clearance is for five years "for" commencement of the construction or operation and not that the environment clearance is only for five years "from" the commencement of construction or operation. Therefore, the Central Government clarified in the Notification of 21-8-2013 that the expression "for a period of five years" shall mean "for a period of five years for commencement of the construction or operation and not five years from commencement of the construction or operation". We do not see how this controversy really arises or its relevance to the present case, but we refer to it since submissions were made to explain the distinction between "for" five years and "from" five years in respect of the validity of an environmental clearance.

150. It is perhaps sought to be contended that if environmental clearance is granted and mining operations commence within the five year period, then the environmental clearance under EIA 1994 is valid till the project or the mining lease period is over. We cannot see how such an inference can be drawn. Moreover, this submission overlooks the decisions in *M.C. Mehta*[15] and *Common Cause*[25] which accept the view that the validity of an environmental clearance granted under EIA 1994 is only five years as also the view that a valid environmental clearance is necessary for the renewal of a mining lease. No notification of the MoEF can overrule decisions of this Court. As far as EIA 2006 is concerned this submission is academic and not relevant since Para 9 of EIA 2006 provides that the environmental clearance would be valid for the estimated project life subject to a maximum of 30 years.

151. The learned counsel for the mining leaseholders also relied upon a decision of the Delhi High Court in *S.N. Mohanty* v. *Union of India*[18] to contend that notwithstanding a Notification issued by MoEF on 4-4-2011 it was not obligatory for a mining leaseholder to obtain a fresh environmental clearance at the time of renewal of a lease, if the environmental clearance was subsisting. In that case, the petitioner had an environmental clearance obtained under EIA 2006 on 15-1-2007 and the first renewal of the mining lease was due on 2-4-2012. In that context, it was submitted that it was not necessary for the

petitioner to obtain environmental clearance for renewal of the mining lease. The Delhi High Court took the view that: (SCC OnLine Del para 22)

> "*22.* ... if a person has a valid and subsisting EC [environmental clearance] at the point of time he seeks a renewal of the mining lease, he would still be required to obtain another EC prior to the grant of renewal by the respondents. That, in our view, is not the intent and purport of the Supreme Court directions in *M.C. Mehta*[15]."

This question does not arise in the context of EIA 1994.

152. One final submission before us was that these cases be referred to a Bench of nine learned Judges since the constitutional validity of the Goa, Daman & Diu Mining Concessions (Abolition & Declaration of Mining Leases) Act, 1987 was under challenge in some cases and the decision in those cases would perhaps render the present proceedings infructuous. In some of these pending cases, this Court had passed an order on 29-10-2002 to await the decision of nine learned Judges in *Property Owners' Assn.* v. *State of Maharashtra*[19]. We are not at all inclined to accept this request and mention it only to reject it.

Correctness of the decision of the High Court in Lithoferro[5]

153. As far as the SLPs are concerned [SLP (C) No. 32138 of 2015 and SLPs (C) Nos. 32699-727 of 2015] we set aside the judgment and order dated 13-8-2014[5] of the High Court in view of our conclusion that the State of Goa was required to grant fresh licences in terms of the decision of this Court in *Goa Foundation*[1]. The High Court proceeded on the

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erroneous basis that it could direct the State of Goa to grant a second renewal of the mining leases notwithstanding the direction in *Goa Foundation*[1].

Conclusions and directions

154. In view of our discussion, we arrive at the following conclusions:

154.1. As a result of the decision, declaration and directions of this Court in *Goa Foundation*[1], the State of Goa was obliged to grant fresh mining leases in accordance with law and not second renewals to the mining leaseholders.

154.2. The State of Goa was not under any constitutional obligation to grant fresh mining leases through the process of competitive bidding or auction.

154.3. The second renewal of the mining leases granted by the State of Goa was unduly hasty, without taking all relevant material into consideration and ignoring available relevant material and therefore not in the interests of mineral development. The decision was taken only to augment the revenues of the State which is outside the purview of Section 8(3) of the MMDR Act. The second

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renewal of the mining leases granted by the State of Goa is liable to be set aside and is quashed.

154.4. The Ministry of Environment and Forests was obliged to grant fresh environmental clearances in respect of fresh grant of mining leases in accordance with law and the decision of this Court in *Goa Foundation*[1] and not merely lift the abeyance order of 14-9-2012.

154.5. The decision of the Bombay High Court in *Lithoferro* v. *State of Goa*[1] (and batch) giving directions different from those given by this Court in *Goa Foundation*[1] is set aside.

154.6. The mining leaseholders who have been granted the second renewal in violation of the decision and directions of this Court in *Goa Foundation*[1] are given time to manage their affairs and may continue their mining operations till *15-3-2018*. However, they are directed to stop all mining operations with effect from *16-3-2018* until fresh mining leases (not fresh renewals or other renewals) are granted and fresh environmental clearances are granted.

154.7. The State of Goa should take all necessary steps to grant fresh mining leases in accordance with the provisions of the Mines and Minerals (Development and Regulation) Act, 1957. The Ministry of Environment and Forests should also take all necessary steps to grant fresh environmental clearances to those who are successful in obtaining fresh mining leases. The exercise should be completed by the State of Goa and the Ministry of Environment and Forests as early as reasonably practicable.

154.8. The State of Goa will take all necessary steps to ensure that the Special Investigating Team and the Team of Chartered Accountants constituted pursuant to the Goa Grant of Mining Leases Policy, 2014 give their report at the earliest and the State of Goa should implement the reports at the earliest, unless there are very good reasons for rejecting them.

154.9. The State of Goa will take all necessary steps to expedite recovery of the amounts said to be due from the mining leaseholders pursuant to the show-cause notices issued to them and pursuant to other reports available with the State of Goa including the report of Special Investigating Team and the Team of Chartered Accountants.

155. The writ petitions and SLPs are disposed of in accordance with the above conclusions and directions.

———

[1] Arising from the Judgment and Order in *Lithoferro* v. *State of Goa*, 2014 SCC OnLine Bom 997 : (2015) 3 AIR Bom R 32 (Bombay High Court, Panaji Bench, WP No. 293 of 2014, dt. 13-8-2014)

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[1] *Goa Foundation* v. *Union of India*, (2014) 6 SCC 590

[2] Actually 137 project proponents — there is some duplication.

[3] *Goa Foundation* v. *Union of India*, (2014) 6 SCC 738

[4] *Goa Foundation* v. *Union of India*, (2014) 6 SCC 590 (footnote 17)

[5] *Lithoferro* v. *State of Goa*, 2014 SCC OnLine Bom 997 : (2015) 3 AIR Bom R 32

[6] *State of M.P.* v. *Krishnadas Tikaram*, 1995 Supp (1) SCC 587

[7] <http://www.goadmg.gov.in/Uploads/288.pdf>.

[8] "122. It is my Government's intention to encourage investment in mining sector and promote sustainable mining practices to adequately meet the requirements of industry without sacrificing environmental concerns. The current impasse in mining sector, including, iron ore mining, will be resolved expeditiously. *Changes, if necessary, in the MMDR Act, 1957 would be introduced to facilitate this.*"

(emphasis supplied)

[9] <http://www.businesstoday.in/current/economy-politics/narendra-modi-cabinet-approves-ordinance-for-mines-auction/story/214253.html>.

<https://timesofindia.indiatimes.com/business/india-business/Cabinet-approves-ordinance-for-mines-auction/articleshow/45765290.cms>.

<http://www.financialexpress.com/economy/reforms-cabinet-approves-ordinance-for-mines-auction/26342/>.

<http://www.livemint.com/Politics/VDXphnUmPYGbN4ImzEBsIK/Govt-passes-executive-order-to-auction-minerals.html>.

[10] *T.N. Godavarman Thirumulpad* v. *Union of India*, (2010) 13 SCC 740

[11] *Goa Foundation* v. *Union of India*, (2014) 6 SCC 590 (footnote 4)

[12] *Goa Foundation* v. *Union of India*, (2015) 1 SCC 153

[13] *DDA* v. *Durga Chand Kaushish*, (1973) 2 SCC 825

[14] *Provash Chandra Dalui* v. *Biswanath Banerjee*, 1989 Supp (1) SCC 487

[15] *M.C. Mehta* v. *Union of India*, (2004) 12 SCC 118

[16] *State of W.B.* v. *Calcutta Mineral Supply Co. (P) Ltd.*, (2015) 8 SCC 655 : (2015) 4 SCC (Civ) 395

[17] *Gajraj Singh* v. *STAT*, (1997) 1 SCC 650

[18] *Common Cause* v. *Union of India*, (2014) 14 SCC 155

[19] *Centre for Public Interest Litigation* v. *Union of India*, (2012) 3 SCC 1

[20] *Manohar Lal Sharma* v. *Union of India*, (2014) 9 SCC 516

[21] *Natural Resources Allocation, In re, Special Reference No. 1 of 2012*, (2012) 10 SCC 1

[22] *Kasturi Lal Lakshmi Reddy* v. *State of J&K*, (1980) 4 SCC 1

[23] *Ajar Enterprises (P) Ltd.* v. *Satyanarayan Somani*, (2018) 12 SCC 756

[24] *Balco Employees' Union* v. *Union of India*, (2002) 2 SCC 333 at paras 46 and 47

[25] *Natural Resource Allocation, In re, Special Reference No. 1 of 2012*, (2012) 10 SCC 1, para 95

[26] *Goa Foundation* v. *Union of India*, (2011) 15 SCC 791

[27] *Sandur Manganese and Iron Ores Ltd.* v. *State of Karnataka*, (2010) 13 SCC 1

[28] *State of Assam* v. *Om Prakash Mehta*, (1973) 1 SCC 584

[29] *Quarry Owners' Assn.* v. *State of Bihar*, (2000) 8 SCC 655

[30] *CIT* v. *Anjum M.H. Ghaswala*, (2002) 1 SCC 633

[31] *Sube Singh* v. *State (NCT of Delhi)*, (2004) 6 SCC 440

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[32] *State of U.P.* v. *Singhara Singh*, AIR 1964 SC 358 : (1964) 1 Cri LJ 263 (2) : (1964) 4 SCR 485

[33] *Tisco Ltd.* v. *Union of India*, (1996) 9 SCC 709

[34] "**8. *Periods for which mining leases may be granted or renewed.***—(1) The maximum period for which a mining lease may be granted shall not exceed thirty years:

Provided that the minimum period for which any such mining lease may be granted shall not be less than twenty years.

(2) A mining lease may be renewed for a period not exceeding twenty years.

(3) Notwithstanding anything contained in sub-section (2), if the State Government is of opinion that in the interests of mineral development it is necessary so to do, it may, for reasons to be recorded, authorise the renewal of a mining lease in respect of minerals not specified in Part A and Part B of the First Schedule for a further period or periods not exceeding twenty years in each case.

(4) Notwithstanding anything contained in sub-section (2) and sub-section (3), no mining lease granted in respect of mineral specified in Part A or Part B of the First Schedule shall be renewed except with the previous approval of the Central Government."

[35] *Common Cause* v. *Union of India*, (2017) 9 SCC 499

[36] *Ambica Quarry Works* v. *State of Gujarat*, (1987) 1 SCC 213

[37] *Rural Litigation and Entitlement Kendra* v. *State of U.P.*, 1989 Supp (1) SCC 504

[38] *S.N. Mohanty* v. *Union of India*, 2012 SCC OnLine Del 4000

[39] *Property Owners' Assn.* v. *State of Maharashtra*, (2013) 7 SCC 522 : (2013) 3 SCC (Civ) 603

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Amrut

IN THE HIGH COURT OF BOMBAY AT GOA

WRIT PETITION NO.400 OF 2023 (Filing No.)
WITH
MISC. CIVIL APPLICATION NO.548 OF 2023 (Filing No.)

1 Sociedade de Fomento Industrial Pvt. Ltd., a
Company incorporated under Indian Companies
Act, 1956 having registered office at Vila
Flores Da Silva, Erasmo Carvalho Street,
P.O. Box 31, Margao, Goa 403 601,
represented herein by its authorized signatory,
Mr Shankar Narayan,
aged 49 years,
resident of H.No.509,
Techno Park, Porvorim Goa.

2 Mr Francisco Lume Pereira,
son of late Jose J. Lume Pereira,
Director of Sociedade de Fomento
Industrial Pvt. Ltd.,
the Petitioner No.1 herein,
aged 74 years,
resident of Senaulim, Verna Goa. ..Petitioners

Versus

1 State of Goa,
Through its Chief Secretary
having office at Secretariat,
Porvorim Goa.

2 The Director,
Directorate of Mines and Geology,
Government of Goa,
Ground Floor of Institute of Menezes
Braganza, Panaji Goa 403 001.

3 Ministry of Environment,
Forest & Climate Change,
3rd Floor, Indira Paryavaran Bhawan,
Jorbagh Road, Aliganj,
New Delhi 110 003.

4 The Goa Foundation,
Through its Secretary, Dr Claude Alvares,
having registered office at
Room No.7, above Mapusa Clinic,
Mapusa Goa 403 507
PAN No.AAAAG0249C,
EMAIL ID. goafoundation@gmail.com
…Respondents

Mr S. S. Kantak, Senior Advocate with Mr Parag Rao, Mr Yashraj Deora Singh, Ms Linette Rodrigues, Mr Preetam Talaulikar, Mr Akhil Parrikar, Ms Neha Kholkar, and Ms Saicha Desai, Advocates for the Petitioners.
Mr D. J. Pangam, Advocate General, with Mr Deep Shirodkar, Additional Government Advocate for the State.
Mr P. Faldessai, Deputy Solicitor General of India, with Mr Raviraj Chodankar, Central Government Standing Counsel for Union of India.
Ms Norma Alvares with Mr Om D'Costa, Advocates for the Applicant/Intervenor in M.C.A. No.548 of 2023 (F)

CORAM: **M. S. SONAK &**
VALMIKI SA MENEZES,JJ

Reserved on : **23rd MARCH 2023**
Pronounced on: **26th APRIL 2023**

JUDGMENT

1. Heard Mr S. S. Kantak, learned Senior Advocate who appears along with Mr Parag Rao, learned counsel for the Petitioners, Mr D. J.

Pangam, learned Advocate General who appears along with Mr Deep Shirodkar, learned Additional Government Advocate for the State, Mr P. Faldessai, learned Deputy Solicitor General of India and Ms Norma Alvares along with Mr Om D'Costa, learned counsel for the Intervenor.

2. Rule. The Rule is made returnable immediately at the request and with the consent of the learned counsel for the parties.

3. The primary issue in this Petition concerns the effect of Section 8B of the Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act) upon the environmental clearances (ECs) for mining leases that were the subject matter of the decisions of the Hon'ble Supreme Court in ***Goa Foundation Vs Union of India***[1], (GF-I) and ***Goa Foundation Vs Sesa Sterlite Limited and others***[2]**,** (GF-II).

4. The Petitioners raise the above issue in the context of a notice inviting tender (NIT) dated 25.01.2023 for the auction of mineral block described Block-VI – Cudnem- Cormolem Mineral Block. The Petitioners argue that Section 8B of the MMDR applies only to the valid ECs concerning the mining leases whose terms may have expired but not to ECs expressly cancelled by the Ministry of Environment and Forests (MoEF) based on the judicial orders in GF-I and GF-II.

1 (2014) 6 SCC 590

2 (2018) 4 SCC 218

The Petitioners argue that such specifically invalidated and cancelled ECs do not revive under Section 8B of MMDR. Therefore, the Petitioners contend that Respondent Nos.1 and 2 were not justified in representing in the NIT that Section 8B of the MMDR Act shall apply to Block VI, implying that successful auction bidders would not be required to obtain a fresh EC for commencing mining operations for this Block.

5. Based on the above arguments, the Petitioners have applied for the following substantive relief :

> "(A). *Issue a Writ of Mandamus or a Writ in the nature of mandamus or any appropriate writ order or direction, commanding the Respondent No.2 to forthwith delete the words "Section 8B of the MMDR Act shall be applicable to these block" appearing under caption List of Mineral Blocks for Auction in the NIT as well as at the appropriate places in the Tender Document pertaining to Block VI and also to delete the words "obtained by the previous lessee" in Part B of the Summary of Mineral Block provided along with the NIT under caption Details/Status, at Sr. No.3 including at the appropriate places in the Tender Document pertaining to Block VI."*

6. There are a few relevant facts in which the above issue/challenge arises, which are not seriously contested. On 22.08.2007, some leases in Block -VI were granted ECs under EIA 2006. Para 9 of EIA 2006 indicates the term of the ECs as the estimated project life or a

maximum of 30 years. However, after Justice M.B. Shah Commission Report concerning large-scale illegalities, including environmental violations by the mining industries in Goa, was tabled in Parliament on 07.09.2012, the State of Goa by order dated 10.09.2012 suspended all iron ore mining operations pending further orders. MoEF followed suit and kept in abeyance ECs of iron ore mines, including the ECs, for leases in Block VI in the State of Goa by order dated 14.09.2012.

7. The Hon'ble Supreme Court examined the legality and validity of the above orders dated 10.09.2012 and 14.09.2012 in GF-I. All challenges to the same were rejected in judgment and order dated 21.04.2014. Accordingly, the Hon'ble Supreme Court *inter alia* observed, "*the order dated 10.09.2012 of the Government of Goa and the order dated 14.09.2012 of MoEF will have to continue till decisions are taken by the State Government to grant fresh leases and* ***decisions are taken by MoEF to grant fresh environmental clearances for mining projects***". (See para 82 of the SCC report in GF-I).

8. The State then formulated the "*Goa Grant of Mining Leases Policy, 2014*" and, based upon the same, commenced granting a second renewal of mining leases from 05.11.2014 onwards. That process was completed on 12.01.2015. Accordingly, such second renewals were given to 88 mining leases. Significantly, on 12.01.2015,

the President promulgated Mines and Minerals (Development and Regulation) Amendment Ordinance 2015 (which was later enacted by the Parliament) whereby the grant of mining leases notified mineral was to be through competitive bidding or auction process.

9. Following the renewal of 88 mining leases, the State requested the MoEF by letters dated 07.01.2015 and 05.02.2015 to lift the ECs abeyance order dated 14.09.2012. As a result, by three separate orders dated 20.03.2015, the MoEF raised the abeyance on ECs regarding 88 mining leases.

10. The second renewal orders issued by the State Government and three orders dated 20.03.2015 of the MoEF raising the EC abeyances were challenged in GF-II directly before the Hon'ble Supreme Court. By judgment and order dated 07.02.2018, the Hon'ble Supreme Court struck down the State's second renewal order and MoEF's orders dated 20.03.2015.

11. Accordingly, by its order dated 23.04.2018, the MoEF cancelled the ECs granted to 88 mining leases covered by the Hon'ble Supreme Court's decision in GF-II. Neither mining lessees nor the State challenged the MoEF's order dated 23.04.2018, cancelling the ECs issued by the MoEF on 22.08.2007. Accordingly, the Petitioners and Goa Foundation (Intervenor) contend that this order of cancellation of ECs has attained finality.

12. The Parliament enacted Mineral Laws (Amendment) Act, 2020 introducing Section 8B with limited retrospective effect from 10.01.2020 (the date of the Ordinance). This provision was to apply only to the mining leases covered by Section 8A(5) and (6). This provision transfers all **valid** approvals, rights, clearances, and licenses of a previous lessee to a new lessee for a period of two years.

13. The Parliament, by MMDR (Amendment) Act 2021, which entered into force on 28.03.2021, substituted the amended Section 8B by removing the validity period of two years regarding valid approvals, rights, clearances, and licenses. The substituted Section 8B transferred and vested in the new lessee the **valid** approvals, rights, clearances and licenses. As a result, new lessees could operate mining leases based on **valid** approvals, rights, clearances, and licenses granted to former lessees.

14. Based upon the amended/substituted Section 8B of the MMDR Act, the State contends that even the cancelled ECs concerning the leases in Block VI would stand revived and transferred and vested in the new lessees/successful auction bidders in terms of NIT dated 25.01.2023. The Petitioners and the intervenor/Respondent – Goa Foundation contested this position and argued that the amended/substituted Section 8B of the MMDR Act would not apply to ECs that were expressly cancelled under the decision of the Hon'ble Supreme Court in GF -II.

15. The Petitioners also contend that the State has correctly represented in NIT that new lessees/successful auction bidders for Block VII -Cudnem mineral block would require a fresh EC The Petitioners contend that there is no difference between Block -VI and Block VII so far as fresh ECs are concerned. Therefore, the State has applied unequal yardsticks violating Article 14 of the Constitution.

16. Thus, as pointed out earlier, the main issue in this Petition is whether the State, through its NIT, can waive or at least represent that the requirement of obtaining a fresh EC would not apply to new lessees/successful auction bidders given the provisions of substituted Section 8B of MMDR.

17. The above issue will have to be examined *inter alia* in the context of the Mineral Laws (Amendment) Act, 2020, the MMDR (Amendment) Act, 2021, the 2021 amendment to the EIA notification 2006 and the decisions of the Hon'ble Supreme Court in GF-I and GF – II.

18. The statement of objects and reasons (SOR) to the Mineral Laws (Amendment) Bill 2020 *inter alia* provides that the mining lease for 334 mines of iron ore, manganese ore, and chromite was expiring on 31.03.2020, out of which 46 were working non-captive mines. It was observed that some States had initiated action to auction these blocks. However, mines allotted through auction could start mining

operations only after obtaining as many as 20 different clearances from Government agencies. This process was causing an inordinate delay in commencing mining operations and subsequent production of the minerals. Therefore, to overcome these difficulties in the mining sector, it has become necessary to facilitate the seamless transfer of all valid rights, approvals, clearances, licenses and the like for a period of two years to a new lessee in case of minerals other than coal, lignite and atomic minerals.

19. Accordingly, consistent with the above objective expressed in SOR, Section 8B was introduced in the MMDR Act, 1957, which provides that notwithstanding anything contained in the Act or any other law for the time being in force, the successful bidder of the mining lease expiring under the provisions of subsection 5 and 6 of Section 8A and selected through auction as per the procedure provided under the Act and rules made thereunder acquired all valid rights, approvals, licenses and the like vested with the previous lessee for a period of two years: provided that subject to such condition as may be prescribed the new lessee shall apply and obtain all necessary rights, approvals, clearances, licenses and the like within a period of two years from the date of grant of a new lease.

20. Section 8B of the MMDR Act was further amended/substituted by the MMDR (Amendment) Act, 2021. The SOR to the 2021 Amendment Bill *inter alia* provides that in order to fully harness the

potential of the mineral sector, increase employment and investment in the mining sector, including coal, increase the revenue to the States, increase the production and time-bound operationalization of mines, maintain continuity in mining operations after the change of lessee, increase the pace of exploration and auction of mineral resources and resolve long pending issues that have slowed the growth of the sector, it is felt necessary to further amend the said Act. The SOR adds that the MMDR Amendment bill 2021 seeks to provide that all the **valid** rights, approvals, clearances, licenses, and the like granted to a lessee in respect of a mine shall **continue to be valid** even after the expiry or termination of the lease and such clearances shall be transferred and vested to the successful bidder of the mining lease. This will ensure continuity in mining operations even with the change of lessee and conservation of minerals and avoid the repetitive and redundant process of obtaining clearances again for the same mine.

21. Accordingly, amended Section 8B was substituted with a new Section 8B. Since the State Government's entire case is based on substituted Section 8B and the amendment to EIA notification, 2006, the provisions of substituted Section 8B are transcribed below for the convenience of reference.

> *"8B. (1) Notwithstanding anything contained in this Act or any other law for the time being in force, all valid rights, approvals, clearances, licences and the like granted to a lessee in respect of a mine (other than those granted under the*

provisions of the Atomic Energy Act, 1962 and the rules made thereunder) shall continue to be valid even after expiry or termination of lease and such rights, approvals, clearances, licences and the like shall be transferred to, and vested; subject to the conditions provided under such laws; in the successful bidder of the mining lease selected through auction under this Act:

Provided that where on the expiry of such lease period, mining lease has not been executed pursuant to an auction under provisions of sub-section (4) of section 8A, or lease executed pursuant to such auction has been terminated within a period of one year from such auction, the State Government may, with the previous approval of the Central Government, grant lease to a Government company or corporation for a period not exceeding ten years or till selection of new lessee through auction, whichever is earlier and such Government company or corporation shall be deemed to have acquired all valid rights, approvals, clearances, licences and the like vested with the previous lessee:

Provided further that the provisions of sub-section (1) of section 6 shall not apply where such mining lease is granted to a Government company or corporation under the first proviso:

Provided also that in case of atomic minerals having grade equal to or above the threshold value, all valid rights, approvals, clearances, licences and the like in respect of expired or terminated mining leases shall be deemed to have been transferred to, and vested in the Government company or corporation that has been subsequently granted the mining lease for the said mine.

(2) Notwithstanding anything contained in any other law for the time being in force, it shall be lawful for the new lessee to continue mining operations on the land till expiry or

termination of mining lease granted to it, in which mining operations were being carried out by the previous lessee."

22. Thus, the 2020 and 2021 amendments seek to impart continuity to all valid rights, approvals, clearances, licenses and the like granted to a previous lessee. The 2020 amendment, however, was restricted, and the rights, approvals, clearances, licenses, etc., obtained by the earlier lessee could be used or operated by the new lessee for only two years. However, the 2021 amendment removes this two-year ceiling. There is also some difference in the language used in Section 8B, introduced by the 2020 amendment and Section 8B, as substituted by the 2021 amendment.

23. Section 8B, as introduced by the 2020 amendment, applied to leases expiring under the provisions of Section 8A(5) and 8A(6). It provided a deeming fiction for the continuance of earlier rights, approvals, clearances, licenses etc., for two years. Within that period, new lessees were expected to obtain fresh approvals, clearances, licenses etc. However, Section 8B, as substituted by the 2021 amendment, is not restricted to leases expiring under subsections (5) and (6) of Section 8A. Further, the substituted Section 8B purports to transfer and vest all valid rights, approvals, clearances, licenses and the like granted to the previous lease in new lessees/successful auction bidders.

24. But significantly, even the substituted Section 8B refers to "*all* ***valid*** *rights, approvals, clearances, licenses and the like granted to a*

lessee in respect of a mine....." The emphasis is on the word "***valid***". Nothing in Section 8B, as initially enacted or substituted by the 2021 Amendment Act, suggests that an invalid or cancelled approval or clearance would either stand revived or legalized and then be transferred or vested in a new lessee. Therefore, upon a plain reading of Section 8B substituted by the 2021 Amendment Act, it is apparent that what was intended to be transferred or vested in the new lessee were all valid rights, approvals, clearances, licenses and the like granted to the previous lessee in respect of a mine. Incidentally, even the SORs to the two Amendment Acts explicitly refer to "*valid rights, approvals, clearances, licenses and the like granted to the lessee in respect of a mine*".

25. Further, the substituted Section 8B provides that such **valid** rights, approvals, clearances, licences, etc. "*shall continue to be valid even after expiry or termination of the lease and such rights, approvals, clearances, licenses and the like shall be transferred to and vested; subject to the conditions provided under such laws; in the successful bidder of the mining lease selected through auction under this Act*. The expression "*continue to be valid*" presupposes that such approvals, clearances, licenses etc., were valid on the date of transfer and vesting.

26. Section 8B does not contemplate either revival of approvals, clearances, or licenses that may have lapsed under the provisions under

which they were issued or cancelled, withdrawn or struck down for some reasons, and such orders have been attained finality for want of challenge or failure of the challenge. Only what is transferred and vested in the new lessee are all valid approvals, clearances, licenses etc. Therefore, based upon provisions of Section 8B, the State cannot contend that ECs that were expressly cancelled by MoEF based on judicial decisions GF-I and GF-II stand revived and shall be transferred and vested in the new lessee/successful auction bidders, thereby obviating the necessity for such new lessee/successful auction bidders from obtaining fresh ECs.

27. Ministry of Environment, Forest and Climate Change (MoEF), vide Notification dated 13.07.2021, has substituted sub-para 3 of Paragraph 11 in the EIA notification, 2006, with the following, namely:

> *"(3) The prior Environmental Clearance vested with the previous lessee shall be deemed to have been transferred during its validity period in terms of the Mines and Minerals (Development and Regulation) Act, 1957 (67 of 1957) as amended by the Mines and Minerals (Development and Regulation) Amendment Act, 2021 (16 of 2021) to the successful bidder of the mining leases, from the date of commencement of new lease for the remaining validity period (calculated from the date from which the said Environmental Clearance was initially granted), subject to the new lessee registering online on PARIVESH portal along with an undertaking to comply with all the conditions of the transferred Environmental Clearance".*

28. The above Notification dated 13.07.2021 refers to the GF-II and amendments introducing Sections 8A and 8B to MMDR Act 1957. The recitals to this Notification refer to aligning the relevant provisions of EIA notification 2006 with the amended MMDR Act, 1957. Therefore, if Section 8B of MMDR refers to *'valid'* ECs, the above Notification, while aligning, cannot be said to have referred to invalid, lapsed or cancelled ECs. Further, we cannot ignore that the MoEF's cancellation of the ECs order dated 23.04.2018 was virtually in deference to or in compliance with the Hon'ble Supreme Court's observations and directions in GF-I and GF-II decisions. Indeed, by amending a notification, the MoEF could not have intended to revive ECs cancelled based upon the observations or directions of the Hon'ble Supreme Court. Therefore, as a Constitutional Court, we cannot support such a strained construction mainly because it would have the effect of reviving ECs adversely commented upon by the Hon'ble Supreme Court In GF-I and GF-II. Besides, such a strained construction would defy the express directions in GF-I and GF-II about the 88 leases not commencing operations until the MoEF issued fresh ECs.

29. Further, even the EIA notification dated 13.07.2021 amending the EIA notification 2006 provides that prior environmental clearance *vested with the previous lessee shall be deemed to have been transferred during its validity period to the successful bidder of the mining leases, from the date of commencement of the new lease for*

the remaining validity period (calculated from the date from which the said environmental clearance was initially granted) subject to new lessee complying with certain conditions.

30. Thus only those ECs vested with the previous lessee shall be deemed to have been transferred to the new lessee. Therefore, if on the date of transfer, an EC that was earlier granted to the previous lessee was not in force either because its validity period had expired or because the same was cancelled or struck down, there is no question of such EC being vested in the earlier lessee on the date of transfer. So also, there is no question of some divested or cancelled EC being transferred or deemed to have been transferred to the new lessee or successful bidder of the mining lease.

31. The amended provisions, including SORs or recitals to the EIA notification 2021, unmistakably indicate that the amendment's object was to ensure continuity in mining operations even with the change of lessee and to avoid repetitive and redundant for obtaining clearances again for the same mine. Thus, the valid approvals, clearances, licenses, etc. granted to the lessee in respect of a mine were to inure for the benefit of the new lessee/successful auction bidder, who could then immediately continue with the mining operations based upon such approvals, clearances, licenses and the like seamlessly, provided of course such approvals, clearances, licenses and the like were valid and existing at the time of transfer and vesting.

32. The above amendments were *inter alia* necessary because even the renewal of a mining lease was invariably regarded as a grant of a fresh mining lease. Based upon this principle, upon the expiry of the term of the mining lease and at the stage of even grant of renewal, fresh ECs had to be necessarily obtained even though the earlier ECs may have been entirely valid. Similarly, getting a fresh EC was necessary if the lease was terminated and a fresh lease was to be granted. Such fresh ECs had to be obtained even though the ECs granted to the former lessee were entirely valid, both regarding their intrinsic merit and validity period. To obviate this repetitive and redundant process of obtaining the ECs again for the same mine, amendments were made to Section 8B and EIA notification, 2006 so that the transfers and operations could be seamless.

33. However, these amendments neither suggest nor can be interpreted to indicate that the ECs whose validity period had already expired or, more importantly, the ECs that were already cancelled because they were found to be infirm and illegal by the Hon'ble Supreme Court would also stand revived, transferred and vested in the new lessee/successful bidders as a consequence of the amendments. Such a construction would then amount to the Legislature, or even the Executive overturning the Hon'ble Supreme Court's judicial decision in a specific case without even bothering to remove the fundamental basis of such a decision or correcting the errors pointed out by the Court. Such a construction would even defy the doctrine of separation

of powers, which is now accepted as one of the facets of the Rule of Law. The Rule of law, in its turn, is now accepted as a constituent of Article 14 of the Constitution.

34. The plain wording of the amendments does not support the State's interpretation. Without Parliament having ever stated so, the State virtually seeks to read the amendment to Section 8B as some sort of legislative overruling of the decision in GF-I and GF-II. In GF-II, the Hon'ble Supreme Court found several faults in the ECs issued to the 88 mining leases that benefited from the second renewal order of the State Government. Not only did the Hon'ble Supreme Court strike down the second renewal order in respect of the 88 leases, but further, the Hon'ble Supreme Court pointed out several illegalities in the issue of the ECs. Therefore, an interpretation that is not supported by the text or the context and further that nullifies express directions of the Hon'ble Supreme Court cannot be accepted.

35. Based upon the State Government's request, the MoEF, which had kept in abeyance the environmental clearances by order dated 14.09.2012, lifted such abeyance order on 20.03.2015. However, the Hon'ble Supreme Court explicitly ruled that the order dated 20.03.2015 lifting the earlier order dated 14.09.2012 keeping in abeyance the ECs was void. Thus the earlier order dated 14.09.2012, keeping in abeyance the ECs dated 22.08.2007 granted to mines in Block VI, was revived. As if this was not sufficient, the MoEF, by a

specific order dated 23.04.2018, cancelled the environmental clearance dated 22.08.2007.

36. Thus as of the date of coming into force of Section 8B in MMDR Act, 1957 or, more pertinently, as of the date of publication of NIT in 2023, EC dated 22.08.2007 was no longer in force. Consequently, the said EC was no longer a valid EC that could, in terms of Section 8B of MMDR Act, 1957, have been transferred and vested to a new lessee or a successful bidder at the proposed auction through NIT. The State was obliged to state this position clearly in the NIT or at least not represent or suggest that no fresh EC was necessary for operating the mines in Block VI of the NIT.

37. In doing so, the State perhaps seeks to ignore or downplay the "*rapacious and rampant exploitation*" of Goa's natural resources "*iron ore mining sector*" coupled with a total lack of concern for the environment and the health and well-being of the denizens in the vicinity of the mines. These are the words with which the Hon'ble Supreme Court commenced its judgment in GF- II:

> "*Rapacious and rampant exploitation of our natural resources is the hallmark of our iron ore mining sector coupled with a total lack of concern for the environment and the health and well-being of the denizens in the vicinity of the mines. The sole motive of mining leaseholders seems to be to make profits (no matter how) and the attitude seems to be that if the Rule of law is required to be put on the*

backburner, so be it. Unfortunately, the State is unable to firmly stop violations of the law and other illegalities, perhaps with a view to maximize revenue, but without appreciating the long term impact of this indifference. Another excuse generally put forth by the State is that of development, conveniently forgetting that development must be sustainable and equitable development and not otherwise."

38. In GF-II, the questions which arose for consideration were set out in para 36, and the same read as follows:-

"*Questions for consideration*

39. *Broadly speaking, on the basis of the submissions and documents placed before us, the questions raised by the Goa Foundation, the State of Goa, the Union of India and the mining lease holders are threefold:*

36.1. (a) Relatable to the second renewal of the mining leases: (i) In view of the decision in Goa Foundation only fresh leases were to be granted by the State of Goa and not second renewals. (ii) For granting fresh leases, the State of Goa should have introduced competitive bidding or the auction process. (iii) Assuming the decision to grant a second renewal to the mining lease holders was valid, the second renewals were not in accordance with law and should be set aside.

36.2 (b) Relatable to the grant of environmental clearances: In view of the decision in Goa Foundation fresh environmental clearances were required to be obtained by the mining lease holders.

36.3 (c) The impugned judgment and order passed by the High Court in Lithoferro vs State of Goa, 2014 SCC OnLine Bom 997, on 13 August, 2014 was erroneous and deserves to be set aside."

40. On the first question, referred to in para 36.1 above, the Hon'ble Supreme Court held that the direction in GF-I was quite clear. Therefore, instead of considering a second renewal of the mining lease, the State of Goa was required to consider a fresh mining lease. Accordingly, the decision of the State of Goa to grant a second renewal to the 88 mining leases was held to be erroneous, contrary to the decision in GF-I and the same was quashed.

41. In the context of the second question referred to in para 36.2 above, relatable specifically to the grant of environmental clearances, the Hon'ble Supreme Court took cognizance of a report of the Vishwanath Anand Expert Appraisal Committee (EAC). In para 86, the Hon'ble Supreme Court held that "*A reading of the report of the EAC is disturbing and acutely highlights the damage to the environment and ecology by the mining lease holders. The complete indifference by all concerned is evident from a careful reading of the report."* The Hon'ble Supreme Court then referred to and quoted in extenso *"Summary of Observations"* and the "C*oncluding Remarks"* from the report of EAC since, according to the Hon'ble Supreme Court, they were self-explanatory.

42. The discussion on the ECs issue is found in Paras 86, 87 and 88 from Goa Foundation-II, transcribed below for the convenience of reference.

> "*86. A reading of the report of the EAC is disturbing and acutely highlights the damage to the environment and ecology by the mining lease holders. The complete indifference by all concerned is evident from a careful reading of the report. We propose to refer to and quote in extenso the "summary of observations" and the "concluding remarks" from the report of the EAC since they are self explanatory:*
>
> *"Summary of Observations*
>
> *I. The absence of specific conditions highlighting the mandatory requirement to obtain prior approval of the Standing Committee of the NBWL [National Board for Wild Life] in the EC [Environmental Clearance] has led to misinterpretation of the legal requirement. There has been an inordinate delay of more than 5 years before effective action against defaulting units were initiated by the Ministry for non-compliance of the Hon" ble Supreme Court order dated 04.12.2006.*
>
> *II. Out of 137 ECs, the requirement of obtaining approval of the Standing Committee of the NBWL under the WL (P) Act 1972 [Wild Life (Protection) Act] has not been complied with in 123 cases where the distances are less than 10 km from the nearest PA [Protected Area].*
>
> *III. In respect of 10 cases approval of the Standing Committee of the NBWL is not mandatory as the mine leases are located beyond 10 km from nearest PA.*

IV. Contrary to the directions of the Hon" ble Supreme Court dated 04.08.2006 in Writ Petition (Civil) No. 202/1995; ECs have been accorded to 41 mines located within 1 km from the nearest PA.

V. In respect of 20 cases mine leases were renewed under the MMDR Act, 1957 prior to grant of FCs [Forest Clearance].

VI. In 29 cases, project proponents have furnished wrong information about distance from the nearest Pas.

VII. Non-compliance of various EC conditions such as excess production/unauthorized dump mining/drawal of ground water without prior approval of CGWB/encroachment; have also been reported in respect of working mines.

Concluding Remarks

A reading of our observations and recommendations would show that without exception, every proponent to whom an environment clearance was issued has either violated its conditions or has furnished information in the application which has been distant from the truth. There are basically two types of violations; one that cannot be legally condoned and those that can be rectified with remedial measures. This is the reason why the committee has recommended that all ECs for mines located within one km from PAs should be revoked and in cases where untruthful information was furnished in the application for EC, such mines should not be allowed to reopen. In the case of those mines which have been closed for more than five years, their reopening has not been recommended without their applying de novo for a fresh environmental clearance as micro environmental conditions on the ground would have changed during the period they remained closed. However, when one looks at the manner in

which the directives dated 04.08.2006 and 04.12.2006 of the Supreme Court have been implemented one cannot help but feel that there is the absence of a bridge mechanism within the Ministry to ensure and oversee that directives of the Courts are complied with due diligence and seriousness.

There are two factors which stand out; in some ECs as mentioned in this report, the condition was inserted that the project proponent should seek approval of the CWLW [Chief Wild Life Warden], in others it was stated that approval of the Competent Authority/Standing Committee of the NBWL should be obtained and in a third category no condition at all was imposed, even though some of these ECs pertain to the same meeting and timelines between 2005 and 2007. It is strange that officials concerned in the MoEF were not aware that other than the Standing Committee of the NBWL no other person was authorized to grant the permission envisaged by the order dated 04.12.2006 of the Supreme Court. This is not to state that any discrepancy in the EC letter would absolve the project proponent from complying with the law of the land. This has resulted in creating ambiguity amongst many of the project proponents and it was not until 01.01.2009, that the MoEF issued a public notice clarifying the position.

Considering that some of the project proponents may have been misguided by the ambivalence of the MoEF in not clearly delineating the legal position, it is suggested that in the case of those project proponents who did not conceal facts in their applications but did not apply for permission to the Standing Committee of the NBWL, their applications may be considered for being placed before the Standing Committee of the NBWL. However this can in no way be construed as a justification on the part of the project proponents for not complying with the requirements of the law. It must be noted for example that in those cases where mining has intersected the ground water, approval of the CGWB [Central Ground Water Board] had not been taken by the project proponents as was

required by the EC Similarly, there are cases where mining operations have taken place without obtaining a FC.

* * *

As regards violations of the conditions of the ECs and where environmental damage has been caused, the proponents concerned should be made accountable and the MoEF should examine as to how some monetary damages can be levied through due legal process based on the Polluter Must Pay principle, the proceeds of which could be used for environmental rehabilitation.

There are concerns about the carrying capacity of the area with regard to its ability to sustain the extent and quantum of mining that has taken place there. It is recommended that a carrying capacity study should be commissioned for the area, or if another study by a nationally recognized institution is coming to fruition the result of that should be acted upon. Such a study should also take into account the impact of mining on the hydrology of the region and the extent of pollution caused to surface and ground water. This study should be compared to the earlier 10 years' baseline data to determine the impact of mining on the biodiversity and hydrology of the area in the last decade. Based on the finding of this, a specific policy for mining of iron ore in the region may be developed. Such a policy along with a proper control and monitoring mechanism is necessary in order to avoid a situation such as the one under question. It would hopefully also ensure that mining in this region is carried out in accordance with best sectoral practices using appropriately clean technologies." Emphasis supplied by us].

87. The report of the EAC reveals that there is not a single environment -related or mining -related law or legal requirement that was not violated by one or the other mining

lease holder. Quite clearly, the Rule of environmental law in Goa had gone with the wind.

88. There was one extremely important requirement relating to extraction of groundwater – that is, clearance from the Central Ground Water Board - but even that was ignored. During the course of submissions, we were informed that there is plenty of groundwater available in Goa. However, what seems to have been overlooked is that with the intersection of groundwater levels with mining operations, the groundwater would get depleted much faster than expected or the quality of the groundwater would deteriorate. It is for this reason that MoEF insisted that clearance for drawal of groundwater must be taken from the Central Ground Water Board and care taken in respect of the intersection of groundwater level with mining operations (this happened in 46 cases). Unfortunately, no heed was paid to these requirements by the State of Goa or any of the mining lease holders and not one mining lease holder has any clearance (where required) from the Central Ground Water Board, or at least none was brought to our notice".

43. The Hon'ble Supreme Court, after referring to the EAC report, proceeded to consider whether fresh ECs were required to be obtained by the 88 mining lease holders claiming the benefit of second renewal. In para 129, the Hon'ble Supreme Court noted the specific direction in para 82 of GF-I that such fresh environmental clearance had to be obtained. Further, the Hon'ble Supreme Court pointed out that some leaseholders had ECs under EIA 1994 and others under EIA 2006. Notwithstanding this, since in GF-I, it was already directed that fresh environmental clearance must be obtained, the Hon'ble Supreme

Court held that this direction had to be complied with by those who were granted a fresh mining lease.

44. In para 130 of GF-II, the Hon'ble Supreme Court observed, "*That apart, the materials before the Court while deciding the Goa Foundation included the report of the Justice Shah Commission, report of the EAC and the report of expert committee constituted by the Court by orders dated 11.11.2013 and 18.11.2013. On a combined reading of the material before it, the Court took a broad view that large-scale mining of iron ore led to several adverse impacts including those related to the environment, ecology and health of the people of Goa and that these illegalities and irregularities were committed by almost all (if not all) mining lease holders as reported by the EAC. The Court also accepted the view of the Expert Committee that the ecology of Goa was being degraded through indiscriminate mining and placed a cap on the annual excavation of iron ore. It was noted that mining by the lessees in Goa after 22 November, 2007 was illegal and that mining operations were suspended by the State of Goa on 10 September, 2012 and environmental clearances granted to the mines were kept in abeyance by the MoEF on* ***14 September, 2012. Considering all this, as well as the law laid down in Goa Foundation to the effect that there is no automatic second renewal of a mining lease but that a second renewal must be granted in accordance with the provisions of Section 8(3) of the MMDR Act, the Court used the expression***

"grant fresh environmental clearances for mining projects" in the passage referred to above.

45. Thus the Hon'ble Supreme Court in GF-II, in clear and unambiguous terms, held that fresh ECs were a must for mining leases in the State of Goa affected by the decision in GF-I and GF-II. This reiteration in GF-II was based not only upon the explicit direction in GF-I but also material in the form of the Justice Shah Commission report, report of EAC, and report of the expert committee constituted by the Court. This direction was also based upon the Hon'ble Supreme Court taking a broad view that large-scale mining of iron ore led to several adverse impacts, including those related to the environment, ecology and health of the people of Goa and that almost all committed these illegalities and irregularities (if not all) mining lease holders as reported by the EAC. All this is evident from the expression "**That apart**", with which para 130 of GF II proceeds.

46. Therefore, to now say that Section 8B of MMDR Act, 1957 or the EIA Notification of 13.07.2021 virtually does away with and nullifies all these clear and specific findings and directions of the Hon'ble Supreme Court in GF-I, and GF-II is a contention that cannot be accepted. Neither do the provisions of Section 8B support such a construction nor can it be said that Parliament intended to legislatively overrule or reverse the specific directions issued by the Hon'ble Supreme Court about obtaining fresh ECs. As noted earlier,

such express directions were first given in GF-I. Moreover, they were reiterated in GF-II when the State Government and MoEF attempted to wriggle out from such directions on the specious plea that a second renewal was granted and earlier orders, keeping in abeyance the environmental clearances lifted.

47. In GF-II, the Hon'ble Supreme Court, after referring to the EAC report, referred to the expert committee report, which Hon'ble Supreme Court observed, makes for some very depressing reading. This is the discussion in para 131 of the Goa Foundation-II, transcribed below for the convenience of reference.

> "*131. We have already adverted to the report of the EAC. As far as the Expert Committee set up by the Court is concerned, it had furnished an Interim Report dated 14 March, 2014 in which it noted large-scale degradation of the environment and recommended placing an annual cap between 20 and 27.5 million tonnes on the extraction of iron ore in Goa. The Expert Committee noted the following (which makes for some very depressing reading):*
>
> > *"The production of iron ore has jumped from 14.6 million tons in 1941 to 41.17 million tons in 2010-2011. In 1980s the production was about 10 MT/annum. The quantum jump in iron ore production in Goa was essentially due to steep rise in exports of fines and other low grade ore of 42% Fe content to China. This has led to massive negative impacts on all ecosystems leading to enhanced air, water, and soil pollution affecting quality of life across Goa. This is evident by three important reports i.e. (i) Areawise Environmental Quality Management*

(AEQM) Plan for the Mining belt of Goa by Tata Energy Research Institute, New Delhi and Goa (1997) and it was submitted to the Directorate of Planning, Statistics, and Evaluation, Government of Goa, (ii) Environmental and Social Performance Indicators and Sustainability Markers in Minerals Development Reporting Progress towards Improved Ecosystem Health and Human Well-being, Phase III by TERI and International Development Research Centre, Ottawa, Canada (2006) and (iii) the Regional Environmental Impact Study of Iron Ore Mining in Goa region sponsored by MoEF, New Delhi (2014) by Indian School of Mines. Besides the above three main reports, a number of scientific research papers on the impact of iron ore mining on the environment and ecology of diverse ecosystems were published by scientists working at Goa University and NIO.

These reports and publications substantiate that the mining, particularly the enhanced level of annual production contributed to adverse impacts on the ecological systems, socio- economics of Goa and health of people of Goa leading to loss of ecological integrity. This is due to enhanced levels of pollutants, particularly RSPM and SPM, sedimentation of materials from dumps and iron ore in rivers, estuaries and shallow depth (20 m) of sea water, agricultural fields, high concentration of Fe and Mn in surface waters and their bioaccumulation." Emphasis supplied]."

48. In para 132 of the GF -II, the Hon'ble Supreme Court held that faced with all this material evidence before it, the Court took the view in GF-I that fresh ECs must be obtained. In the context of an attempt by the State of Goa to bypass this direction, the Hon'ble Supreme Court at para 132 observed: "*Unfortunately however, the*

State of Goa was more concerned with earning revenue rather than the health of the people of Goa or enforcing the rule of law and therefore gave a complete go-bye to the directions of this Court and to the concerns of the citizens of Goa and requested the MoEF to lift the abeyance on the environmental clearances."

49. The Hon'ble Supreme Court, in para 135 of GF-II, also made scathing observations about misleading information contrary to some earlier decisions of the Hon'ble Supreme Court, resulting in the lifting of order keeping in abeyance of environmental clearances. The Hon'ble Supreme Court held that the order dated 20.03.2015 lifting abeyance was "*cryptic*" and issued "*without application of mind*". The observations in paras 137 and 140 of the Goa Foundation-II are relevant and transcribed below for the convenience of reference.

> "*137. The third order of 20 March, 2015 is extremely cryptic in the matter of lifting the abeyance order of 14 September, 2012 on environmental clearances. While dealing with 35 mining leases for which environmental clearance had been granted under EIA 1994 and 37 mining leases for which environmental clearance had been granted under EIA 2006, the following is stated:*
>
> > *"It has been decided in the Ministry that the EC issued under 1994 notification in case they are valid and subsisting would not require fresh EC at the time of renewal (OM L-11011/15/2012-IA-II (M) dated 20.3.2015. Therefore it has been decided to lift abeyance on the 72 cases of which 35 cases had been granted EC under the provisions of EIA notification 1994 and 37 cases*

had been granted EC under EIA notification 2006." Emphasis supplied].

140. What is disturbing is that notwithstanding several and various violations, the MoEF granted environmental clearance to 72 mining leases. It seems to us that the MoEF acted without any application of mind in lifting the order placing all the environmental clearances in abeyance. Since the entire exercise carried out by the MoEF on 20 March, 2015 was mechanical, at the behest of the State of Goa, without due application of mind, without considering the multiple illegalities and irregularities committed by the mining lease holders or passing on the buck to the State of Goa and without considering relevant material such as the report of the EAC and the Expert Committee appointed by this Court, the exercise of lifting the abeyance order on 20 March, 2015 by the MoEF must be held void and as directed by the Court in Goa Foundation all the mining lease holders must obtain fresh environmental clearance for their mining project."

50. The Hon'ble Supreme Court at para 142 of the GF -II emphasized that issues impacting society must be looked at holistically and not in a disaggregated manner. An overall perspective was necessary on such matters, including issues that impact the environment and the people of a community, region, or State. For this reason, it was essential to look at them broadly; otherwise, if that broader perspective was lost, everyone would be a loser, and no one would be a real beneficiary. One or two violations here and there may be wished away as inconsequential, but multiple violations by several persons can result in serious problems. The Court quoted the novelist

and philosopher Ayn Rand: **We can evade reality, but we cannot evade the consequences of evading reality.**

51. Therefore, the Hon'ble Supreme Court ruled that there was no doubt that the Mineral Policy, the Grant of Mining Leases Policy, the amendment to the MMDR Act, the report of the EAC and the report of the Expert Committee *must be considered in the larger context of constitutionalism, the Rule of law, environmental jurisprudence as well as the fundamental right of the people of Goa to have clean air and protection of the fragile ecology.* The Court ruled that *Governance cannot and should not be carried out de hors the interests of the people and some uncomfortable decisions may be inevitable for balancing the equities*.

52. Finally, in GF-II, the Hon'ble Supreme Court held that the second renewal of the mining leases granted by the State of Goa was liable to be quashed and set aside. Further, the Court reiterated that the MoEF was obliged to grant fresh environmental clearances in respect of the fresh mining leases in accordance with law and the decision in GF-I and not merely lift the abeyance order of 14.09.2012. Therefore, the mining leaseholders who had been granted the second renewal in violation of the decision and directions of this Court in GF-I were given time to continue their mining operations till 15 March 2018. However, after this date, they were directed to stop all mining operations "*until fresh mining leases (not fresh renewals or*

other renewals) are granted and fresh environmental clearances are granted." Yet the State is bent on defying this clear and unambiguous direction a second time.

53. The Hon'ble Supreme Court directed that the State of Goa should take all necessary steps to grant mining leases in accordance with the MMDR, 1957. Further, the MoEF was also directed to take all necessary steps "*to grant fresh environmental clearances to those who are successful in obtaining fresh mining leases".* Finally, this exercise was directed to be completed by the State of Goa and MoEF as reasonably practicable.

54. The learned Advocate General, however, stressed upon para 139 of the GF-II to urge that whatever may have been the directions of the Hon'ble Supreme Court in GF I and GF-II, given the Parliamentary amendment to Section 8B and the EIA Notification dated 13.07.2021, fresh ECs were no longer essential for mines holding ECs under EIA,2006. He submitted that Parliament is Sovereign and Supreme in such matters, and the command of the Parliament must be obeyed.

55. Para 139 of GF I reads as follows:-

> *"139. As regards the 37 mining leases that had obtained environmental clearance under EIA 2006, since the validity of the environmental clearance is for the estimated project life or*

a maximum of 30 years in terms of paragraph 9 of EIA 2006 therefore no violation can be found on the ground of validity for the time period. To this limited extent, no interference is necessary at this stage in respect of these 37 mining leases. We make it clear, however, that this is subject to our conclusion that fresh mining leases were required to be granted by the State of Goa. Consequently, a mining lease holder obtaining a fresh mining lease would require a fresh environmental clearance in terms of EIA 2006."

56. The learned Advocate General submitted that the Hon'ble Supreme Court had expressly held that the ECs under EIA 2006 for the estimated project life or a maximum of 30 years in terms of Para 9 of EIA 2006 were valid in the above para. He submitted that the Hon'ble Supreme Court also found it unnecessary to interfere with the ECs for 37 mining leases that had obtained environmental clearances under EIA 2006. Therefore, based upon such reading of Para 139, the learned Advocate General submitted that ECs granted under EIA 2006 were valid and in terms of amended Section 8B of the MMDR, 1957, such valid ECs would continue to remain valid and stand transferred and vested to the new lessee/successful auction bidder. Therefore, he submitted that there was no longer any requirement for obtaining a fresh environmental clearance. He submitted that even specific directions in GF-I and GF-II would no longer apply, given the legislative introduction and amendment to Section 8B of the MMDR. The Advocate General submitted that Parliament is "*sovereign*" and "*supreme*" in such matters and, therefore, notwithstanding any judicial decision, the command of the Parliament will have to be

abided by. He submitted that the State of Goa was not some island to which the Parliamentary legislation was inapplicable.

57. With respect, we cannot agree with the learned Advocate General's broad-based contention. Firstly Para 139 has to be read in its entirety. Secondly, Para 139 has to be read along with the other Paras commencing from 129 to 142 of the decision in Goa Foundation-II. Thirdly, the last four lines of 139 also cannot be ignored where the Hon'ble Supreme Court has clarified that its observations in the preceding lines of Para 139 are subject to the Court's consideration that fresh mining leases were required to be granted by the State of Goa and consequently, the mining leaseholders obtaining a fresh mining lease would require a fresh environmental clearance in terms of EIA 2006. Therefore, it almost appears that the Hon'ble Supreme Court was conscious of potential attempts at misinterpretation and clarified that the lines now quoted by the learned Advocate General were subject to the specific direction for obtaining fresh ECs.

58. Under our Constitutional scheme, it is the Constitution itself that is supreme. Therefore, the argument based upon the sovereignty that the Parliament undoubtedly has cannot persuade us to hold that explicit judicial directions in GF-I, equally explicitly reiterated in GF-II, can now be ignored by the State Government relying upon amendment to Section 8B or amendment to EIA notification 2006. Moreover, even the argument of Supremacy of the Parliament

overlooks the doctrine of separation of powers, acknowledged as an essential facet of the Rule of Law. The Rule of law, in turn, is a crucial constituent of Article 14 of the Constitution. But, as noted earlier, even the text of Section 8B or the Notification dated 13.07.2021 does not support such a broad construction. Even otherwise, it is well settled that legislative or executive powers cannot be employed to overrule or reverse judicial orders without bothering to cure the defects or remove the fundamental basis of judicial decisions.

59. In ***Government of Kerala, Irrigation Department and Ors, vs James Varghese and Ors[3].*** and ***State of Tamil Nadu vs State of Kerala[4],*** the Hon'ble Supreme Court has explained that even without the express provision of the separation of powers, the doctrine of separation of powers is an entrenched principle in the Constitution of India. This doctrine informs the Indian Constitutional structure and is essential to the Rule of law. In other words, the doctrine of separation of powers though not expressly engrafted in the Constitution, its sweep, operation and visibility are apparent from the scheme of the Indian Constitution.

60. The two decisions hold that the independence of Courts from the Executive and Legislature is fundamental to the Rule of law and one of the basic tenets of the Indian Constitution. Separation of judicial power is a significant principle under the Constitution of

3 (2022) 9 SCC 593
4 (2014) 12 SCC 696

India. Accordingly, breaching the separation of judicial power may negate equality under Article 14. Separation of powers between three organs – the Legislature, Executive and Judiciary, is also nothing but the consequence of principles of equality enshrined in Article 14 of the Constitution of India. The Court held that legislation could be invalidated based on a breach of the separation of powers since such a breach negates equality under Article 14 of the Constitution.

61. In GF-I and GF-II, the Hon'ble Supreme Court pointed out several reasons based upon which the direction was issued for fresh mining leases to obtain fresh ECs. In particular, the GF-II gives several reasons supporting this direction, including but not limited to materials like the Justice Shah Commission report, EAC report, and expert committee report. The Hon'ble Supreme Court refers to accepting the broad view in such matters. Based upon a combined reading of material before it, the Hon'ble Supreme Court took into consideration several impacts, including those related to environment ecology and the health of the people of Goa, and these illegalities and irregularities were committed by almost all (if not all) mining leaseholders as reported by the EAC.

62. Therefore, the direction for obtaining fresh ECs was not connected solely with the direction to obtain fresh mining leases (and not fresh renewal or other renewal). Still, this direction was based upon all such material referred to in great detail by the Hon'ble

Supreme Court in GF-I and GF-II. Therefore, merely because the law may have been amended by the introduction of Section 8B, explicit direction for obtaining fresh environmental clearance cannot be said to have been nullified by such amendment. Besides, upon properly construing the amended clause, it is clear that only valid ECs could be continued, transferred, and vested in the new lessee. Accordingly, even Section 8B as it now stands does not contemplate either validation or continuance of ECs which, upon adjudication, were found to be legally infirm or all ECs that were explicitly cancelled by the MoEF based upon observations of the Hon'ble Supreme Court in GF -I and GF-II. This also substantially answers the learned Advocate General's argument about the State of Goa being converted into an island where the provisions of Section 8B of the MMDR Act would not apply. Section 8B would undoubtedly apply to the State of Goa. But the provision applies only to transferring and vesting valid ECs to the new lessees/successful bidders, not where ECs are cancelled or struck down by judicial orders. By the proposed construction, the State wishes to read into the provision something the Parliament did not say or intend to say.

63. Mr Kantak pointed out that in the context of amendment to the MMDR Act by which Section 8A was introduced, the State Government, by communication dated 19.11.2019, agreed that some of the mining lessees would be entitled to the benefit of the extended lease term i.e. from 1987 to 2037 (for 50 years) in terms of Section

(A)(3) of the MMDR Act, 1957. However, by pointing out the specific directions in GF-I and GF-II decisions, the State Government declined to extend the benefit of Section 8A to such mining lessees.

64. Therefore, when applying provisions of Section 8A of the MMDR Act, 1957, the State Government did not consider itself bound by the amended provisions but chose to follow explicit directions issued by the Hon'ble Supreme Court in GF-I and GF-II judgments. These explicit directions required the State Government to consider cases of mining leases in the State of Goa for the grant of fresh leases and not renewal or extension of their term. However, when it comes to the application of Section 8B of the MMDR, at least in the context of Block VI mines, the State Government wants to rely upon its peculiar interpretation of Section 8B, notwithstanding the explicit directions in GF-I and GF-II judgments that such mines cannot operate without obtaining fresh ECs.

65. Incidentally, the State Government's order dated 19.11.2019 in the context of Section 8A was challenged in Writ Petition No.1005 of 2019 (Vedanta Limited and Another Vs Director of Mines & Geology and others). The Petitioners raised contentions almost similar to what are now raised by the State in this matter. There, the State defended its order by raising arguments similar to what are now raised by the present Petitioners and Intervenors. Accordingly, this Petition was dismissed by the Division Bench by order dated 25.11.2019.

66. The learned Advocate General's contention in defence of the State Government's order dated 19.11.2019 refusing to apply provisions of Section 8A of the MMDR is set out in Para 5 of this Court's order dated 25.11.2019 and reads as follows:-

> "*Shri Pangam, however, points out that the decision of the Hon'ble Apex Court in Goa Foundation – II judgment is quite clear inasmuch as all mining operations in the State of Goa ordered to be stopped with effect from 16/03/2018 until fresh mining leases or other renewals and* ***fresh environmental clearances are granted."***

67. The Division Bench, in its order dated 25.11.2019, while dismissing the Writ Petition No.1005 of 2019, also observed the following in Para 9 as follows:-

> "*9. Secondly, we note that the directions of the Hon'ble Supreme Court in Goa Foundation-II are quite clear in that the State of Goa has been directed to take all necessary steps to grant the "fresh mining leases" in accordance with the provisions of MMDR, 1957. The Ministry of Environment and Forests is also directed to take all necessary steps to grant "fresh environmental clearances" to those who are successful in obtaining "fresh mining leases". The Hon'ble Supreme Court, in the same judgment has also directed the State of Goa to stop all mining operations with effect from 16 March, 2018 until "fresh mining leases (not fresh renewals or other renewals)" are granted and "fresh environmental clearances are granted". Faced with such clear and categorical directions, we agree with the learned Advocate General that the State of Goa had no option but to reject the representation*

made by the Petitioner, for the present. There is accordingly, no case is made out to interfere with the impugned communication."

68. Vedanta Limited and Another instituted the Petition (s) for Special Leave to Appeal (C) No(s).29211/2019 to challenge this Court's order dated 25.11.2019 in Writ Petition No. 1005 of 2019. However, the same was dismissed by the Hon'ble Supreme Court by order dated 07.09.2021. Similarly, the Review Petition (C) Diary No.41515 of 2019 in SLP (C) No.32138 of 2015 instituted by the State of Goa to challenge the decision in GF-II was also dismissed by the Hon'ble Supreme Court as barred by limitation and also on merits. Again, this is clear from the Hon'ble Supreme Court's order dated 09.07.2021.

69. The Hon'ble Supreme Court's order dated 09.07.2021 dismissing the Review Petition against the Goa Foundation-II judgment is transcribed below for the convenience of reference:-

"*The Judgment of the Court was delivered by :*

Dr D. Y. Chandrachud, J *- The review petitions have been preferred by the State of Goa (Diary No 41515 of 2019 and Diary No 41517 of 2019, both with a delay of 650 days and Diary No 41453 of 2019 and Diary No 41545 of 2019, both with a delay of 651 days) and by Vedanta Limited (formerly known as M/s Sesa Sterlite Limited) (Diary No 18430 of 2020, Diary No 18435 of 2020, Diary No 18438 of 2020 and Diary No 18447 of 2020, all four with a delay of 907 days) against the judgment of a two-Judge Bench of this Court in* ***Goa***

Foundation vs Sesa Sterlite Limited & Ors[5], *[hereinafter referred to as "Goa Foundation (2)"], pronounced on 7 February 2018.*

2. In accordance with Rule 2 of Order XLVII of the Supreme Court Rules, 2013, an application for review of a judgment has to be filed within thirty days of the date of the judgment or order that is sought to be reviewed. No cogent grounds have been furnished for the delay between 20 and 26 months by the two parties in filing their applications for review. The Judges comprising the two-Judge Bench in Goa Foundation (2), Madan B. Lokur and Deepak Gupta, JJ., retired from this Court on 30 December 2018 and 6 May 2020, respectively. The State of Goa preferred its four review petitions in the month of November 2019, after Justice Madan B. Lokur, J's retirement, while Vedanta Limited preferred its four review petitions in the month of August 2020, right after Deepak Gupta, J's retirement. Such practice must be firmly disapproved to preserve the institutional sanctity of the decision-making of this Court. The review petitioners were aware of the decision of this Court.

3. ***Keeping in mind the above, we are inclined to dismiss these review petitions on the ground of limitation alone. However, in any event, we also find that no legitimate grounds for review of the judgment in Goa Foundation (2) have been made out, and dismiss these review petitions on merits as well.***

4. Pending application(s), if any, are disposed of."

70. Some of the erstwhile mining lessees made yet another attempt to bypass the explicit directions in GF-I and GF-II once again by relying upon Sections 8 and 8A of the MMDR Act, 1957 and the

5 (2018) 4 SCC 218

decision of the Hon'ble Supreme Court in ***Common Cause Vs Union of India,*** 2016(11) SCC 455. The erstwhile lessees contended that irrespective of the directions in GF-II and by virtue of the provisions in Sections 8 and 8A of the MMDR Act, as interpreted in *Common Cause* (supra), they were eligible and entitled to treat the original lease period as being of 50 years to be reckoned from 1987 and up to 2037. After the State Government did not accept such contentions, erstwhile mining lessees instituted several petitions, including Writ Petition No.255 of 2022 (*Lithoferro Vs Director of Mines and Geology) others*). This batch of petitions was disposed of by the Division Bench of this Court vide judgment and order dated 07.10.2022 (See 2022 SCC OnLine Bom 3420).

71. Before the Court, the Petitioners, by relying upon Sections 8 and 8A of the MMDR Act, 1957, urged that notwithstanding the specific directions in GF-I and GF-II, under Sections 8 and 8A of the MMDR Act, 1957, their lease terms stood extended up to 2037. Additionally, the Petitioners placed strong reliance on Common Cause (Supra).

72. In the above batch of petitions, the submissions on behalf of the Goa Foundation (Intervenor) and the State of Goa are recorded in Para 21 of the judgment and order dated 07.10.2022. One of the contentions on behalf of the Goa Foundation and the State of Goa was that the declaration in Para 87.1 of the Goa Foundation-I

judgment was conclusive. The Goa Foundation and the State of Goa also contended that the directions for grant of "*fresh lease" i*n the GF-I judgment *"was deliberate and conscious decision distinct and different, from granting of second renewal of expired leases in other States and, therefore, Goa has not been discriminated."*

73. The Division Bench of this Court, in its judgment and order dated 07.10.2022, after considering the several arguments which were advanced before it dismissed all the writ petitions by erstwhile mining lessees. The Division Bench in Para 38 specifically concurred with the order dated 25.11.2019 passed by the coordinate Bench of this Court in Writ Petition No.1005 of 2019 filed by M/s Vedanta Ltd. and another. The Division Bench squarely rejected the erstwhile lessees' contentions about specific directions in GF-I and GF-II judgments being watered down by the 2015 amendment to the MMDR Act, 1957. The Division Bench noted that the GF-II judgment not only reinforced the directions issued in GF-I but, in Para 154.6, held and directed the mining leaseholders to stop all mining operations until fresh mining and environmental clearances are granted.

74. The Special Leave Petition against the above judgment and order dated 07.10.2022 passed by the Division Bench in *Lithoferro* (supra) and other batch petitions was dismissed by the Hon'ble Supreme Court on 21.11.2022 (*Sociedade Zarapkar and Parkar*

Limitada Vs The State of Goa and others, Petition for Special Leave to Appeal (C) No(s). 19694/2022).

75. Thus, in the context of amended provisions of Sections 8 and 8A of the MMDR Act, 1957, even the State Government supported the Goa Foundation's contention that specific directions in GF-I and GF-II judgments would prevail and that such directions were not watered down by the amended provisions. However, in the context of amended provisions of Section 8B of the MMDR Act, 1957, the State of Goa contends that this provision would prevail over the express directions in the GF-I and the GF-II judgments that fresh ECs must be obtained before the commencement of any mining operations. This is notwithstanding the position that Section 8B of the MMDR Act, 1957 contemplates only the transfer and vesting of "*valid*" ECs and not ECs already cancelled by the MoEF based upon scathing observations made by the Hon'ble Supreme Court in the GF-II judgment. Therefore, Mr Kantak and Ms Alvares are justified in pointing out the contradictions in the stance of the State Government.

76. Mr Kantak also pointed out that regarding Block VII (Cudnem Mineral Block), two lessees had obtained ECs under the EIA 2006. However, regarding Block VII, the State had not applied Section 8B, and the interpretation now put forth. The State was quite clear that fresh EC would be necessary for Block -VII even though it had EC under EIA, 2006. But when it comes to Block -VI, the State contends

that no fresh EC was necessary. Mr Kantak submitted that this amounts to arbitrariness violating Article 14 of the Constitution.

77. The learned Advocate General acknowledged that fresh EC would be necessary for leases included in Block-VII even though such leases had been environmental clearance under EIA 2006. However, he submitted that this was because some of the areas in this Block were affected by the provisions of the Forest (Conservation) Act 1980. Incidentally, this was not the stance of the Director & ex-officio Joint Secretary (Mines and Geology), Government of Goa, in his affidavit dated 06.03.2023. In para 25 of his affidavit, the Director has pleaded that in relation to clearances granted under 2006 notification, Section 8B applies and such clearances were transferred and vested in the successful bidder.

78. Thus, on affidavit, the Director & ex-officio Joint Secretary (Mines) states that the directions of the Hon'ble Supreme Court regarding obtaining fresh ECs would not apply to ECs granted under EIA notification 2006 because, to such ECs provisions of Section 8B of the MMDR,1957 would apply. This was perhaps the State Government's understanding of the position. However, the learned Advocate General, during the course of his arguments, did not endorse the Director's line (as he was undoubtedly entitled to) but submitted across the Bar that the provisions of Section 8B were not applied to Block -VII (Cudnem) even though ECs had been issued the EIA

notification 2006 because of some forest issues. All that we think is that such contradictions would be minimized if Section 8B is construed to apply to the continuance of valid ECs and not ECs that are cancelled based upon the scathing observations of the Hon'ble Supreme Court. That we believe is the proper and lain construction of Section 8B of the MMDR Act.

79. The learned Advocate General argued that the Petitioners had no locus standi to maintain this Petition or, in any case, this Petition was premature. He submitted that even after the auction if the Petitioners were indeed successful, the Petitioners might have to obtain a fresh EC. However, the learned Advocate General submitted that there was no cause of action or good reason to interfere with the impugned endorsement made in the NIT at this stage or for this reason.

80. The Petitioners have evinced interest in participating in the tender/auction process. The decision on the bid to be offered would, to some extent, depend upon whether fresh EC is required or not. Apart from the fact that obtaining a fresh EC would involve greater expenses that would have to be factored in, getting a fresh EC would imply the application of different time schedules and timelines for payment of bid amounts and the commencement of mining operations.

81. Mr Kantak has pointed out how different timelines and schedules would apply to cases where fresh ECs must be obtained. Mr Kantak also pointed out how an Applicant stands to forfeit a substantial amount if mining operations are not commenced within the timeline indicated. Finally, Mr Kantak pointed out that if, after being declared a successful bidder, the Petitioners cannot begin the mining operations for want of fresh EC, the Petitioners would stand to forfeit the substantial amount or be involved in unnecessary and avoidable litigation.

82. According to us, the Petitioners cannot be non-suited for want of locus standi. The Petitioners have a real and substantial interest in the subject matter of this Petition and the issues raised therein. The Goa Foundation that has intervened in this Petition has also contended that fresh EC is a must in such matters. Considering the zeal with which the Goa Foundation has pursued the mining issue, the Petitioners are justified in anticipating that the Goa Foundation would move the Courts to ensure that the successful bidder obtains a fresh EC before any mining operations are commenced. Therefore, this Petition cannot be rejected on the ground that the Petitioner lacks locus standi or that this Petition was premature.

83. The learned Advocate General also pointed out that this Petition is malafide because the Petitioners have restricted the relief to Block VI of NIT and not other Blocks. Mr Kantak submitted that the

Petitioners were interested in bidding for Block VI, not other Blocks. Therefore, the relief was claimed only in respect of Block VI. Mr Kantak, however, submitted that there was no malafide involved, and once the Court declares the law, the same would apply in respect of other Blocks if similarly placed.

84. No malafide could be inferred because the Petitioners restrict the relief to the Block in which the Petitioners have evinced interest. However, if fresh ECs are required for other Blocks, then obviously, the law will also apply to such blocks. Even without any legal intervention, the State has not exempted the Block VII mines from the requirement of obtaining fresh EC.

85. As noted earlier, MoEF, based upon the observations of the Hon'ble Supreme Court in GF-I and GF-II, cancelled the ECs vide order dated 23.04.2018. Earlier, the MoEF had, by order dated 14.09.2012, kept in abeyance such ECs. This order was effectively withdrawn, or abeyance was lifted vide order dated 20.03.2015. However, this order dated 20.03.2015 was declared void and vitiated by non-application of mind by the Hon'ble Supreme Court in GF-II.

86. Thus, even as of date, the MoEF order dated 23.04.2018 stands. Even if it is assumed that this order does not stand, the MoEF order dated 14.09.2012 stands after the order dated 20.03.2015 rejecting this order was declared void by the Hon'ble Supreme Court.

Accordingly, there was no valid EC that could have been continued or which could have been transferred and vested in the new lessee. Mr Kantak relied on ***Pune Municipal Corporation Vs State of Maharashtra and others***[6] to submit that executive orders do not carry any brand of invalidity on their forehead. Therefore, if any executive order aggrieves the party, such party must challenge the same and get the same declared void or otherwise struck down.

87. The learned Advocate General, however, contended that the MoEF order dated 23.04.2018 was only an executive or statutory order that would fall in line with Section 8B of the MMDR Act, 1957. Accordingly, he contended that the MoEF order dated 23.04.2018 would not override or affect Parliamentary Legislation in Section 8B, which contains a non-obstante clause.

88. As noted earlier, nothing in Section 8B of the MMDR Act, 1957 revives ECs that are already cancelled. Section 8B refers only to valid rights, approvals, clearances, licences, etc. Further, Section 8B provides that such valid clearances shall continue to be valid after the expiry or termination of the mining lease. The expression "*continue to be valid"* presupposes that EC was valid on the date of transfer and vesting. Therefore, this is not a case of an executive or statutory order overriding the Parliamentary Legislation. Instead, this is a case where proper construction of Section 8B of the MMDR Act, 1957 would

6 (2007) 5 SCC 211

result in the harmonious implementation of the directions of the Hon'ble Supreme Court in GF-I and GF-II judgments, the MoEF's Executive or Statutory orders and the provisions of the Parliamentary Legislation.

89. In GF-I and GF-II judgments, the Hon'ble Supreme Court relied upon the Justice Shah Commission's report, the Committee experts comprising Dr. C.R. Babu (Ecologist), Dr S.C. Dhiman (Geologist/Hydrogeologist), Prof. B.K. Mishra (Mineralogist), Prof. S. Parameswarappa (Forestry), Shri Parimal Rai (nominee of the Ministry of Environment and Forests, Government of India), NEERI report for macro level EIA study in the State of Goa, data submitted by various agencies including Goa State Pollution Control Board etc. based upon all this material directly concerned with the degradation of the environment in Goa due to rampant illegal mining, the Court concluded that the entire State of Goa and its people were victims of rapacious and rampant exploitation of our natural resources was the hallmark of iron ore mining sector coupled with a total lack of concern for the environment and the health and well-being of the denizens in the vicinity of the mines. The Court referred to the report of EAC, which reveals that there was not a single environment-related or mining-related law or legal requirement that was not violated by one or the other mining lease holder.

90. The Hon'ble Supreme Court noted that "*quite clearly, the rule of environmental law in Goa had gone with the wind.*" The Court noted that no clearance was obtained from the Central Ground Water Board for groundwater extraction. In the context of the submission that there is plenty of groundwater available in Goa, the Court observed that what seems to have been overlooked was that with the intersection of groundwater levels with mining operations, the groundwater would get depleted much faster than expected or the quality of the groundwater would deteriorate. The Court noted that, unfortunately, no heed was paid to these requirements by the State of Goa or any of the mining lease holders, and no one mining leaseholder has any clearance (where required) from the Central Ground Water Board.

91. The Hon'ble Supreme Court noted that even the State of Goa was alive to the fact that many (if not all) mining lease holders had violated the terms of the mining lease or some statutory obligation. The offences ranged, amongst others, from illegal sale of ore, sale of royalty challan without ore, encroachment of adjoining areas outside the lease, overproduction in excess of the limit specified in the environmental clearance, unscientific mining operations, violations concerning payment of royalty amount, re-use of old royalty challans for defrauding, illegal mining activities etc. etc.

92. The Hon'ble Supreme Court also noted that iron ore production in the State of Goa jumped from 14.6 million tons in 1941 to 41.17 million tons in 2010-2011. The Court noted that in the 1980s, the production was about 10 MT/per annum. This has led to massive negative impacts on all ecosystems leading to enhanced air, water, and soil pollution, affecting the quality of life across Goa. The Court quoted expert committees' notings that various reports and publications substantiate that the mining, particularly the enhanced annual production contributed to adverse impacts on the ecological systems, socio-economics of Goa and health of the people of Goa, leading to loss of ecological integrity. This is due to enhanced levels of pollutants, particularly RSPM and SPM, sedimentation of materials from dumps and iron ore in rivers, estuaries and shallow depths (20 m) of seawater, agricultural fields, high concentration of Fe and Mn in surface waters and their bio-accumulation. Faced with this material evidence before it, the Court took the view in GF-I that fresh environmental clearance must be obtained.

93. This conscious decision of the Hon'ble Supreme Court in GF-I judgment which was reiterated in GF-II judgment, cannot be bypassed by regarding the ECs which were explicitly cancelled by the MoEF order dated 23.04.2018 as valid only to grant new lessees/successful auction bidders the benefit of Section 8B of the MMDR Act, 1957. As noted earlier, the proper construction of Section 8B of the MMDR Act, 1957 indicates that only valid ECs

were to stand transferred and vested in the new lessees/successful auction purchasers. If the State Government's interpretation is to be accepted, then the ECs issued in 2007, based upon which the mining industry in the State of Goa virtually caused havoc by rapacious and rampant exploitation regardless of any concern for environment, health and well-being of the citizens, would have to be revived and transferred to the new lessees/successful bidders. The impact of rapacious and rampant exploitation, including several severe environmental violations by the mining industry between 2007 and 2012, would have to be ignored. This, according to us, would not be a proper mode of construing provisions of Section 8B of the MMDR Act, 1957. In any case, based upon strained construction suggested by the State of Goa, express directions of the Hon'ble Supreme Court in GF-I and GF-II judgments cannot be nullified or ignored.

94. For all the above reasons, we allow this Petition and make the Rule absolute in terms of prayer clause (A) quoted in paragraph 5 of this judgment and order. However, we clarify that fresh ECs will have to be obtained even by the successful bidders to Block -VII or other Blocks to which the decisions of the Hon'ble Supreme Court in GF-I and GF-II apply or to mining blocks in respect of which the ECs were cancelled by the MoEF by order dated 23.04.2018.

95. The Petition is accordingly disposed of. The Misc. Civil Application is also allowed and disposed of accordingly. No costs.

96. All concerned can act on the authenticated copy of this order.

VALMIKI SA MENEZES, J **M. S. SONAK, J**

TARI AMRUT NAGESH Digitally signed by TARI AMRUT NAGESH
Date: 2023.04.26 14:31:01 +05'30'

ra

IN THE HIGH COURT OF BOMBAY AT GOA

PIL WRIT PETITION NO.1/2008

VILLAGERS OF THE SHIRGAO VILLAGE, C/o Nilu Mukund Gaonkar, Vadacha Wada, at Shrigao Goa.

... PETITIONER

Versus

1. SIRIGAO NAGARIK SANGHATANA, Sirigao-Goa.

2. STATE OF GOA through its Chief Secretary having its office at the Secretariat, Porvorim - Goa.

3. DEPUTY COLLECTOR/SDO, Bicholim Goa.

4. EXECUTIVE ENGINEER/ CANAL OFFICER, Works Division/Water Resources Department, Panaji Goa.

5. GOA STATE POLLUTION CONTROL BOARD, Panaji Goa.

6. M/S. BANDEKAR COMPANY PVT.LTD., Sirigao Goa.

7. M/S. CHOWGULE AND COMPANY PVT. LTD., Sirigao Goa.

8. M/S DEMPO MINING CORPORATION LTD., Bicholim Goa.

9. UNION OF INDIA, through
Department of Mines Safety,
Margao-Goa.

10. THE SECRETARY, Ministry
of Environment & Forests,
Panjavaran Bhavan, CGO
Complex, Lodi Road, New
Delhi – 110 003. ... RESPONDENTS

WITH
WRIT PETITION NO.214/2020

RAJARAM BANDEKAR
(SIRIGAO) MINES PRIVATE
LIMITED, a Company set up
under the Companies Act,
1956, with its Registered
Office at 601, 6th floor, Dr.
Ozler Forum, near St.
Andrews' Church, Vasco-Da-
Gama, Goa 403802.
(represented herein by its
duly authorised General
Manager, Mr. Felix Fernandes,
major, resident of House No.
217, Mangor Hill, Vasco, Goa. ... PETITIONER

Versus

1. THE STATE OF GOA,
through
its Chief Secretary,
Secretariat, Alto Porvorim,
Bardez, Goa.

2. DIRECTOR OF MINES &
GEOLOGY, Directorate of
Mines & Geology,
Government of Goa, Menezes
Braganza Institute, Panaji,
Goa, 403001.

3. THE NORTH GOA DISTRICT MINERAL FOUNDATION, a Trust established under Section 9B(1) of the Mines and Minerals (Development and Regulation) Act, 1957, (represented by its Chairman, District Magistrate (North), Panaji, Goa. ... RESPONDENTS

Ms Norma Alvares, Amicus Curiae with Ms M. Simoes and Mr Om D'Costa, Advocates for the Petitioner in PIL WP No.1/2008.

Mr. Devidas Pangam Advocate General with Mr. Deep Shirodkar, Additional Government Advocate for Respondent Nos. 2 to 4 in PILWP 1/2008 and with Ms. Maria Simone Judith Correia, Additional Government Advocate for Respondent Nos. 1 and 2 in WP 214/2020.
Mr. Manish Salkar, Advocate for Respondent No.5 in PILWP 1/2008.

Mr. A. F. Diniz, Senior Advocate, along with Mr. Ryan Menezes and Ms. S. Alvares, Advocates for Respondent No. 6 in PILWP 1/2008 and for the Petitioner in WP 214/2020.

Mr. S. D. Lotlikar, Senior Advocate, along with Mr. T. Sequeira and Ms. Sailee Kenny, Advocates for Respondent No. 7 in PILWP 1/2008.

Mr. Sudin Usgaonkar, Senior Advocate along with Ms. T. Mashelkar, Advocate for Respondent No. 8 in PILWP 1/2008.

CORAM: **M. S. KARNIK & NIVEDITA P. MEHTA, JJ.**

Reserved on: **17th JANUARY 2025**

Pronounced on: **30th JANUARY 2025**

JUDGMENT: (Per M. S. Karnik, J.)

1. The PIL Writ Petition No.1/2008 and Writ Petition No.214/2020 raise issues which are inter-linked and hence disposed of by a common judgment. The PIL Writ Petition raises several issues one of which was about desilting of agricultural fields, savat khazan, kharat khazan and poi/rivulet. The grievance in the PIL Writ Petition is that as a result of pumping from the working mining pit and discharge of water into the fields canals/rivulet, considerable environmental damage was caused to the agricultural fields thereby degrading the soil fertility as a result of silt deposition from the mining overburdens. Considerable expenditure had to be incurred to desilt the agricultural fields and the rivulet. The question is whether the expenditure incurred towards desilting is to be recovered from the mining companies (respondents no.6 to 8) or from the District Mineral Foundation Trust towards which the mining companies are making regular contributions pursuant to its establishment.

2. The challenge in Writ Petition No.214/2020 is to the proviso to Rule 13(1)(b) of the Goa District Mineral Foundation (Trust) Rules, 2018 (said Rules). The challenge in brief is that the impugned proviso is ultra

vires Section 9B of the Mines and Minerals (Development & Regulation) Act, 1957 (MMRD). Firstly, we deal with the challenge in this Writ Petition.

3. According to Mr A. F. Diniz, learned Senior Advocate for the petitioner submitted that in view of the proviso to Section 9B(3), only the Central Government can give directions regarding the composition and utilization of funds by the District Mineral Foundation Trust (DMFT). The impugned proviso made by the State Government, is therefore, ultra vires the rule-making powers conferred upon the State Government. Mr Diniz submits that in any case, the proviso is illegal, arbitrary, unreasonable, null and void. He submits that the entire purpose of establishing DMF is to take up, inter alia, environmental preservation and pollution control measures incidental to mining activities in a specified area. He submits that if some measures are necessary on account of mining pollution, then, the funds from DMF ought to be allowed to be used for the said purpose. He submits that the proviso to the extent it excludes the activities meant to be taken up under the “polluter pays principle” is ex facie illegal, unreasonable, arbitrary and unconstitutional. He

submits that excluding this class of activities amounts to discrimination and therefore the impugned proviso is liable to be declared as ultra vires and struck down.

4. The brief facts giving rise to the challenge are set out hereafter. The petitioner is a company set up under the Companies Act, 1956. The petitioner is the beneficiary of Title of Mining Concession bearing number T/C 4/1949 in Sirigao (Shirgao), Goa, granted by the erstwhile Portuguese regime. Consequent upon the Goa, Daman and Diu Mining concessions (Abolition and Declaration as Mining Leases) Act, 1987, the mining concessions in Goa were deemed as Mining Leases and the petitioner as lessee thereof.

5. In view of the judgment of the Hon'ble Supreme Court in *Goa Foundation V/s. Union of India & Ors.* dated 21.04.2014 passed in Writ Petition No.435/2012, the Mines & Mineral (Development & Regulation) Act 1957 (MMDR Act) was amended inter alia adding Section 9B thereto, which Section reads as follows:

> "***9B. District Mineral Foundation**.- (1) In any district affected by mining related operations, the State Government shall, by notification, establish a trust, as a non-profit*

body, to be called the District Mineral Foundation.

(2) The object of the District Mineral Foundation shall be to work for the interest benefit of persons, and areas affected by mining related operations in such manner as may be prescribed by the State Government.

(3) The composition and functions of the District Mineral Foundation shall be such as may be prescribed by the State Government.

[Provided that the Central Government may give directions regarding composition and utilisation of fund by the District Mineral Foundation.]

(4) The State Government while making rules under sub-sections (2) and (3) shall be guided by the provisions contained in article 244 read with Fifth and Sixth Schedules to the Constitution relating to administration of the Scheduled Areas and Tribal Areas and the Provisions of the Panchayats (Extension to the Scheduled Areas) Act, 1996 (40 of 1996) and the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (2 of 2007).

(5) The holder of a mining lease or a composite licence granted on or after the date of commencement of the Mines and Minerals (Development and Regulation) Amendment Act, 2015, other than those covered under the provisions of sub-section (2) of section 10-A, shall, in addition to the

royalty, pay to the District Mineral Foundation of the district in which the mining operations are carried on, an amount which is equivalent to such percentage of the royalty paid in terms of the Second Schedule, not exceeding one-third of such royalty, as may be prescribed by the Central Government.

(6) The holder of a mining lease granted before the date of commencement of the Mines and Minerals (Development and Regulation) Amendment Act, 2015 [and those covered under the provisions of sub-section (2) of section 10-A], shall, in addition to the royalty, pay to the District Mineral Foundation of the district in which the mining operations are carried on, an amount not exceeding the royalty paid in terms of the Second Schedule in such manner and subject to the categorisation of the mining leases and the amounts payable by the various categories of lease holders, as may be prescribed by the Central Government."

6. The State Government framed the Goa District Mineral Foundation Rules, 2016 (the 2016 Rules) under Section 9-B of the MMDR Act. The 2016 Rules were thereafter repealed and replaced by the Goa District Mineral Foundation (Trust) Rules, 2018 (2018 Rules), which came into force w.e.f. 10.01.2019.

7. In view of Section 9B of the MMDR Act, the petitioner has paid a sum of Rs.92,44,000/- to respondent no.3, the District Mineral Fund Trust (DMFT) during the short periods in the year 2016-2017 and 2017-2018 during which the petitioner operated its mining lease. Other mining lessees within the State of Goa have also paid various amounts to the DMFT. The total amount paid by mining lessees in the State of Goa to the DMFT runs into several hundred crores of rupees. The mining operations in the State of Goa were banned w.e.f. 15.03.2018.

8. A brief reference to the PIL petitioner needs a mention at this stage. In 2008, Public Interest Litigation Writ Petition No.1/2008 (*Villagers of Shirgao Village V/s. Sirigao Nagarik Sanghatana & Others*, (connected PIL petition) was registered in this Court pursuant to a letter by certain persons allegedly from the village of Shirgao, claiming inter alia that the village fields were affected by mining operations of the petitioner and two other mining companies, Respondents No. 7 & 8 in Writ Petition No. 214 of 2020 i.e. Chowgule and Co. Pvt. Ltd. (reflected in the petition as Chowgule Mining Co. Pvt. Ltd.) and Dempo Mining Corporation Ltd. (now Sesa Mining Corporation

Ltd.).

9. According to Mr Diniz, learned Senior Advocate, the petitioner as well as other mining companies, paid handsome compensation to the agriculturists regularly for several years apart from the contribution to the DMFT. At one stage, the three Companies even cultivated the village fields and produced two bumper crops to the knowledge of the Zonal Agricultural Officer and proved that the fields were cultivable and that the concerned persons were deliberately keeping them fallow so as to avail of crop loss compensation from the companies. The petitioner jointly with other two mining companies has supplied Sintex water storage tanks to each household and also drinking water meters and paid water consumption bills over several years.

10. Pursuant to the order passed in Goa Foundation case by the Hon'ble Supreme Court, mining in Goa came to a standstill. After resumption of mining in 2017, an application bearing MCA No.354/2017 was filed in the said petition seeking various reliefs, including de-siltation of the fields 'Sawat Khazan'. On 04.09.2018, this Court recorded the communication issued by the competent authority requesting the

identification of fields, rivulets, etc. that could be taken up for desiltation in Shirgao village so that the work could be carried out under the District Mineral Foundation Funds.

11. The Proviso to Rule 13(1)(b) is relied upon by the respondent-State to contend that the activities relating to the 'polluter pays principle' are excluded from the activities of the DMFT. Rule 13 of the 2018 Rules containing the said proviso which is under challenge reads thus:-

> "***13. Scope of the District Mineral Foundation Trust.-*** *The District Mineral Foundation Trust shall work for the interest and benefits of person, and areas affected by the mining related operations and in particular shall focus on the following areas, as per priorities determined in the Perspective and annual District Mineral Foundation plans.*
>
> *(1)* ***High priority areas.-*** *(a) Drinking water supply- Centralized purification systems, water treatment plants. permanent/temporary water distribution network including standalone facilities for drinking water, laying of piped water supply system.*
>
> *(b)* ***Environment preservation and pollution control measures-****Effluent treatment plants,*

prevention of pollution of streams, lakes, ponds, ground water, other water sources in the region, measure for controlling air and dust pollution caused by mining operations and dumps, mine drainage system, mine pollution prevention technologies, and measures for working or abandoned mines and other air, water & surface pollution control mechanisms required for environment friendly and sustainable mine development.

However activities meant to be taken up under the "polluter pays principle" or as per the obligations of the industries under the environment management plan or mines management plan should not be taken up under District Mineral Foundation Trusts.

(c) ***Health care-*** *The focus must be on creation of primary/secondary health care facilities in the affected areas. The emphasis should not be only on the creation of the health care infrastructure, but also on provision of necessary staffing, equipment and supplies required for making such facilities effective. To that extent, the effort should be to supplement and work in convergence with the existing health care infrastructure of the local bodies, State and Central Government. The*

expertise available with the National Institute of Miners' Health may also be drawn upon to design special infrastructure needed to take care of mining related illnesses and diseases. Group Insurance Scheme for health care may be implemented for mining affected persons.

(d) ***Education-*** *The focus must be on augmentation and development of resources and infrastructure for improving both secondary and elementary education. This may include construction of school buildings, Additional class rooms, Laboratories, Libraries, Art and crafts room, Toilet blocks, Drinking water provisions, Residential Hostels for students/teachers in remote areas, sports infrastructure, engagement of teachers/other supporting staff, e-learning setup, other arrangement of transport facilities (bus/van/cycles//rickshaws/etc.) and nutrition related programmes.*

(e) ***Welfare of Women and Children-*** *Special programmes for addressing problems of maternal and child health, malnutrition, infectious diseases, etc. can be taken up under the PMKKKY.*

(f) ***Welfare of aged and disabled people-*** *Special programmes for welfare of aged and disabled*

people.

(g) ***Livelihood & Skill development-*** *Skill development for livelihood support, income generation and economic activities for local eligible persons particularly around local resources such as agri-based, forest resources, horticulture etc. The projects//schemes may include training, development of skill development centers, self-employment schemes, support to vulnerable sections such as women//women groups/tribal groups, support to self help groups, placement oriented training to youth and provision of forward and backward linkages for such self-employment economic activities.*

(h) ***Sanitation-*** *Collection, transportation & disposal of waste, cleaning of public places, provision of proper drainage & Sewage Treatment Plant, provision for disposal of fecal sludge, provision of toilets and other related activities.*

(2) ***Other priority Areas.-*** *(a) Physical infrastructure - Providing required physical infrastructure road, bridges, railways and waterways projects with priority in directly affected areas.*

(b) ***Irrigation-*** *Developing alternate sources of*

irrigation, adoption of suitable and advanced irrigation techniques.

(c) ***Energy and Watershed Development-*** *Development of alternate source of energy (including micro-hydel) and rainwater harvesting systems, augmentation of integrated watershed management practices, development of orchards, integrated farming and economic forestry and restoration of catchments.*

(d) Any other measures for enhancing environmental quality in mining district.

In addition to the above, the scope will include implementing the objectives specified in Pradhan Mantri Khanij Kshetra Kalyan Yojana which are not specifically enlisted herein;"

(emphasis supplied)

12. Mr Diniz, learned Senior Advocate submits that the said proviso to Rule 13(1)(b) to the extent that it excludes activities under the 'Polluter Pays Principle' from the scope of activities of the Mineral Foundation is ultra vires, illegal and void. He submits that the exclusion of the activities under the Polluter Pays Principle is ultra vires Section 9B of the MMDR Act and defeats the very purpose and intent thereof. He further

submits that the said exclusion directly conflicts with the powers of the Mineral Foundation under the Goa Mineral Ore Permanent Fund Scheme including Clause 8 thereof and the objects and functions of the Goa Mineral Ore Permanent Fund Trust and as also defeats the very intent and purpose for which the funds are to be collected and utilized under Section 9B of the MMDR Act as also the judgment of the Hon'ble Supreme Court in Writ Petition No. 435/2012.

13. The learned Senior Advocate submits that the funds of the Mineral Foundation are contributed by the mining lessees themselves precisely for the purpose of remedying or mitigating, any environmental problems that may arise due to mining operations, and the Mineral Foundation is duty bound to utilize the funds so contributed towards the purposes visualized under Section 9B of the MMDR Act and to advance its purpose rather than stultifying it, and by making the said exclusion, the very purpose for which the Fund is created and contributions received from the mining companies, will be defeated.

14. The learned Senior Advocate submitted that the Rules have misconstrued the concept of "polluter pays principle" vis-a-vis the mining operations including that of the Petitioner that are/were being conducted with all

permissions and in accordance with applicable laws.

15. Learned Senior Advocate relied upon the following decisions in support of his submissions:

(i) ***Asnew Drums Private Ltd. & Ors. v/s. Maharashtra State Finance Corporation & Ors. - 1971 (3) SCC 602.***

(ii) ***State of T.N. & Anr. v/s. P. Krishnamurthy & Ors. - (2006) 4 SCC 517*** in support of his submissions.

16. Mr S. D. Lotlikar, learned Senior Advocate appearing on behalf of respondent no.7 in PIL Writ Petition No.1/2008 submitted that the respondent no.7/mining company has strictly adhered to the measures suggested by the concerned respondents. Our attention was invited to the various reports submitted and the prompt response of the mining companies to contend that not only have the mining companies contributed to the DMFT but on its part over and above these contributions have gone out of its way to help the agriculturists. It is submitted that the mining companies themselves have undertaken agriculture in the so-called affected areas which resulted in yield of bumper crops consistently. This submission was made by Mr Lotlikar to bring home the point as regards the allegation made that the lands

are adversely affected is only with a view to arm-twist the mining companies into paying more compensation. Mr Lotlikar submitted that the PIL Writ Petition is a mischievous attempt to squeeze the mining companies into paying compensation which they are not liable to. It is submitted that the 2016 Rules contemplated restoring of the ecology. The 2018 Rules virtually negate whatever is provided in the 2016 Rules which is impermissible. The 2018 Rules cannot be read in such a manner. It is moreover submitted that the 2018 Rules have been given retrospective operation as recovery is sought to be made from the mining companies for the alleged damage caused to the environment even before the 2018 Rules came into force. It is therefore submitted that the PIL Writ Petition is devoid of any merits and should be dismissed.

17. Mr Sudin Usgaonkar, learned Senior Advocate appearing on behalf of respondent no.8 in PIL Writ Petition No.1/2008 submitted that respondent no.8 has filed several replies dated 29.03.2008, 13.07.2009, 04.09.2017, 18.04.2018 and 25.09.2019 in the PIL Writ Petition refuting the contentions of the PIL Petitioners as well as those of the State Government. The gist of the arguments of Mr Usgaonkar is that respondent no.8 on its part has contributed to the DMFT and not only that, but the respondent no.8 has taken adequate measures to

curtail pollution, covering trucks, non-user of the old road and use of dedicated route by the mining company. The concern of drying of water source, lack of water was addressed by making adequate provisions for water, the de-siltation was done, the foundation was created for alternate water provision and even cultivation was done by the mining companies to help the agriculturists. It is therefore submitted that not only does the contribution to the DMFT secures the interest of the villagers but over and above that the respondent no.8 has taken adequate measures as directed from time to time to resolve the problems. Mr Usgaonkar submitted that the PIL Writ Petition cannot be converted into a suit for recovery. It is submitted that assuming without admitting, the respondent no.8 is liable to compensate in view of the polluter pays principle, the quantification of the damages to the extent the respondent no.8 is liable is a fact-finding exercise which requires evidence and hence cannot be the scope of a Writ Petition under Article 226 of the Constitution of India. Mr Usgaonkar submitted that there are several disputed questions of fact and even respondent no.8 has a right to cross-examine the experts who have submitted the report which aspects cannot be gone into by this Court hearing a Public Interest Litigation. It is submitted that the respondent no.8 has raised objections to the report of NIRI i.e. the one

submitted under the supervision of Shri Chachadi. Respondent no.8 has also complied with the bio-remediation as indicated. Mr Usgaonkar, learned Senior Advocate submitted that respondent no.8 has been responsible and has attended all meetings with the Collector to survey the area for de-siltation (savat khazan). It is further submitted that a detailed reply was filed on 25.09.2019 which mentions about the geographical features of the land and agricultural fields not affected by mining activities or water discharge from mining dumps. It is submitted that the iron ore is located far away from the savat khazan. It is pointed out that the mining dump was covered with geo-textile mat and plantation was done. Further it is submitted that water from the mining area/dump was taken to the mineral pits and agricultural fields were not affected by the mining activities. Learned Senior Advocate relied upon the letter of the Zonal Agricultural Officer (ZAO) to submit that the letter clearly indicated that siltation due to mining cannot be ascertained. Reliance is then placed on the certificate of analysis of the ITA Lab (Goa) Pvt. Ltd. dated 22.03.2019 giving soil composition. It is therefore submitted by learned Senior Advocate that there is absolutely no material to justify the report assessing damage to the extent of Rs.2 crore or for that matter any higher quantum and hence not only respondent no.8 is

not liable to pay its share of damages as ascertained, but is entitled to refund of the amount deposited pursuant to the interim orders passed by this Court.

18. Heard learned Senior Advocate at length. We have also heard Ms. Norma Alvares, learned Amicus Curiae who meticulously invited our attention to the relevant materials on record while adhering her submissions. Shri Pangam, the learned Advocate General apart from the oral submissions invited our attention to the affidavit in replies in opposition of the Writ Petition and in support of the PIL Petition.

19. In order to properly appreciate the submissions advanced it will be apposite to understand the purpose of creation of Goa Iron Ore Permanent Fund as well as the concept of 'Polluter Pays Principle' expounded by the Hon'ble Supreme Court. The Hon'ble Supreme Court by an order dated 21.01.2016 in ***IA Nos.87, 88 and 90 in Writ Petition (Civil) No.435/2012 – Goa Foundation v/s. Union of India & Ors***., observed thus:-

> *" After having heard, we are of the view that the purpose for creation of Goa Iron Ore Permanent Fund as was noted in paragraphs 77 and 78 of our judgment in the Goa Foundation Case was mainly intended for maintaining intergenerational equity and sustainability of mining for all times to come.*

However, much we looked into the various materials brought to our notice we are afraid that there was any comprehensive scheme formulated which would meet the requirement for which the said Fund was directed to be created. At this stage, learned Advocate General for the State of Goa came forward to suggest that if the State Government is directed to prepare a Scheme, the State is too willing to prepare the Scheme and submit before this Court. Since the whole of the mining operations pertaining to this case is with reference to the mines situated in the State of Goa, we feel that it will be better in the interest of the State of Goa as well as mining operations by directing the State of Goa to prepare a comprehensive Scheme.

With that view, while we direct the State of Goa to prepare a Scheme exclusively concentrating on the aspect of intergenerational equity vis-a-vis sustainable development of mines in the State of Goa, we also permit the petitioner to forward its suggestion to the State Government to enable the State Government to frame the Scheme. Any such suggestions shall be forwarded within a week's time from this date. If any comprehensive Scheme is framed by the State Government, the same shall be forwarded to the Central Empowered Committee and

the Central Empowered Committee is directed to examine the same and submit its Report. The Report of the Central Empowered Committee and the Scheme shall be filed before this Court within a period of six weeks from the date of communication of this order."

20. In ***Vellore Citizens' Welfare Forum v/s. Union of India & Ors. - (1996) 5 SCC 647*** the Hon'ble Supreme Court made following observations in the context of the polluter pays principle. The relevant paras 10 to 19 read thus:-

"10. The traditional concept that development and ecology are opposed to each other, is no longer acceptable. "Sustainable Development is the answer. In the international sphere, "Sustainable Development" as a concept came to be known for the first time in the Stockholm Declaration of 1972. Thereafter, in 1987 the concept was given a definite shape by the World Commission on Environment and Development in its report called "Our Common Future". The Commission was chaired by the then Prime Minister of Norway, Ms. G.H. as "Brundtland Report". In 1991 the World Conservation Union, United Nations Environment Programme and Worldwide Fund for Nature, jointly came out with a

document called "Caring for the Earth" which is a strategy for sustainable living. Finally, came the Earth Summit held in June 1992 at Rio which saw the largest gathering of world leaders ever in the history -deliberating and chalking out a blueprint for the survival of the planet. Among the tangible achievements of the Rio Conference was the signing of two conventions, one on biological diversity and another on climate change. These conventions were signed by 153 nations. The delegates also approved by consensus three non-binding documents namely, a Statement on Forestry Principles, a declaration of principles on environmental policy and development initiatives and Agenda 21, a programme of action into the next century in areas like poverty, population and pollution. During the two decades from Stockholm to Rio "Sustainable Development" has come to be accepted as a viable concept to eradicate poverty and improve the quality of human life while living within the carrying capacity of the supporting ecosystems. "Sustainable Development" as defined by the Brundtland Report means "Development that meets the needs of the present without compromising the ability of the future generations to meet their own needs". We have no hesitation in holding that "Sustainable Development"

as a balancing concept between ecology and development has been accepted as a part of the customary international law though its salient features have yet to be finalised by the international law jurists.

11. Some of the salient principles of "Sustainable Development", as culled out from Brundtland Report and other international documents, are Inter-Generational Equity, Use and Conservation of Natural Resources, Environmental Protection, the Precautionary Principle, Polluter Pays Principle, Obligation to Assist and Cooperate, Eradication of Poverty and Financial Assistance to the developing countries. We are, however, of the vies that "The Precautionary Principle" and "The Polluter Pays Principle" are essential features of "Sustainable Development". The "Precautionary Principle" - in the context of the municipal law – means :

(i) Environment measures - by the State Government and the statutory authorities - must anticipate, prevent and attack the causes of environmental degradation.

(ii) Where there are threats of serious and irreversible damage, lack of scientific certainly should not be used as a reason for postponing,

measures to prevent environmental depredation.

(iii) The "onus of proof" is on the actor or the developer/industrialist to show that his action is environmentally benign.

12. "The Polluter Pays Principle" has been held to be a sound principle by this Court in Indian Council for Enviro-Legal Action v. Union of India. The Court observed: (SCC p.246, para 65)

> *"... we are of the opinion that any principle evolved in this behalf should be simple, practical and suited to the conditions obtaining in this country."*

The Court ruled that : (SCC p.246, para 65)

> *"Once the activity carried on is hazardous or inherently dangerous, the person carrying on such activity is liable to make good the loss caused to any other person by his activity irrespective of the fact whether he took reasonable care while carrying on his activity. The rule is premised upon the very nature of the activity carried on".*

Consequently the polluting industries are

"absolutely liable to compensate for the harm caused by them to villagers in the affected area, to the soil and to the underground water and hence, they are bound to take all necessary measures to remove sludge and other pollutants lying in the affected areas". The "Polluter Pays Principle" as interpreted by this Court means that the absolute liability for harm to the environment extends not only to compensate the victims of pollution but also the cost of restoring the environmental degradation. Remediation of the damaged environment is part of the process of "Sustainable Development" and as such polluter is liable to pay the cost to the individual sufferers as well as the cost of reversing the damaged ecology.

13. The Precautionary Principle and the Polluter Pays Principle have been accepted as part of the law of the land. Article 21 of the Constitution of India guarantees protection of life and personal liberty. Articles 47, 48-A and 51-A(g) of the Constitution are as under :

> *"47. Duty of the State to raise the level of nutrition and the standard of living and to improve public health. - The State shall regard the raising of the level of nutrition and the*

standard of living of its people and the improvement of public health as among its primary duties and, in particular, the State shall endeavour to bring about prohibition of the consumption except for medicinal purposes of intoxicating drinks and of drugs which are injurious to health.

48-A. Protection and improvement of environment and safeguarding of forests and wildlife. - The State shall endeavour to protect and improve the environment and to safeguard the forests and wild life of the country.

51-A. (g) To protect and improve the natural environment including forests, takes, rivers and wildlife, and to have compassion for living creatures."

Apart from the constitutional mandate to protect and improve the environment there are plenty of post-independence legislations on the subject but more relevant enactments for our purpose are : The Water (Prevention and Control of Pollution) Act, 1974 (the Water Act), The Air (Prevention and Control of Pollution) Act, 1981 (the Air Act) and the Environment (Protection) Act, 1986 (the Environment Act). The Water Act provides for

the constitution of the Central Pollution Control Board by the Central Government and the constitution of one State Pollution Control Boards by various State Governments in the country. The Boards function under the control of the Governments concerned. The Water Act prohibits the use of streams and wells for disposal of polluting matters. It also provides for restrictions on outlets and discharge of effluents without obtaining consent from the Board. Prosecution and penalties have been provided which include sentence of imprisonment. The Air Act provides that the Central Pollution Control Board and the State Pollution Control Boards constituted under the Water Act shall also perform the powers and functions under the Air Act. The main function of the Boards, under the Air Act, is to improve the quality of the air and to prevent, control and abate air pollution in the country. We shall deal with the Environment Act in the later part of this judgment.

14. In view of the above-mentioned constitutional and statutory provisions we have no hesitation in holding that the Precautionary Principle and the Polluter Pays Principle are part of the environmental law of the country.

15. Even otherwise once these principles are accepted as part of the Customary International Law there would be no difficultly in accepting them as part of the domestic law. It is almost an accepted proposition of law that the rules of Customary International Law which are not contrary to the municipal law shall be deemed to have been incorporated in the domestic law and shall be followed by the courts of law. To support we may refer to Justice H.R. Khanna's opinion in A.D.M. v. Shivakant Shukla, Jolly George Varghese case and Gramophone Co. case.

16. The Constitutional and statutory provisions protect a person's right to fresh air, clean water and pollution-free environment, but the source of the right is the inalienable common law right of clean environment. It would be useful to quote a paragraph from Blackstone's commentaries on the Laws of England (Commentaries on the Laws of England of Sir William Blackstone) Vol.III, fourth edition published in 1876. Chapter XIII, "Of Nuisance" depicts the law on the subject in the following words :

"Also, if a person keeps his hogs, or other noisome animals, or allows filth to accumulate

on his premises, so near the house of another, that the stench incommodes him and makes the air unwholesome, this is an injurious nuisance, as it tends to deprive him of the use and benefit of his house. A like injury is, if one's neighbour sets up and exercises any offensive trade; as a tanner's, a tallow-chandler's, or the like; for though these are lawful and necessary trades, yet they should be exercised in remote places; for the rule is, 'sic utere tuo, ut alienum non leadas'; this therefore is an actionable nuisance. And on a similar principle a constant ringing of bells in one's immediate neighbourhood may be a nuisance.

> *... With regard to other corporeal hereditaments; it is a nuisance to stop or divert water that used to run to another's meadow or mill; to corrupt or poison a watercourse, by erecting a dye-house or a lime-pit, for the use of trade, in the upper part of the stream; to pollute a pond, from which another is entitled to water his cattle; to obstruct a drain; or in short to do any act in common property, that in its consequences must necessarily tend to the prejudice of one's neighbour. So closely*

does the law of England enforce that excellent rule of gospel-morality, of 'doing to others, as we would they should do unto ourselves'."

17. Our legal system having been founded on the British Common law the right of a person to pollution-free environment is a part of the basic jurisprudence of the land.

18. The Statement of Objects and Reasons to the Environment Act, inter alia, states as under :

"The decline in environmental quality has been evidenced by increasing pollution, loss of vegetal cover and biological diversity, excessive concentrations of harmful chemicals in the ambient atmosphere and in food-chains, growing risks of environmental accidents and threats to life-support systems. The world community's resolves to protect and enhance the environmental quality found expression in the decisions taken at the United Nations Conference on the Human Environment held in Stockholm in June 1972. Government of India participated in the Conference and strongly voiced the environmental concerns. While several measures have been taken for

environmental protection both before and after the Conference, the need for a general legislation further to implement the decisions of the Conference has become increasingly evident.

Existing laws generally focus on specific types of pollution or on specific categories of hazardous substances. Some major areas of environmental hazardous are not covered. There also exist uncovered gaps in areas of major environmental hazards. There are inadequate linkages in handling matters of industrial and environmental safety. Control mechanisms to guard against slow, insidious build-up of hazardous substances especially new chemicals in the environment, are weak. Because of a multiplicity of regulatory agencies, there is need for an authority which can assume the lead role for studying, planning and implementing long-term requirements of environmental safety and to give direction to, and coordinate a system of speedy and adequate response to emergency situations threatening the environment.

In view of what has been stated above,

there is urgent need for the enactment of a general legislation on environmental protection which inter alia, should enable coordination of activities of the various regulatory agencies, creation of an authority or authorities with adequate powers for environmental protection, regulation of discharge of environmental pollutants and handling of hazardous substances, speedy response in the event of accidents threatening the environment and deterrent punishment to those who endanger human environment, safety and health".

Sections 3, 4, 5, 7 and 8 of the Environment Act which are relevant are as under :

"3. Power of Central Government to take measures to protect and improve environment. - (1) Subject to the provisions of this Act, the Central, Government shall have the power to take all such measures as it deems necessary or expedient for the purpose of protecting and improving the quality of the environment and preventing, controlling and abating environmental pollution.

(2) In particular, and without prejudice to the generality of the provisions of sub-section (1), such measures may include measures with respect to all

or any of the following matters, namely -

(i) coordination of actions by the State Governments, officers and other authorities -

(a) under this Act, or the rules made thereunder; or

(b) under any other law for the time being in force which is relatable to the objects of this Act;

(ii) planning and execution of a nation-wide programme for the prevention, control and abatement of environmental pollution;

(iii) laying down standards for the quality of environment in its various aspects;

(iv) laying down standards for the emission or discharge of environmental pollutants from various sources whatsoever :

Provided that different standards for emission or discharge may be laid down under this clause from different sources having regard to the quality or composition of the emission or discharge of environmental pollutants from such sources ;

(v) restriction of areas in which any industries, operations or processes or class of industries,

operations or processes shall not be carried out or shall be carried out subject to certain safeguards;

(vi) laying down procedures and safeguards for the prevention of accidents which may cause environmental pollution and remedial measures for such accidents;

(vii) lying down procedures and safeguards for the handling of hazardous substances;

(viii) examination of such manufacturing processes, materials and substances as are likely to cause environmental pollution;

(ix) carrying out and sponsoring investigations and research relating to problems of environmental pollution;

(x) inspection of any premises, plant, equipment, machinery, manufacturing or other processes, materials or substances and giving, by order, of such directions to such authorities, officers or persons as it may consider necessary to take steps for the prevention, control and abatement of environmental pollution;

(xi) establishment or recognition of environmental laboratories and institutes to carry

out the functions entrusted to such environmental laboratories and institutes under this Act;

(xii) collection and dissemination of information in respect of matters relating to environmental pollution;

(xiii) preparation of manuals, codes or guides relating to the prevention, control and abatement of environmental pollution;

(xiv) such other matters as the Central Government deems necessary or expedient for the purpose of securing the effective implementation of the provisions of this Act.

(3) The Central Government may, if it considers it necessary or expedient so to do for the purposes of this Act, by order, published in the Official Gazette, constitute an authority or authorities by such name or names as may be specified in the order for the purpose of exercising and performing such of the powers and functions (including the power to issue directions under Section 5) of the Central Government under this act and for taking measures with respect to such of the matters referred to in sub-section (2) as may be mentioned in the order and subject to the supervision and control of the

Central Government and the provisions of such order, such authority or authorities may exercise the powers or perform the functions or take the measures so mentioned in the order as if such authority or authorities had been empowered by this Act to exercise those powers or perform those functions or take such measures.

4. Appointment of officers and their powers and functions. - (1) Without prejudice to the provisions of sub-section (3) of section 3, the Central Government may appoint officers with such designations as it thinks fit for the purposes of this Act and may entrust to them such of the powers and functions under this Act as it may deem fit.

(2) The officers appointed under sub-section (1) shall be subject to the general control and direction of the Central Government or, if so directed by that Government, also of the authority or authorities, if any, constituted under sub-section (3) of section 3 of any other authority or officer.

5. Power to give directions. - Notwithstanding anything contained in any other law but subject to the provisions of this Act, the Central Government may, in the exercise of its powers and performance of its functions under this Act, issue directions in

writing to any person, officer or any authority and such person, officer or authority shall be bound to comply with such directions.

Explanation. - for the avoidance of doubts, it is hereby declared that the power to issue directions under this section includes the power to direct -

(a) the closure, prohibition or regulation of any industry, operation or process; or

(b) stoppage or regulation of the supply of electricity or water or any other service.

7. Persons carrying on industry, operation etc., not to allow emission or discharge of environmental pollutants in excess of the standards. - No person carrying on any industry, operation or process shall discharge or emit or permit to be discharged or emitted any environmental pollutant in excess of such standards as may be prescribed.

8. Persons handling hazardous substances to comply with procedural safeguards. - No person shall handle or cause to be handled any hazardous substance except in accordance with such procedure and after complying with such safeguards as may be prescribed".

19. Rule 3(1), 3(2), and 5(1) of the Environment (Protection) Rules, 1986 (the Rules) are as under:

"3. Standards for emission or discharge of environmental pollutants. - (1) For the purposes of protecting and improving the quality of the environment and preventing and abating environmental pollution, the standards for emission or discharge of environmental pollutants from the industries, operations or processes shall be as specified in Schedule I to IV.

3. (2) Notwithstanding anything contained in sub-rule(1), the Control Board or a State Board may specify more stringent standards from those provided in Schedules I to IV in respect of any specific industry, operation or process depending upon the quality of the recipient system and after recording reasons therefor in writing.

5. Prohibition and restriction on the location of industries and the carrying on of processes and operations in different areas. - (1) The Central Government may take into consideration the following factors while prohibiting or restricting the location of industries and carrying on of processes and operations in different areas -

(i) Standards for quality of environment in its various aspects laid down for an area.

(ii) The maximum allowable limits of concentration of various environment pollutants (including noise) for an area.

(iii) The likely emission or discharge of environmental pollutants from an industry, process or operation proposed to be prohibited or restricted.

(iv) The topographic and climatic features of an area.

(v) The biological diversity of the area which, in the opinion of the Central Government needs to be preserved.

(vi) Environmentally compatible land use.

(vii) Net adverse environmental impact likely to be caused by an industry, process or operation proposed to be prohibited or restricted.

(viii) Proximity to a protected area under the Ancient Monuments and Archaeological Sites and Remains Act, 1958 or a sanctuary, National Park, game reserve or closed area notified as

such under the Wild Life (Protection) Act, 1972 or places protected under any treaty, agreement or convention with any other country or countries or in pursuance of any decision made in any international conference, association or other body.

(ix) Proximity to human settlements.

(x) Any other factor as may be considered by the Central Government to be relevant to the protection of the environment in an area".

(emphasis supplied by us)

21. Before we proceed to deal with the challenge to the proviso to the 2018 Rules, it is relevant to notice at this stage the grievance raised by the PIL petitioner. The petition raised several issues, one of which was about desilting of the agricultural fields 'Savat Khazan' and 'Kharat Khazan' and the poi/rivulet. The petition relied upon the Order dated 28.11.2005 passed by the Deputy Collector by which the three mining companies were directed to carry out desiltation of the three items, which was not done. It would be pertinent to reproduce a notice cum order dated 28.11.2005 of the Deputy Collector and SDO, Bicholim, Goa which has an important bearing for a decision in the present matter. The order

reads thus:-

"NOTICE CUM ORDER

Whereas on the basis of crdible Information received by this office, it is seen that the agricultural properties of the Sirigao Village namely Savat Knazan and Kharat Khazan land are affected by mining silt of the above mining companies.

And whereas several meetings were held in the office of the Deputy Collector of the above mining companies for making efforts to desilt the said paddy fields presently covered under the mining silt. The villagers/ agriculturists have agreed to keep the land fallow for the present season so as to enable desiltation of the paddy fields by the mining companies.

And whereas during the meetings held in this office, the mining companies have agreed in principle that there exists mining silt in the agricultural paddy fields, which is requires to be removed by the mining companies.

And whereas the ZAO Bicholim and AE WRD have also participated in the meeting opined that the productivity of the paddy field is badly affected by the mining silt and removal of the silt from the

paddy field is urgently required.

And whereas the mining companies were directed to prepare an estimate and submit the time bound programme of desiltation and to submit the periodical bar chart of the area-wise work to be undertaken, of the land to be desilted.

The mining companies represented by their respective managers however did not submit the bar chart of the desiltation programme on the appointed date but informed that the joint site inspections have been done in that directions and estimate is under preparation.

Upon hearing the applicants and the representatives of the mining company following have been decided for taking action by the mining companies.

1. That the M/s Bandekar Mines shall fix reading gauge in the Dhonachi Tali on or before 5th December 2005 and to give the compliance. The AE WRD to monitor the periodical changes in the water level of the Dhonachi tali.

2. That the mining companies shall commence the desiltation of the paddy fields namely Sawat Khazan, Kharat Khaza including Poi (water

pond) of Sirigao Village from 10th December 2005 onward.

3. That the Periodical Bar Chart / plan showing the execution of work to be undertaken should be submitted to this office by 9th December 2005 at 9.30 a.m. in the meeting to be attended by the ZAO Bicholim, AE WRD, Bicholim Mamlatdar Bicholim and the representatives of all the mining companies.

4. That the review meeting on the progress of work executed for desiltation of paddy fields will be now on 23/12/2005. Parties to come with the progress report for the meeting.

That the AE WRD and the 240, Bicholim should monitor and give timely guidance for the desilation work and ensure the quality of work from the point of maintaining the fertility of the land.

That the Mamlatdar of Bicholim shall assist the mining companies, in the event there is any doubt about the rights of the parties to the paddy fields.

That the cultivators and the Mining companies are free to discuss on the quantum of

compensation payable towards the crop loss due to mining silt In the event they are not able to come to arrive at an amicable agreement, the issue shall be referred to the ZAO Bicholim.

Take notice that in the default of taking action as per the above directions, action as provided under section 33 of LRC will be initiated against the above named mining companies and cost of desiltation will be recovered from these mining companies as an arrears of land revenue.

Parties shall therefore appear before the undersigned on 9th December 2005 at 9.30 a.m. without fail for giving explanation on above points.

Given under my hand and seal of this Court on this 28th November 2005

sd/-
(Arvind V. Bugde)
Deputy Collector & SDO
Bicholim Goa."

22. Further, the Goa State Pollution Control Board (GSPCB) conducted inspection and submitted its Report dated 01.02.2008 which refers to pumping from the working mining pit and discharge of the water into the

fields and the canal/river. The inspection report reads thus:-

" ***INSPECTION REPORT***

As directed by the Member secretary, the undersigned Keshav Fadke (JEE), Nandan Prabhudessai (JEE) along with Sunny Pirankar (JLA) inspected the Mines at Sirigao Village of Bicholim Taluka, of M/s. Rajaram Bandekar (Sirigao) Mines Pvt Ltd., M/s Chowgule & Co. Pvt. Ltd. And M/s. Dempo Mining Co Ltd And the village and the locations in the vicinity of the on 01/02/2008.

I ***INSPECTION OF VILLAGE***

Mr Nillu Mukund Gaonkar, Mr Eknath Gaonkar and Mr Digambar Gaonkar were present during the inspection and showed the locations which were effected due to mining activity in the Village.

Dhondachi Tali - Water level was 70cms in the said Tali during inspection

During inspection it was observed that some part of the agricultural fields in the Sirigao Village were being cultivated. Cultivation activity was in progress during inspection. Major part of the field area is silted. Sample of the silt from the fields was collected

The springs (Ayurvedic Spring & Kasavachi Tali) were shown by the villagers during the inspection. It

was noticed during the inspection that the said springs had dried up. In the Akvarachi Tali the water is only in the central part of the Tali.

The villagers than showed us the wells in the residential area in the vicinity of the mine. On inspection of the well the same were observed to be dried up.

The villagers then showed the Sirgao Creek (Manaswada) where they alleged that mining company was discharging the water sample was collected from the Sirigao Creek (Manaswada). Silt sample was also collected from this creek.

II ***INSPECTION OF MINES***

1. M/s. Rajaram Bandekar (Sirigao) Mines Pvt. Ltd.,

- The mine was in operation during the inspection.

- The unit has obtained Consent to Establish from GSPCB The unit has also obtained Environmental Clearance from the Ministry of Environment and Forest, Government of India However the Mining Company has not obtained Consent to Operate under Water and Air Act from the Board.

- Unit has a dry screening plant within the lease area and the same was not in operation during the inspection.

- Pumping from the working mining pit was in progress. The same is discharged in the non working mining pit where hydrated lime is added. The part of the said water is then pumped in the settling pond for recharging the wells and the remaining is

discharged in the Sirigao River after passing through series of filter beds.

Sample was collected at the final discharge point into the Sirigao river. However it was observed that trucks were being washed along the length of the drain, upstream of the collection point.

The mine officials were present during collection of samples. Tow samples were collected at each location and one Sample collected during inspection was offered to the Mining Company officials, however they refused to accept the same.

2. ***M/s. Dempo Mining & Co. Pvt. Ltd., Bicholim Iron Ore Mine***

- The mine was in operation during the inspection.

- The unit has obtained Consent to operate under Water And Air Act from GSPCB. The unit has obtained Environmental Clearance from the Ministry of Environment and Forest, Government of India,

- The Mine has Five Leases out of which Mandoor Baga Lease is in the Mandoor, Sirigao, Mayem Village.

- Pumping from the working mining pit was in progress located in the above said lease. The same is discharged in the settling pond (field). The part of the said water is then discharged in the fields after addition of Hydrated Lime and Magnasol (flocculant) and the remaining water drains into the rivulet of Sirigao River.

- Samples were collected from these locations.

The mine officials were present during collection of samples. Two samples were collected at each location and one Sample collected during inspection was offered to the Mining Company officials, however they refused to. accept the same.

3. ***M/s. Chowgule & Co. Pvt. Ltd., Sirigao Iron Ore Mine***

- The mine was in operation during the inspection.

- The unit has obtained Consent to operate under Water Act and applied for renewal of Consent under the Air Act from GSPCB. The unit has obtained Environmental Clearance from the MoEF, Gol.

- Unit has a dry screening plant within the lease area and the same was not in operation during the inspection.

- The lease has two pit, Sirigao Pit and the Poira Pit.

- The Water from the Sirigao pit is discharged at three locations

- *The water is discharged into three settling ponds which are in series. The water is than further drained into the Poira Khorjuem Canal.*

- *The official of M/s Chowgule and Co Shri Ramesh Chodankar, Mines Manager informed that water is being discharged into settling pond for recharging of wells and partly into the Vazracho nallah. Filter beds have not been provided at the discharge point. The filter beds are provided beyond the Panchayat office which is about 100 meters from the discharge point.*

- Shri Ramesh Chodankar further informed that the water is discharged behind the Lairai Temple drain for recharging the Water Table in the area and the same flows back into the mining pit.

- Samples were collected from these locations

- The Water from the Poira pit is discharged at following two locations. However no pumping was in progress during inspection.

The water is discharged into settling ponds and further through the filter beds into Goinguinim Canal.

The water is discharged into other settling pond into the Peira Khorjuem Canal.

The mine officials were present during collection of samples Tow samples were collected at each location and one Sample collected during inspection was offered to the Mining Company officials, however they refused to accept the same."

23. By Order dated 16.6.2008 passed in PIL Petition this Court appointed NEERI, Nagpur as Commissioner/Expert Consultant to examine three issues, one of which was about the damage to agricultural fields. The NEERI submitted its Report dated 19.03.2009, of which the Executive Summary inter alia observes that the silt deposition from the mining overburdens has degraded

the soil fertility in the agricultural fields. It is significant to carefully analyze this inspection report which reads thus:-

"INSPECTION REPORT

Assessment of depletion of ground water sources and land degradation in Sirigaon village and mitigation measures

EXECUTIVE SUMMARY

The present study is an outcome of the directives of the Honourable Mumbai High Court at Goa (PIL No. 1/2008) to focus on the alleged depletion of water resources, degradation of agricultural fields' vis-à-vis the mining activity in Sirigaon village (Bicholim Taluka) in the North Goa district.

The study area (60 sq. km) has been delineated on the basis of watershed and covers the working mining pits of the three mining companies namely M/s. Dempo Mining Corporation Pvt Ltd., M/s. Rajaram Bandekar (Sirigaon) Mines Pvt. Ltd. and M/s. Chowgule and Company Pvt. Ltd. It covers most of the dug wells in the Sirigaon village.

The study area is covered by the Survey of India (Sol) toposheet No. 48E/14/SE (scale 1:25,000). The

elevation in the village outside the mining pit varies from 0.095 m to 8.639 m.

The topography in the nearby Sirigaon village has been altered significantly due to the open cast mining activity. The topographic highs which were present earlier have now been removed during the mining activity and large depressions have been created in the form of Mine pits. In view of the sustained mining activity, depressions have been created with the bottom level varying between - 20 m (amsl) to - 43 m (amsl).

Goa receives rainfall from the southwest monsoon and spans four months i.e. from June to September. The rainfall data for the last five years indicate that the average annual rainfall is approximately 2846 mm out of which 2785 mm is contributed by the south west monsoon.

The geology of the study area comprises of laterites followed by manganeferous clay. The manganeferous clay is underlain by iron ore formation. The thickness of laterites varies from 3 m to 15 m as evident in the lithologs provided by M/s. Chowgule & Company Private limited and M/s. Rajaram Bandekar (Sirigaon) Mines Pvt. Ltd. The laterites are followed by manganeferous clay which

is followed by limonitic clays.

The iron ore formations underlie the clay formations. The iron ore formations vary from friable ore to powdery ore. At places, friable ore is followed by powdery ore though friable ore is absent at many places and only powdery ore is encountered. The available lithologs provided by M/s. Chowgule and Company Pvt. Ltd. indicates that the thickness of the powdery ore zone varies from 10 m to 32 m in one of their drilling sites.

The top lateritic formation constitutes the unconfined aquifer in the study area. The zone comprising the ore body serves as the confined aquifer. The unconfined aquifer is tapped for extraction of water. All the dug wells located in the Sirigaon village are tapping the unconfined aquifer only.

Field visits were undertaken for assessing the water resources in the village in the months of August, October and December 2008. Inspection was made for design and implementation of the recharge structures for augmentation of water resources in the month of January 2009. Observation well network was established for measurement of water levels and collection of samples for physicochemical

and heavy metal analysis. It is observed that the water table in August 2008 varied from 0.50 m to 6.55 m. In October 2008 and December 2008, it varied from 0.90m to 10.30m and 2.70 m to 9.70m respectively. The groundwater scenario was worse in December 08, when almost all the dug wells in Sirigaon village had dried up. However, the wells from neighboring villages 14 had water column even in the month of December, 08.

The mine pit water levels for all the three mines is below-20 m (amsl). The flow direction is indicative of water flow from the aquifer to the mine pit. Water seepage to the pit from the mine watt on the village side is also noticed during the field visits. Schematic diagram of ground water profile in the Sirigaon and mine area is presented in the Figure.

The deepening of the mines has led to loss of recharge area for the dug wells seated at the foot hills of the plateau. Hence, the water scarcity in the village dug wells is attributed to the loss of recharge area as well as the deepening of the mine.

Water samples were collected from the mining pit of the three companies and dug wells of the Sirigaon village. The water samples were analysed for physicochemical parameters and heavy metals

levels. The analysis results indicate that the water quality is within permissible limits (BIS 10500:1991) for drinking water as well as for irrigation purpose as per the guidelines (BIS 11624:1986)

Groundwater balance study was carried out for the Sirigaon village. It is established that the requirement of the village can be met by undertaking artificial recharge scheme in a holistic way. Roof top rain water harvesting, water absorption trench, sub-surface dykes and bentonite grout have been proposed for artificial recharge and control of water seepage to the mine pits.

The State Government has provided organized piped water supply scheme to the Sirigaon village.

Artificial recharge schemes have been commissioned recently on a small scale by M/s. Rajaram Bandekar Mines Pvt. Ltd. and M/s. Chowgule and Company Pvt. Ltd. During the field visits it was observed that the recharge to the nearby dug wells was very insignificant.

Roof top rainwater harvesting is proposed as Priority I to address the water Bcarcity problem in the village. Creation of recharge trench and control of mine scarelly Pepage are advocated as Priority.

Aquifer storage, recover (ASR) by construction of sub-surface dyke is proposed as Priority III. It is suggested that the artificial recharge of ground water is initiated stepwise. Roof top rainwater harvesting, if not adequate, is to be followed by the construction of recharge trench. Priority III (ASR) is the last alternative.

An estimated cost of Rs. 660.25 lakhs will be incurred towards installation of the comprehensive recharge schemes to address the water scarcity in the village. The estimate includes the cost towards DPR preparation, maintenance charges and the post-project monitoring charges.

Soil samples were collected from the silt affected area as well as the control sites. The collected soil samples were characterized for various physico-chemical and microbiological parameters (such as bulk density, texture, pH, exchangeable calcium, magnesium, sodium, potassium, available N, P, K, heavy metals and enumeration of different soil microbes).

The soil analysis results indicate that the silt deposition from the mining overburdens has degraded the soil fertility in the agricultural fields of Sirigaon village.

Proper slope stabilization needs to be carried out in the mining areas to minimize runoff of the over burden dump material to the nearby agricultural fields.

Integrated Biotechnological Approach (IBA) is suggested as mitigation measures for restoring the soil quality of the silt affected area. The cost estimate for remediation of silt affected soll by implementation of IBA technology has been worked out to be approximately 1.8 lakhs per hectare area which includes the materials cost, land preparation cost and labour cost etc."

24. Vide directions dated 03.3.2010 to all three mining companies, the GSPCB inter alia directed that the remediation of the silted soil be done. This Court vide Order dated 08.07.2010 issued certain directions to the GSPCB, the relevant ones being as under:-

"*10. As far as the aforesaid objection is concerned, we feel that the Pollution Control Board will have to conduct regular inspection and monitoring to ascertain the compliance with the directions issued on 3rd March, 2010. In case the Pollution Control Board finds that the concerned Companies or concerned persons are slow in implementing the directions, the Pollution Control Board will have to*

issue further directions specifying the time limit for compliance with directions. As of today, it is not possible to fix an outer limit for compliance with the said directions. Pollution Control Board is seized of the matter and it is expected that the Pollution Control Board will take action and will issue necessary further directions in case requirement of issuing such directions arises on the basis of inspection and monitoring.

11. We direct that the directions contained in Order dated 23rd February, 2010 as well as in the earlier Orders passed by this Court will continue to operate till further orders. We direct the Pollution Control Board to file compliance report in this Court as regards the compliance by the Mining Companies of the directions issued under Section 33(A) of the Water (Prevention and Control of Pollution), Act, 1974. The compliance report shall be filed within a period of three months from today. We direct the Pollution Control Board to file compliance report as regards compliance with what is stated in paragraph 4 of the Order dated 23rd February, 2010. The compliance report shall be filed by the Pollution Control Board by 31st August, 2010.

12. On application made by the parties to the

Petition, Registry is directed to make available copies of the compliance reports submitted by the Goa Pollution Control Board subject to payment of necessary copying charges. As and when reports are submitted by the Goa Pollution Control Board, the parties to the Petition will be free to apply to this Court for seeking necessary directions. We make it clear that copies of the reports filed by the parties to the Petition shall be supplied free of costs to the learned Amicus Curiae appointed to espouse the cause of the Petitioner."

25. The Zonal Agricultural Officer by letter dated 04.12.2018 made certain recommendations including desiltation of water resources, fields, demarcation of paddy fields, etc. Vide Order dated 07.03.2019 in MCA No. 354/2017, this Court directed the Sarpanch and Zonal Agricultural Officer to inspect the site and report on two questions, first of which was whether there was any mining silt still at the site. The Zonal Agricultural Officer submitted a Report dated 22.03.2019 inter alia stating that content of iron and manganese is observed to be high. The soil health card from five locations show that the iron, manganese and sulphur concentration is very high. The Mines Department, along with its Affidavit dated 15.04.2019, produced on record the Certificates of Analysis which show extremely high levels of Iron. This

Court vide Order dated 18.12.2019 directed the exercise of desiltation to be carried out. The State Government appointed an agency to carry out the desiltation work. The expenditure incurred should be borne by the Mining Companies or the DMFT towards which the mining companies were making contribution is the question which this Court is to decide as per the interim order. As an interim measure, this Court directed part of the expenditure be paid by Mining Companies and the rest from DMF fund till the decision on the issue of liability to pay.

26. Now let us go back to the challenge in the Writ Petition No. 214 of 2020 to the proviso of Rule 13 of 2018 Rules. Section 9B of the MMDR Act, 1957 which provides for the establishment of the District Mineral Foundation (DMF) introduced in the statute books by virtue of the Mines and Minerals (Development and Regulation) Amendment Act, 2015. The Statement of object and reasons contained in the bill so far as it pertains to the establishment of the DMFT, records the salient feature of the said Amendment bill as follows - “Safeguarding interest of affected persons: There is provision to establish District Mineral Foundation in the districts affected by mining related activities." In our opinion, the DMFT was established solely in order to secure socio economic justice to the persons affected by mining

activities. We have already reproduced Section 9B herein before. The DMF Rules, 2016 were framed by the Government of Goa under Section 9B as stated herein before.

27. Before we proceed further with the challenge to the proviso of the DMF Rules, 2018, it would be pertinent to note the factors which lead to the creation of the DMF fund and the exclusion of the activities covered under the 'polluter pays principle'. The DMF Rules, 2016 were framed by the Government of Goa under section 9B of the MMDR Act. The said Rules were not in consonance with the model forms issued by the Central Government and therefore did not in so many words exclude the activities covered under the 'Polluter pays principle'. Neither was a trust created for the discharge of functions under section 9B of the MMDR Act, hence Goa Foundation filed a PIL WP bearing No. 30/2017 challenging the said Rules and the constitution of the DMF. In accordance with the orders passed therein, the Goa District Mineral Foundation (Trust) Rules, 2018 came to be notified which repealed the 2016 DMF Rules.

28. If we notice sub-section (2) of section 9B, it provides that the object of DMF is to work for the intent and benefit of persons affected by mining in the manner prescribed by the State Government. Sub-section (3)

thereof provides that the DMF shall function in the manner prescribed by the State Government and the proviso to sub-section (3) provides that the Central Government may give directions regarding composition and utilisation of funds by the District Mineral Foundation. Further, section 20A of the MMDR Act empowers the Central Government to issue directions to the State Government as may be required for the conservation of mineral resources, or any policy matter in the national interest, and for the scientific and sustainable development and exploitation of mineral resources. A careful perusal of Section 9B and the relevant provisions of the Act leaves us in no manner of doubt that the State Government is empowered to make its own Rules for the user of the said fund. Powers of the Central Government to issue directions to the State Government with respect to the utilisation of the funds is in addition to the powers conferred on the State Government.

29. In fact, by an order dated 16/09/2015, the Central Government in exercise of powers under Section 20A directed as follows;

> *"NOW THEREFORE the Central Government in exercise of powers conferred under section 20A of the MMDR Act, 1957, in national interest hereby*

directs the concerned State Governments to incorporate the 'Pradhan Mantri Khanji Kshetra Kalyan Yojana' (the details of which are annexed herewith) into the rules framed by the District Mineral Foundations and to implement the said Scheme."

30. A perusal of the guidelines which have been incorporated into the DMF Rules 2018 makes it clear that the guidelines as well as the DMF Rules 2018, contemplate the utilisation of the funds of the DMF for ensuring socio economic justice for the persons affected by the mining activities. The DMF funds are to be utilized towards making provisions for drinking water supply, education, health care, welfare of Women and Children, welfare of aged and disabled people, livelihood and skill development, sanitation, providing required physical infrastructure such as roads, bridges, railways and waterways projects with priority in directly affected areas, Irrigation, Energy and Watershed Development and Environment preservation and pollution control measures. However, the PMKKY scheme specifically records that 'Activities meant to be taken up under the 'polluter pays principle' should not be taken up under the PMKKKY.' The State of Goa being in agreement with the same has incorporated the same into its own Rules in the form of the proviso/second unnumbered paragraph in

Rule 13(1)(b) of the DMF Rules of 2018.

31. It is significant to note that sub section 4 of Section 9B of the MMDR Act provides that whilst making the rules, the State Government shall be guided by the provisions contained in Article 244 read with Fifth and Sixth Schedules to the Constitution of India relating to administration of the Scheduled Areas and Tribal Areas and the Provisions of the Panchayats (Extension to the Scheduled Areas) Act, 1996 (40 of 1996) and the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (2 of 2007). This fortifies the fact that the DMF Fund is solely constituted to secure socio-economic justice to the persons affected by mining and not for the benefit of the mining companies or to condone the environmental pollution/damage caused by the mining companies.

32. Section 9B is a beneficial legislation which aims at improving the lives of persons affected by mining and does not seek to take away the mining companies strict liability and duty to indemnify for pollution caused by it. It is at this juncture that we must be conscious of what the 'polluter pays principle' is. The polluter pays principle which has become a part of the law of the land demands that the financial cost of preventing or remedying damage caused by pollution should lie with

the undertakings which cause the pollution, or produces the goods which cause the pollution. Under the principle it is not the role of the Government to meet the costs involved in either prevention of such damage, or in carrying out remedial action, because the effect of this would be to shift the financial burden of the pollution incident on the tax payer. The responsibility of repairing the damage is personally that of the offending industry. When the activity carried out is hazardous or inherently dangerous, the person carrying on such activity is liable to make good the loss caused to any other person by his activity irrespective of the fact whether he took reasonable care while carrying on his activity. Mining activity by its very nature is a polluting activity. Not only does it pollute the environment but it has an impact on the people living within the vicinity of the mine or are displaced as a result of the mining activities. Accepting the arguments of Mr Diniz, learned Senior Advocate that the contribution made by the mining companies towards the DMF fund covers pollution caused by the mining activities will lead to disastrous consequences. The argument that 'pollution is incidental to mining activity and it is for this purpose the DMF fund is created and therefore the expenses caused due to pollution should be paid from the DMF fund', is completely misconceived. As indicated earlier, the purpose of constituting the DMF

fund is completely different as mining activity by its very nature has impact on the people living within the vicinity and it is for this reason that the fund is created. If the argument of Mr Diniz, learned Senior Advocate is to be accepted then we will have to go to the extent of saying that the DMF is created to indemnify the mining companies for the pollution caused by them.

33. In addition to the principle of polluter pays which has become the law of the land, as held the Supreme Court, apart from the constitutional mandate to improve and protect the environment there are plenty of post independence legislations like The Environment Protection Act, the Air (Prevention and Control of Pollution Act, 1981, the Water (Prevention and Control of Pollution) Act, 1974 and the MMDR Act to address the environmental concerns. The mining lease executed between the mining companies and the State which is in Form 'K' of the Mineral Concession Rules, 1960 fastens the liability on the mining companies for all the damage caused by them as a result of their mining activities. The relevant covenant reads thus:-

> "*4. The lessee/lessees shall make and pay such reasonable satisfaction and compensation as may be assessed by lawful authority in accordance with the law force on the subject for all damage, injury or*

disturbance which may be done by him/them in exercise of the powers granted by this lease and shall indemnify and keep indemnified fully and completely the State Government against all claims which may be made by any person or persons in respect of any such damage, injury or disturbance and all costs and expenses in connection therewith.

15. The lessee/lessees shall make and pay reasonable satisfaction and compensation for all damage, injury or disturbance or person or property which may be done by or on the part of lessee/lessees in exercise of the liberties and power granted by these presents and shall at all times save harmless and keep indemnified the State Government from and against all suits. claims and demands which may be brought or made by any person or persons in respect of any such damage, injury or disturbance."

34. Section 9B in no manner seeks to do away with the inherent liability fastened on the mining companies by virtue of the environmental jurisprudence developed by the Supreme Court or under the Central legislations. The argument of the mining companies that the alleged polluting incident having taken place prior to the coming into force of the 2018 Rules, hence the rules cannot be

made retrospectively applicable to apply the polluter pays principle, is without any merit. The polluter pays principle is always a part of the environmental jurisprudence and has been succinctly expounded by the Hon'ble Supreme Court. The liability is already fastened on the mining companies in view of the Mineral Concession Rules, 1960 and in terms of the well-settled legal principles. The damage caused by the mining companies as a result of their mining activities has to be made good by them. The constitution of the DMFT is for the purpose set out in the Rules which is completely different from the liability on the mining companies for the environmental damage caused by them as a result of the mining activities. For the aforesaid reasons, the proviso/second un-numbered paragraph in Rule 13(1)(b) of DMF Rules 2018 cannot be said to be ultra vires the parent Act. The said Rules cannot be read down in the manner prayed for by Mr A. F. Diniz, learned Senior Advocate as that would amount to the Rule travelling beyond the scope and ambit of the parent Act. The Goa Iron Ore Permanent Fund (GIOPF) was contributed by the Government of Goa in compliance with the directions of the Hon'ble Supreme Court passed in Goa Foundation-I. Following observations are relevant :-

> "*We cannot, therefore, prohibit mining altogether, but if mining has to continue, the lessees who*

benefit the most from mining, must contribute from their sale proceeds to the Goan Iron Ore Permanent Fund for sustainable mining. Accordingly, in exercise of our powers under Article 32 read with Article 21 of the Constitution, we direct that henceforth 10% of the sale proceeds of iron ore excavated in the State of Goa and sold by the lessees must be appropriated towards the Goan Iron Ore Permanent Fund for the purpose of sustainable development and inter-generational equity and the State of Goa in consultation with the CEC will frame a comprehensive scheme in this regard and submit the same to this Court within six months."

35. As is evident, the GIOPF is constituted for a different purpose i.e. inter-generational equity whilst the DMF is constituted for a socio-economic cause i.e. the improvement of the lives of the persons affected by mining operations. Hence the mere fact that the mining companies in Goa are additionally required to make a contribution towards the GIOPF, the same in no manner makes their contribution towards the DMF excessive or unnecessary.

36. We need to notice a significant aspect that in the interlocutory applications bearing Nos.87, 88 and 90 filed by some of the mining companies before the Hon'ble

Supreme Court in Goa Foundation-I, wherein the mining companies in Goa submitted that they need not contribute towards the GIOPF after coming into force of the Mines and Minerals (Development and Regulation) Amendment Act, 2015, the Supreme Court expressed that "the purpose for creation of the GIOPF as was noted in paragraphs 77 and 78 of our judgment in the Goa Foundation case was mainly intended for maintaining the intergenerational equity and sustainability of mining for all times to come." The said interlocutory applications were withdrawn by the mining companies.

37. In our considered opinion, there is no conflict with the two distinct funds created, the object of which is completely different and distinct i.e. in the ultimate aid of addressing the environmental concerns which stem from the basis that mining activity by its very nature is a polluting activity which not only pollutes the environment but it has an impact on the people living in the mining areas or are displaced as a result of the mining activities.

38. We find no merit in the Writ Petition No.214/2020 in its challenge to the Proviso to Rule 13(1)(b) of the Goa Mineral Foundation (Trust) Rules, 2018. Consequently, Writ Petition No.214/2020 is dismissed. The Rule is discharged.

39. Now let us deal with the Public Interest Litigation (Writ Petition) No.1/2008.

40. So far as the liability of the mining companies to pay the damages arrived at, which is seriously contested by the learned Senior Advocates appearing for the mining companies, it would be material to set out some facts which may bear repetition but necessary to deal with the submissions in context.

41. The PIL Writ Petition was registered as Public Interest Litigation Writ Petition based on a letter received by this Court from the villagers of Sirigao in the year 2005. The petition raised several issues, one of which was about desilting of agricultural fields (savat khazan, kharat khazan) and poi/rivulet. Reliance was placed on the order dated 28.11.2005 of the Deputy Collector by which the three mining companies (respondents no.6, 7 and 8) were directed to carry out desiltation of the three items, which was not done. The GSPCB conducted inspection and submitted its report dated 01.02.2008 which refer to pumping water from working mining pit and discharge of the water into the fields and the canal/river. By order dated 16.06.2008, this Court appointed NIRI, Nagpur as Commissioner/Expert Consultant to examine three issues, one of which was about the damage to the agricultural fields. The NEERI

submitted its Report dated 19.03.2009, of which the Executive Summary inter alia observes that the silt deposition from the mining overburdens, has degraded the soil fertility in the agricultural fields. We have reproduced the contents of these letters/reports in the earlier part of this judgment.

42. The GSPCB also issued directions dated 03.03.2010 to all three mining companies inter alia directing that remediation of the silted soil be done. This Court passed an order dated 08.07.2010 issuing 'Rule' and issued certain directions to the GSPCB.

43. The ZAO by letter dated 04.12.2018 made certain recommendations including desiltation of water resources, fields, demarcation of paddy fields, etc. By order 07.03.2019 in Misc. Civil Application No.354/2017, this Court directed the Sarpanch and the ZAO to inspect the site and report on two questions, one of which was whether there was any mining silt still at the site. The ZAO submitted a report dated 22.03.2019 which inter alia states that content of iron and manganese is observed to be high. The soil health card from five locations show that the iron, manganese and sulphur concentration is very high. The Mines Department, along with its Affidavit dated 15.4.2019, produced on record the Certificates of Analysis which show extremely high levels of Iron.

44. This Court by order dated 18.12.2019 directed that desiltation be carried out. The three mining companies (Respondents No. 6 to 8) were directed to contribute Rs. 65,00,000/- each while the District Mineral Foundation was to contribute Rs. 2,00,00,000/- upfront, to enable the work to commence. It was made clear that the issue whether the mining companies should be made to bear the full expenditure or whether not to make any contribution towards the work, would be decided at the time of final hearing of the petition.

45. The work was tendered and awarded by the Water Resources Department to M/s Abhinandan Buildcon by Work Order dated 24.01.2020. By order dated 25.04.2022 in Misc. Civil Application No.1101/2020, the State was permitted to withdraw Rs.1 crore out of the amounts deposited by the mining companies. The order dated 16.01.2023 in Stamp Number (Application) No.1101/2020 recorded that the work entrusted to M/s. Abhinandan Buildcon had been completed. The tenor of the order is all issues concerning the petitioners are sorted out and the matter was kept for further consideration to decide the issue of liability of the mining companies to pay for the work.

46. After the work was completed, the State filed Misc. Civil Application No.2805/2023 to withdraw the balance

amount. By order dated 03.01.2024 passed in the said application, this Court permitted the State to withdraw the balance amount of Rs.97,50,000/- from the amounts which were deposited by the mining companies. The issue therefore which now survives for consideration is whether the mining companies should be made liable to bear the entire expenditure incurred in relation to the subject work. Learned Senior Advocates for the mining companies resisted their liability to pay the amounts mainly on the following grounds:

(i) they have already contributed to the DMF and hence they should not be directed to pay the amounts;

(ii) Kharat Khazan was never the subject matter of the petition;

(iii) they are not responsible for the siltation and hence they cannot be liable for the contribution; and

(iv) they have already carried out the work of Savat Khazan.

47. So far as the ground (i) is concerned, it is pertinent to note that the DMF was constituted in 2016 and the contributions were made only thereafter. The pollution activity i.e. the subject matter of the petition is is in relation to the acts of the mining companies prior to 2016. As such the contribution made to the DMFT from

the year 2016 is for the purpose for which the DMFT is created and is not to be utilized in view of our detailed findings hereinbefore in relation to the activities which are covered by the 'polluter pays principle'. The silt deposition in the area was on account of the mining activities for which the mining companies are liable. There are reports indicating that such silt deposition has degraded the soil fertility in the agricultural fields. We have referred to various reports of the experts which clearly indicate without a manner of doubt that the mining companies were responsible for the silt deposition. The exercise of desiltation is carried out pursuant to the orders passed by this Court. The expenditure was determined for such desiltation work which was carried out by an agency appointed by the State. The only question was whether the expenditure incurred has to be at the cost of the mining companies or the DMF. We have no manner of doubt that it is the mining companies who will have to bear the expenditure of desiltation applying the 'polluter pays principle' and having regard to the purpose for which the DMF was constituted which surely is not for the benefit of the mining companies.

48. So far as the second ground is concerned, i.e. the submission that 'Kharat Khazan' is not the subject matter of the petition, it is necessary to refer to the relevant

portion of paragraph 5 of the Letters Petition which is as under:

> *"Dy Collector cum SDM at Bicholim was pleased to passed an order in Case No. 37/MINES/SHIRGAO/275/2004/1040 observing that the Mining Companies have agreed in principle that there exist mining silt in the agriculture fields which is required to be removed by mining companies. And ZAO Bicholim and AE WRD have opined that the productivity of the paddy field is badly affected by the mining silt and removal of the silt from paddy field is urgently required...*
>
> *directed that the mining companies should take immediate action and their failure to comply with direction, action as provided under section 33 of LRC will be initiated against the said mining Companies. But till date no company had complied with the said Order. And now villagers are running into crises due to no agriculture produce*."

49. A reference to the order dated 28.11.2005 of the Deputy Collector issuing directions is relevant reading thus:

> "*Whereas on the basis of credible information received by this office, it is seen that the agricultural properties of the Sirigao Village namely Savat Khazan and Kharat Khazan land are affected by mining silt of the above mining companies...*
>
> *...And whereas during the meetings held in this*

office, the mining companies have agreed in principle that there exists mining silt in the agricultural paddy fields, which is requires to be removed by the mining companies.

And whereas the ZAO Bicholim and AE WRD have also participated in the meeting opined that the productivity of the paddy field is badly affected by the mining silt and removal of the silt from the paddy field is urgently required...

Upon hearing the applicants and the representatives of the mining company following have been decided for taking action by the mining companies...

2. That the mining companies shall commence the desiltation of the paddy fields namely Savat Khazan, Kharat Khazan including Poi (water pond) of Sirigao Village from 10th December 2005 onward.

Take notice that in the default of taking action as per the above directions, action as provided under section 33 of LRC will be initiated against the above named mining companies and cost of desiltation will be recovered from these mining companies as an arrears of land revenue..."

50. The said order of the Deputy Collector was not challenged by any of the companies who agreed to

comply with the directions. The order categorically refers to the 'Kharat Khazan' as well. It directed the companies to desilt the Kharat Khazan and Poi and not just the Savat Khazan. The PIL Petitioner at paragraph 5 has complained of non-compliance of the directions. The contentions of the mining companies that 'Kharat Khazan' is not a part of the petition is therefore without any merit.

51. The third contention of the learned Senior Advocates for the mining companies is that the mining companies are not responsible for the desiltation and hence they are not responsible to pay. A reference to the order dated 28.11.2005 of the Deputy Collector makes it amply clear that:-

(i) there exists mining silt in the agricultural paddy fields, which is required to be removed by the mining companies and

(ii) mining companies agreed that the silt is to be removed by them.

In the face of this order and the facts emerging from the record which are so glaring, the contentions of the learned Senior Advocates that the mining companies are not responsible for the siltation is without any merit.

52. As regards the fourth and the last contention that the work of desiltation was already carried out by the mining companies earlier, the observations relied upon by the mining companies are based on the inspection report dated 17.03.2008. The said report refers to the work being done only on Savat Khazan, for which also 10,000 sq.mtrs. was not undertaken. Admittedly, no work was undertaken in relation to the Kharat Khazan and Poi.

53. As regards the Savat Khazan also, apart from the fact that the work was done in the year 2008-09, in 2019 when inspections were held as per the directions of this Court vide order dated 07.03.2019, it was found that the fields did have silt accumulated and high amount of Iron and Manganese contents were found which required desilting. It was then that this Court by order dated 18.12.2019 ordered that desiltation be done. From the Plan at page 332 in Misc. Civil Application No.354/2017, the Reports and the affidavits of the mining companies itself (one of which is at pages 370 to 377 in MCA 354/2017), it is clear that the pits and the area where the dumps/overburden are stacked is at a higher level. The water flowing from the said areas and the water which is pumped out carry the silt and mineral with it which then gets deposited in the fields and the water bodies, which is a continuous process. Hence, the work which was

purportedly done in 2008-09 was not done properly and even otherwise, the silt from the leases/dumps/overburden of the mining companies continued to get deposited in the water bodies and the fields in question. The reports indicate that the fields have very high iron and manganese contents. The mining companies are responsible for the same and cannot evade/avoid liability in respect of the same. The report of the experts in no uncertain terms states that the fields have very high Iron and Manganese contents. It is the responsibility of the mining companies to make good the expenditure incurred. The reports are already on record pursuant to the orders passed by this Court. The interim orders passed by this Court were duly complied by the mining companies. The only issue therefore remained was whether the contribution made from the DMF fund in in fact the liability of the mining companies. We hold that it is the liability of respondents no.6, 7 and 8 i.e. the mining companies to bear the expenditure of Rs.2 crore paid by DMFT as well. There is no dispute that the expenditure is incurred. There are no disputed questions of fact involved in this petition, the question involved which we have already answered.

54. We direct respondents no.6, 7 and 8 to jointly pay/reimburse an amount of Rs.2 crore (Rupees Two Crores only) to the District Mineral Foundation Trust

desiltation work which was done in terms of the directions of this Court vide order dated 18.12.2019 within a period of six months from the date of uploading of this order.

55. Rule issued in the Public Interest Litigation (Writ Petition) No.1/2008 is disposed of in the aforesaid terms. Misc. Applications, if any, do not survive and are also disposed of.

56. We cannot but appreciate the efforts of Ms Norma Alvares, learned Senior Advocate in consistently and continuously assisting this Court appearing as an Amicus Curiae from the year 2008 onwards. We must also record that Ms Norma Alvares was ably assisted by Mr Om D'Costa in the PIL Writ Petition No.1/2008 at the time of hearing.

NIVEDITA P. MEHTA, J. **M. S. KARNIK, J.**

Signed by: SUCHITRA NANDAN SINGBAL
Designation: Personal Assistant
Date: 16/04/2025 18:12:13

FINAL ENVIRONMENTAL IMPACT ASSESSMENT
&
ENVIRONMENT MANAGEMENT PLAN

Project	**Block-II Sirigao - Mayem Mineral Block**
Sector and Category	**1(a) – Cat-'B'**
Area	**171.2472 Ha.**
Location	**Sirigao & Mayem Villages of Bicholim Taluka, North Goa District, Goa State**
Project Proponent	**Salgaocar Shipping Company Private Limited**
Office Address	**Plot No 15 Salgaocar Bhavan, Altinho, Tiswadi Panjim**
Baseline data Collected	**Summer 2023 (March to May-2023)**
Name of MoEF& CC Accredited laboratory	**Environmental Laboratory , Bengaluru (unit Mineral Engineering Services),**
Public Hearing	**19.06.2024**

July-2024

EIA Consultant

MINERAL ENGINEERING SERVICES
(Accredited by QCI-NABET ORG000756)
Ballari: 25/XXV, Club Road, Ballari-583103, Karnataka,
Tel 08392-267421
&
Goa : 22/120/2, Bay View Colony near Ocean Heights, Donapaula, Goa 403004
Email : mesbly25@gmail.com

SALGAOCAR SHIPPING CO. PVT. LTD.
Salgaocar Bhavan, Altinho, Panaji, Goa – 403001
CIN: U13100GA1975PTC000223
Tel: +91-832-2460500 Email: - info@smilindia.com

November 27/2023

UNDERTAKING BY PROJECT PROPONENT

The Environment Impact Assessment report of Block-II Sirigao - Mayem Mineral Block over an area of 171.2472 Ha located at Sirigao and Mayem Village of Bicholim Taluka, North Goa District of Goa State is prepared by Mineral Engineering Services accredited NABET Consultant (QCI NO:ORG000756). The preparation of the EIA Report was conducted in accordance with the EIA Notification, 2006.

We hereby undertake that the information and data provided in the EIA Report and submitted to the Ministry are factually correct and we are fully accountable for the same.

SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

AUTHORISED SIGNATORY

MINERAL ENGINEERING SERVICES

Recognized by NABET Valid upto 15.05.2026

QCI.No. ORG000756

UNDERTAKING

This is to declare that the prescribed ToRs have been complied with and that the data submitted is factually correct in respect of EIA & EMP report prepared for Salgaocar Shipping Company Private Limited in respect of Block-II Sirigao - Mayem Mineral Block located in Sirigao & Mayem Villages of Bicholim Taluka, North Goa District, Goa State.

For Mineral Engineering Services

(M.S.Raju)
Consultant

Date: 27.11.2023

Place: Ballari

25/XXV, Club Road, Ballari-583103, Karnataka. Landline no. : 08392-267421.
E-mail: mes_msraju@yahoo.co.uk Website : www.envtest.com
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QUALITY COUNCIL OF INDIA
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National Accreditation Board for Education and Training

Certificate of Accreditation

Mineral Engineering Services, Bellary

25/XXV, Club Road, Bellary, Karnataka- 583103

*The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –*

S.No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including open cast and underground mining	1	1 (a) (i)	A
2	Mineral beneficiation	7	2 (b)	A

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated July 04, 2023 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/23/2806 dated July 28, 2023. The accreditation needs to be renewed before the expiry date by Mineral Engineering Services, Bellary following due process of assessment.

Sr. Director, NABET
Dated: July 28, 2023

Certificate No.
NABET/EIA/2326/RA 0296

Valid up to
May 15, 2026

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to the QCI-NABET website.

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय भारत सरकार
MINISTRY OF ENVIRONMENT FOREST & CLIMATE CHANGE GOVT OF INDIA

Speed Post

F.No. LB/99/7/2021-INST LAB-HO-CPCB-HO/Pvt./ 1601

Dated: 28th January 2023
07th June 2023

Recognition Certificate

To,

Head of Laboratory,
M/s Environmental Laboratory (Unit of Mineral Engineering Services),
#948, 2nd Cross, St. Thomas Town Post, Kammanahalli Road, Bengaluru--560084,
Karnataka.

Subject: Recognition of M/s Environmental Laboratory (Unit of Mineral Engineering Services), #948, 2nd Cross, St. Thomas Town Post, Kammanahalli Road, Bengaluru--560084, Karnataka, as Environmental laboratory under the Environmental (Protection) Act- 1986.

Sir,

I am directed to refer the online application, dated 27/10/2022 for the recognition of your laboratory under Environmental (Protection) Act, 1986. Based on the recommendations of the concerned Division, approval of Competent Authority for recognition of Environmental laboratories and your acceptance of the revised terms and conditions at Annexure-III & IV of the guidelines for recognition of environmental laboratories, CPCB approves the renewal of recognition **M/s Environmental Laboratory (Unit of Mineral Engineering Services), #948, 2nd Cross, St. Thomas Town Post, Kammanahalli Road, Bengaluru--560084, Karnataka** and shall be notified in the Gazette of India. Considering the current requirement of mandatory accreditation/ certifications of the laboratory, **this recognition shall be valid up to 23/05/2025.**

2. As sought in the aforementioned application, **M/s Environmental Laboratory (Unit of Mineral Engineering Services), #948, 2nd Cross, St. Thomas Town Post, Kammanahalli Road, Bengaluru--560084, Karnataka** may undertake the following tests:

i. **Physical Tests**-Conductivity, Colour, pH, Fixed & Volatile Solids, Total Solids, Total Dissolved Solids, Total Suspended Solids, Turbidity, Temperature, Velocity & Discharge Measurement of Industrial Effluent Stream, Flocculation Test (Jar test), Odour, Salinity, Settleable Solids and Sludge Volume Index.

ii. **Inorganic (General and Non-metallic):** Acidity, Alkalinity, Ammonical Nitrogen, Chloride, Chlorine Residual, Dissolved Oxygen, Fluoride, Total Hardness, Total Kjeldahl Nitrogen (TKN), Nitrite Nitrogen, Nitrate Nitrogen, Phosphate, Sulphate, , Silica, Cyanide and Sulphide.

iii. **Inorganic (Trace Metals):** Boron, Cadmium, Calcium, Total Chromium, Chromium Hexavalent, Copper, Iron, Lead, Magnesium, Mercury, Nickel, Potassium, Sodium, Sodium Absorption Ratio, Zinc, Arsenic, Aluminium, Barium, Selenium, Tin, Antimony, Cobalt and Vanadium,

iv. **Organics (General) and Trace Organics:** Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Oil and Grease, Phenolic Compounds, Pesticides (each) (Organo-Chlorine and Organo Nitrogen-Phosphorus), Surfactant, Tanin & Lignin, Poly-Chlorinated biphenyl (PCB's) each, Poly-Nuclear Aromatic Hydrocarbon (PAH).

v. **Microbiological Test:** Total Coliform, Faecal Coliform, *E. coli, Faecal Streptococci* and Total Plate Count.

vi. **Toxicological Tests:** Bioassay Method for Evaluation of Toxicity using Fish and Measurement of Toxicity Using Daphnia or Other Organism.

vii. **Biological Test:** Macrophytic Identification, Planktonic Identification Count and Chlorophyll.

Contd.

viii. **Characterization of Hazardous Waste:** Corrosivity, Ignibility (Flash point) and Measurement of Heavy Metals/Pesticides in the Waste/Leachate.

ix. **Soil/Sludge/Sediment and Solid Waste:** Boron, Cation Exchange Capacity (CEC), Electrical Conductivity, Nitrogen (Available), Organic Carbon/Matter (Chemical Method), pH, Phosphorous (Available), Phosphate (Ortho), Phosphate (Total), Potassium, SAR in Soil Extract, Sodium, Soil moisture, TKN, Calorific Value, Ammonia, Bicarbonate, Calcium, Calcium Carbonate, Chloride, Colour, H.Acid, Heavy Metal, Magnesium, Nitrate, Nitrite, PAH, Pesticide, Potash (Available), Sulphate, Sulphur, Total Organic Carbon, Total Water Soluble Salt and Water Holding Capacity.

x. **Ambient Air/ Fugitive Emissions:** Nitrogen Dioxide (NO_2), Sulphur Dioxide (SO_2), Total Suspended Particulate Matter, Respirable Suspended Particulate Matter PM_{10}, Ammonia, Carbon Monoxide, Chlorine, Lead, Ozone, Benzene Toluene Xylene (BTX), Polycyclic Aromatic Hydrocarbon (PAH) Benzo-a-Pyrine & others and $PM_{2.5}$.

xi. **Stack Gases/ Source Emission:** Particulate Matter, Sulphur Dioxide, Velocity & Flow, Carbon Dioxide, Carbon Monoxide, Temperature, Oxygen, Oxides of Nitrogen, Acid Mist, Ammonia, Total Hydrocarbon, Hydrogen Sulphide and Carbon Disulphide.

xii. **Noise Level:** Noise Level Measurement (20-140 dBa) and Ambient Noise and Source Specific Noise.

xiii. **Meteorological:** Ambient Temperature, Wind Direction, Wind Speed, Relative Humidity, Solar Radiation and Rainfall.

3. Further, the following analysts have been approved as Government Analysts.

   i. M. Sachin Raju
   ii. Binu Mani
   iii. Arshiya Kousar

4. The laboratory shall compulsorily participate in the Analytical Quality Exercise conducted by the Central Pollution Control Board (CPCB) to ascertain the capability of the laboratory and analysis carried out and shall submit quarterly progress report to CPCB.

5. The surprise inspection/periodic surveillance of the recognized environment laboratory will be undertaken by CPCB to assess its proper functioning systematic operation and reliability of data generated at the laboratory.

6. It is also mandatory for the laboratory to have requisite accreditations of the ISO: 17025 and ISO:45001 and its renewal as per accreditation rules. This recognition is subject to such accreditations and renewals as applicable. The laboratory is required to apply online for further renewal of recognition through CPCB web portal after renewal of the mandatory accreditations / certifications concerned.

7. The laboratory should compulsorily follow the accepted terms and conditions. In case of serious non-compliance of any of the terms and conditions, the laboratory may be black listed for a minimum period of two years and civil/criminal proceedings, as applicable, may be initiated for performing functions on behalf of the Government in an unauthorized manner.

Yours faithfully,

7/6/23

(Dr. K. Ranganathan)
Scientist-E & Divisional Head
Instrumentation laboratory

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COVERAGE OF TOR

Itemwise Compliance Status of TORs issued by State Level Environment Imapct Assessment Authority- Goa (SEAC)

ToR No.	TOR Point	TOR Complinance / Reference in EIA Report
1.	Year –wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.	The year wise production details are not applicable as it is a fresh grant. The Goa Government has auctioned the Block II Sirigao-Mayem Mineral Block as a fresh Lease. And LOI is issued to Salgaocar Shipping Company Pvt Ltd. The mine operations will commence after obtaining necessary Statutory clearances and execution of lease Deed
2.	A copy of the document in support of the fact that the Proponent is the rightful lease of the mine should be given.	The state govt. has auctioned the subject Mineral Block as a fresh mining lease and Lettter of Intent (LOI) is issued to Salgaocar Shipping Company Pvt Ltd. LOI is attached as Annexure. No.1
3.	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	All documents are compatible and are in the name of Salgaocar Shipping Company Pvt Ltd, Goa
4.	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery / toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (Core and buffer zone).	The high resolution imagery (Plate No-4) Topo sheet (Plate No-3) Geomorphology (Plate No -9) Geological map (Plate No – 8) are enclosed
5.	Information should be provided in Survey of India Topsheet in 1:50,000 scale indicating geological map of the area, geomorhphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	The Key Plan is enclosed as Plate.no.3 Ref chapter 3
6.	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State land diversion for mining should have approval from State land use Board of the concerned authority.	The state govt. has auctioned the subject Mineral Block as a fresh mining lease and LOI is issued to Salgaocar Shipping CompanyPvt Ltd

7.	It should be clearly stated whether the Proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement /deviation/violation of the environmental or forest norms/conditions. The hierarchical system or administrative order of the company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliance / violations of environmental norms to the Board of Directors of the Company and /or shareholders or stakeholders at large, may also be detailed in the EIA Report.	The Project Proponent has a well laid out environmental policy. The details are given vide para 10.2.The compliance of EC conditions will be ensured by the committee formed under Environmental policy of the Project proponent.
8.	Issues relating to Mines Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc., should be detailed. The proposed safeguard measures in each case should also be provided.	Slope stability study will be carried out through a reputed institute, after commencement of mining operations .
9.	The study area will comprise of 10 km zone around the mines lease from lease periphery and the data contained in the EIA such as waste generation etc., should be for the life of the mine / lease period.	The study area comprises of the lease area and 10 kms radius around ML area. The EIA covers all the activities upto the end of mining lease period in chapter-2
10.	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and pose operational phases and submitted. Impact, if any, of change of land use should be given.	Land use plan enclosed. Refer Para-3.7, **Vide Plate No.17**
11.	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.	There is no proposal to stack the over Burden outside the Mining Lease area. Hence, this condition is not applicable.
12.	A certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest	No forest land involved . The duly aunthenicated letter is enclosed as **Annexure.No.4**

	land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the 4 Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the expert Appraisal Committees.	
13.	Status of forestry clearance for the broken up area and virgin forestland involved in the project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	Not applicable
14.	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not applicable
15.	The vegetation in the RF/PF area in the study area, with necessary details, should be given.	Chapter -3 , Refer para 3.8
16.	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.	There detailed flora & fauna study was conducted during study period and there were 22 species of schedule -1 recorded & the conservation study is given in chapter-10 , para 10.7
17.	Location of National Parks, Sanctuaries, Biospher Reserves, Wildlife Corridors, Ramsar Site Tiger. Elephant Reserves / (existing as well as proposed), if any, within 10km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	The authenciation letter from Goa Forest Dept showing the distance of Dr.Salim Ali Bird Sanctuary from Mineral Block area is enclosed as Annexure-5 .
18.	A detailed biological study of the study area [core zone and buffer zone (10km radius of the periphery of the mine lease)] shall be carried	The detailed biological study was conducted during summer season 2023, and there were recorded some schedule-1 fauna in 10 kms

	out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	radius. List of flora & fauna duly authenciated by DCF, North Goa is enclosed vide Annexure-8. Budgetary provision for wildlife conservation is given vide chapter 10, para 10.7, Table No 10.9.
19.	Proximity to Areas declared as 'Critically polluted' or the Project area likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered.	The Mining Lease area does not fall under Critically Polluted Area or Aravali Range. Hence, this condition is not applicable.
20.	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area. Location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	The Mining Lease area does not fall under any Coastal Regulation Zone (CRZ). Hence, this condition is not applicable.
21.	R&R Plan / Compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State / National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs/STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease	No R & R issue is involved. In the study area, a need based sample survey, family-wise was carried out to assess their requirements of SCs /STs and other weaker sections of the society. The action plan program prepared and included in the EIA Report. No shifting of villagers located in the Mining lease area is required

	area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.	
22.	One season (non-monsoon) [i.e. March-May (summer Season); October-December (post monsoon season); December – February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, Noise level, soil and flora and fauna shall be collected and the AAQ and other data so complied presented date-wise in the EIA and EMP Report. Site – specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominate downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, Particularly for free silica, should be given.	One season data [Mar-May-2023 (Summer season)] on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna has been collected and date wise data presented in the EIA Report. Site-specific meteorological data has also been collected and included in the EIA Report. The location of monitoring stations has been finalized to represent whole of the study area, keeping in view the pre-dominant downwind direction and location of sensitive receptors. One monitoring station is located within 500 m of the mine lease in the predominant downwind direction. The details of mineralogical composition of PM_{10}, particularly for free silica are also presented in the EIA Report. Refer Chapter-3 Vide Annexure No.-7.
23.	Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used on a modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	The air quality modeling was done using AERMOD software Ref Chapter-4, Para.4.5.2
24.	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should ne indicated.	The total water requirement for the capacity of Mine is 221 KLD. The source is the Pit water: 220 KLD & open well : 1 KLD for domestic purpose. Refer Chapter-2, Para: 2.6.6, Table.2.11
25.	Necessary clearance from the Competent Authority for drawl of requisite quality of water for the Project should be provided.	The hydrogeological report and approval from WRD for ground water is enclosed as Annexure-6 & the hydrogeology report is enclosed as Appendix-1
26.	Description of water conservation measures	The detailed water conservation measures are

	proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	given in.Hydrogeolgical Report (Appendix-1)
27.	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	The impact on the water quality chapter -4 para 4.7 and Necessary safeguard measures like garland drains, settling ponds are mentioned in chapter- 10, Para-10.5.3
28.	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will interest groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities in these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.	The mine workings are intresecting the ground water table. The hydro geological study is conducted and the NOC is obtained from WRD. The hydro geological report is enclosed as Appendix No. 1
29.	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out	Seasonal nallah is passing through the mineral block area, and is mentioned in Chapter 3 para 3.5.2.3. The nearest river towards North-West direction i.e, Assonora river which is 0.56 kms,Chapter -3 para 3.5.3
30.	Information on site elevation, working depth, groundwater table etc, should be provided both in AMSL and BGL. A schematic diagram may also be provided for the same.	The details are provided in hydrogeological Report in Appendix-1 working depth as shown in Conceptual Section Plate No-7A
31.	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility	The green belt development plan for five-year plan period is about 5.41 Ha area and 8100 saplings proposed. The detailed plan is given vide Chapter- 10, Details of Green Belt Development Plan is provided Table 10.5

	value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	
32.	Impact on local transport infrastructure due to the Project should be indicated.Projected increase in truck traffic as a result of the Project in the present road network (including those outside of the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.	The traffic density study is carried out as per Indian Road Congress Guidelines. Ref Chapter 3 para 3.10 & Chapter-4, Para-4.10
33.	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.	The details of shelter and other facilities for the mine workers are provided in the EIA Report. Ref Chapter -2, Para 2.6.9
34.	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	The status of land use at conceptual post mining stage including the details of Reclamation and Restoration of mined out areas and the plans with adequate number of sections have been included in the EIA report. Enclosed as Plate. No.7 & 7A
35.	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	The detailed impact and preventive measures on occupational health is given vide chapter-7, Para.7.5 Also OH&S plan provided in chapter 10 para 10.10
36.	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	Health status of population in the study area Ref. Chapter-3, Para.3.9.1.17 in table 3.41 Health impact on population Chapter -4 Para 4.9.1 (b)
37.	Measures of socio economic significance and influence to the local community proposed to be provide by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for	Impact study on the local population is done . Detailed study is given in Chapter-4, Para.4.9 Chapter -8 para 8.1.1, social benefits provided in para 8.4

	implementation.	
38.	Detailed environmental management plan(EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.	Detailed Environmental Management Plan is prepared. The budget of Rs. 20 lakhs capital Cost and Rs. 75 lakhs recurring cost is presented in the report. Refer Chapter -10 for EMP, budget provided in Para- 10.8
39.	Public Hearing points raised and commitment of the Project Proponent on the same along with the time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	The time bound action plan with budgetary for the issues raised during public hearing is given in Chapter-7, **Para 7.1** . The response to the issues raised by public is enclosed as Annexure-9
40.	Details of litigation pending against the project, if any, with direction / order passed by any Court of Law against the Project should be given.	There are two litigations that are pending before the Hon'ble High Court of Bombay of Goa, wherein in one Writ Petition the tendering process is challenged and in the other Writ petition the project is challenged. Details are as given herein below: 1) <u>Wherein the tendering process is challenged</u>: Writ Petition 592 of 2022 filed by MSPL V/s The State of Goa and 6 others (SSCPL is respondent No. 5). SSCPL has filed its reply to the W.P. Replies and arguments are heard and the case is fixed for final orders/Judgement, (The case is disposed) 2) <u>Wherein the project is challenged</u>. PIL. WP/ 32/2023 filed by Dinanath Shambu Gaonkar and others V/s Directorate of Mines & Geology, Goa and 3 others (SSCPL is respondent No. 3) The case is fixed for filing of reply by SSCPL.

41.	The cost of the Project (Capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	The cost of the Project is Rs. 12622.12 lakhs. The cost towards implementation of EMP will be Rs. 75 lakhs recurring
42.	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	Chapter-7 para 7.3
43.	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, Social, economic, employment potential etc.	The environmental, social, economic benefits including employment potential of the mine proposal have been included in the EIA Report. Refer Chapter-8, table 8.1
44.	Besides the above, the below mentioned general points are also to be followed :-	
a)	Executive summary of the EIA/EMP report	Executive Summary report along with EIA & EMP is Submited to GSPCB
b)	All documents to be properly reference with under and continuous page numbering	Documents are properly referenced and pages are numbered
c)	Where data are presented in the report especially in tables, the period in which the data were collected and the source should be indicated.	Period of data collected and source indiacted
d)	Project Proponent shall enclose all the analysis/ testing reports of water, air, soil noise etc, using the MoEF&CC/ NABL accredited laboratories. All the original analysis/ testing reports should be available during appraisal project.	Baseline data collected by Environmental Laboratory unit of M/s. Mineral Engineering Services, which is accredited by MoEF&CC is enclosed
e)	Where the documents provided are in a language other than english, an english translation should be provided	All documents are in English
f)	The Questionnaire for environmental appraisal of mining projects as devised earlier by the ministry shall also be filled and submitted	During final EC presentation PP will submit Questionnaire to SEAC and SEIAA, Goa
g)	While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF&CC vide O.M.No J/11013/41/2006-IA.II(I) dated 4th august 2009, which are available on the website of this ministry , should be followed	Instructions are duly followed
h)	Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission	Project Proponent had Applied for TOR Corrigendum seeking Correction in the Organisation Name & SEIAA, Goa granted the TOR Corrigendum vide letter No. 115/3/2023-24/GSEIAA/project-Prop/204 dated 24.11.2023

	should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arsisng out of the P.H process) will entail conducting the P.H again with revised documentation	and is enclosed as Annexure No.2A.
i)	As per the circular no. J-11011/618/2010-IA.II(I) dated 30.05.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from regional office of ministry of environment, forest and climate change, as may be applicable	Not applicable

EIA & EMP TEXT

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Chapter-1
INTRODUCTION

1.0 INTRODUCTION

Salgaocar Shipping Company Private Limited (SSCPL), declared as the preferred bidder by Directorate of Mines & Geology, Government of Goa, for Block-II Sirigao - Mayem Mineral Block, located in Mayem & Sirigao villages of Bicholim Taluka, North Goa District, Goa State. SSCPL intends to obtain prior Environmental clearance from SEIAA for the production of 1.0 MTPA of Iron Ore.The Government of Goa, in pursuant to the Mines and Minerals (Development and Regulation) Act 1957, and the Mineral (Auction) Rules, 2015, issued notice inviting tender dated 30.09.2022 to commence the auction process of iron ore mineral blocks for grant of mining leases. The e-auction was conducted for the mineral blocks in accordance with the Tender Document. Salgaocar Shipping Company Private Limited was declared as the **preferred bidder** under Rule 9(9) (iii) of auction Rules, for Block-II Sirigao - Mayem Mineral Block, located in Mayem & Sirigao villages of Bicholim Taluka, North Goa District, Goa State.Further, upon submission of the first instalment, being 20% of the upfront payment, Directorate of Mines & Geology, Government of Goa issued **Letter of Intent (LOI) vide letter no. DMG/25/Auction Cell/LOI-function/2023/2802 dated 13.01.2023** for the grant of a mining lease for Block-II – Sirigao-Mayem Mineral Block, located in Mayem & Sirigao villages, of Bicholim Taluka, North Goa District, Goa State over an area of 171.2472 Ha for a period of 50 years. Copy of the Letter of Intent is enclosed as ***Annexure No. 1***

Salgaocar Shipping Company Private Limited on confroming with all the terms and conditions as led in the tender document and in pursuant to the Auction rules, will furnish an irrevocable and unconditional performance security to the State Government, Goa to become **Successful Bidder**. Upon obtaining all the necessary consents, approvals as required under applicable laws for commencement of mining operations, Salgaocar Shipping Company Private Limited will sign MINE DEVELOPMENT AND PRODUCTION AGREEMENT (MDPA) with the State Government.After signing of MDPA the mining lease deed will be executed and the mining lease will be valid for a period of 50 years.

Mining Plan has been prepared and submitted to Indian Bureau of Mines (IBM) in compliance to the terms and conditions no. 3(3.2) (a)(iv) of the Letter of Intent and under the provisions of Rule 16(1) of MCR 2016 for grant of mining lease over an area of 71.2472 Ha. to obtain environmental clearance for the production capacity of 1.0 million tonnes per annum of iron ore.

The Mining Plan has been approved by Indian Bureau of Mines, Goa vide letter No. MCDR-MPC0FE/3/2023-GOA-IBM_RO-GOA dated 07/08/2023. The approval letter is enclosed as **Annexure No. 3.**

1.1 *PURPOSE OF THE REPORT*

The project proponent intends to obtain prior Environmental Clearance from SEIAA,Goa for the production of 1.0 MPTA as it is a prerequisite condition to execute the Mining Lease Deed and commence production activities**.** The proposed project is a **Category B** Project under activity 1(a) as per the Environment Impact Assessment (EIA) Notification dated 14th September 2006 .The project proponent had applied via online mode to Sate Environmental Imapct Assesment Authority, Goa (GSEIAA) for the grant of Terms of Reference(TOR) for the production of 1.0 MTPA of Iron Ore and subsequently, the TOR was granted by SEIAA vide its letter no. 115/3/2023-24/GSEIAA/Project-Prop/166 dated 18.10.2023 and is enclosed as ***Annexure No.2.***

The Project propent had applied for corrigendum Company name correction i.e., Salgaocar Shipping Company Limited to Salgaocar Shipping Company Private Limited (SSCPL) on 18.10.2023 To SEIAA Goa. The TOR Corrigendum was granted by SEIAA Goa vide its letter no No. 115/3/2023-24/GSEIAA/project-Prop/204 dated 24.11.2023 and is enclosed as ***Annexure No.2A.***This report is prepared in accordance with the EIA Notification, 2006 and addresses all the conditions of the approved TOR. This report presents the baseline condition of the project area, the possible impacts in the surroundings due to the project, mitigation measures and management plan.

1.2 IDENTIFICATION OF PROJECT PROPONENT & PROJECT

1.2.1 *IDENTIFICATION OF PROJECT PROPONENT*

Salgaocar Shipping Company Private Limited is a part of Salgaocar Group which is a leading conglomerate of industries founded by late Shri. Anil Salgaocar. The Salgaocar Group is mainly involved in the mining and export of Iron Ore and allied activities for last many decades and is known for its Quality and sustainable development.

The group has exported Iron Ore to China, Japan, Europe and the far East and has been one of the pioneers of mining and export of Iron Ore Industry in Goa. The group has vast experience in the field of Iron Ore Mining and has operated multiple Iron Ore mines in Goa upto 2012 before the ban on Iron Ore Mining. The group also owns its own fleet of shipping vessels including barges, tugs and transhippers. The group is also involved in Shipping and Real Estate business.

Salgaocar Group is once again gearing up for resumption of Iron Ore Mining operations in Goa. The group has participated in the E-Auction of Iron Ore mining blocks being conducted by Government of Goa through its group entity Salgaocar Shipping Company Private Limited.Salgaocar Shipping Company Private Limited is a 100% subsidiary of Salgaocar Mining Industries Pvt. Ltd. (SMIPL), which is the flagship company of the Salgaocar Group. Salgaocar Shipping Company Private Limited was incorporated in Goa in June 1975 and has its office at Salgaocar Bhavan, Altinho, Panaji, Goa

1.2.2 PROJECT

Salgaocar Shipping Company Private Limited is proposing iron ore production from Block- II Sirigao-Mayem Mineral Block situated in Mayem & Sirigao villages of Bicholim Taluka, North Goa District, Goa State.The proposed iron ore mining project is spread over an area of 171.2472Ha and capacity of project is 1.0 MTPA. Mining will be carried out by opencast mechanised method using heavy earth moving machinery, without drilling and blasting.The ore and waste formations are soft & friable in nature, excavation will be carried out using combination of ripper dozer, excavators and dumpers. This approach not only minimizes the impact on the surrounding landscape but also promotes safe and sustainable mining practices.

1.2.3 PROJECT PROPONENT & ADDRESS

Registered Address: Salgaocar Shipping Company Pvt Ltd.,
Plot No 15 Salgaocar Bhavan
Altinho, Tiswadi
Panjim
Phone No. : 9423320259
Email :finance@smilindia.com

1.3. BRIEF DESCRIPTION OF NATURE, SIZE AND LOCATION OF THE PROJECT AND ITS IMPORATNCE TO THE COUNTRY, REGION

1.3.1 Brief Description of Nature, Size and Location Of The Project

The Block-II-Sirigao-Mayem mineral block is located in Sirigao &Mayem villages of BicholimTaluka of North Goa District, Goa State, over and an area of 171.2472Ha. The Sirigao-Mayem mineral block area comes under Toposheet No. 48E/14 of Survey of India, bounded by latitudes $15^0$35'20.233" N to $15^0$36'21.621" N and longitude $73^0$53'40.069" E to $73^0$54'50.014" E. The State Highway SH-1 is at a distance of 2.19kms, the nearest Railway station is Tivim Railway station, at a distance of 6.0 kms, and the nearest airport is Mopa Airport at a distance of 23.1 kms.

The location plan, DGPS plan of the mineral block and key plan showing 10km buffer zone has been enclosed vide **Plate No.1, Plate No.2 and Plate No.3** respectively.The proposed lease area is having about 23.58 million tonnes of mineral reserves & resources. The Iron Ore produced will be sold in domestic and export markets.

1.3.2 STATUTORY CLEARANCES

Salgaocar Shipping Company Private Ltd shall obtain all the necessary statutory clearances before commencement of work like Environmental Clearance, CTO from GSPCB, NOC from Water Resource Department of Goa etc.All the documents/approvals/permissions including Approved Mining Plan and EIA-EMP shall be compatible with one another in terms of the Mineral Block Area, production levels, waste generation and its management, mining technology etc.

1.3.3 MINING PLAN

The mining plan was prepared and submitted under Rule 16(1) of MCR, 2016, with a production capacity of 1.0mtpa to Indian Bureau of Mines, Goa. The Mining Plan is approved vide letter No. MCDR-MPC0FE/3/2023-GOA-IBM_RO-GOA dated 07/08/2023. The approval letter is enclosed as **Annexure No. 3**.

1.3.4 OTHER CLEARANCES

There is no forest land & ESA within Mining Lease area. Letter from DMG & SEIAA is enclosed as **Annexure - 4**

There is Salim Ali Bird Sanctuary at a distance of of 8.53Km from the lease area. Enclosed vide **Annexure No-5**

Ground water Approval : The detailed ground water study is given vide in Hydrogeological report enclosed as **Appendix-1** and the WRD approval letter is enclosed as **Annexure-6**

1.3.5 IMPORTANCE OF THE PROJECT TO THE COUNTRY AND REGION

The major usage of Iron Ore in India is for manufacturing of steel. The major iron ore producing states are Odisha, Jharkhand, Chhattisgarh, Karnataka and Goa. India is world's 4th largest Iron Ore producer and 3rd largest exporter after Australia and Brazil.

As per the UNFC system, as on 1.4.2015, India possesses hematite resources of 22487 Million Tonnes, of which 5422 Million Tonnes are under 'Reserves' category and the balance 17065 Million Tonnes are under 'Remaining Resources' category. Major resources of haematite are located in Odisha (7559 Million Tonnes or 34%), Jharkhand (5286 Million Tonnes or 23%), Chhattisgarh (4858 Million Tonnes or 22%),

Karnataka (2,467 Million Tonnes or 11%) and Goa (1189 Million Tonnes or 5%).The balance 5% is spread in Andhra Pradesh, Assam, Bihar, Madhya Pradesh, Maharashtra, Meghalaya, Rajasthan, Telangana and Uttar Pradesh.

Magnetite is another principal Iron Ore that also occurs in the form of oxide, either in igneous or metamorphosed banded magnetite silica formation, possibly of sedimentary origin. Exports of iron ore decreased considerably from 7.30 Million Tonnes in the 2014-15 to 5.4 Million Tonnes in 2015-16.In spite of the current turmoil, Indian GDP is expected to grow in multitudes and reach around $ 27 trillion by 2050. Infrastructural development will play an instrumental role in achieving this GDP level.

It is an undeniable fact that steel plays a pivotal role particularly in reference to the infrastructural sector. In this context, the production of 500 MT of steel is an imperative by 2050 and for this, 840 MT of iron ore per annum is required. This calls for wise use of our limited resources and to strategically plan for the future to meet the imminent demand, when it finally arrives in India. The per capita steel consumption of 74.1 kgs remains very low, compared to the international average of 190 kgs and China's average of 400 kgs. There exists a great prospect for a much higher investment into capacity addition in the country. Increase in steel capacity, addition will fuel up the demand for Iron Ore in the country. Rural per capita steel consumption is set to rise in Construction & Infrastructure sector. In the case of present project area, the main revenue generating resources are Tourism, Agriculture and Iron Ore Mining. The state will get revenue in terms of taxes and royalties, DMF and the country will be benefited in terms of income tax and export duty and NMET.This will definitely improve the socioeconomics of the region and the country.The opening of this Mine shall provide direct employment and indirect employment opportunities in the form of hired truck drivers, hired machine operators, local workshops, contract workers for construction works like parapet wall, silpaulin covering work, plantation work, cleaning works etc. for the local villagers.

1.4 SCOPE OF THE STUDY

The scope of the EIA/EMP Study is as per the approved TORs issued by SEIAA,Goa vide its letter no 115/3/2023-24/GSEIAA/Project-Prop/166 dated 18.10.2023 given vide as ***Annexure.No.2*** **.**The EIA/EMP Study is also based on baseline environmental data collected in the months of March to May 2023, Mining Plan and related secondary information. The EIA-EMP is prepared as per the generic structure as defined in the EIA notification dated 14th September 2006 and as amended time to time addressing all the TOR conditions given by EAC, SEIAA.

1.4.1 BASELINE DATA GENERATION

The study includes a detailed characterization of the baseline environment of core zone covering Mineral Block and Buffer zone over an area covering 10 km radius around the Mineral Block Area. The study includes assessing the environmental parameters like Air, Water, Noise, Land, Biological and Socio-economic aspects covering three months i.e., March to May -2023. The details of Environmental Monitoring have been covered in the EIA report.

1.4.2 SECONDARY DATA COLLECTION:

Secondary data was collected from the following sources:
India Meteorological Department (IMD)
Geological Survey of India (GSI)
Botanical Survey of India
Zoological Survey of India
CGWB, GOI
NRSC, Survey of India (SOI), ICAR
National Bureau of Soil Survey and Land Use Planning (NBSS &LUPP)
Census of India, 2011
Approved Mining Plan

1.4.3 STRUCTURE OF THE EIA & EMP REPORT

This EIA report has been prepared in line with the Generic Structure prescribed by the MoEF&CC vide its EIA Notification 2006 dated 14th Sep, 2006 and its subsequent amendments.

Table 1.1: EIA Report Structure

Chapter No	EIA Structure
1	Introduction
2	Project Description
3	Description of the Environment
4	Anticipated Environmental Impact & Mitigation Measures
5	Analysis of Alternatives (Technology & Site)
6	Environmental Monitoring Program
7	Additional Studies
8	Project Benefits
9	Environmental Cost Benefits
10	Environment Management Plan (EMP)
11	Summary & Conclusion
12	Disclosure of Consultant Engaged

Chapter-2
PROJECT DESCRIPTION

PROJECT DESCRIPTION

2.1 TYPE of PROJECT

The proposed project falls under screening category of 'B' [EIA notification 2006, Sl. No 1(a) of Schedule: Mining of Minerals] i.e. <250 Ha respect of non-coal Mine. The project requires prior Environmental Clearance from SEIAA, Goa to execute the lease.

It is an opencast Iron ore mining project using Heavy Earth Moving Machineries (HEMM). There shall be no Drilling and Blasting involved in this project.

2.1.1 YEAR - WISE PRODUCTION DETAILS

This is a e-auctioned mine. The mine operations will commence after obtaining the necessary clearances and execution of the lease Deed.

2.2 NEED FOR THE PROJECT

The present mining project involves the production of 1.00 million tonnes of Iron Ore per annum, based on the current mineable reserves, the life of the mine shall be 15 years and may enhance on the outcome of the proposed exploration during the mining plan period. The lease is valid for 50 years.

The iron ore produced from the mine will be dry processed, by crushing and screening, and will be exported or sold to the domestic market

This project is expected to yield a positive impact on the socio-economic environment of the region. It helps in this area's sustainable development, including further development of physical infrastructural facilities. The opening of this mine will boost the economy of the State and improve the socio-economic status of the region.

Besides, the direct and indirect employment opportunities, this project will also generate revenue for the state in terms of taxes and royalties, DMF and the country will be benefited in terms of income tax and export duty and NMET.

The Lessee shall extend social benefits like a supply of water for irrigation purposes, health care measures, and educational benefits to the surrounding villagers.

2.3 LOCATION OF THE PROJECT

Maps showing general location, specific location of the mineral block area, key plan showing buffer zone area of 10kms from the mineral block boundary and High resolution, map are shown in **Plate. No.1 ,2 ,3 & 4** respectively

2.3.2. PROJECT DETAILS & ENVIRONMENTAL SETTING

The geographical aspect of the Mine Location is given below.

Table 2.1: Project Details

Land Details & Survey Nos	Total Mineral Block Area 171.2472 Ha., Non-Forest land, coming under villages Sirigao & Mayem. Survey No's: Sirigao village: 1,2,3,4,5,6,7,46,47,48,84,90,91,92,93,94,95,96, 97 & 98. An area of 0.7625Ha. is coming under Road. Mayem Village: 12, 47, 48, 56,57,58,59, 60, 61, 62,79,80,84. An area of 0.3685Ha, is coming under Road
Geographical Coordinates	Latitude 15° 35'20.233" to 15°36' 21.620" N & longitude of 73°53' 40.069" E to 73° 54' 50.014" E.
Survey of India (SOI) Topo-sheet No	**48E/14**
Reserves& Resources	23.584 Million Tonnes
Production Capacity	1.00 mtpa
Life of the Mine	15 Years based on the present mineable reserves. The mining lease will be valid for 50 years from the date of execution of the mining lease.
Water requirement	221 KLD
Power requirement	200KVA DG set
Man Power Requirement	132, Both Direct & Indirect employment
Nearest airport	Mopa – 23.1 Kms
Nearest Railway Station	Tivim- 6.0 kms
Nearest Highway	SH-1 – 2.19 kms from mineral Block
Environmental Protection Cost	Capital Cost: Rs.20.0 lakhs Recurring Cost: Rs 75Lakhs
Project Cost	Rs. 12622.12 lakhs

Table.2.2 Environmental Setting

Sanctuary / Tiger Reserve/Elephant / any other Reserve Forest	Tiger reserve within study area **Elephant** reserve within study area Mayem Forest Kharpal RF Kasarpal RF Ambadgaon RF Salim Ali Bird Sanctuary	None None 0.190 Km 8.4 Km 5.1 Km 9.4 Km 8.56 km
Biosphere Reserve	None	-
Water Bodies	Asnora river	0.56 Km
	CorjuemStream	Touching the Lease Area
	Mapusa River	1.25 km
	Bicholim River	4.02Km
	Mandovi River	4.3 kms
	Chapora River	7.3 km
	Mayem Lake	3.4km
	Amthane Dam	7.0 Km

	Dhasi Lake	7.3 Km
Defence Installation	None	--
Seismic Zone	III	--
Nearest Habitat	Sirigao Village Within the lease	50m buffer zone will be maintained from the periphery of the nearest habitat. Mining operations will be carried out without drilling and blasting
Archaeological monuments/	Namuzgah/Idgah Fort at corjuem Fort at Colvale	3.73 Km 0.664 km, 5.6 km
Sensitive man made landuses& places of worships	ShriLairaeTemple(new) Lamgao caves Sateri Temple (Lamgao) Mhatrai temple Sateri Temple (Mulgao) Kelbai Temple Mahadev Temple Lairaee Temple (Old)	Within Mineral Block(Min Buffer of 50m shall be provided and no drilling and blasting shall be carried out.) 2.43 km 2.18 Km 2.53 km 1.60 km 1.7 km 1.58 km 0.92 km
Coastal Regulation Zone (CRZ)	--	--
Distance from the HFL of the river in m	Assnora River	0.56 km
Nearest School	Govt. High School Sirigao	There is one school within lease area. The strength of school is 56 Nos

List of Schools

Sr. No.	School Name	Distance in (Km)
1	Ideal High school, Pilgao	5.57
2	Govt. high school, Mulgao	1.91
3	Govt. high school, Shriodwadi, Mulgao	2.47
4	Vijyanand high school, Mayem	1.81
5	Shree Mahamaya High school, Mayem	3.4
6	Our lady of grace high school, Bicholim	3.7
7	Shree Shantadurga high school, Bicholim	3.23

Industries	Cashew factory Bicholim Industrial estate	3.27 Km 4.45Km
Mangrove	Corjuem Stream Mangrove	0.034 km from Mineral Block

2.4 SIZE OR MAGNITUDE OF OPERATION (Including associated activities required by or for the project)

The proposed project extends over an area of 171.2472 Ha consisting of non-forest land. The Boundary pillars are given below table and given vide plate.No.2 DGPS plan

Table.No.2.3 Boundary Pillars

Pillar No.	Pillar Latitude	Pillar Longitude
A	15^0 36' 14.310"	73^0 53' 40.069"
B	15^0 36' 21.621"	73^0 53' 40.938"
C	15^0 36' 17.421"	73^0 54' 06.524"
D	15^0 35' 57.409"	73^0 54' 34.906"
E	15^0 35' 51.801"	73^0 54' 30.296"
F	15^0 35' 41.907"	73^0 54' 50.014"
G	15^0 35' 20.233"	73^0 54' 36.040"
H	15^0 35' 35.315"	73^0 54' 01.582"
I	15^0 35' 48.817"	73^0 54' 06.775"

The Iron ore reserves and resources as on 01.04.2023, as per the approved mining plan Parameters:

Total Mineral Reserves &Resource :23.58 Million Tonnes

Nature of ore : Iron ore (medium hard & soft)

Max. Proposed Production : 1.00 MTPA

Ore to waste ratio (m3/ton)average : 0.4074

Mineral Reserves/Resources: Mineral Resources: (Mineral resources may be estimated purely based on the level of exploration, with reference to the threshold value of minerals declare by IBM)

Table.No. 2.4 *level of exploration*

Level of exploration	Area in Ha		Total area in Ha.
	Forest	Non-forest	
G-1	0	26.983500	26.983500
G-2	0	8.727300	8.727300
G-3	0	70.539100	70.539100
G-4	0	0	0
Area to be explored	0	64.997300	64.997300
Total	**0**	**171.2472**	**171.2472**

Table 2.4a Reserves & Resources

Classification	Code	Quantity tonnes			Grade(Fe%)	
		Forest	Non-Forest	Total	Forest	Non-Forest
A. Mineral Reserve						
1. Proved Mineral Reserve (A)	111	-	11403605	11403605	-	53.30
2. Probable Mineral Reserve (A)	121	-	-	-	-	-
3. Probable Mineral Reserve (A)	122	-	3137649	3137649	-	53.39
B. Remaining Resources						
1. Feasibility Mineral Resource (B)	211	-	4004579	4004579	-	55.75
2. Prefeasibility Mineral Resource (B)	221	-	-	-	-	-
3. Prefeasibility Mineral Resource (B)	222	-	-	-	-	-
4. Measured Mineral Resource (B)	331	-	-	-	-	-
5. Indicated Mineral Resource (B)	332	-	37207	37207	-	55.65
6. Inferred Mineral Resource (B)	333	-	5003990	5003990	-	55.16
7. Reconnaissance Mineral Resource (B)	334	-	-	-	-	-
Total Mineral Resources (A+B)		**-**	**23587030**	**23587030**	**-**	

The Geological Plan & sections is given vide Plate. 5 & 5A to 5G

2.5 SCHEDULES FOR APPROVAL & PROJECT IMPLEMENTATION

Mining operations will be commenced after obtaining all the statutory permissions and approvals. The following is the tentative schedule for Environmental Clearance by SEAC, SEIAA.

Table. No. 2.5: Tentative Schedule for Approval & Project Implementation

Sr.No	Activity	Timeline
1	Baseline Data Collection & Environment Impact Assessment (EIA) Study	Mar-May 2023
2	Preparation of Draft EIA Report	Dec-2023
3	Submission of EIA Report to Goa Pollution Control Board (GSPCB)	Dec-2023
4	Public Consultation	Feb-2024
5	Submission of Final EIA Report incorporating	March-2024
6	Appraisal by Expert Appraisal Committee	March-2024
7	Grant of Environmental Clearance by SEIAA, Goa	April-2024

The Project shall be implemented immediately after obtaining all the necessary clearances and after executing the mining lease deed.

2.6 PROJECT DESCRIPTION – INCLUDING DRAWINGS SHOWING PROJECT LAYOUT, COMPONENTS OF THE PROJECT ETC / TECHNOLOGY AND PROCESS DESCRIPTION.

The proposed project extends over an area of 171.2472 Ha consisting of non-forest land. The project is an open cast mining mechanized mine with HEMM .The surface plan & Conceptual Plan are given vide **Plate No.6 & 7**

2.6.1 Geology

The mining lease area comprises a major ridge running northwest-southeast direction. The ridge separates the two villages, Sirigao in the northeast and Poira (Mayem) in the southwest. Geologically the auction block comprises of the rocks belonging to the Bicholim Group of formation of the DharwarSupergroup. The ore deposits of Block-II - Sirigao-Mayem Mineral Block is a part of the Sirigao-Bicholim iron ore deposits. The northern or Sirigao band shows shallow to medium dips towards NE, whereas the southern or Poira band shows north-easterly shallow to steep dips. The ore body extends over a strike length of 2065m with a variable width of 30-35m. dipping on either side with varying angles of dip. The total mineralized area in the auctioned block comes to around 55.456 Ha, unexplored area of 64.9973 Ha and non-mineralized area of 50.7939 Ha

The local lithological sequence occurring within the mineral block area is summarized below:

Laterite

Lumpy ore

Powdery ore with intercalated clays

Underlying formations (Phylite/MnPhyllliteclays)

2.6.1.1 Structure

The ore body is a north-westerly plunging overturned anticline. The axis of the anticline follows the NW-SE trending Sirigao ridge. The general strike of the deposit is N60W S60E. Both north-easterly and south-westerly dips are observed. The chemical analysis of surface iron ore samples are given below:

Table 2.6: The chemical analysis of Surface iron ore samples

S. No.	Radicals	Wt%
1	Fe	57.94
2	Fe	53.06
3	Fe	56.46
4	Fe	57.94
5	Fe	57.54
6	Fe	59.69
7	Fe	52.60
8	Fe	57.82
9	Fe	59.13
10	Fe	52.04

2.6.2 TECHNOLOGY AND PROCESS DESCRIPTION

2.6.2.1 MINING METHODOLGY

2.6.2.1.1 Existing Mine workings:

Presently the Block II Sirigao-Mayem Block(Mine) is not in operation. The Mining operation will commence after obtaining all statutory permissions/ clearances.

2.6.2.1.2 Proposed Mine workings:

The mining operations are proposed to be carried out in a scientific and systematic manner. There are 3 pits within the proposed mining lease area. **Table 2.7** gives the details of active pits along with dimensions.

Table 2.7 Details of Active Pits

Sl. No	Pit ID	Area Covered by Pit(Ha)	Pit Dimensions(L*W*D)
1	Pit - 1 Active	29.53	730X400X80
2	Pit - 2 Active	34.68	1070X450X115
3	Pit 3 Reclaimed and rehabilitated	17.31	240X810X39

The development and production will be done systematically by maintaining a bench height of 6 m and width more than the height in both ore and overburden benches. The slope of Overburden and Ore benches shall be maintained at 65^0 and an overall slope of 28^0respectively.The slope of the bench shall be maintained properly as per the stability of the strata. Gradient of the haulage road will be maintained as 1:16. The capping of hard laterite cover and Hematite ore will be removed by deploying Eco-Friendly ripper dozer. The use of ripper dozer will eliminate the conventional drilling and blasting.

The year-wise production and development for the first block period is given below:

Table 2.8. The year-wise production and development for the mining plan period

Sr. No.	Year	Pit ID	Total Over Burden/ Waste Quantity (t)	Total ROM Quantity (t)
1	Year1	Pit-1	291360.00	480000.00
2	Year2	Pit-1 & Pit-2	212600.00	580000.00
3	Year3	Pit-2	1463100.00	700000.00
4	Year4	Pit-1 & Pit-2	468500.00	830000.00
5	Year5	Pit-1 & Pit-2	489800.00	1000000.00
		TOTAL	**2925360.00**	**3590000.00**

The maximum production proposed is 1.0mtpa during 5th year, The production & development quantities for 5th year is given below

Table 2.9 Details of maximum production quantities

Total handling (T)	1489800.00
ROM Qty (T)	1000000.00
Waste Qty (T)	489800.00

2.6.2.1.3 Loading, Hauling, and Waste Dumping: The ore and overburden will be excavated using hydraulic excavators and will be transported to designated backfilling/ ore stacking locations using 20 tonner dumpers

2.6.2.1.4 Transport:

Iron ore produced will be exported or will be sold to domestic market. For export Iron ore will be transported by 10.5 tonner tippers from mine site to jetty; from jetty, ore will be transported trough barges to the port/transshipper. Domestic sale will be as per buyer's need. Route: Mine to Sinqurerim Jetty Via MDR 02

Mine to Sinqurerim Jetty via MDR 02. The total distance is 4.83km out of which 0.62Km public road.

2.6.2.1.5 Mine design parameters: There are 3 pits within the mineral block area. Ore is available up to a maximum depth of -33mSL. The haul roads will be maintained in 1:16 gradient. Safety bunds will be maintained along the main haulage roads

2.6.2.1.6 Briefly giving salient features of the proposed method of working indicating Category of mine.

- Mining will be carried out by opencast fully mechanized mining method with the use of heavy earth moving machinery.
- The maximum production proposed for this mine is 1.00 million tonnes. It is proposed to operate the mine in General shifts having effective working hours of 6hrs 00 mins per day. During monsoon minimum excavation will be carried out along with other safety and environmental protective measures.

- The Heavy earth-moving machinery(HEMM) is used for the excavation, loading, hauling & transporting of ore and waste rock. There will be no drilling and blasting operations.
- Ripper dozers will be used for ripping hard material for removal of waste and winning of ore. The excavation will be done by hydraulic excavators.
- The waste material will be transported from the mine face to backfilling site using 20-tonner capacity dumpers.
- It is proposed to work the mine by forming systematic benches up to a maximum depth of -33m.
- Year-wise excavation shall be carried out by leaving the safety barrier of 7.5m from the lease boundary and a statutory barrier of 50m from the habitat, public road and nearby nallah
- Mine working will be optimized considering both safety and mineral conservation aspects.

2.6.3 MACHINERY:

The machinery requirement has been calculated considering maximum handling of Ore & Waste during Mining Plan period with general shift workings. The list of machineries along with its capacity is given in the below Table

Table 2.10 List of Mining Machineries proposed to be deployed at the mine

Sl No.	*Type*	*Make*	*Capacity (m^3)*	*No.of Equipment*
1	Hydraulic Excavator	Cabelco	0.90	3
2	Hydraulic Excavator	Cabelco	1.7	9
3	Wheel loader	Volvo	1.70	7
4	Ripper and Dozer	Cat	325	5
5	Dumper	Tata HM2021	20 tonner	34

2.6.4 MANPOWER

There a number of officers, supervisory staff and other workmen as direct and in direct employees is indicated in Table **2.10** below.

Table 2.11 Direct and Indirect employees

S. No	Designation	Nos
1	1st Class Mines Manager	1
2	Mining Engineer	5
3	Geologist	2
4	Electrical Engineer	1
5	Mechanical Engineer	1

6	Mine Foreman	8
7	Mining Mate	4
8	Others	2
	Direct employment	**24**
9	Operator/technician /other	68
10	Semiskilled	10
11	Unskilled/	30
	Indirect employment	**108**
	Total	**132**

2.6.5 WASTE HANDLING AND DISPOSAL

During the mining plan period, the waste generated will be utilized for backfilling, the exhausted part of the pit No. 1. The total waste quantity generated during the mining plan block period will be 29,25,360 tonnes. A cumulative area of 11.64Ha will be utilized for Backfilling.

2.6.6 WATER REQUIREMENT

Total Water requirement is about 221 KLD.

The Breakup of the requirement is given vide Table No.2.11 below

Table 2.11 Requirement of Water

Purpose	QTY (KLD)	Source
Dust Suppression	200	Rain water harvested in mine pit
Green Belt	10	
Vehicle Washing	10	
Domestic	1	Open Well water from buffer zone villages
Total	221	

SOURCE OF WATER

The rain water falling within the lease area will be channelized into the mining pits. The heavier particles in the water gets settled down, the clear water will be utilized for dust suppression, vehicle washing and for plantation. Well water from outside the lease area will be utilized for drinking and domestic purposes.

2.6.7 POWER REQUIREMENT

The estimated overall power requirement including utilities and auxiliary facilities for the proposed mine are indicated below:

- Annual energy consumption:0.28 MW

Source of Power: Solar panels and DG Set with capacity of 200 KV, if required electric power supply connection from state grid will be obtained

Standby DG Set with capacity of 200 KVa 1 no.

2.6.8 LIFE OF MINE

The total reserves and resources of the mineral block is 23.58 million tonnes, out of which the mineable reserves are 14.54 million tonnes. Based on the maximum production of 1.0million tonnes, the life of the mine is expected to be 15years. Life of the mine may increase, based on the outcome of the proposed exploration during the plan period

2.6.9 SITE SERVICES

The normal site services required for mining will be provided within the Mining Lease. They include the following:

1. Canteen
2. Rest shelters
3. Drinking water facility on the site
4. Latrines and urinals on the site
5. Dispensary/OHC on site

Safety and firefighting and quality control facilities etc

2.7 DESCRIPTION OF MITIGATIVE MEASURES TO BE IMPLEMENTED

2.7.1 Mitigative measures for control of Air Pollution

Air pollution mitigation measures would be for the point and fugitive sources within the plant.

Mostly, the air pollution mitigation measures guided by the Indian regulatory standards are mostly confined to the control of particulate dust, SO_2 and NO_2 emissions.

Dust will be generated from loading/Unloading operations, due to vehicular movement, due to machineries used in the activity.

Proper mitigation measures will be taken to reduce impact from activity like water sprinkling, barricading etc. to prevent dust escaping to atmosphere.

During operation phase, proper maintenance of vehicles and equipment will help in controlling the gaseous emissions. Vehicle meeting PUC norms will be used to further control the gaseous emission. Water sprinkling on roads will prevent fugitive dust.

2.7.2 Mitigative measures for control Water Pollution.

Parameters, which influence the water quality due to mining activities, are suspended solids and dissolved solids generated due to wash off from the dumps, runoff from workings.

Mitigative measures Proposed are afforestation of backfilled areas to stabilize the soil, diverting the surface runoff to the settling ponds through garland drains. Retention walls shall be constructed at the toe of dumps to arrest the silt content in the rainwater passing directly from dumps.

2.7.3 Mitigative measures for control of Noise Pollution

Proper noise abatement measures will be taken and persons working close to machine and machine operators will be provided with personal protective equipment viz. Ear plugs / Ear muffs etc. for further protection. Various measures proposed to reduce noise pollution include reduction of noise at source, provision of acoustic lagging for the equipment & suction side silencers, selection of low noise equipment.

2.7.4 Solid Waste Management

Waste generated at this mine will be transported to backfilling/ temporary dumping site by 20 tonner dumper. The entire waste shall be backfilled in the exhausted portion of the pit.

Chapter-3

DESCRIPTION OF THE ENVIRONMENT

3.0 DESCRIPTION OF THE ENVIRONMENT

3.1 STUDY AREA

The study area of 10 km radius (from the boundary of Mineral Block) has been considered for assessing the baseline environmental status. The study area covering 10 km radius of the Mineral Block falls in Toposheet Number 48 E/14 of Survey of India.

3.2 STUDY PERIOD

The base line data for various environmental components were collected from March to May- 2023, which is the summer season. The sampling and analysis was carried out by Environmental Laboratory (Unit of Mineral Engineering Sevices), Bangalore approved by MoEF&CC & CPCB.

3.3 ENVIRONMENTAL COMPONENTS

Considering the Environmental setting of the project, project activities and their interaction, environmental regulations & standards, the following Environmental Components have been included in EIA Study vide table No. 3.1 as a part of baseline data.

Table.3.1 Environmental Components

•	Site Specific Micrometeorological Data (hourly readings from core zone) on wind speed & direction (wind roses), temperature, humidity, atmospheric pressure. There was no rainfall during monitoring period i.e March to May 2023
•	Ambient Air Quality Sampling at 8 Stations on 24-hourly basis, for 2 days in a week for 13 weeks in summer season for the parameters PM_{10}, $PM_{2.5}$, and Heavy Metals analysis in Particulates, SO_2, NO_2, CO, Ozone, Benzene and Benzo(a)pyrene.
•	Noise Level Measurements at 9 locations for, Leq day and night , values once in the season
•	Water Quality Sampling by grab sampling once in the study period
➢	Surface Waters -5 locations
➢	Ground Waters -8 Locations
•	Soil Quality Sampling at 5 locations once in the study period for
➢	Textural & Physical Parameters
➢	Nutrients (like NPK etc.)
•	Land use & Land Cover pattern using LISS IV Mx Data from NRSC
•	Biotic Attributes
➢	Flora & Fauna –Core & Buffer Zone
•	Socio-Economic Profile, based on 2011-Census and Survey 2023:
➢	Total Population / Household Size / Age
➢	Gender Composition
➢	S.C. / S.T.
➢	Literacy Level
➢	Occupational Structure

3.4 METHODOLOGY

Comprehensive information on methodologies followed for baseline studies are given below.

3.4.1 MICROMETEOROLOGY

The micrometeorology and microclimatic parameters were recorded by installing a Weather Monitoring Station. The data on wind speed, wind direction, ambient temperature, relative humidity, rainfall was recorded at hourly intervals during the study period.

3.4.2 AMBIENT AIR QUALITY

Calibrated Fine Particulate Samplers were used for sampling PM_{10}. Calibrated Respirable Dust Samplers were used for sampling $PM_{2.5}$. Gaseous samples were collected by using integrated gas sampling assembly.

Table 3.2: Parameters for Air Monitoring

Monitored parameters & duration	Method used
24 hourly monitoring twice a week for for 3 months	
PM_{10} $PM_{2.5}$	Gravimetric Sampling using Respirable Dust Sampler
Sulphur Dioxide (SO_2)	Modified West & Gaeke Method
Nitrogen Dioxide (NO_2)	Jacob & Hoechhiesher Method
Lead	AAS Method after sampling on EPM 2000 or equivalent filter Paper
Ammonia	Independent blue method
Benzene	Adsorption & desorption followed by GC analysis
Nickel	AAS Method after sampling on EPM 2000 or equivalent filter Paper
Arsenic	AAS Method after sampling on EPM 2000 or equivalent filter Paper
Benzo-alco-pyrene	Solvent extraction followed by HPLC/GC analysis
24 hourly monitoring twice a week for for 3 months	
CO	Non dispersive Infrared (NDIR) Spectroscopy
Ozone	Chemical method

3.4.3 NOISE LEVELS

Noise levels were monitored during day time as well as night time. The sound level meters were used in accordance with IS: 9979 and IEC 651 standards for noise surveys. The basic unit of measurement is A-weighted sound level, the most widely used scale. The measurements were taken in the fast mode and were sampled to yield Leq (logarithm equivalent noise level).

3.4.4 WATER QUALITY

Samples of groundwater and surface water were collected by engaging the services of MoEFCC recognized laboratory. The samples were analysed for physico-chemical and bacteriological parameters.Samples for chemical analysis were collected according to CPCB Guidelines for Water Quality Monitoring Doc no MINARS/27/2007-08. Sterilized bottles were used for collection of water samples for bacteriological analysis. Due care was taken to ascertain the integrity during transportation of samples.

Table 3.3: Standard/Method followed for Analysis of Water Parameters

Sl.No.	Parameter	Unit	Reference
1	Taste	-	IS:3025 (5)
2	Odour	-	IS:3025 (7)
3	pH	-	IS:3025 (11)
4	Colour	Hazen units	IS:3025(04)
5	Turbidity	NTU	IS:3025 (10)
6	Total Dissolved Solids	mg/l	IS:3025 (16)
7	Total Hardness	mg/l	IS:3025(21)
8	Iron (as Fe)	mg/l	IS:3025 (53)
9	Chlorides (as CI)	mg/l	IS:3025(32)
10	Residual Chlorine	mg/l	IS:3025(26)
11	Calcium (as Ca)	mg/l	IS:3025(40)
12	Magnesium (as Mg)	mg/l	IS:3025(46)
13	Alkalinity (as $CaCO_3$)	mg/l	IS:3025(23)
14	Dissolved Oxygen	mg/l	IS:3025(38)
15	Sulphate (as SO_4)	mg/l	IS:3025(24)
16	Fluoride (as F)	mg/l	IS:3025 (60)
17	Nitrate (as NO_3)	mg/l	IS:3025(34)
18	Cyanide (as CN)	mg/l	IS:3025(27)
19	Pesticides	mg/l	APHA 23rd ED
20	Phenols (as C_6H_5OH)	mg/l	IS:3025(43)
21	Manganese (as Mn)	mg/l	IS:3025 (59)
22	Chromium (as Cr)	mg/l	IS:3025 (52)
23	Copper (as Cu)	mg/l	IS:3025(42)
24	Selenium (as Se)	mg/l	IS:3025 (56)
25	Cadmium (as Cd)	mg/l	IS:3025 (41)
26	Arsenic (as As)	mg/l	IS:3025(37)
27	Boron (as B)	mg/l	IS:3025(57)
28	Mercury (as Hg)	mg/l	IS:3025(48)
29	Lead (as Pb)	mg/l	IS:3025(47)
30	Zinc (as Zn)	mg/l	IS:3025(49)
31	Percent sodium	mg/l	APHA 23rd ED
32	BOD_3 days @ 27 °c	mg/l	IS:3025(44)
33	COD	mg/l	IS:3025 (58)
34	Oil & Grease	mg/l	IS:3025(39)
35	Total Coliform per 100 ml	--	IS:15185:2016
36	E.Coli per 100 ml	--	IS:15185:2016

Sl.No.	Parameter	Unit	Reference
37	Total Suspended Solids	mg/l	IS: 3025(17)
38	Barium (as Ba)	mg/l	IS : 3025 (P-2) :2019
39	Aluminium (as Al)	mg/l	IS: 3025(P-55) : 2019
40	Ammonia (as total Ammonia-N)	mg/l	IS : 3025 (P-34) 2019
41	Anionic Detergents (as MBAS)	mg/l	Annex K of IS:13428 :2022
42	Silver (as Ag)	mg/l	IS : 3025 (P-2) : 2019
43	Molybdenum (as Mo)	mg/l	IS: 3025 (P-2) :2019
44	Sulphide (as H_2S)	mg/l	IS: 3025 (P-21) : 2019
45	Mineral Oil	mg/l	IS : 3025 (P-39) : 2021
46	Chloramines (as Cl_2)	mg/l	IS: 3025 (P-26) : 2021
47	Nickel (as Ni)	mg/l	IS: 3025(P-2): 2019
48	Potassium(as K)	mg/l	IS: 3025(P-45)
49	Electric Conductivity	µmhos/cm	IS: 3025(P-14)
50	Temperature	^{0}C	IS : 3025(P-9)

3.4.5 SOIL CHARACTERSTICS & METHODOLOGY

Soils of the district can be classified into 4 types namely (i) Laterite soil (ii) Saline soil (iii) Marshy soil and (iv) Alluvial soil.

The soil types observed within the buffer area are as follows:

(i) Lateritic soil is the major soil type in the district. It is highly porous & permeable, slightly acidic with low pH values, low in organic matter, Calcium and Phosphorus.

(ii) Saline soil in the district occurs in the flood plains of rivers in Bicholim, Bardez and Tiswadi taluka. Soil is deep and poorly drained, high in pH and high in organic matter (iii) Marshy soil occurs in large extent in n low-lying waterlogged and tidal-affected area

(iv) Alluvial Soil This soil is very fertile in nature. Alluvial soil is mainly used for the production of vegetables. Various proportions of sand, silt, and clay in different amounts form the alluvial soil.The Major soil type observed in the mining block is of lateritic type.

Methodology: Soil samples were collected from 6 locations during the summer season of 2023 using sampling augers for analysis of physical and chemical parameters.A map showing different sampling locations was prepared. Each area was traversed separately.

A slice of the plough layer was cut at intervals of 15 to 20 steps or according to the area to be covered. At least 10 to 15 samples from each sampling unit were collected and placed in a bucket or tray. Generally, 10 to 20 spots must be taken for one composite sample depending on the size of the field.After scrapping away surface liter; a uniform thick slice of soil was obtained from the surface upto the plough depth from each place. A "V'' shaped cut to a depth of 15 cm was made in the sampling spot using spade to remove 1 to 2 cm slice of soil.

The sample was collected on the blade of the spade and put in a clean bucket. In this way, sample was collected from all the spots marked for one sampling unit. In case of hard soil, samples were taken with the help of augur from the plough depth and collected in the bucket. The collected sample from each location was uniformaly mixed before homogenizing the soil samples

Sr. No	Crop	Soil Sampling Depth (Cm)
1	Grasses and grasslands	5-7
2	Rice, finger millet, groundnut, pearl millet, small millets etc. (shallow rooted crops)	15-20
3	Cotton, Red gram, sugarcane, banana, tapioca, vegetables etc., (deep rooted crops)	22-25
4	Perennial crops, plantations and orchard crops	Three soil samples at 30,60 and 90 cm

3.4.6 CALIBRATION

The sampling and analytical instruments with valid calibrations were used. The correction factors, if any, were applied in the computation of the data.

3.4.7 FLORA-FAUNA

A general ecological survey covering an area of 10 km radius around Mineral Blockwas conducted using least count quadrate method and reported. Tree species were surveyed by taking quadrates of 100 m x 100 m distributed randomly.

Shrub species were surveyed by taking quadrates of 10m x 10m. Herb species were surveyed by taking quadrates of 1 m x 1 m.

The data obtained was further used to estimate Relative Dominance, Relative Density (RD), Relative Frequency (RF) and Importance Value index (IVI) as per the formulae. Faunal survey covered the Terrestrial Fauna, Avian Fauna and Aquatic Fauna. The survey was based on personal observation, enquiry with local population and records available. This study included the identification of endangered and rare species as per Red Book.

3.4.8 SOCIO-ECONOMIC SURVEY

The Socio-Economic profile of the population living in study area was prepared based on Census 2011 data and Survey 2023. The location of the proposed project lies within an earlier Mining Area; thus the project does not involve resettlement/ rehabilitation.

3.4.9 LAND ENVIRONMENT:

3.4.9.1 Landuse and Landcover:

Study of existing land use was done through satellite image processing. The data used for analysis was sourced from RESOURCESAT-2 LISS IV with satellite data of 5.0 m resolution dated 08.03.2023.

3.4.9.2 Geology: The geology of the region was studied to understand the rock formations and mineral compositions, terrain using topographic maps and relief maps.

3.4.9.3 Hydro geology:

The study involved finding sources of water including ground and surface water bodies in the Mineral Block area and buffer zone of 10km radius. The drainage pattern in the region was studied.

3.5 ENVIRONMENTAL SCENERIO

3.5.1 GEOLOGY

3.5.1.2 REGIONAL GEOLOGY

Goa is dominantly covered by the rocks belonging to Dharwar Supergroup of Archean-Proterozoic age, except for a narrow strip along the North-eastern corner occupied by the Deccan Traps of Upper Cretaceous to Lower Eocene age.Iron Ore Formations of Goa indicate two successive and transitional epochs and environments of deposition.

Based on the prominent structural discordance and environment of deposition, the Goan Iron Ore Formations can be broadly categorized into two formations namely, North Goa and South Goa Formations. Precambrians at North Goa form the extension of Dharwar Formations noted in Karnataka.

This forms a part and continuation of a major geosyncline, showing a general NNW-SSE elongation. Evolution of geosyncline is accompanied by sub-marine volcanism represented by metavolcanics. This is followed by the deposition of Metagraywacke and Tilloid. Furthermore, the submarine volcanism and Greywacke deposition is accompanied by the deposition of Ferruginous Quartzite mainly along the borders of geosyncline. The evolutionary stage ends up with three phases of folding, metamorphism and basic intrusions.

The impressions of these folding are marked in North Goa Iron Ore Formations. Dharwar super group of rocks in Goa are locally named as Goa Group of rocks which have characteristic NNW-SSE strike and dips are moderate.

Of the above, Bicholim formation has pink phyllite horizon with banded ferruginous and manganiferous quartzite constitute the economically minable manganese and iron ore bearing horizon and extends over the entire length of Goa from north to south. Litho units are highly folded and the rocks have attained green schist facies grade of metamorphism. Extensive development of laterite in the form of capping over the rocks is seen and further, the rocks show the effect of deep weathering

3.5.1.2 LOCAL GEOLOGY

The mining block area comprises of a major ridge running northwest-southeast direction. The ridge separates the two villages, Sirigao in northeast and Poira (Mayem) in the south west. Geologically the auction block comprises of the Bicholim Group of rocks formation belonging to Dharwar Supergroup.

The ore deposits of Block-II - Sirigao-Mayem Mineral Block is a part of the Sirigao Bicholim deposits. Northern or Sirigao band shows shallow to medium dips towards NE whereas southern or Poira band shows north-easterly shallow to steep dips.

The ore body extends over a strike length of 2065m with a variable width of 30-35m dipping on either side with varying angles of dip. The ore occurs at shallow depths from the surface at the crustal part of the anticline, the ore body dips on either side of the ridge and is deep seated at the foot of the ridge on either side.

Structure: The ore body is a north-westerly plunging overturned anticline. The axis of the anticline follows the NW-SE trending Sirigao ridge. General strike of the deposit is N60W- S60E. Both north-easterly and south-westerly dips are observed. The geological foramtions & Lithology are given vide Plate.No. 8 & 8A.

3.5.2 TOPOGRAPHY/ GEOMORPHOLOGY / PHYSIOGRAPHY

3.5.2.1 TOPOGRAPHY: The topography is undulating low hill terrain extending all along the Mineral Block in the North West and South East direction. There is no Forest land within the Mineral Block area. As the study area is located on the near to the Western Ghats and receives heavy rainfall during monsoon season; the average annual rainfall is about 3917mm.

The Mayem- Sirigao Mineral Block is situated in North Goa district and extends between Lat 15° 35' 20.233" N to 15° 36′ 21.621″ N & longitude of 73°53′ 40.069" E to 73° 54′ 50.014″ E. The Block Area is occupied by a hill range running in a NW-SE direction. The highest and lowest elevations are 120 m (amsl) in the North Eastern corner and -33.7 m (amsl) in Pit No.1 respectively.

3.5.2.2 GEOMORPHOLOGY:

The state is divided into four morphological units namely;

1. The coastal plains with dominant marine land forms on the west,
2. Vast etch plain,
3. Low dissected denudational hills with valleys
4. Deeply dissected high Western Ghats with denudational hills rising to a maximum elevation of 832m amsl and occurring all along the eastern part of the state.

The geomorphology of the area is shown in ***Plate No.9***

3.5.2.3 PHYSIOGRAPHY:

The mining block area comprises of a major ridge running northwest-southeast direction. The ridge separates the two villages, Sirigao in northeast and Poira (Mayem) in the southwest.

The block area falls in the northern most part of Bicholim - Sirigao iron ore deposit of North Goa and attains about 120 metres (MSL) as highest level towards North eastern boundary. The present lowest level is -33.7metres (MSL) at Pit No.1. There is a seasonal nallah passing through the South western part of the mineral block area.

The Konkan Railway line passes through northwestern and south western comer of the block area over a length of 773m. Part of the sirigao village (around 11.40Ha.) is coming within the mineral block area towards northern boundary.

Rain water flows along the first order streams.

Digital Elevation Map is given vide drawing ***Plate No 10***

3.5.3 DRAINAGE PATTERN:

No specific drainage pattern is observed in the Mineral Block area. Sirigao Mayem Mineral block study area fall under Mondovi River basin of Taluka Bicholim, Bardez, Sattari, Sanguem, Tiswadi & Ponda. The catchment area of Mondovi River 1580 Sqkm. The Sahyadri hill ranges in the east forms the main watershed. The streams originating here flow in west and north west direction to join the Arabian Sea. The study area drainage pattern is dendritic and sub dendritic. The drainage pattern in regional scale is sub-dendritic in nature. Principal perennial rivers draining through the district are, Terekhol, Chapora, Mandovi & Zuari and non – perennial (seasonal) river Baga.

The river basin of all these westerly flowing short rivers originates from Sahyadri Hill ranges and drain in the Arabian Sea in the west under estuarine environment.

Primarily the underlying rocks govern the drainage system in the area. The drainage pattern is generally dendritic type.

As the area is part of the midlands which are called as foot hills of Western Ghats belt and receives heavy rainfall during monsoon season and the average annual rainfall is about 3917 mm. Dendritic to sub dendritic type of drainage is observed in study area.

RainWater shall accumulate in the mine pits during monsoon rainfall. The eastern border of the state generally marks the water divide between easterly and westerly flowing rivers.

Rivers in study area (*Aerial Distance*)

Mandovi River - 4.56Km at Pilgao Village

Assonora River - 0.56 km from Mineral Block

The drainage pattern is given vide ***Plate No 11***

3.6 BASE LINE & BASE MAPS -ENVIRONMENTAL COMPONENTS

3.6.1 BASELINE SCHEDULE

The location of air, water, noise and soil sampling stations were selected for appropriate monitoring. A monitoring station was positioned at core zone (project site) for micro-meteorological data collection. The schedule of the environmental monitoring programme is described below:

Table.No.3.4 Baseline Schedule

Environmental component	Sampling period	Number of Sampling Stations	Parameters
Micro-Meteorology	Mar to May 2023	One	Temp, Relative humidity, Rainfall, Wind speed, wind direction
Air Quality	Mar to May 2023	8 Stations	PM_{10},$PM_{2.5}$,SO_2,NO_2,CO,NH_3,C_6H_6,B(a)P,O3,As, Lead & Nickel
Water Quality	May 2023	5 -Surface water & 8 -Groundwater	IS : 2296, 1982 Class C Norms , IS-10500:2012 & CPCB NORMS
Noise	April-2023	9 Stations	L_{eq} (Day and Night)
Soil	May-2023	5 Samples	Physical & Chemical parameters of Indian standards IS: 2720
Land use	May-2023	Core & Buffer Zone	--
Ecology & Biodiversity	April 2023	Core & Buffer Zone	Flora & Fauna Survey
Socio-Economic	April - 2023	10 Kms Study area	Socio-economic Survey
Hydrogeology	Jan-2023	Core & Buffer Area	Ground Water Study

Table.No.3.5 Environmental Attributes & Frequency of Sampling

Sl. no	Environmental Component	Sampling Locations	Sampling period	Sampling Parameters	Total Sampling period	Sampling Frequency
1.	Meteorology	Sirigao Village	Mar to May 2023	Temp, Relative humidity, Rainfall, Wind speed, wind direction	3 months	Hourly
2	Ambient Air Quality	A1-Within Mineral Block A2-Sirigao Village A3-Mulgao village A4-Sircaim village A5-Calvim village A6-Sinquirem village A7-Advalpale village A8-Lamgao village	Mar to May 2023	PM_{10}, $PM_{2.5}$,SO_2, NO_2, CO,O3 ,NH_3, B(a)P, Heavy Metals : Pb , As, Ni, Hg & Free silica	2 days/ week	24 hourly
3	Noise levels	N1-Core zone N2-Sirigao Village N3-Lamgao village N4-Mulgao village N5-Corjuem village N6-Sircaim village N7-Calvim village N8-Sinquirem village N9-Assonora Village	April-2023	L_{eq} (Day and Night)	Once during study period	24 Hourly
4	Surface Water Quality	SW1-Culvert near chimulwada village SW2- Mayem Lake SW3 – Tivim Nallah SW4- Assonara River Upstream SW5- Assonara RiverDownstream	May-2023	As per IS – IS:2296	Once during study period	Grab Sampling
	Ground Water Quality	GW1 – Sirigao village GW2 - Assnora village GW3 –Advalpale village GW4 - Mulgao village GW5 – Sircaim village GW6- Calvim Village GW7-Sinquerim village GW8- Mayem village (*All samples were collected are open well water)	May-2023	As per IS – 10500: 2012		
5	Soil	S1 –Old rejection dump S2 –Mayem village S3 –Sirigao Village S4-Vainginim village S5- Conrjuem Village)	May 2023	Physical and Chemical constituents, suitability for agricultural growth	Once during study period	Grab sampling

6	Land use	Core & Buffer Zone	May-2023	--	Once during study period	Grab Sampling
7	Ecology & Biodiversity	Core & Buffer Zone	April-2023	Flora & Fauna Survey	Once during study period	Grab Sampling
8	Socio-Economic	10 Km Study area	April-2023	Socio-economic Survey	Once during study period	Grab Sampling
9	Hydro geology	Core & Buffer Area	Jan-2023	Bore well study	Once during study period	Grab Sampling

3.6.2 MICROMETEOROLOGICAL STATUS

3.6.2.1 CLIMATIC CONDITIONS

The annual weather of North Goa suggests that May is the hottest month where the mean daily temperature increases to about 30^0C. January is the coolest with mean daily temperature of about 23^0C. The temperature is highest (around 33^oC) in pre–monsoon months of April & May and again in post-monsoon Months of November & January.

Due to proximity to the Arabian Sea, humidity throughout the year is more than 60% and ranges between 80 to 90% during monsoon period. As a result of the orographic influence, rainfall increases towards the Western Ghats, with average annual rainfall of about 3917.76 mm. Over 90% of annual rainfall occurs during monsoon months of June to September. About 32% of the annual rainfall is received during July.

Table No. 3.6: Annual Rainfall Data from 2018-2022 in mm

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
2018	0	1.63	3.32	13.34	123.33	986.42	1177.28	747.19	113.75	130.98	12.38	1.64	3311.26
2019	0	0	1.97	4.79	2.2	631.17	1477.71	1396.07	779.79	508.25	50.35	0.19	4852.49
2020	0.05	0	6.49	20.48	22.59	934.62	748.26	1368.11	640.71	266.83	0.46	20.23	4028.83
2021	16.31	10.25	0.64	10.26	346.07	971.99	1038.61	401.84	606.93	240.19	192.86	76.55	3912.5
2022	0.75	0	10.39	42.18	121.64	728.32	1249.01	652.56	465.73	197.96	8.1	7.09	3483.73
										Average			**3917.76**

Source: - Hydromet Division, Indian Meteorological Department, New Delhi

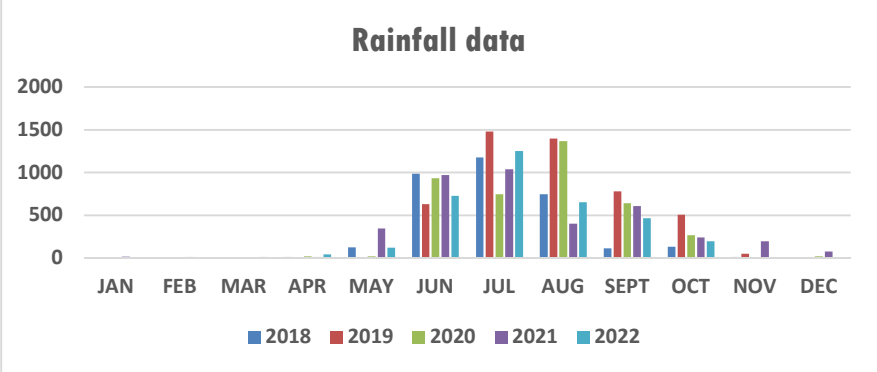


Fig.3.1 Monthly Rainfall for North Goa District

3.6.2.2 *BASE LINE MICROMETEOROLOGICAL STATUS*

The summary of hourly micrometeorologicaldata collected during March to May, 2023, i.e. Summer Season forparameters viz. wind speed, direction, temperature, relative humidity, are presented in **Table 3.7.** Wind roses diagram have been drawn and presented as **Figure 3.2.**

Observations:

Observations during the study period are as given below:

- Predominant winds directions were from West to East
- Wind Speed ranged between 1.9-17.3 kmph
- Calm condition prevailed for 36.73% of the study period
- Temperature ranged between Min 17.2 to Avg Max 37.6^{o}C
- Relative humidity values ranged between 18.2% to 99.6%
- The collected meteorological data during this season represents the local weather phenomena.
- No major rainy days during the study period were observed

Table 3.7: Site-Specific Micro-Meteorological Data 2023

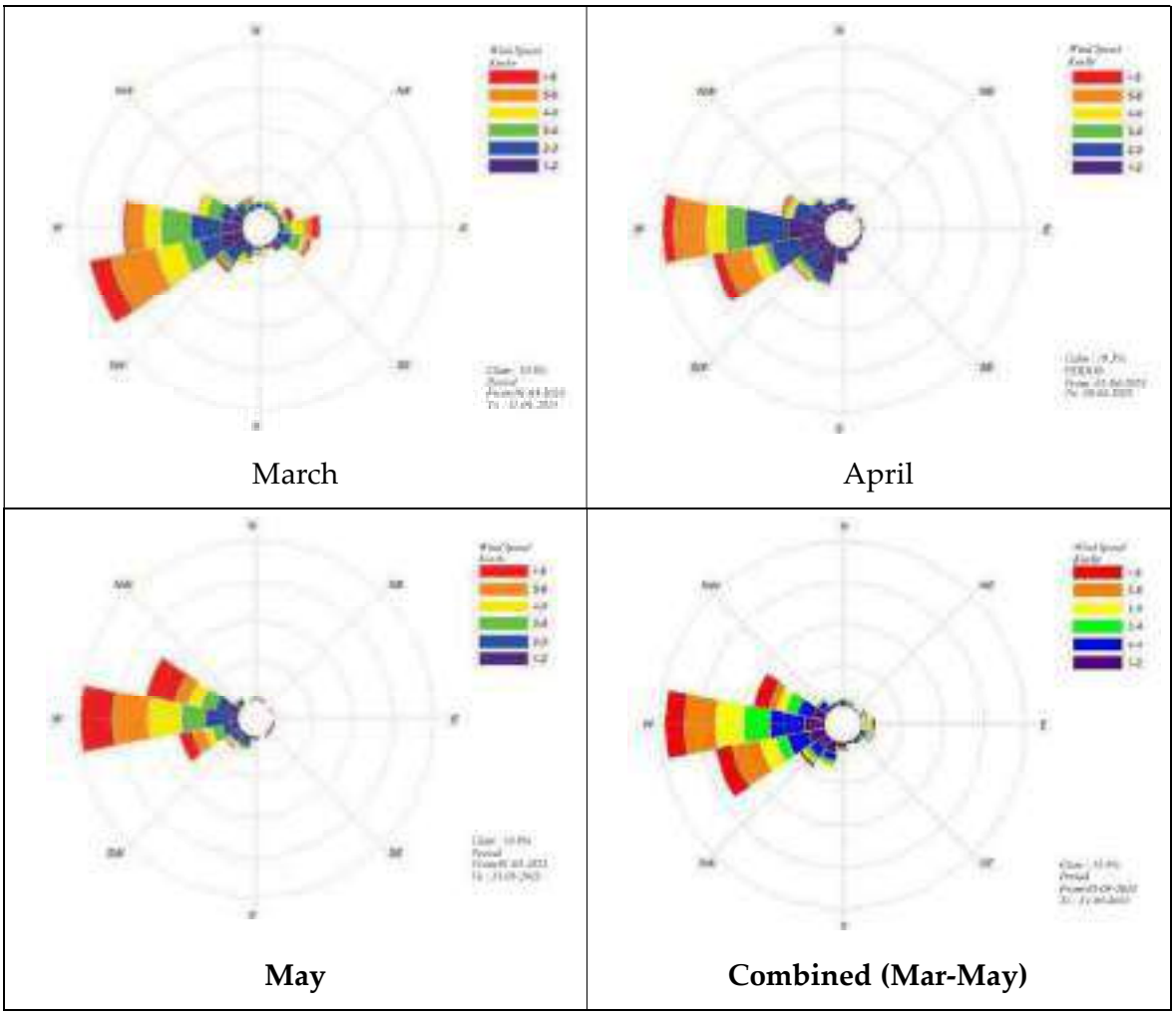
Date	Temperature in ^{O}C		Relative Humidity in %	
	Min.	Max.	Min.	Max.
01/03/2023	18.2	34.3	19.3	88.8
02/03/2023	19.3	34.4	19.5	89.7
03/03/2023	17.2	34.2	29.4	90.6
04/03/2023	19.5	34.3	34.6	91.8
05/03/2023	19.2	34.5	41.3	92.7
06/03/2023	19.3	34.3	48.5	91.8
07/03/2023	19.4	33.4	43.8	87.8
08/03/2023	19.2	34.5	37.6	92.9
09/03/2023	20.3	35.3	35.3	89.8
10/03/2023	19.2	35.4	30.4	90.7
11/03/2023	19.0	35.3	26.2	91.8
12/03/2023	19.6	35.4	28.5	91.7
13/03/2023	19.3	35.3	31.3	89.6
14/03/2023	21.2	36.5	41.4	89.5
15/03/2023	18.5	36.3	42.2	88.4
16/03/2023	20.2	36.4	41.6	87.5
17/03/2023	21.3	36.3	35.8	77.8
18/03/2023	21.2	36.4	36.7	88.7
19/03/2023	23.4	33.3	34.8	90.6
20/03/2023	20.2	33.3	27.6	87.5
21/03/2023	22.2	36.6	33.3	90.7
22/03/2023	22.5	35.3	30.4	91.8

23/03/2023	21.5	36.8	18.2	89.7
24/03/2023	22.3	35.2	26.3	89.6
25/03/2023	22.2	36.3	26.4	89.8
26/03/2023	22.5	36.5	43.6	96.9
27/03/2023	22.3	36.2	51.8	99.8
28/03/2023	22.4	36.6	47.3	95.6
29/03/2023	22.3	36.5	45.4	89.6
30/03/2023	22.4	36.4	41.5	94.8
31/03/2023	24.5	32.3	39.6	93.7

Date	Temperature in ^{O}C		Relative Humidity in %	
	Min.	Max.	Min.	Max.
01/04/2023	21.3	37.2	43.7	97.7
02/04/2023	22.1	37.4	40.5	95.3
03/04/2023	22.4	37.2	32.6	96.1
04/04/2023	22.6	36.1	37.7	95.4
05/04/2023	23.1	37.3	45.4	93.6
06/04/2023	23.0	36.2	48.5	84.2
07/04/2023	23.2	37.4	47.4	98.6
08/04/2023	23.1	36.3	40.3	98.3
09/04/2023	23.4	36.1	53.4	97.6
10/04/2023	23.5	35.6	55.7	94.5
11/04/2023	21.4	37.3	33.4	91.6
12/04/2023	23.2	36.4	54.7	90.1
13/04/2023	23.1	37.3	46.8	96.3
14/04/2023	24.1	36.2	59.3	94.5
15/04/2023	23.4	32.4	45.5	98.3
16/04/2023	23.3	37.4	36.4	76.6
17/04/2023	19.4	35.6	50.5	90.3
18/04/2023	20.3	36.1	37.4	96.4
19/04/2023	22.1	37.4	49.5	93.8
20/04/2023	22.3	37.3	34.3	89.1
21/04/2023	24.2	37.2	44.6	94.1
22/04/2023	23.4	37.4	31.2	82.2
23/04/2023	23.5	37.6	51.3	89.8
24/04/2023	22.6	37.2	42.8	97.8
25/04/2023	22.4	37.4	45.3	92.3
26/04/2023	23.4	37.5	41.6	97.4
27/04/2023	22.1	37.6	46.3	99.7
28/04/2023	20.1	36.7	59.5	97.3
29/04/2023	22.1	36.3	37.7	95.3
30/04/2023	21.3	37.4	49.6	95.7

Date	Temperature in ^{O}C		Relative Humidity in %	
	Min.	Max.	Min.	Max.
01/05/2023	22.3	37.3	42.5	97.3
02/05/2023	22.5	37.5	39.7	96.3
03/05/2023	23.4	37.3	39.4	98.0
04/05/2023	22.6	37.6	40.6	94.1
05/05/2023	20.3	36.1	50.6	94.0
06/05/2023	22.4	37.1	38.6	95.3
07/05/2023	21.3	36.2	42.3	90.3
08/05/2023	23.4	37.3	55.4	94.1
09/05/2023	23.5	37.4	59.1	91.2
10/05/2023	23.7	36.3	58.3	90.0
11/05/2023	23.4	35.6	38.6	87.8
12/05/2023	21.6	31.3	64.1	95.0
13/05/2023	21.5	33.2	59.3	99.1
14/05/2023	23.0	36.1	55.1	99.1
15/05/2023	22.3	36.3	64.5	99.4
16/05/2023	23.1	37.5	56.3	87.3
17/05/2023	22.5	33.1	51.2	81.0
18/05/2023	21.3	36.0	51.8	98.3
19/05/2023	20.6	35.6	52.3	98.1
20/05/2023	20.4	35.3	50.6	87.0
21/05/2023	19.6	35.7	63.8	99.0
22/05/2023	21.3	31.3	61.5	97.3
23/05/2023	21.5	33.5	62.5	96.0
24/05/2023	22.3	34.3	51.6	99.6
25/05/2023	22.6	34.2	46.0	90.3
26/05/2023	21.5	34.6	55.0	91.0
27/05/2023	21.6	33.5	51.6	89.0
28/05/2023	21.3	35.2	51.0	90.4
29/05/2023	21.5	35.6	50.1	87.5
30/05/2023	22.6	35.1	56.1	88.0
31/05/2023	22.3	35.6	56.3	91.3

The wind rose diagram at site is shown in Fig. 3.2



March | April

May | **Combined (Mar-May)**

Fig 3.2 WINDROSE

3.6.3 AMBIENT AIR QUALITY

The ambient air quality of buffer zone covering 10 km radius around the mine was studied to determine the baseline condition.

The study area consisted of mostly rural environment. The various sources of air pollution in the region were dust arising from unpaved village roads, domestic fuel burning, and vehicular traffic.

The prime objective of baseline air quality survey was to assess the existing air quality of the study area. This will also be useful in assessing the conformity to standards of ambient air quality at operational stage.

3.6.3.1 SELECTION OF SAMPLING STATIONS

The baseline status of the ambient air quality was assessed through scientifically designed Ambient Air Quality Monitoring Network. The selection of sampling locations for the air quality surveillance programme was based on the following.

(a) Representation of the Mine

(b) Representation of down wind direction

(c) Representation of upwind direction

(d) Representation of cross wind direction

(e) Representation of residential areas

(f) Representation of regional background levels

(g) Representation of sensitive receptors

The AAQ monitoring, stations have been selected on the basis of wind direction. The wind direction conditions have been considered and correlated during the monitoring. The stations monitored for ambient air quality are furnished below and refer **Plate No.12**

Table 3.8 : Location of Ambient Air Quality Monitoring Stations

Location of Air Monitoring Stations									
Code No	Locations	Direction	Distance km	Latitude			Longitude		
				D	M	S	D	M	S
A1	Within Mineral Block	--	-	15	35	27.12	73	54	20.08
A2	Sirigao Village	0.55	N	15	36	34.91	73	54	11.16
A3	Mulgao village	2.14	NNE	15	37	8.81	73	54	56.00
A4	Sircaim village	2.80	NW	15	37	20.32	73	52	27.60
A5	Calvim village	2.90	SW	15	34	8.20	73	53	16.60
A6	Sinquirem village	1.07	SEE	15	35	3.00	73	53	47.97
A7	Advalpale village	3.80	N	15	38	22.92	73	53	50.90
A8	Lamgao village	3.00	SEE	15	35	18.95	73	56	30.61

Table 3.9: National Ambient Air Quality Standards

Sl. no	Pollutants	Time Weighted Average	Concentration in Ambient Air		Methods of Measurement
			Industrial, Residential, Rural and other Areas	Ecologically, Sensitive Area (Notified by Central, Government)	
1	Sulphur Dioxide (SO2), µg/m³	Annual * 24 Hours **	50 80	20 80	-Improved West and Gaeke Method -Ultraviolet Fluorescence
2	Nitrogen Dioxide (NO2), µg/m³	Annual * 24 Hours **	40 80	30 80	-Jacob & Hochheiser modified (NaOH-NaAsO2) Method -Gas Phase Chemiluminescence
3	Particulate Matter (Size less than 10 µ) or PM_{10}, µg/m³	Annual * 24 Hours **	60 100	60 100	-Gravimetric -TEOM -Beta attenuation
4	Particulate Matter	Annual *	40	40	-Gravimetric

	(Size less than 2.5 μ) or $PM_{2.5}$, μg/m³	24 Hours **	60	60	-TEOM -Beta attenuation
5	Ozone (O3) μg/m³	8 Hours * 1 Hour **	100 180	100 180	-UV Photometric -Chemiluminescence
6	Lead (Pb) μg/m³	Annual * 24 Hours **	0.50 1.0	0.50 1.0	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper - ED-XRF using Teflon filter
7	Carbon Monoxide(CO), mg/m³	8 Hours ** 1 Hour **	02 04	02 04	-Non dispersive Infrared (NDIR) Spectroscopy
8	Ammonia (NH3), μg/m³	Annual * 24 Hours **	100 400	100 400	-Chemiluminescence -Indophenol blue method
9	Benzene (C6H6), μg/m³	Annual *	05	05	-Gas Chromatography (GC) based continuous analyzer -Adsorption and desorption followed by GC analysis
10	Benzo(a)Pyrene (BaP) Particulate phase only, ng/m³	Annual *	01	01	-Solvent extraction followed by HPLC/ GC analysis
11	Arsenic (As), ng/m³	Annual *	06	06	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
12	Nickel (Ni), ng/m³	Annual *	20	20	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper

* Annual Arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

NOTE: Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigations.

Photographs: Air Monitoring

Sirigao Village

Mulgao Village

3.6.3.2 FREQUENCY OF MONITORING

Ambient air quality (AAQ) samples were collected twice a week for 24-hour at each site. The ambient air quality samples were collected for continuous 13-weeks beginning from 1st March to 31st May, 2023.The samples were preserved and analysed as per the standard methods recommended by Standard Operating Procedure (SOPs) of Central Pollution Control Board (CPCB 2011). Samples for Ozone (O_3) and Carbon Monoxide (CO) were collected by randomly collecting the gas through one-hour sampling procedure. Samples for Ammonia (NH_3) were randomly collected for its presence.

3.6.3.3 METHOD OF ANALYSIS

Ambient air samples were analysed with Gravimetric, Colorimetric & Atomic Absorption Spectrophotometric (AAS) method as per standard methods specified by Central Pollution Control Board (CPCB 2011) and IS 5182.

3.6.3.4 OBSERVATIONS

The ambient air quality monitoring results for all the stations for the study period are presented under **Annexure No 7.** The statistical analysis report for SO_2, NO_2, PM_{10} & $PM_{2.5}$, are presented in the below table No.3.10, and all the parameters were found to be well within the limits.

Table 3.10: Ambient Air QualityBaseline Data- Statistical Analysis

Station Code : A1 Within Mineral Block					**A2 Sirigao Village**				**A3, Mulgao village**			
	SO_2	**NO_2**	**PM 10**	**PM 2.5**	**SO_2**	**NO_2**	**PM 10**	**PM 2.5**	**SO_2**	**NO_2**	**PM 10**	**PM 2.5**
Min.	6	9	30	16	6	9	33	15	7	9	35	18
98%	13	17	52	31	12	16	50	27	13	17	55	33
Max.	13	18	53	33	12	16	50	27	13	18	56	34
Avg.	9	12	39	22	9	12	43	22	10	13	46	25
SD	2	2	6	4	2	2	5	4	2	2	6	4
No. of obs	26				26				26			
Station Code : A4, Sircaim village					**A5, Calvim village**				**A6, Sinquirem village**			
	SO_2	**NO_2**	**PM 10**	**PM 2.5**	**SO_2**	**NO_2**	**PM 10**	**PM 2.5**	**SO_2**	**NO_2**	**PM 10**	**PM 2.5**
Min.	6	9	30	15	6	<9	29	15	6	9	30	15
98%	12	15	53	31	12	17	47	29	12	20	52	35
Max.	12	16	53	31	12	17	48	29	12	21	53	35
Avg.	9	12	44	24	9	12	38	21	9	13	42	24
SD	2	2	7	4	2	2	5	4	2	3	5	5
No. of obs	26				26				26			

Station Code : A7, Advalpal Village					A8, Lamgao Village			
	SO_2	NO_2	PM 10	PM 2.5	SO_2	NO_2	PM 10	PM 2.5
Min.	<4	9	33	16	5	9	30	15
98%	9	14	52	28	11	16	43	27
Max.	9	14	54	29	11	17	43	27
Avg.	7	11	41	22	9	12	38	21
SD	1	2	5	3	2	2	4	3
No. of obs	26				26			

Limits for Industrial, Residential, Rural and other Areas for 24 hrs	SO_2	NO_2	PM 10	PM 2.5
	80	80	100	60

RESULTS:

Analysis of Particulate Matter showed that there was no free silica in the PM_{10}, other heavy metal contents like lead, nickel, and arsenic were below the detection limit. The details on the levels of the various parameters as observed during the AAQ study are as summarized below:

Results :

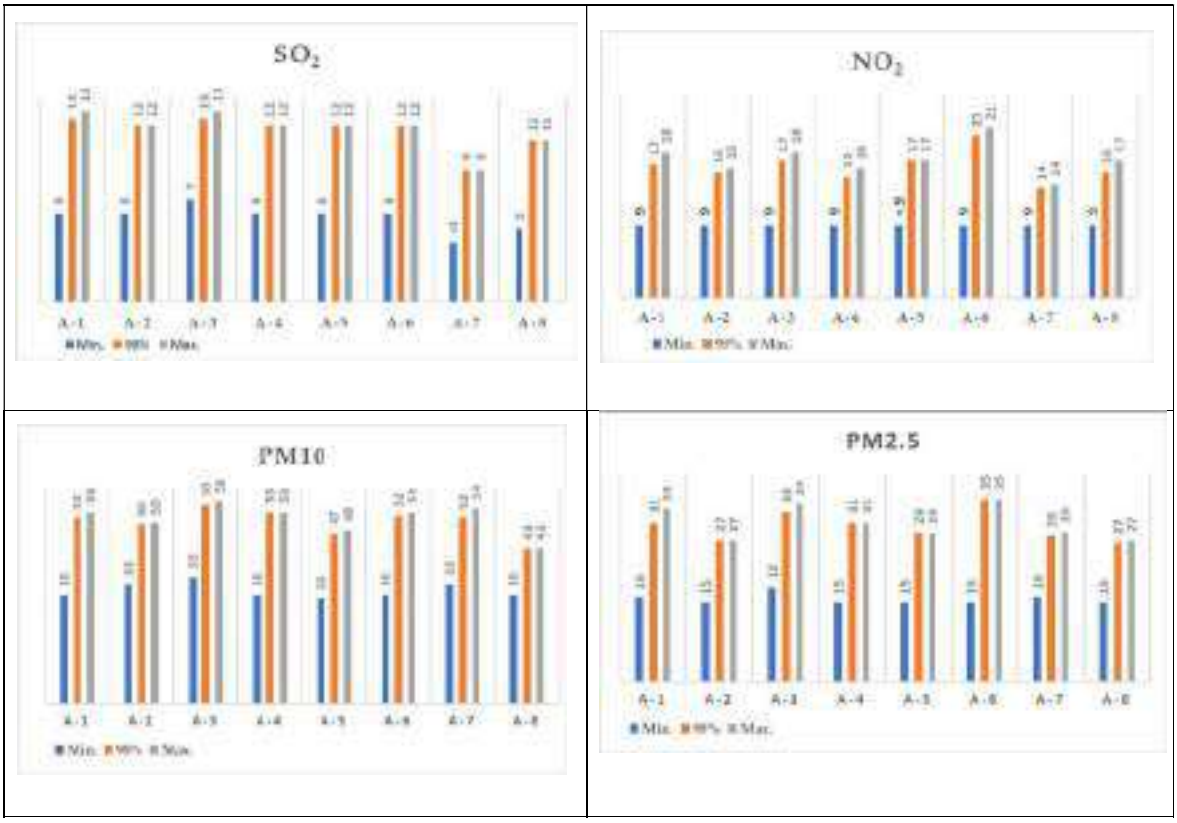


Fig.3.3 Graph Showing Air values

Sulphur Dioxide (SO_2)

A maximum value of 13.0 μg/m^3 was observed at Core Zone within Mineral Block and Mulgao village and minimum value of <4 μg/m^3 was observed at the Advalpale village. The average values were observed to be in the range of 7.0 to 10.0 μg/m^3.

Oxides of Nitrogen (NO_2)

A maximum value of 21.0 μg/m^3 was observed at Sinquirem village and minimum value of <9μg/m^3 was observed at Calvim village. The average values were observed to be in the range of 11 to 13.0 μg/m^3.

Particulate Matter (PM_{10}):

A maximum value of 56.0 μg/$m^3$was observed at Mulgao Village. This was mainly due to the public transportation. A minimum value of 29.0 μg/$m^3$was observed at Calvim Village. The average values were observed to be in the range of 38.0 to 46.0 μg/m^3.

Respirable Particulate Matter ($PM_{2.5}$)

A maximum value of 35.0 μg/$m^3$was observed at sinquirem village and minimum value of 15.0μg/m^3 at Sirigao village and was observed The average values were observed to be in the range of 21.0 to 25.0 μg/m^3.

Ozone (O_3)

The O_3 concentrations at all the locations in the study area were observed to be well within the limits as specified by CPCB standards.

The results of the air quality monitoring were found to be well within the permissible limits for the industrial, residential, rural and other areas as per the National Ambient Air Quality Standards (NAAQS) of Central Pollution Control Board (CPCB).

The quantities of Ammonia, Benzene, Benzo-(a)-pyrene, Arsenic & Nickel analyzed at all the locations were below the detectable limit.

3.6.4 MINERALOGICAL COMPOSITION OF PM_{10}

The Free Silica content in ore and waste was estimated as <0.043% using personal dust samplers as per DGMS circular which is much lower than the 5% limit of Free Silica.

A copy of the report on Air borne dust and free silica analysis is enclosed vide **Annexure No. 7**

3.6.5 NOISE LEVEL

3.6.5.1 SAMPLING STATIONS

The location of the sampling stations for studying noise levels during Summer, 2023 is given in Table 3.11.

Table 3.11: Location of Noise Level Monitoring Stations

Location of Noise Monitoring Stations										
Code No	Locations	Distance km	Direction	Latitude			Longitude			Zone
				D	M	S	D	M	S	
N1	Core zone Within M L Area	--	--	15	35	34.61	73	54	16.81	Industrial area
N2	Sirigao Village	0.18	N	15	36	23.33	73	54	07.81	Commercial area
N3	Lamgao village	3.03	SEE	15	35	17.96	73	56	28.53	Residential area
N4	Mulgao village	2.10	NE	15	37	8.81	73	54	56.00	Commercial area
N5	Corjuem village	1.30	W	15	35	44.47	73	53	21.00	Residential area
N6	Sircaim village	2.34	NW	15	37	17.83	73	52	47.98	Residential area
N7	Calvim village	3.02	SW	15	34	8.20	73	53	16.60	Residential area
N8	Sinquirem village	1.07	SW	15	35	4.32	73	53	44.89	Residential area
N9	Assonora Village	1.62	N	15	37	10.04	73	54	8.89	Commercial area

The Location of Noise Monitoring Stations is given vide **Plate No. *13***

Photographs : Noise Monitoring

Sircaim Village

Lamgao Village

3.6.5.2 NOISE LEVEL BASELINE DATA

The reports for the ambient noise levels monitored during the Summer season, 2023 are presented in **Annexure No.7**

Observations: There is no mining activity in the core zone as it is a e-auctioned mineral block. Only minimal movement of vehicles in the study area were observed during the survey.

Table.No.3.11a Results:

Code No.	Monitoring stations	Area	Day	Night
			L_{eq}	L_{eq}
Core Zone				
N1	Core zone Within M L Area	Industrial area	46.0	38.7
Buffer Zone				
N2	Sirigao Village	Commercial area	46.3	44.9
N3	Lamgao village	Residential area	48.3	35.9
N4	Mulgao village	Commercial area	61.2	39.6
N5	Corjuem village	Residential area	44.5	38.0
N6	Sircaim village	Residential area	50.4	40.0
N7	Calvim village	Residential area	46.0	39.0
N8	Sinquirem village	Residential area	45.4	39.0
N9	Assonora Village	Commercial area	49.8	41.5

Noise Quality Standards

Permissible limits as per ILO Code of Practice	Ambient Noise Levels	Leq. Limit dB(A)	
		Day	Night
For Unprotected ear - 8 hrs working shift	Industrial areas	75	70
Warning limit - 85 dB(A)	Commercial area	65	55
Danger limit - 90 dB(A)	Residential area	55	45
Worker not to be exposed for more than 115 dB(A)	Silence Zone	50	40

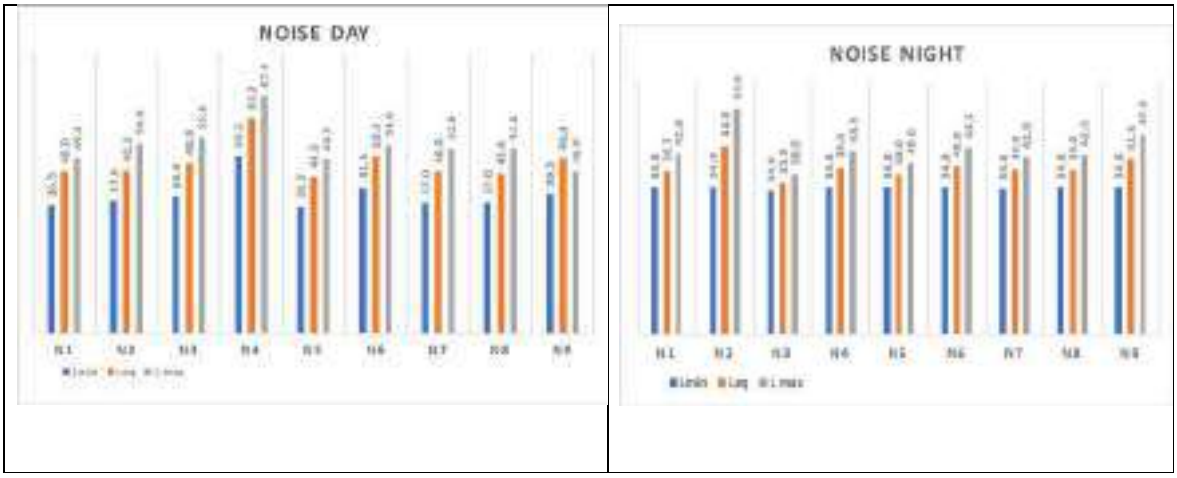


Fig.No: 3.4 Graph value for Noise Levels

Result Interpretation : The results are observed to be well within the permissible limits.

3.6.6 WATER ENVIRONMENT

3.6.6.1 WATER STREAMS/TANKS

There are no surface water bodies within the block area. The nearest river towards Northern direction i.e, Assonora river which is 0.56km away. The Corjuem Stream touches lease boundary

3.6.6.2 GROUND WATER REGIME

The ground water table in the Mineral Block is at 10m bgl. During rainy season most of the rain water from broken up area and dumps is diverted to the mine pit through garland drain/trenches. The rain water will accumulate into the mine pit which will recharge the ground water. The detailed ground water study is given vide in Hydrogeological report enclosed as **Appendix-1**

3.6.6.3 WATER QUALITY BASELINE DATA

The baseline data collected to assess the water quality in the study included both surface water and ground water.

3.6.6.3.1 LOCATION OF SURFACE WATER & GROUND WATER QUALITY SAMPLING STATIONS

The Surface and ground water samples were collected during Summer season-2023. Location of Surface & Ground Sampling Stations is given vide ***Plate No.14 & 15***

Table 3.12: Location of Surface Water & Ground Water Sampling Stations

Code No	Locations	Physical Observation	Distance km	Direction	Latitude			Longitude		
					D	M	S	D	M	S
SURFACE WATER										
SW1	Culvert near chimulwade mayem village	Light brown color was observed due to algae formation, fishy odour, Creek back water	3.90	S	15	33	19.18	73	54	22.25
SW2	Mayem Lake	Green color observed due to algae, water is odour less and suspended solids were present	3.46	SE	15	34	30.21	73	56	20.62
SW3	Tivim Nallah Water	Some suspended solids were observed, light brown color	4.34	SW	15	37	40.28	73	51	39.86
SW4	Assonora River Up stream Water	The stream were observed to be green color due to stagnant water and algae formation, fishy odour, small aquatic fishes were observed	0.028	NW	15	36	22.00	73	53	40.08
SW5	Assonora River Downstream Water	The stream where observed to be green color due to and algae formation, fishy smell odour	0.58	W	15	35	45.39	73	53	42.87

GROUND WATER										
GW1	Sirigao village	Open Well. The water observed to be colorless, Less suspended solids, used for domestic purpose	--	--	15	36	17.00	73	53	59.86
GW2	Assonora Village	Open Well water, No odour, less suspended matter	1.30	N	15	37	1.12	73	54	5.43
GW3	Advalpale Village	Open well water, Less suspended solids observed	3.80	N	15	38	23.21	73	53	50.54
GW4	Mulgao village	Open Well water , No suspended matter , colorless and odour free	2.00	NNE	15	37	4.38	73	58	26.90
GW5	Sircaim village	Open Well water Colorless, odorless and less suspended matter	2.00	NW	15	37	9.42	73	52	54.61
GW6	Calvim village	Open Well water , The sample is clear and observed to be no suspended solids	2.90	SSW	15	34	10.26	73	53	20.18
GW7	Sinquirem Village	Open Well water Colorless, odour free & seen some dry leaves on the surface of the well	1.10	SSW	15	35	1.96	73	53	47.56
GW8	Mayem Village	Open Well water Colorless and no suspended solids	3.12	SE	15	34	34.33	73	56	10.20

Photograph : Surface Water Samples

Mayem Lake

Assonora River Downstream water

Photograph : Ground Water Samples

Mayem Village

Mulgao village

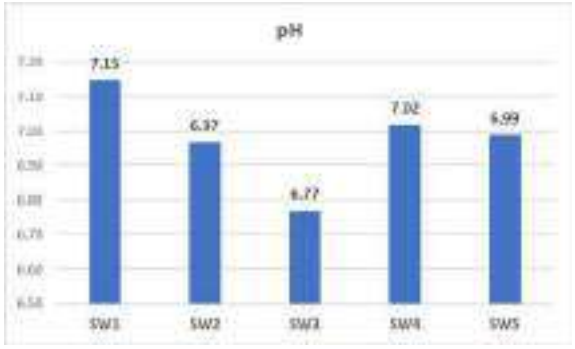
3.6.6.3.2 SURFACE WATER QUALITY

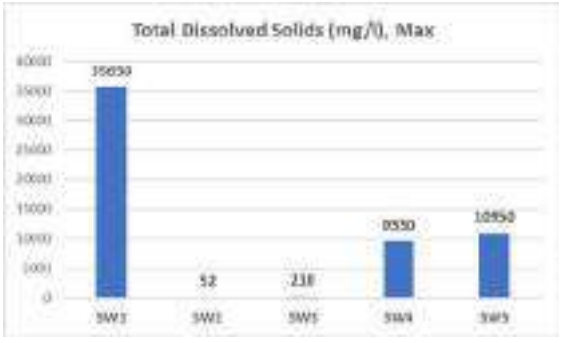
The surface water samples collected during Summer Season -2023 were analyzed and the results were compared with IS: 2296. The analysis reports of surface water are presented under **Annexure No.7**

Table.3.12a RESULTS

Sl. No.	Parameters	SW1	SW2	SW3	SW4	SW5	Limits For Stream Water Standards
1	pH	7.15	6.97	6.77	7.02	6.99	6.5 to 8.5
2	Dissolved Oxygen (as O_2), mg/l, Min	5.8	5.8	5.8	6.2	6.3	4
3	Total Dissolved Solids (mg/l), Max	35650	52	210	9550	10950	1500
4	Nitrates (as NO_3),mg/l, Max	0.7	0.3	0.1	<0.1	0.2	50
5	Chloride (as Cl),mg/l, Max	1805.7	10.06	112.8	1657.7	3860.0	600
6	Sulphates as SO_4 (mg/l), Max	1980.0	<1	12.8	360.0	530.0	400
7	Biochemical Oxygen Demand (as O_2), mg/l	<3	<3	<3	<3	<3	3
8	Total Coliform (mpn/100ml)	2	2	7	5	8	5000
9	Total Suspended Solids (mg/l)	12	14	16	12	16	-
10	Total Hardness (as $CaCO_3$),mg/l	600	36	140	3630	3300	-
11	Chemical Oxygen Demand (COD) mg/l	28	18	22	32	36	-

Surface Water :





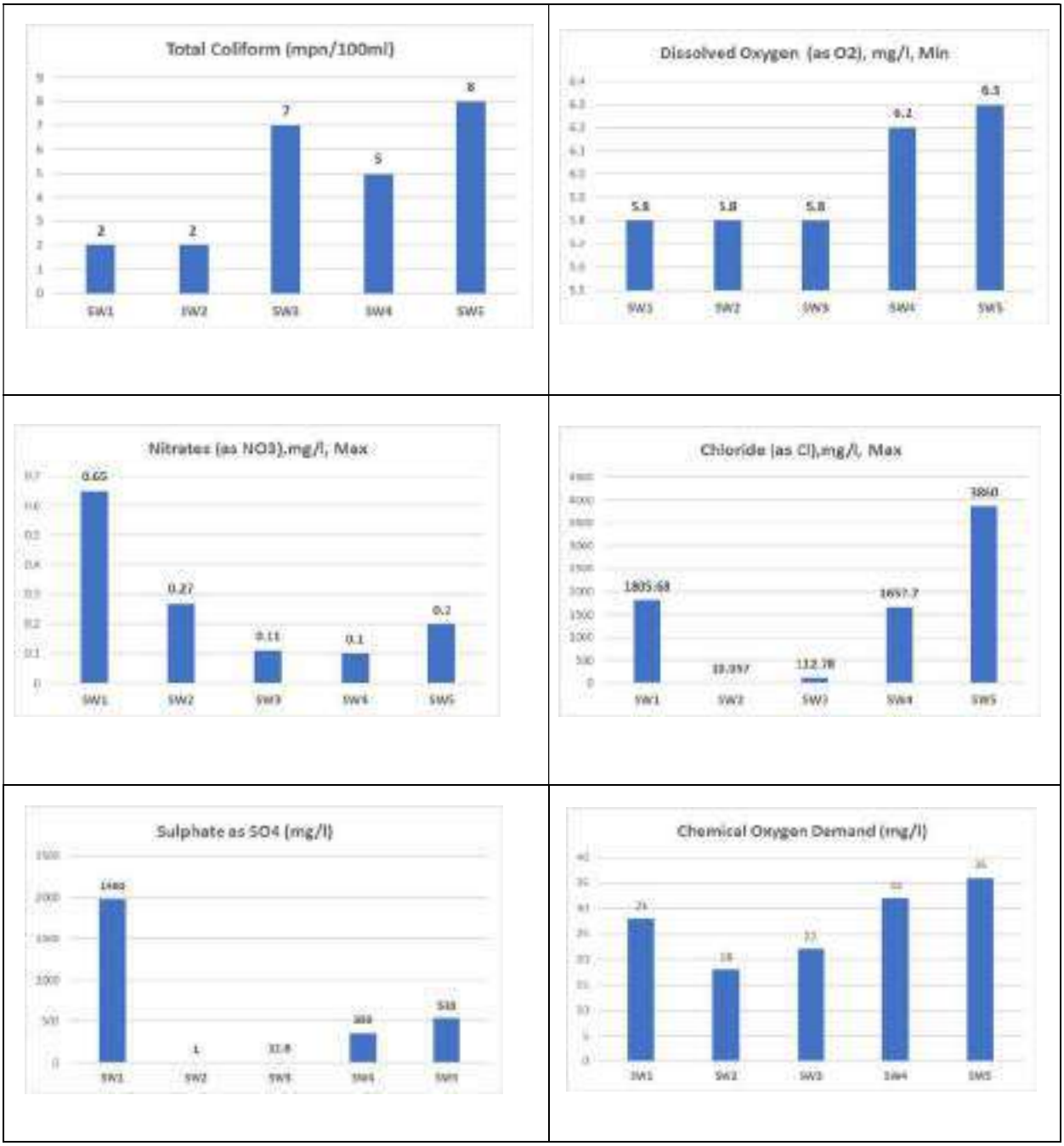


Fig. No. 3.5 Graph for Surface Water results

Results Interpretation:

The results of the analysis of the samples revealed that surface water samples of four locations i.e Culvert near Chimulwade mayem village, Assonora river Up Stream Water & Assonora river down stream Water were having high TDS, Total hardness, Sulphates, and Chlorides. This is mainly because of the influence of creek water. Whereas the remaining parameters of other locations were found to be within permissible limits.

3.6.6.3.3 GROUND WATER QUALITY

8 Nos. of Ground Water Samples were collected from Core Zone and Buffer Zone and analyzed as per IS 10500:2012 standards.

The parameter-wise results are given below and the test report is enclosed under **Annexure.No.7**

Table.No. 3.12b Results:

Parameters	Result				Desirable Limits	Permissible Limits
	GW1	GW2	GW3	GW4		
pH	6.77	6.08	6.95	5.63	6.5 to 8.5	6.5 - 8.5
Electrical Conductivity (µmhos/cm)	124.0	105.0	82.0	80.0	-	-
Total Dissolved Solids, mg/l, Max	75	36	48.0	28	500	2000
Calcium (as Ca),mg/l, Max	6.5	8	4.90	7	75	200
Chloride as Cl (mg/l),mg/l, Max	20	50	13.59	15	250	1000
Fluoride (as F),mg/l, Max	<0.1	<0.1	<0.1	<0.1	1	1.5
Magnesium (as Mg)mg/l, Max	1.5	4.0	<1	3.0	30	100
Nitrates (as NO_3),mg/l, Max	0.21	2	1.2	4	45	45
Sulphates (as SO_4),mg/l, Max	3.85	7	2.5	8	200	400
Alkalinity (as $CaCO_3$) mg/l, Max	25	25	15	10	200	600
Total Hardness (as $CaCO_3$),mg/l,Max	22.44	37	16.32	29	200	600
Escherichia Coli/100ml	Absent	Absent	Absent	Absent		
Total Coliform (mpn/100ml)	<1	<1	<1	<1	--	--

Parameters	Result				Desirable Limits	Permissible Limits
	GW5	GW6	GW7	GW8		
pH	5.90	5.89	6.66	6.28	6.5 to 8.5	6.5 - 8.5
Electrical Conductivity (µmhos/cm)	91.0	113	88.0	91	-	-
Total Dissolved Solids, mg/l, Max	24	63.0	49	25.0	500	2000
Calcium (as Ca),mg/l, Max	7	7.35	6.54	4.90	75	200
Chloride as Cl (mg/l),mg/l, Max	12	8.05	12.6	14.09	250	1000
Fluoride (as F),mg/l, Max	<0.1	<0.1	<0.1	<0.1	1	1.5
Magnesium (as Mg)mg/l, Max	2.0	2.47	1.5	1.98	30	100
Nitrates (as NO_3),mg/l, Max	1.6	0.4	0.15	0.8	45	45
Sulphates (as SO_4),mg/l, Max	8.40	14.42	<1	7.4	200	400
Alkalinity (as $CaCO_3$) mg/l, Max	25.0	50.0	30	20	200	600
Total Hardness (as $CaCO_3$),mg/l, Max	24.5	28.6	22.44	20.4	200	600
Escherichia Coli/100ml	Absent	Absent	Absent	Absent		
Total Coliform (mpn/100ml)	<1	<1	<1	<1	--	--

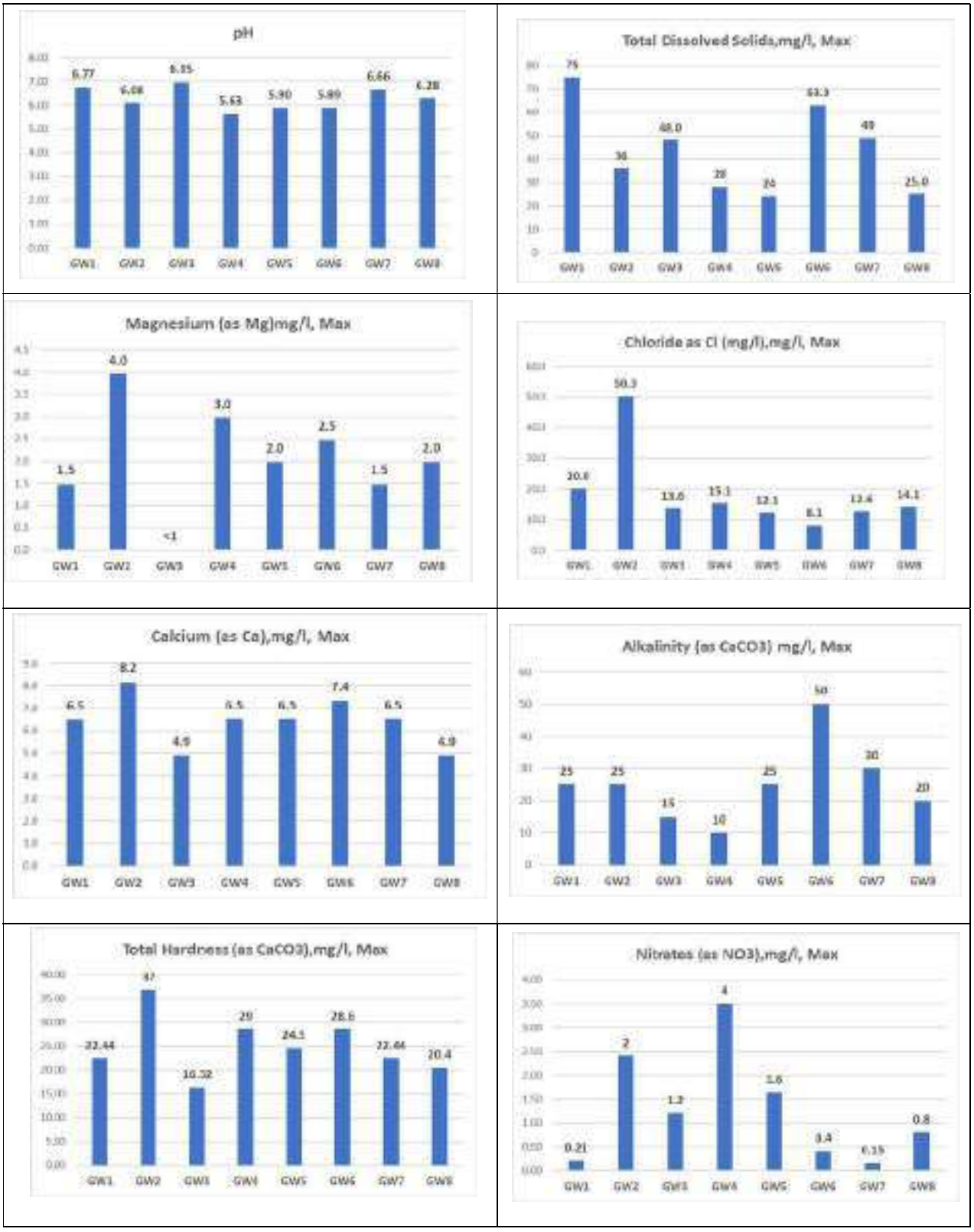


Fig. No. 3.6 Graph Showing Ground water parameters

Results Interpretation: *The location of open well samples at Assonara, Mulgao, Sircaim, Calvim & Mayem villages were found to have pH in slightly acidic in nature. This is possibly due to the occurrence of lateritic ore. The soil is rich in iron and aluminum oxides and hence it makes the ground water slightly acidic in nature. The other parameters were seen to be within the limits.*

3.6.5 SOIL QUALITY

3.6.5.1 LOCATION OF SOIL SAMPLING STATIONS

The locations of the sampling stations to assess soil quality during Summer season, 2023 are given in Table 3.13. Location of Soil Sampling Stations Plan ***Plate No.16***

Table 3.13: Location of Soil Quality Sampling Stations

Code No	Locations	Physical Obs.	Distance km	Direction	Latitude			Longitude		
					D	M	S	D	M	S
S1	Dump Soil Within Mineral Block	Dump Plantation	--	--	15	35	52.41	73	54	26.15
S2	Mayem Village	Fairly dense forest Cashew Plantation	0.640	SSE	15	35	3.27	73	53	48.54
S3	Sirigao Village	Agricultural Land	0.225	NNW	15	36	26.32	73	53	57.0
S4	Vainginim village	Agricultural soil	2.57	S	15	37	13.43	73	52	29.72
S5	Corjuem village	Agricultural soil	1.45	SWW	15	35	3.27	73	54	48.54

3.6.5.2 SOIL QUALITY BASELINE DATA

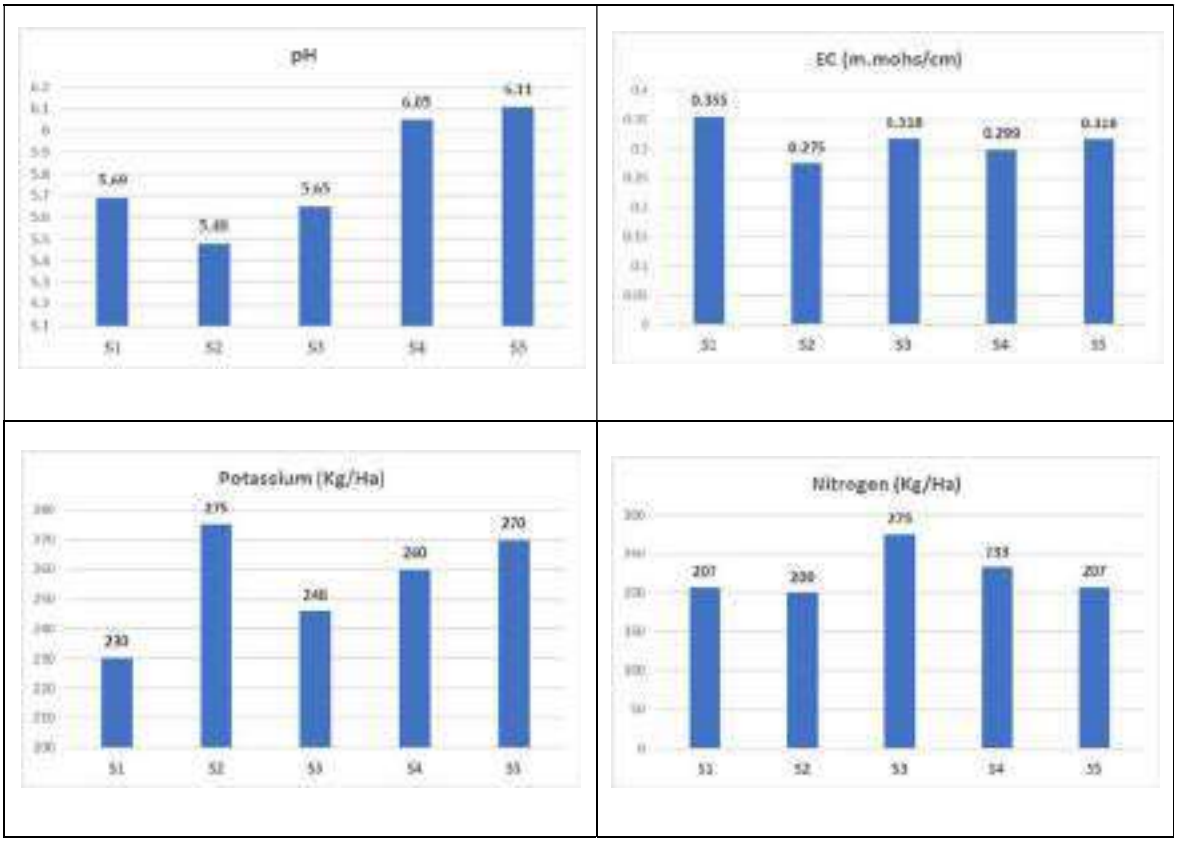
The quality of soil observed in the core zone and buffer zones are presented under **Annexure.No-7.**

Photographs: Soil Samples

Mayem Village

Table.3.13a Results

PARAMETERS	Unit	S1	S2	S3	S4	S5	Normal	High
Physical Properties								
Colour	--	Red soil	Red soil	Red soil	Red soil	Red soil	--	--
Textural class	--	Sandy Clay	Clay Loam	Clay Loam	Clay Loam	Clay Loam	--	--
Water holding capacity	%	31.63	37.25	31.05	33.72	30.00	--	--
pH	--	5.69	5.48	5.65	6.05	6.11	6.3	>8.3
EC	m.mohs/cm	0.355	0.275	0.318	0.299	0.316	1.0 to 2.0	>2
Chemical Properties								
Organic Carbon	%	1.15	1.09	1.18	0.72	0.69	0.5 to 0.75	>0.75
Nitrogen as N	Kg/Ha	207	200	275	233	207	280-560	>560
Phosphorous as P	Kg/Ha	17.6	18.5	14.6	20.0	22.3	9 to 22	>22
Potassium as K_2O	Kg/Ha	230	275	246	260	270	50 to 120	>120
Micro- nutrients								
Boron (as B)	mg/Kg	0.41	0.36	0.18	0.29	0.33	--	--
Iron (as Fe)	%	3.62	4.75	3.65	4.78	3.55	--	--



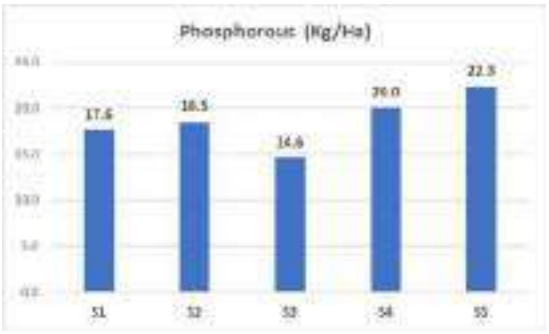


Fig .No. 3.7 Graphs : The graphs showing some critical parameters

Results Interpretation

The dominant soil type observed in the mining block is of lateritic type. The results show that the soils are with pH varies from 5.48 to 6.11, texture varies from sandy clay to clay loam, Electrical Conductivity ranges from 0.275 to 0.355 µS/cm which is a measure of the soluble salts and ionic activity in the soil. The other observed parameters are within the permissible limits.

3.7. LAND ENVIRONMENT

3.7.1 LAND USE AND LAND COVER FOR 10 KM RADIUS OF MINE

The map showing land use details within 10 km radius from the Mineral Blockis furnished below. The land use of the entire study area is as given below in Table 3.14.

The detailed plan showing the Land use and vegetation index is enclosed as drawing no. ***Plate No.17***and ***Plate No.18*** respectively**.**

Table. No. 3.14 Land use of study area around 10 kms radius

Sl.no	Particulars	Area Ha	%
1	Forest Area	330.0	0.88
2	Vegetation	14811.0	39.43
3	Settlements	5530.0	14.72
4	Water bodies	2815	7.49
5	Mangroves	1264	3.36
6	Broken up area & pit water bodies	451	1.20
7	Agriculture land	3384	9.01
8	Scrub Land	8982.0	23.91
Total Area		37567	100

3.7.1.1 LAND USE - MINERAL BLOCK

The Mineral Block Area consists of 171.2472 Ha of land. Land use details of the existing period is given below in Table No. 3.15.

Table 3.15: Land Use - Mineral Block Area

Pre Mining Use	**AREA** (Ha)
Barren / Waste land with small bushes & shrubs	2.30
Land under Agriculture / Crops	0.000
Land covered with Plants	0.000
Land under Grass Cover	0.000
Land under Public Infrastructure / Utilities (water bodies, roads, railways, electric lines, telephone lines etc.)	12.07
Land under Habitation & temples	11.4
Land under Monuments & places of Historical Importance	0.00
Degraded by Pits & Excavation	81.700
Degraded by Dumps & Material Staking	40.83
Covered under Mine Infrastructure (plants, shades, buildings etc.)	0.27
Land under Forest	0.000
Any Other, please specify below(Unused)	22.68
	171.25

3.8 ECOLOGY AND BIODIVERSITY BASELINE DATA

3.8.1 A STUDY REGION

3.8.1.1 Study Region

The biodiversity study was undertaken to assess the biodiversity of Mining Block Area and its buffer area of 10 Km radius with the following objectives.

1. Collection and synthesis of secondary information on the status of biodiversity in study region
2. Field survey to assess the status of flora and fauna component in core and buffer areas of project site
3. Identification and listing of flora and fauna which are important as per the Amended Wildlife Protection Act 2022.

The authenticated list of flora and fauna obtained from the Forest Department, is enclosed as **Annexure.No.8**

3.8.1.2 Approach

A participatory and consultative approach was followed in executing the assignment on Ecology & Biodiversity assessment of the Mineral Block and 10-km buffer region. Further enquiries were made with forest officials, revenue department and local villagers. Literature survey included a review of the forest working plan, Census hand book, Gazetteer and other records related to the ecology of the region.A team comprising flora and fauna specialist from Mineral Engineering Services along with EIA Co-Ordinator had visited the Block-II Sirigao -Mayem Mineral Block Iron Ore Mine and 10-km buffer area during 7th to 10th April 2023; and held discussion with mine authority.

The baseline data on biodiversity of the region collected during April, 2023 is presented in the format provided in model TOR in EIA Guidance manual prepared by Administrative Staff College of Hyderabad, 2010 on behalf of MoEF&CC, Government of India.

3.8.1.3 FLORAL STUDIES

Forest Types: Forest types were closely observed on the ground and identified using Champion & Seth, forest classification of India. The identified forest types were verified, and confirmed from forest working plan for the north Goa Forest Division with specific emphasis on Bicholim forest ranges, Sirigao village, Bicholim taluka published and other authenticated sources.

Quartile Approach: In order to provide representative ecological status 10-km buffer was divided into four quartiles for biodiversity sampling, i.e., NE (Q-1), NW (Q-2) SW (Q-3) and SE (Q-4) as given in Fig. 3.8. Each of the quartiles were examined for representative flora on randomly sampled quadrats for trees (25x25-m), shrubs (10x10-m) and herbs (2x2-m) depending upon prevailing geographical conditions and bio-diversity aspects of study area.

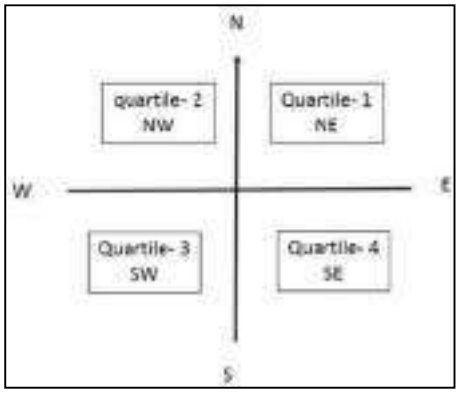


Figure. 3.8. Schematic diagram shown 10- km radius buffer area representation under four quartiles for ecology and biodiversity sampling.

Phyto-sociological parameters, viz., Abundance, Density, Frequency (%) were measured as given below. A total of 10 quadrats were laid down randomly within core area and 40 quadrats were laid down within four quartiles randomly (10/quartile) in buffer area each quadrat trees, shrubs, and herbs as per the Fig.3.8

Quadrats method: Quadrats of 25 × 25-m were laid down randomly within core and 10-km buffer area; each quadrat was laid to assess the trees (>5 cm GBH) and one, 10 × 10-m sub-quadrat nested within the quadrat for shrubs, and two, plots 2 × 2-m for herbs, climbers & grass is given in **Fig. 3.9**.

The quadrats were laid randomly to cover the area to maximize the sampling efforts and minimize the species homogeneity, such as small stream area, trees in agricultural bunds, tank bunds, farm forestry plantations, wildlife areas, natural forest area, avenue plantations, house backyards, etc.

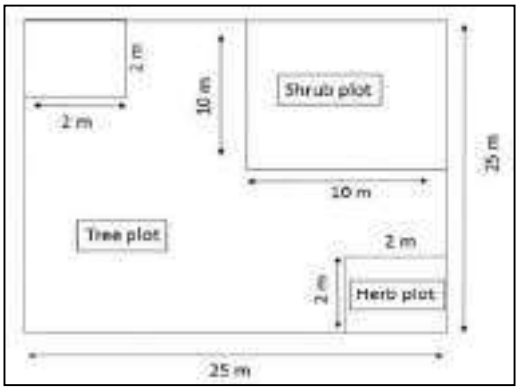


Figure.3.9. Schematic representation of quadrats for trees, shrubs, herbs & grass.

Following formulae was used for calculating the frequency (%), abundance and density of the floral species

$$\%\ \text{Frequency of species A} = \frac{\text{Number of quadrats of occurrence of species A}}{\text{Total number of quadrats studied}} \times 100$$

$$\text{Abundance of species A} = \frac{\text{Number of individuals of species A in total quadrats studied}}{\text{Number of quadrats of occurrence of species A}}$$

$$\text{Density of species A} = \frac{\text{Number of individuals of species A in total quadrats studied}}{\text{Total area studied}}$$

Biodiversity Analysis using index: Species diversity will be calculated by using Shannon and Wiener (1963) formula as follows:

$$H' = -\sum_{i=1}^{R} p_i \ln p_i$$

Whereas H' is Shannon index of general diversity, p_i is often the proportion of individuals belonging to the i^{th} species in the dataset of interest.

Screening IUCN and other sources for species Conservation status: Besides measuring these parameters, other biodiversity aspects in the form of endemic status, keystone species, threatened status, and IUCN, Red-data books of the Botanical Survey of India (BSI), have been verified for their conservation status (*see*http://www.iucnredlist.org/static/categories_criteria_3_1).

A **keystone species** is a species that has a disproportionately large effect on its environment relative to its abundance. Such species are described as playing a critical role in maintaining the structure of an ecological community, affecting many other organisms in an ecosystem and helping to determine the types and numbers of various other species in the community. The IUCN Species Programme of the IUCN Species Survival Commission (SSC), has for more than four decades been assessing the conservation status of species, subspecies, varieties and even selected sub-populations on a global scale in order to highlight taxa threatened with extinction and therefore promote their conservation.

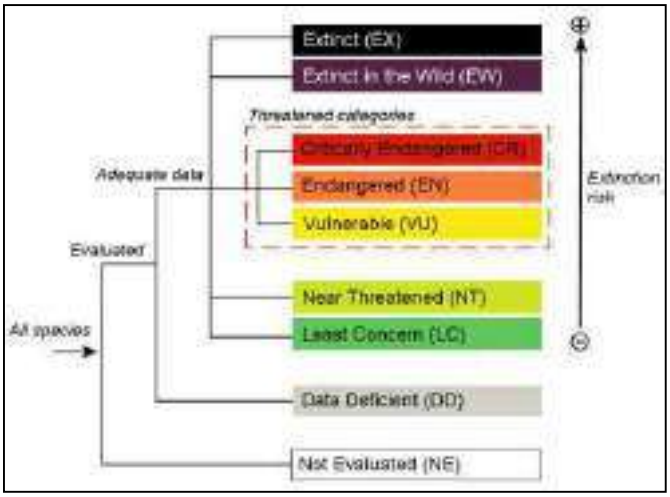


Figure 3.10. IUCN categories showing threatened species categories

The IUCN Red List of Threatened Species provides taxonomic, conservation status and distribution information on plants and animals that have been globally evaluated using the IUCN Red List Categories and Criteria (Fig. 3.10.).

This system is designed to determine the relative risk of extinction, and the main purpose of the IUCN Red List is to catalogue and highlight those plants and animals that are facing a higher risk of global extinction (i.e., those listed as *Critically Endangered, Endangered* and *Vulnerable*). The IUCN Red List also includes information on plants and animals that are categorized as *Extinct* or *Extinct in the Wild*; on taxonomic group that cannot be evaluated because of insufficient information (i.e., are *Data Deficient*); and on plants and animals that are either close to meeting the threatened thresholds or that would be *threatened* if not considered for an ongoing taxon-specific conservation programme (i.e., *Near Threatened*).

3.8.2 EQUIPMENT USED FOR FIELD SURVEY:

Plant assessment: Rope used for quadrat demarcation and measuring tape for quantifying plants. For more detailed identification, we used binoculars to observe canopy tree leaves and flowers/fruits, along with magnifying lenses for finer floral pattern identification.

Faunal assessment: For each transect, we used measuring tapes to demarcate the transact and binoculars. We used binoculars for bird observation and direct wildlife sightings. Additionally, indirect methods viz. pug mark, scat identifying etc were used, and we consulted field guides such as "Mammals" by Vivek Menon, "Butterflies" by Isaac Kehimkar, and "Birds of India" by Krys Kazmierczak for reference.

3.8.3 FAUNAL DIVERSITY

Mammals: Mammals were observed using indirect methods such as faecal matter (i.e., scat) and pug mark by establishing 10 × 100-m linear transects depending on the habitat (i.e., existing wildlife game routes/forest trails used). Few mammals were documented by direct sighting.

Bird: Point count method was used for bird documentation as per standard method by Sutherland (1996), which involved 10-minute observation in each point during early morning hours (6.00 to 10.00 AM). 20 point-counts were enumerated in each quartile, which constituted a total of 80 points-counts (20 × 4) within 10-km radius area.

Butterfly: The butterfly was enumerated by two linear transects, of 10 × 100 m were laid at each quartile at an interval of 1 km. Further, reptiles and fishes documented in existing literature and secondary information in consultation with local people and wildlife experts were recorded.

Apart from field observation, consultations were held with knowledgeable persons of the villages and frontline forest department officials to validate the field observation and information cited in the literature.

3.8.4 OBSERVATIONS AND DISCUSSIONS

3.8.4.1 Overview of project areas

The forest of the region was categorized as southern moist deciduous mixed forests and southern secondary moist mixed deciduous forests (Champion & Seth, 1967), in 'A revised survey of the forest types of India'. The region presents a wide range of altitudes, aspects, slopes, drainage, and spills giving rise to a variety of locality factors reflected in the occurrence of number of forest types from tropical semi-evergreen to mangrove forests.

These types are broadly differentiated and described here as per recognized and revised forest classification of Champion & Seth. As shown in Fig 3.11

- 3BC2 – Southern moist mixed deciduous forests
- 2A/C2- Westcost Semi Evergreen Forest
- 4B/TS2-Mangrove Forest

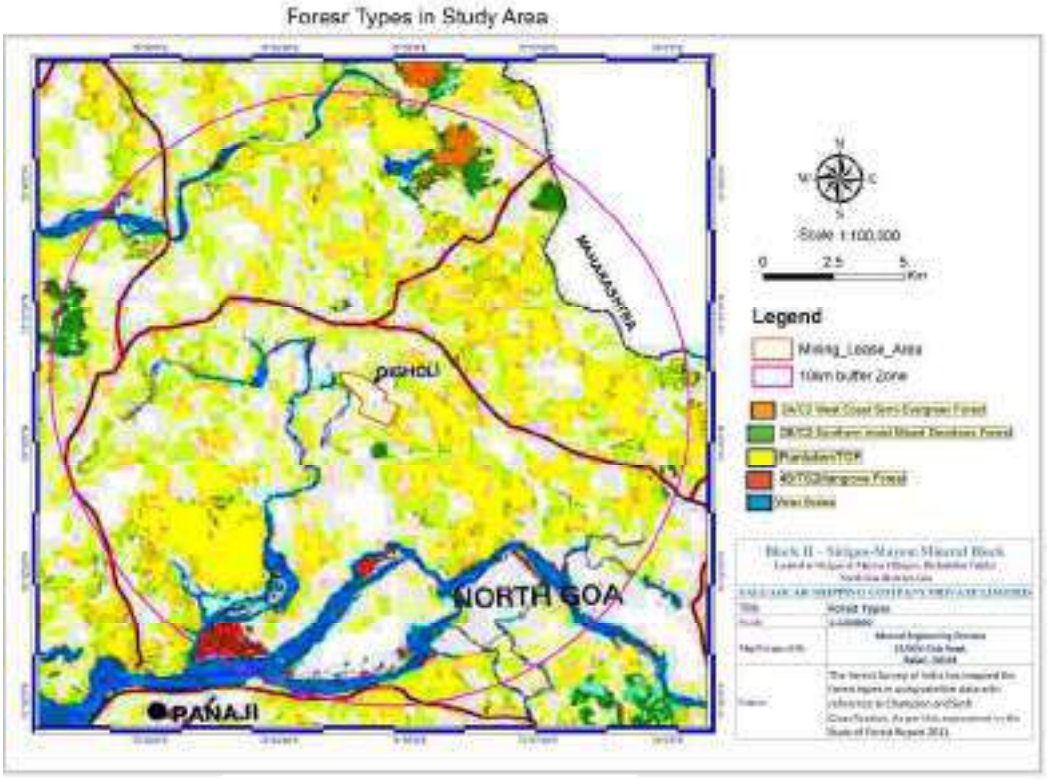


Fig: 3.11 Forest Types

Photo.

Open grass regenerated with Acacia auriculiformis in open area

Native vegetation with coconut trees etc,

Mixed forest with cashew plantation and Trema orientalis species

Coconut trees in and arround Village settlement

FLORA: Total 34 species were recorded within core area, of which 21 species trees (5/ ha), and 7 species shrubs (13 /ha), and 6 species herbs (115/ha) recorded (Table 3.16)

Table . 3.16 List of plants (trees, shrubs and herbs) reported from Core area

Sl. No	Species name	Family	Common Name	IUCN status
TREE				
1	*Anacardium occidentale*	Anacardiaceae	kaju	NE
2	*Acacia auriculiformis* *	Fabaceae	Acacia	NE
3	*Eucalyptus sps*	Myrtaceae	Nilgiri	NE
4	*Casuringa equisettifolia*	Casuarinaceae	Suru	NE
5	*Alstonia scholaris*	Apocynaceae	Saton	LC
6	*Samanea saman*	Fabacaeae	Rain tree	NE
7	*Bauhinia racemose*	Fabacaeae	Apto	LC
8	*Artocarpus heterophyllus*	Moraceae	Phanas	LC
9	*Bombox ceiba*	Bombacaceae	Sanwar	LC
10	*Delonix regia*	Fabacaeae	Gulmohar	NE
11	*Emblica officinalis*	Phyllanthaceae	Aonla	LC
12	*Garcinia indica*	Clusiaceae	Kokum	VU
13	*Gmelina arborea*	Lamiaceae	Shivan	LC
14	*Leucaena leucocephala*	Fabacaeae	Subabul	NE
15	*Mangifera indica*	Anacardiaceae	Mango	DD
16	*Syzygium cumini*	Myrtaceae	Jamun	LC
17	*Trema orientalis*	Cannabaceae	Charcoal tree	LC
18	*Acacia catechu*	Fabacaeae	Khair	LC
19	*Canthium dicoccum*	Rubiaceae	Ceylon boxwood	LC
20	*Ziziphus mauritiana*	Rhamnaceae	Indian jujube	LC
21	*Macaranga peltata*	Euphorbiaceae	Chandada	LC
SHRUBS				
1	*Acacia paniculate*	Mimosaceae	shembi	LC
2	*Calotropis gigantean*	Asclepidiaceae	rui	LC
3	*Carissa congesta*	Apocynaceae	Karamda	LC
4	*Crotolaria virosa.*	Fabacaeae	khulkhulo	LC
5	*Helictris isora*	Malvaceae	kevan	LC

6	*Lantana camara**	Verbenaceae	Ghaneri	LC
7	*Ziziphus oenoplea*	Rhamnaceae	kanera	LC
HERBS AND CLIMBERS				
1	*Asparagus racemosa*	Asparagaceae	Satavar	LC
2	*Rauwolfia serpentina*	Apocynaceae	Atki	LC
3	*Ipomea cmuricata*	Convolvulaceae	Bhingari	LC
4	*Ocimum sanctum*	Lamiaceae	*Tulasi*	LC
5	*Cromoleina odoreta**	Asteraceae	Ran mari	LC
6	*Smilax zeylanica*	Smilacaceae	Ghot vel	LC

NOTE: * Invasive species

FAUNA: Total 22 species were observed within the core area, of which 12 species are birds, 3 species of mammals ,3 species of reptiles & 4 Butterflies **(Table 3.17).**

Table 3.17 List of faunal species – Birds, Mammals and Reptiles in the core area

Sl. No.	Common name	Scientific name	Family	IUCN / WPA status
	BIRDS			
1	Common Iora	*Aegithina tiphia*	Irenidae	II/LC
2	Common Myna	*Acridotheres tristis*	Sturnidae	II/LC
3	Crow Pheasant	*Centropus sinensis*	Cuculidae	II/LC
4	Green Bee Eater	*Merops orientalis*	Meropidae	II/LC
5	House Crow	*Corvus splendens*	Corvidae	II/LC
6	House Sparrow	*Passer domesticus*	Passeridae	II/LC
7	House Swift	*Apus affinis*	Apodidae	II/LC
8	Indian Robin	*Saxicoloides fulicata*	Turdinae	II/LC
9	Jungle Crow	*Corvus macrorhynchos*	Corvidae	II/LC
10	Jungle Myna	*Acridotheres fuscus*	Sturnidae	II/LC
11	Red-wattled Lapwing	*Vanellus indicus*	Charadriidae	II/LC
12	Red-whiskered Bulbul	*Pycnonotus jocosus*	Pycnonotidae	II/LC
	MAMMALS			
13	Indian Hare	*Lepus nigricollis*	Leporidae	II/LC
14	Rat	*Rattus rattus*	Muridae	IV/LC
15	Common grey mongoose	*Herpestes edwardsii*	Herpestidae	II/LC
	REPTILES			
16	Green Forest lizard	*Calotes calotes*	Agamidae	IV/LC
17	Roux's Forest lizard	*Calotes rouxii*	Agamidae	IV/LC
18	Russell's Viper	*Daboia russelii*	Viperidae	I/LC
	BUTTERFLIES			
19	Common Pierrot	*Castalius rosimon*	Lycaenidae	IV/LC
20	Tailess Line Blue	*Prosotas dubiosa indica*	Lycaenidae	IV/LC
21	Grey Count	*Tanaecia lepidea*	Nymphalidae	IV/LC
22	Common Jezebel	*Delias eucharis*	Pierinae	IV/LC

3.8.5 BUFFER AREA

The Ecological Sensitive habitat was assessed within a 10 km radius, divided into 4 quartiles (Q1, Q2, Q3 & Q4) as shown in Fig. 3.12 for easy interpretation and locating of important habitats. Eighteen significant ecosystems were observed, demanding special attention and protection due to their ecological significance and vulnerability. This area includes critical habitats, biodiversity hotspots, and potential ecological services. The habitats falling within a 5 km radius such as Mayem RF, Bicholim River, Mayem lake, Mangroves, Assonara River, and Mapuca River require special care, particularly concerning downstream soil erosion, forest fires due to human pressures, and road encroachments and over extractions/exploitation. Please refer to table 3.18 and table 3.19 for detailed information. Overview of buffer area (10-km radius) in all 4 directional quartiles - eco-sensitive areas, plantations, and development activities so on (Table 3.18).

Table. 3.18 General description of landscape within 10 km radius from core area (all 4 directions of North, East, West and South).

Quartiles	Trees/ Shrubs	Species richness	Density/ha	Species diversity (H')	Habitat Characteristics
Quartile 1 North-East	Trees	42	1834	2.37	Kharpal and Ambadgaon Reserve Forest Cashew mixed forest, Open scrub rest Main powerline (High tension wire) Maharashtra State boundary (<5 km)
	Shrubs	13	4710	2.14	
	Herbs	10	86500	2.16	
Quartile 1 North-West	Trees	35	1714	2.78	Konkan Railway track, Reserve Forest Amthane Dam. Main power line
	Shrubs	9	2120	1.84	
	Herbs	9	2050	2.36	
Quartile 3 South-West	Trees	54	234	1.87	Diwadi Island. Mandovi river and its tributaries Mangrove forest and swamps, Konkan railway track
	Shrubs	8	1220	1.84	
	Herbs	10	2500	1.36	
Quartile 4 South-East	Trees	44	734	2.17	Mandovi River and its tributaries, Mangrove Forest / swamps, Open scrub, Kudne river, Volvot river, Harvalem Waterfalls
	Shrubs	11	3820	2.64	
	Herbs	9	11500	2.06	
Overall	Trees	62			
	Shrubs	16			
	Herbs	15			

Detailed Eco-Sensitive Areas

Table 3.19 Ecologically Important habitat from the core area boundary

Sl. No.	Important ecosystem	Distance Km	Quartile direction
1	Ambadgaon RF	9.4	Q 1 (North-East)
2	Mayem RF	0.190	Q 1 (North-East) & Q4 (South-East)
3	Kharpal RF	8.4	Q 1 (North-East)
4	Kasarpal RF	5.1	Q 1 (North-East)
5	Amthane dam	7.0	Q 1 (North-East)
6	Dhasi Lake	7.3	Q2 (North-West)
7	Assnora River	0.45	Q 1 (North-East) &Q2 (North-West)
8	Mangroves	0.31	Q2 (North-West)/ Q3 (South-West) & Q4 (South-East)
9	Chapora River	7.3	Q 1 (North-East) &Q2 (North-West)
10	Salim Ail Bird Sanctuary	8.1	Q3 (South-West)
11	Mapusa River	1.25	Q2 (North-West)
12	Mayem Lake	3.4	Q4 (South-East
13	Divar Island	5.34	Q4 (South-East) & Q3 (South-West)
14	Mandovi River	4.3	Q4 (South-East)
15	Volvoti River	7.88	Q4 (South-East)
16	Bicholim River	4.02	Q4 (South-East)
17	Kudnem River	8.76	Q4 (South-East)

Fig No. 3.12 Study area quartile I, II, III, & IV

FLORAL DIVERSITY

***TREE*:** Overall 66 species of trees were enumerated from the reserve forest and riparian habitats.

Table 3.20 Trees growing buffer area of 10-km radius

Sl.No.	Species name	Common Name	Family	IUCN Status
1	*Acacia catechu (L.f.) Willd. var.*	Khair/Kath	Fabaceae	LC
2	*Adina cordifolia Hook. f. ex Brandis*	Hedu	Rubiaceae	LC
3	*Alstonia scholaris (L.) R.Br.*	Saton	Apocynaceae	LC
4	*Annona squamosa L.*	Sitafal	Annonaceae	LC
5	*Artocapus lakoochu Wall. ex Roxb*	Otamb	Moraceae	LC
6	*Artocarpus heterophyllus Lam.*	Phanas	Moraceae	LC
7	*Artocapus integrifolius Auct.*	Palphanas	Moraceae	LC
8	*Bischofia javanica Bl.*		Phyllanthaceae	LC
9	*Bombax malabaricum DC.*	Sawar	Bombacaceae	LC
10	*Buchanania latifolia Roxb.*	Chara	Anacardiaceae	LC
11	*Butea monosperma (Lam.) Taub.*	Palas	Fabaceae	LC
12	*Caesalpinia bonducella (L.) Fleming*	Sagargote	Caesalpinaceae	LC
13	*Careya arborea Roxb.*	Kumayo	Lecythidaceae	LC
14	*Caryota urens L. (Kithul) sap.*	Bhillemad	Arecaceae	C
15	*Cassia fistula L.*	Baavo	Fabacaeae	C
16	*Casurina equsitefollia*	Suru	Casurinaceae	C
17	*Cassia siamea Lam.*		Fabaceae	C
18	*Celtis cinnamomea Lindl. ex Planch.*		Ulmaceae	LC
19	*Clerodendron sp.,*		Lamiaceae	LC
20	*Cordia wallichii L.*		Boraginaceae	LC
21	*Dalbergia calofolia Roxb.*		Fabaceae	C
22	*Dalbergia latifolia*	sisam		VU
23	*Delonix regia (Hk.) Raf.*	gulmohar	Fabaceae	LC
24	*Diospyros montana Roxb.*		Ebenaceae	C
25	*Erythrina indica L.*	pangaro	Fabaceae	LC
26	*Ficus arnottiana (Miq.) Miq.*	Chota umber	Moraceae	LC
27	*Ficus glomerata Roxb.*	Rumad	Moraceae	LC
28	*Ficus microcarpa L.f.*	Ghol	Moraceae	LC
29	*Flueggea leucopyrus Willd.*		Phyllanthaceae	C
30	*Gliricidia sepium (Jacq.) Kunth*	Saryache jhad	Fabaceae	C
31	*Glochidion velutinum L.*		Euphorbiaceae	C
32	*Grewia robusta L.*		Tiliaceae	LC
33	*Grewia tiliifolia Vahl.*	Dhaman	Tiliaceae	LC
34	*Holoptelea integrifolia (Roxb.) Planch.*		Ulmaceae	LC
35	*Holarrhena pubescens (Buch.-Ham.)*	kudo	Apocynaceae	LC
36	*Hopia perviflora Bedd.*		Lythraceae	LC
37	*Hydnocarpus wightiana Bl.*	khashti	Achariaceae	C
38	*Lagistromia lanceolata*	Nano	Myrataceae	C

39	*Lagistromia microcarpa*	Anye	Myrataceae	LC
40	*Lannea grandis (Dennst.) Engl.*	moi	Anacardiaceae	LC
41	*Macaranga peltata (Roxb.) Muell.*	chandado	Euphorbiaceae	LC
42	*Mallotus philippensis (Lam.) Muell.*	shendri	Euphorbiaceae	LC
43	*Mangifera indica L.*	ambo	Anacardiaceae	LC
44	*Memecylon umbellatum Burm.*	anjan	Melastomataceae	LC
45	*Mitragyna parviflora (Roxb.) Korth.*	kalam	Rubiaceae	LC
46	*Olea dioica L.*		Oleaceae	LC
47	*Psydrax dicocos*		Rubiaceae	VU
48	*Peltophorum pterocarpum (DC.)*	Sonmohar	Fabaceae	LC
49	*Polyalthia longifolia Sonn.*	False Ashoka	Annonaceae	C
50	*Pterocarpus marsupium Roxb.*		Fabaceae	C
51	*Radermachera xylocarpa (Roxb.) Schm.*	Khadshing	bignoniaceae	C
52	*Randia dumetorum L.*	Gel	Rubiaceae	C
53	*Sapindus emarginatus L.*	Ritho	Sapindaceae	C
54	*Schleichera oleosa (Lour.) Oken*	Kusumb	Euphorbiaceae	LC
55	*Semecarpus anacardium L. f.*	Bibo	Anacardiaceae	LC
56	*Spondias mangifera Willd.*	Ambado	Anacardiaceae	LC
57	*Syzygium caryophyllatum (L.) Alton*	Bhedsa	Myrtaceae	VU
58	*Syzygium cumini (L.) Skeels*	Jambhul	Myrtaceae	LC
59	*Terminalia paniculata Roth*	kindal	Combretaceae	LC
60	*Thespesia populnea (L.) Correa*	Bhendi	Malvaceae	LC
61	*Trema orientalis (L.) Bl.*	Charcoal tree	Cannabinaceae	LC
62	*Vitex alticima L. f.*		Verbenaceae	LC
63	*Wrightia tinctoria*	Kalo kudo	Apocynaceae	LC
64	*Xylia xylocarpa (Roxb.) Taub.*	Zambo	Mimosaceae	C
65	*Ziziphus mauritiana Lam.*	Bor	Rhamnaceae	LC
66	*Zizhiphus sp.*	Makad bor	Rhamnaceae	LC

SHRUBS: Total 19 species recorded in 10 km buffer area.

Table 3.21 Shrubs growing 10-km radius

S. No.	Species name	Common Name	Family	IUCN Status
1	*Acacia paniculata Willd.*	shembi	Mimosaceae	C
2	*Amaranthus spinosus L.*		Amarantheceae	C
3	*Annona murocata L.*		Annonaceae	C
4	*Calotropis gigantea L.*	Rui	Asclepidiaceae	C
5	*Carissa congesta L.*	Karvand/kanna	Apocynaceae	C
6	*Chromolaena odorata (L.) K.R.*	Ranmari	Astraceae	C
7	*Crotolaria virosa (Roxb.) Bake.*	Khulkhulo	Fabacaeae	C
8	*Helictris isora*	Murud sheng/ kevan	Malvaceae	C
9	*Holarrhena pubesence*	Kudo	Apocynaceae	C
10	*Ixora brachiata Roxb. ex DC*		Rubiaceae	C

11	*Jatropha gossypiifolia*	Erand	Euphorbiaceae	C
12	*Lantana camara L.*	Ghaneri	Verbenaceae	C
13	*Micrococos ap*	Hasoli	Micrococcaceae	LC
14	*Ziziphus oenoplea Miller.*	kanera	Rhamnaceae	C
15	*Ziziphus rugosa*	chunna	Rhamnaceae	LC
16	*Getenia floribunda*	Uski	Combretaceae	LC
17	*Mullava spicata*	Waghati	Fabaceae	LC
18	*Dalbergia sp*		Fabaceae	LC
19	*Pandanus oddoratissimus*	Kegadi	Pandanaceae	LC

***HERBS**:* Total 31 species recorded in 10 km buffer area. The dominant species were *Acrostichum aureum*, *Asparagus racemose, Borreria articulata,* and *Cymbopogon citratus,*

Table 3.22. List of herbs reported within 10-km radius

S. No.	Species Name	Common Name	Family	IUCN status
1	*Cynodon dectylon*	Durva	Poaceae	C
2	*Ageratum conyzoides*	sahadevi	Astraceae	LC
3	*Alternanthera sessilis*		Amaranthaceae	LC
4	*Asparagus racemosa*	shatavari	Asparagaceae	C
5	*Borreria articulata*		Rubiaceae	C
6	*Justicia procumbance*		Acantaceae	C
7	*Cassia tora*	taikilo	Caesalpinaceae	C
8	*Cymbopogon citratus*	ganjan	Poaceae	C
10	*Acrostichum aureum*	Akur	Pteridaceae	LC
12	*Justicia simplex*		Acantaceae	LC
13	*Ipomea cmuricata*		Convolvulaceae	C
14	*Biopbytum sensitivim*	bhuimad	Oxalidaceae	C
15	*Cyperus difformis*		Cyperaceae	C
16	*Lantana camara*	Ghaneri	Verbenaceae	C
17	*Mimosa pudica*	Lajaki	Fabaceae	C
18	*Ocimum sanctum*	Tulasi	Lamiaceae	C
19	*Physalis minima*	Popati	Solanaceae	VU
20	*Premna coriacea*		Verbenaceae	C
21	*Solanum indicum*	Ranvangi	Solanaceae	LC
22	*Sida cordifolia*	Tupkati	Malvaceae	C
23	*Smilex zylenica*	Ghotvel	Smilacaceae	C
24	*Smithia purpurea*		Fabaceae	C
25	*Rauwolfia serpentina*	Atki	Apocynaceae	C
26	*Sylleginella fern*	Mhaterechi bondra	Pteridophyte	C
27	*Tridax procumbance*		Asteraceae	C
28	*Mucuna pruriens*	Khajkuyali	Fabaceae	C
29	*Dioscorea bulbifera*	karande	Dioscoreaceae	C
30	*Derris scandens*		Fabaceae	C
31	*Dalbergia sp.*		Fabaceae	C

MANGROVE FOREST

Total 16 species recorded from the mangrove estuary nearby Assonora and Mandovi River and closer to Salim Ali Bird Sanctuary. The dominant family was Rhizophoraceae and followed by Lythraceae and Acanthaceae

Table 3.23 list of Mangrove species recorded from the 10 km radius

Sl. No.	Species Name	Family	IUCN status
1	*Rhizophora mucronata*	Rhizophoraceae	LC
2	*Rhizophora apiculata*	Rhizophoraceae	LC
3	*Avicennia marina*	Acanthaceae	LC
4	*Avicennia officinalis*	Acanthaceae	LC
5	*Sonneratia alba*	Lythraceae	LC
6	*Sonneratia caseolaris*	Lythraceae	LC
7	*Ceriops tagal*	Rhizophoraceae	LC
8	*Bruguira gymnorhiza*	Rhizophoraceae	C
9	*Bruguiera cylindrica*	Rhizophoraceae	LC
10	*Kandelia candel*	Rhizophoraceae	LC
11	*Lumnitzera racemosa*	Combretaceae	LC
12	*Aegiceras corniculatum*	Primulaceae	LC
13	*Dolichandron spathecae*	Bignoniaceae	C
14	*Excocaria agalocha*	Euphorbiaceae	C
15	*Acanthus ilicifolius*	Acanthaceae	LC
16	*Acrostichum aureum*	Pteridaceae	LC

OUTSIDE FOREST LANDSCAPE:

Avenue trees and human settlement:

Total 25 species were recorded in the roadside and human settlement; most of these species were planted and some are naturally regenerated.

Table. 3.24 list of species recorded from avenue forest and nearby human settlement within 10 km radius.

Sl. No	Species name	common name	Family	habit
1	*Tamarindus indica*	Tamrind/imli	Cesalpinaceae	Tree
2	*Annona reticulata*	Ramphal	Annonaceae	Tree
3	*Bambusa sp*	Bamboo	Bambocaceae	Tree
4	*Bougainvillea spectabilis*	Bouganvilla	Nyctaginaceae	Tree
5	*Cassia fistula*	Amaltas	Fabaceae	Tree
6	*Dalbergia latifolia*	Shisam/ Shisoo	Fabaceae	Tree
7	*Delonix regia*	Gulmohar	Fabaceae	Tree
8	*Phyllanthus emblica*	Awala/.Avala	Phyllanthaceae	Tree
9	*Psidium guajava*	Peru/Gauva	Myrtaceae	Tree
10	*Samanea saman*	Rain tree	Fabaceae	Tree
11	*Sapindus mukorossi*	Ritha/Reetha	Sapindaceae	Tree
12	*Swetenia mahagoni*	Mohagony	Meliaceae	Tree

13	*Syzygium cumini*	Jamun	Myrtaceae	Tree
14	*Terminalia bellerica*	Ghoting/behada	Combretaceae	Tree
15	*Acacia auriculiformis*	Babul	Mimosaceae	Tree
16	*Garcinia indica*	kokum	Clusiaceae	Tree
17	*Pongamia pinnata*	Karuaini	Fabaceae	Tree
18	*Ficus benghalensis*	Banyan tree	Moraceae	Tree
19	*Ficus religiosa*	Peepal Tree	Moraceae	Tree
20	*Vitex negundo*	Nirgundi	Lamiaceae	Shrub
21	*Mucuna pruriens*	Kavachkuiri	Fabaceae	Climber
22	*Dioscorea bulbifera*	Aerial yam	Dioscoreaceae	Climber
23	*Zornia diphylla*	Two-Leaf Zornia	Fabaceae	Herb
24	*Justicia simplex*	Simple Justicia	Acanthaceae	Herb
25	*Cynodon dactyl*	Lawn Grass	Poaceae	Grass

DOMESTICATED / CULTIVATED SPECIES

The landscape had many horticulture plants which were grown around the backyard of village houses. In addition, large scale plantations like Cashew, Coconut, Mango, and Areca nut were found in farmlands. There were seasonal paddy and vegetable cultivations within the 10 km buffer area.

Table. 3.25 List of species from 10 km radius which are domesticated or cultivated from the farmland

Sl. No.	Species name	common name	Family	habit
1	*Annona reticulata*	Ramphal	Annonaceae	Tree
2	*Phyllanthus emblica*	Awala/.Avala	Phyllanthaceae	Tree
3	*Psidium guajava*	Peru/Gauva	Myrtaceae	Tree
4	*Carica papaya*	Papaya	Caricaceae	Tree
5	*Musa paradisiaca*	Bannana	Musaceae	Tree
6	*Acacia auriculiformis*	Babul	Mimosaceae	Tree
7	*Anacardium occidentale*	Cashew	Anacardiaceae	Tree
8	*Areca catechu*	Areca Nut	Arecaceae	Tree
9	*Cocos nucifera*	Coconut	Arecaceae	Tree
10	*Garcinia indica*	Kokum	Clusiaceae	Tree
11	*Tamarindus indica*	Tamarind	Cesalpinaceae	Tree
12	*Mangifera indica*	Mango	Anacardiaceae	Tree
13	*Piper betle*	Betel leaves	Piperaceae	climber
14	*Oryza sativa*	Paddy	Poaceae	Herbs

The plant species recorded in the study area were grouped into three categories i.e. endemic, rare and threatened and keystone species and are given in below Table 3.26 Overall, 5 important species were recorded within the study area. Within buffer area, 5 keystones, one endemic species was recorded.

Table 3.26 Endemic, Keystone and Threatened species recorded in 10-km radius area

Sl. No.	Species	Family	Core/buffer region	Habitat	Status
1	*Ficus arnottiana* (Miq.) Miq.	Moraceae	Buffer	Open	Keystone
2	*Ficus benghalensis* L.	Moraceae	Buffer	Open	Keystone
3	*Ficus glomerata* Roxb.	Moraceae	Buffer	Open	Keystone
4	*Ficus racemosa* L.	Moraceae	Buffer	Open	Keystone
5	*Ficus religiosa* L.	Moraceae	Buffer	Open/ Rivulets	Keystone

BIODIVERSITY: FAUNA

Overall, 216 species recorded from both primary observation and secondary publications and reports, in case of fauna 16 species of Mammals , 13 reptile species , 16 frogs and toads species , 132 Bird species , 27 butterfly species and 12 aquatic fishes and crabs species were reported from the region as per Amended WPA 2022. The details are listed below -

Table 3.27. List of the species reported from 10-km radius.

Sl. No	Local Name	Scientific name	Family	IUCN /WPA
MAMMALS				
1	Bonnet macaque	*Macaca radiate*	Cercopithecidae	LC/I
2	Rat	*Rattus rattus*	Muridae	LC/IV
3	Common grey mongoose	*Herpestes edwardsii*	Herpestidae	LC/ II
4	Indian Hare	*Lepus nigricollis*	Leporidae	LC/ II
5	Flying fox bat	*Pteropus giganteus*	Pteropodidae	LC/II
6	Indian porcupine	*Hystrix indica*	Hystricidae	LC /II
7	Striped squirrel	*Funambulus palmarum*	Sciuridae	LC/IV
8	Hanuman Lagnur	*Semnopithecus*	Cercopithecidae	LC/I
9	Common leopard*	Panthera pardus	Felidae	LC /I
10	Wild boar*	*Sus scrofa*	Suidae	LC /II
11	Small Indian civet*	*Viverricula indica*	Viverridae	LC /II
12	Small-clawed otters*	*Aonyx cinereus*	Mustelidae	VU/II
13	Smooth-coated otter*	*Lutrogale perspicillata*	Mustelidae	VU/I
14	Wild Gaur*	*Bos gaurus*	Bovidae	VU/I
15	Black Naped Hare	*Lepus nigricollis*	Leporidae	LC/II
16	Pangolin *	*Pholidota*	Manidae	LC/I
REPTILES				
1	Common Kukri Snake	*Oligodon arnensis*	Colubridae	LC /IV
2	Roux's Forest lizard	*Calotes rouxii*	Agamidae	LC/IV
3	Checkered Keelback	*Xenochrophis piscator*	Colubridae	LC/ IV
4	Striped Keelback	*Amphiesma stolatum*	Colubridae	LC /IV
5	Saw scaled Viper	*Echis carinatus*	Viperidae	LC/IV
6	Cobra	*Naja naja*	Elapidae	LC/I

7	Bark gecko	*Hemidactylus leschenaultia*	Gekkonidae	LC/IV
8	Montane trinket snake	*Coelognathus helena monticollaris*	Colubridae	LC /IV
9	Common Sand Boa	*Gongylophis conicus*	Boidae	NT /IV
10	Russell's Viper*	*Daboia russelii*	Viperidae	LC/I
11	Common Indian monitor lizard	*Varanus bengalensis*	Varanidae	NT/I
12	Crocodile*	*Crocodylus palustris*	Crocodylidae	VU/ I
13	Indian rat Snake*	*Ptyas mucosa*	Colubridae	LC / I
	AMPHIBIANS			
1	Common Indian toad	*Bufo melanostictus*	Bufonidae	LC
2	Jerdon's narrow mouthed frog*	*Ramanella Montana*	Microhylidae	NT
3	Konkan bush frog*	*Philautus bombayensis*	Rhacophoridae	LC
4	Bamboo tree frog*	*Polypedates leucomystax*	Rhacophoridae	LC
5	Common tree frog	*Polypedates maculatus*	Rhacophoridae	LC
6	Malabar gliding frog*	*Rhacophorus malabaricus*	Rhacophoridae	LC
7	Skipper frog	*Euphlyctis cyanophlyctis*	Ranidae	LC/IV
8	Jerdon's bull frog*	*Hoplobatrachus crassus*	Ranidae	LC/IV
9	Indian bull frog	*Hoplobatrachus tigerinus*	Ranidae	LC/IV
10	Brown leaping frog*	*Indirana semipalmata*	Ranidae	LC/IV
11	Paddyfield frog	*Fejervarya limnocharis*	Ranidae	LC/IV
12	Hill cricket frog*	*Minervarya syhadrensis*	Ranidae	LC/IV
13	Fungoid frog*	*Hydrophylax malabaricus*	Ranidae	LC/IV
14	Bronzed frog	*Rana temporalis*	Ranidae	VU/IV
15	Indian burrowing frog	*Sphaerotheca breviceps*	Ranidae	LC/IV
16	Dobson's burrowing frog*	*Sphaerotheca dobsoni*	Dicroglossidae	LC
	BIRDS			
1	Alpine Swift *	*Tachymarptis melba*	Apodidae	LC/II
2	Ashy Drongo	*Dicrurus leucophaeus*	Dicruridae	LC/II
3	Ashy Prinia *	*Prinia socialis*	Sylviinae	LC/II
4	Asian Fairy-Bluebird	*Irena puella*	Irenidae	LC/II
5	Asian Koel *	*Eudynamys scolopacea*	Cuculidae	LC/II
6	Asian Palm Swift	*Cypsiurus balasiensis*	Apodidae	LC/II
7	Banded Bay Cuckoo *	*Cacomantis sonneratii*	Cuculidae	LC/II
8	Besra *	*Accipiter virgatus*	Accipitridae	LC/I
9	Black Bittern *	*Dupetor flavicollis*	Ardeidae	LC/II
10	Black Drongo	*Dicrurus macrocercus*	Dicruridae	LC/II
11	Black Eagle	*Ictinaetus malayensis*	Accipitridae	LC/I
12	Black Kite	*Milvus migrans*	Accipitridae	LC/II
13	Black-capped Kingfisher*	*Halcyon pileata*	Alcedinidae	VU/II
14	Black-crowned Night Heron*	*Nycticorax nycticorax*	Ardeidae	LC/II
15	Black-headed Babbler	*Rhopocichla atriceps*	Timaliinae	LC/IV
16	Black-headed Munia *	*Lonchura malacca*	Estrildidae	LC/II
17	Blue-bearded Bee-eater *	*Nyctyornis athertoni*	Meropidae	LC/II
18	Blue-breasted Rail	*Gallirallus striatus*	Rallidae	LC/IV
19	Blue-eared Kingfisher *	*Alcedo meningting*	Alcedinidae	LC/II

20	Blue-tailed Bee-eater	*Merops philippinus*	Meropidae	LC/II
21	Blue-winged Parakeet *	*Psittacula columboides*	Psittacidae	LC/II
22	Brahminy Kite	*Haliastur indus*	Accipitridae	LC/I
23	Brainfever Bird *	*Hierococcyx varius*	Cuculidae	LC/II
24	Bronzed Drongo*	*Dicrurus aeneus*	Dicruridae	LC/II
25	Bronze-winged Jacana *	*Metopidius indicus*	Jacanidae	LC/II
26	Brown Wood Owl *	*Strix leptogrammica*	Strigidae	LC/I
27	Brown-backed Needletail-Swift	*Hirundapus giganteus*	Apodidae	LC/II
28	Brown-headed Barbet	*Megalaima zeylanica*	Capitonidae	LC/IV
29	Brown Fish-Owl	*Ketupa zeylonensis*	Strigidae	LC/IV
30	Cattle Egret	*Bubulcus ibis*	Ardeidae	LC/II
31	Chestnut Bittern	*Ixobrychus cinnamomeus*	Ardeidae	LC/I
32	Chestnut-headed Bee-eater	*Merops leschenaulti*	Meropidae	LC/II
33	Collared Kingfisher *	*Todiramphus chloris*	Alcedinidae	LC/II
34	Common Buttonquail	*Turnix suscitator*	Turnicidae	LC/II
35	Common Cuckoo	*Cuculus micropterus*	Cuculidae	LC/II
36	Common Hill-Myna	*Gracula religiosa*	Sturnidae	LC/I
37	Common Iora	*Aegithina tiphia*	Irenidae	LC/II
38	Common Myna	*Acridotheres tristis*	Sturnidae	LC/II
39	Common Ringed Plover *	*Charadrius hiaticula*	Charadriidae	LC/II
40	Common Tailorbird	*Orthotomus sutorius*	Sylviinae	LC/II
41	Coppersmith Barbet *	*Megalaima haemacephala*	Capitonidae	LC/IV
42	Cotton Teal	*Nettapus coromandelianus*	Anatidae	LC/I
43	Crested Goshawk	*Accipiter trivirgatus*	Accipitridae	LC/I
44	Crested Serpent Eagle	*Spilornis cheela*	Accipitridae	LC/I
45	Crested Tree-swift	*Hemiprocne coronata*	Hemiprocnidae	LC/I
46	Crimson-throated Barbet	*Megalaima rubricapilla*	Capitonidae	LC/IV
47	Emerald Dove	*Chalcophaps indica*	Columbidae	LC/II
48	Eurasian Marsh Harrier	*Circus aeruginosus*	Accipitridae	LC/II
49	Eurasian Woodcock *	*Scolopax rusticola*	Scolopacidae	LC/II
50	Forest Eagle-Owl	*Bubo nipalensis*	Strigidae	LC/I
51	Franklin's Prinia *	*Prinia hodgsonii*	Sylviinae	LC/II
53	Flame Thorated bulbul	*Motacilla maderaspatensis*	Motacillidae	LC/II
54	Great Cormorant	*Phalacrocorax carbo*	Phalacrocoracidae	LC/II
55	Greater Coucal	*Centropus sinensis*	Cuculidae	LC/II
56	Greater Racket-tailed Drongo *	*Dicrurus paradiseus*	Dicruridae	LC/II
57	Green Imperial Pigeon *	*Ducula aenea*	Columbidae	NT/II
58	Grey Heron *	*Ardea cinerea*	Ardeidae	LC/II
59	Grey Junglefowl	*Gallus sonneratii*	Phasianidae	LC/II
60	House Crow	*Corvus splendens*	Corvidae	LC/IV
61	House Sparrow	*Passer domesticus*	Passeridae	LC/II
62	House Swift	*Apus affinis*	Apodidae	LC/II
63	Indian Cuckoo	*Cuculus micropterus*	Cuculidae	LC/II
64	Indian Edible-nest Swiftlet *	*Collocalia unicolor*	Apodidae	LC/IV

65	Indian Hanging-Parrot	*Parrot Loriculus vernalis*	Psittacidae	LC/IV
66	Indian Jungle Nightjar *	*Caprimulgus indicus*	Caprimulgidae	LC/II
67	Indian Peafowl	*Pavo cristatus*	Phasianidae	LC/I
68	Indian Plaintve Cuckoo *	*Cacomantis passerinus*	Cuculidae	LC/II
69	Indian Pond-Heron *	*Ardeola grayii*	Ardeidae	LC/II
70	Indian Robin	*Saxicoloides fulicata*	Turdinae	LC/II
71	Indian Shag*	*Phalacrocorax fuscicollis*	Phalacrocoracidae	LC/II
72	Jerdon's Chloropsis *	*Chloropsis cochinchinensis*	Irenidae	LC/II
73	Jungle Babbler *	*Turdoides striatus*	Timaliinae	LC/IV
74	Jungle Bush Quail*	*Perdicula asiatica*	Phasianidae	LC/II
75	Jungle Crow	*Corvus macrorhynchos*	Corvidae	LC/II
76	Jungle Myna	*Acridotheres fuscus*	Sturnidae	LC/II
77	Large Egret	*Casmerodius albus*	Ardeidae	LC/IV
78	Large Pied Wagtail *	*Motacilla maderaspatensis*	Motacillidae	LC/II
79	Lesser Coucal	*Centropus bengalensis*	Cuculidae	LC/II
80	Lesser Whistling-Duck	*Dendrocygna javanica*	Anatidae	LC/II
81	Little Cormorant	*Phalacrocorax niger*	Phalacrocoracidae	LC/II
82	Little Egret	*Egretta garzetta*	Ardeidae	LC/II
83	Little Grebe	*Tachybaptus ruficollis*	Podicipedidae	LC/II
84	Little Green Heron	*Butorides striatus*	Ardeidae	LC/II
85	Malabar Whistling Thrush *	*Myophonus horsfieldii*	Turdinae	LC/II
86	Mountain Imperial-Pigeon *	*Ducula badia*	Columbidae	LC/II
87	Oriental Honey Buzzard *	*Pernis ptilorhynchus*	Accipitridae	LC/I
88	Pacific Swift *	*Apus pacificus*	Apodidae	LC/II
90	Paddyfield Pipit	*Anthus rufulus*	Motacillidae	LC/II
91	Pheasant-tailed *	*Hydrophasianus chirurgus*	Jacanidae	LC/II
92	Plain Flowerpecker	*Dicaeum minullum*	Dicaeidae	LC/II
93	Plain Prinia *	*Prinia inornata*	Sylviinae	LC/II
94	Plum-headed Parakeet *	*Psittacula cyanocephala*	Psittacidae	LC/II
95	Purple Heron*	*Ardea purpurea*	Ardeidae	LC/II
96	Purple Moorhen *	*Porphyrio porphyrio*	Rallidae	LC/II
97	Purple-rumped Sunbird *	*Nectarinia zeylonica*	Nectariniidae	LC/IV
98	Quaker Tit-Babbler *	*Alcippe poioicephalA*	Timaliinae	LC/II
99	Red Spurfowl	*Galloperdix spadicea*	Phasianidae	LC/II
100	Red-rumped Swallow *	*Hirundo daurica*	Hirudinidae	LC/II
101	Red-vented Bulbul *	*Pycnonotus cafer*	Pycnonotidae	LC/IV
102	Red-wattled Lapwing*	*Vanellus indicus*	Charadriidae	LC/II
103	Red-whiskered Bulbul	*Pycnonotus jocosus*	Pycnonotidae	LC/II
104	Rose-ringed Parakeet	*Psittacula krameri*	Psittacidae	LC/II
105	Rufous Babbler *	*Turdoides subrufus*	Timaliinae	LC/IV
106	Rufous-bellied Babbler *	*Dumetia hyperythra*	Timaliinae	LC/II
107	Scarlet Minivet *	*Pericrocotus flammeus*	Campephagidae	LC/II
108	Shikra	*Accipiter badius*	Accipitridae	LC/I
109	Small Bee-eater	*Merops orientalis*	Meropidae	LC/II
110	Small Blue Kingfisher	*Alcedo atthis*	Alcedinidae	LC/II
111	Small Green-billed Malkoha	*Phaenicophaeus viridirostris*	Cuculidae	LC/II

112	Small Minivet	*Pericrocotus cinnamomeus*	Campephagidae	LC/I
113	Spot-billed Duck *	*Anas poecilorhyncha*	Anatidae	LC/II
114	Spotted Babbler	*Pellorneum ruficeps*	Timaliinae	LC/II
115	Spotted Dove	*Streptopelia chinensis*	Columbidae	LC/II
116	Spotted Owlet	*Athene brama*	Strigidae	LC/II
117	Stork-billed Kingfisher*	*Halcyon capensis*	Alcedinidae	LC/IV
118	Streaked Fantail-Warbler*	*Cisticola juncidis*	Sylviinae	LC/II
119	Tickell's Blue-Flycatcher *	*Cyornis tickelliae*	Muscicapinae	LC/II
120	Tickell's Flowerpecker *	*Dicaeum erythrorynchos*	Dicaeidae	LC/II
121	Western Reef Egret	*Egretta gularis*	Ardeidae	LC/II
122	White-bellied Sea-Eagle	*Haliaeetus leucogaster*	Accipitridae	LC/I
123	White-bellied Tree Pie *	*Dendrocitta leucogaster*	Corvidae	LC/II
124	White-breasted Kingfisher*	*Halcyon smyrnensis*	Alcedinidae	LC/II
125	White-breasted Waterhen *	*Amaurornis phoenicurus*	Rallidae	LC/II
126	White-rumped Needletail-Swift *	*Zoonavena sylvatica*	Apodidae	LC/II
127	White-rumped Shama *	*Copsychus malabaricus*	Turdinae	LC/II
128	Wire-tailed Swallow	*Hirundo smithii*	Hirudinidae	LC/II
129	Yellow Wagtail	*Motacilla flava*	Motacillidae	LC/II
130	Yellow-eyed Babbler	*Chrysomma sinense*	Timaliinae	LC/II
131	Yellow-fronted Pied woodpecker*	*Dendrocopos mahrattensis*	Picidae	LC/II
132	Yellow-wattled Lapwing *	*Vanellus malarbaricus*	Charadriidae	LC/II
		BUTTERFLIES		
1	Spot swordtail*	*Graphium nomius Esper*	Papilionidae	C
2	Crimson rose*	*Pachiopta hector Linnaeus*	Papilionidae	LC/II
3	Common rose	*Pachliopta aristolachiae Fabricius*	Papilionidae	C
4	Red helan*	*Princepes helenus helenus Hampson*	Papilionidae	C
5	Malabar banded peacock*	*Papilio buddh Westwood*	Papilionidae	II
6	Lime butterfly*	*Papilio demoleus Linnaeus*	Papilionidae	C
7	Chocolate albatross*	*Appias lyncida Cramer*	Pierinae	II
8	Common Jezebel*	*Delias eucharis Drury*	Pierinae	C
9	Common emigrant	*Catopsilla pomona Fabricius*	Coliadinae	C
10	Common grass Yellow	*Eurema hecabe contubernalis Moore*	Coliadinae	C
11	Angled Sunbeam*	*Curetis dentata Moore*	Curetinae	C
12	Common Silverline	*Spindasis vulcans fusca Moore*	Theclinae	C
13	Angled pierrot	*Caleta caleta decidia Cromer*	Polypmmatinae	C
14	Pea Blue*	*Lamipes boeticus Linneaus*	Polypmmatinae	II
15	Common pierrot	*Castalius rosimon rosimon*	Polypmmatinae	II
16	Dark pierrot*	*Tarueus ananda*	Polypmmatinae	IV
17	Common four ring	*Ypthima hubenri hubenri Fabricius*	Polypmmatinae	C
18	Common nawab	*Polyura athamas athamas Drury*	Charaxinae	C
19	Angled Castor	*Ariadne ariadne pallidior Frusthorfer*	Nymphalinae	C

20	Common castor	*Ariadne merione assama Evans*	Nymphalinae	C
21	Lemon pansy *	*Precis lemonias lemonias L*	Nymphalinae	C
22	Commander	*Moduza procis procis Cramer*	Nymphalinae	C
23	Tree Nymph	*Idea malabarica Moore*	Danainae	C
24	Common Indian Crow	*Euploea core Cramer*	Danainae	C
25	Plain Tiger	*Danaus (Anosia) chrysippus L*	Danainae	C
26	Grass demon	*Edaspes folcus Cramer*	Hesperiidae	C
27	Common dart	*Potanthus spp Fabricius*	Hesperiidae	C
		AQUATIC SPECIES		
1	Spangled emperor*	*Lethrinus nebulosus*	Lethrinidae	NE
2	Mangrove red snapper*	*Lutjanus argentimaculatus*	Lutjanidae	NE
3	Malabar blood snapper	*Lutjanus malabaricus*	Lutjanidae	NE
4	John's snapper*	*Lutjanus johni*	Lutjanidae	NE
5	Indian mackerel	*Rastrelliger kanagurta*	Lutjanidae	DD
6	Goatee croaker	*Dendrophysa russelli*	Sciaendae	NE
7	Chacunda gizzard-shad*	*Anodontostoma Chacunda*	Clupeidae	NE
8	Engraved catfish	*Arius caelatus*	Ariidae	NE
9	Shetki	*Gerres limbatus*	Gerreidae	NE
10	Kalundar	*Etroplus suratensis*	Cichlidae	NE
Crabs				
11	Christian crabs	*Charybdis cruciate*	Portunidae	NE
12	Blue swimming crab	*Portunus Pelagicus*	Portunidae	NE

Note: *LC - Least concern, NT - near threaten, VU – Vulnerable, C-Common, NE- Near Threathend, DD-Data Deficient, Wildlife Protection Act -2022*

**** Secondary sources :***

1. https://ebird.org/hotspot/L967292/bird-list?rank=lrec – Salim Ali Bird Sanctuary

2. https://forest.goa.gov.in/sites/default/files/2022-06/ffnorth.pdf - Goa Forest Deparment

3.9 SOCIAL ENVIRONMENT

3.9.1 BRIEF METHODOLOGY OF DATA COLLECTION / DESCRIPTION OF ENVIRONMENT

Generally, population and environment are dependent upon each other in echo balance. People's livelihood and their lifestyles are to a large extent depend upon the environment. However, the fragile balance between population and environment may be disturbed when people over exploit the natural resources more than required.An attempt was made to understand the current socio-economic status of the study area and to predict the impact of the mining project on their lives and surroundings. The data would also help in designing suitable CSR (Corporate Social Responsibility) activities in the mining buffer zone to bring positive changes on the livelihood of the population in the area.

The data for the study was collected in April 2023 using methods like random sample survey of households, in-depth interviews and Focus Group Discussions (FGDs). Data on socioeconomic status of population was collected using random sample survey of households. Data on the infrastructure facilities was collected from the village elders, local officials and secondary sources. Assessment of minimum needs of the community was collected using FGDs and in-depth interviews.Data on morbidity pattern was collected from any one or more Primary Heath Centre (PHC) either in buffer zone or nearby buffer zone. Data on village population, caste composition, literacy status, labor force participation, and occupational and industrial classification of workers have been collected from Census 2011 and through a sample survey.There are 56 villages/towns - 50 villages and 6 census towns (CT), in the buffer zone. Of these, 56 villages/towns, 45 villages and 6 towns are located in 6 talukas of North Goa and 5 villages in Dodamarg taluka of Sindhudurg district in Maharashtra. As the data pertains to large number of villages and towns are in North Goa, the buffer zone is compared to North Goa District.Five Villages/towns, namely Mayem, Bicholim, Sirigao, Lamgao and Pilgao, were selected randomly probability proportional to population size. All households were listed in selected villages and town for the selection of households. Twenty households were selected randomly with equal probability from each village/town. In all, data were collected from 100 households for the study. The Census 2011 data was tabulated below. Detailed methodology, sampling, aims and objectives, data collection methods, schedules, tabulation plan, quality checks, report layout and other techniques are presented in SOP. The Socio-Economic survey was conducted on 12th to 16th of April 2023. The list of villages in which the survey was conducted are:

Table No. 3.28: List of Villages Surveyed

Villages Names	Nos of Households
Mayem	25
Bicholim	15
Sirigao	30
Lamgao	10
Pilgao	20

3.9.1.1 Demographic Status:

Population size and sex composition are presented in Tables 3.29 from census. Generally, population size is expected to grow steadily over time, but small habitats like villages and small towns may sometimes experience negative growth because of migration and other rare causes like endemic diseases.

3.9.1.1a Population in the Buffer Zone- Broad Findings:

The total population of these villages and towns is 197,452 according to census 2011 and the population could grow marginally to 214,493 according to projections 2023.The village population size varies widely from 202 persons in Caraim to 9076 in Tivim. Nine villages are having less than 1000, followed by 19 villages between 1000 and 2000, and the rest 22 villages and 6 towns have population more than 2000. The sex ratio ranges as low as 927 females for 1000 males as per the survey 2023 as compared to 984 females in the census 2011 in buffer zone. This could be possibly due to high female mortality in reproductive ages. The sex ratio is lowest in Paliem. The sex ratio is highest in Calvim village with 1239 females for 1000 males. This was observed to be due to male out-migration for better job opportunities. The average number of persons per household is similar according to census 2011 (4.3) and in survey 2023 (4.2) in buffer zone.The sex ratio is higher in the district according to projections in 2023 than in census 2011. This may be due to improvement in female mortality which has been observed in the country as a whole.

Comparison with district: The sex ratio in the buffer zone is lower than the district. The average number of persons per household in buffer zone is the same as that of district.

Inferences focusing need assessment: In general, there are more males than females in buffer zone because females experience maternal mortality in reproductive ages. However, there has been an improvement in the sex ratio according to projections because of notable decline in maternal mortality. Even then, there is a need to consider reproductive health care among females to reduce reproductive morbidity and maternal mortality.

Table 3.29: Population in buffer zone villages, 2011 Census.

Village	Number of households	Male	Female	Total	Sex ration/(F/M per 1000)
Alorna	600	1351	1300	2651	962
Cansarvornem	310	752	630	1382	838
Ozorim	394	892	777	1669	871
Dargalim	1331	2872	2824	5696	983
Tuem	652	1422	1329	2751	935
Oxel	633	1329	1465	2794	1102
Nadora	295	648	609	1257	940
Pirna	632	1267	1301	2568	1027
Assonora	944	1898	1972	3870	1039
Sircaim	713	1442	1408	2850	976
Tivim	2244	4552	4524	9076	994
Assagao	952	2216	2151	4367	971

Paliem	314	778	599	1377	770
Punola	199	445	419	864	942
Ucassaim	278	509	568	1077	1116
Nachinola	645	1360	1365	2725	1004
Corjuem	640	1303	1422	2725	1091
Calvim	113	180	223	403	1239
Olaulim	172	308	351	659	1140
Pomburpa	757	1554	1541	3095	992
Mapusa (M Cl)	9466	20322	19667	39989	968
Salvador do Mundo (CT)	1516	3228	3145	6373	974
Aldona (CT)	1624	2925	3345	6270	1144
Caraim	44	103	99	202	961
Navelim	280	522	611	1133	1170
Goltim	423	755	879	1634	1164
Malar	382	813	817	1630	1005
Ella	1258	2702	2670	5372	988
Bainguinim	388	754	747	1501	991
Jua (CT)	1057	1971	2163	4134	1097
Bicholim (M Cl)	3978	8771	8215	16986	937
Mencurem	306	674	707	1381	1049
Dumacem	59	147	149	296	1014
Salem	761	1724	1703	3427	988
Adwalpale	326	686	726	1412	1058
Sirigao	361	820	797	1617	972
Mulgao	926	1998	1894	3892	948
Ona	167	336	349	685	1039
Maulinguem North	323	739	718	1457	972
Curchirem	435	1033	1010	2043	978
Sarvona	787	1865	1721	3586	923
Maem	1728	3763	3781	7544	1005
Vainguinim	156	347	359	706	1035
Aturli	112	234	233	467	996
Naroa	419	952	945	1897	993
Piligao	600	1295	1348	2643	1041
Amone	694	1482	1481	2963	999
Podocem	241	479	487	966	1017
Poriem	903	2172	2018	4190	929
Tivrem	454	960	918	1878	956
Candola (CT)	1280	2742	2612	5354	953
Vazare	342	698	695	1393	996
Ambadgaon	283	552	565	1117	1024
Matane	467	1073	921	1994	858
Ayee	386	850	803	1653	945
Kasai	931	1964	1847	3811	940
Buffer Zone	46681	99529	97923	197452	984
North Goa	191766	416677	401331	818008	963
Projections 2023					
Buffer Zone	54047	107571	106927	214493	994
North Goa	227694	453305	441969	895274	975

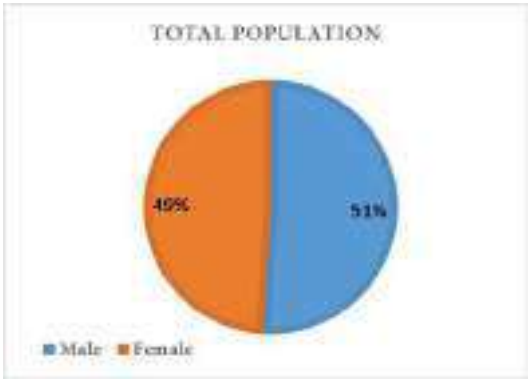


Fig.3.13. Graph showing Male & Female population

3.9.1.1 b Percentage distribution of population by age and sex in buffer zone- Broad Findings:

The age structure of the population is presented in **Table 3.30** from survey 2023. The fertility levels have generally been declining in the state and in India. Even in buffer zone, fertility seems to be low as the percentage of population less than 14 and is around 21 as per according to the survey (a rough indicator of level of birth rate for 15-year period). Age structure by sex is very important parameter because it influences many socioeconomic and medical needs of population. So, the CSR activities need to consider the age and sex distribution of population for micro level planning.

Inferences focusing need assessment:

About 17 per cent of elderly (60+) are in need of assistance like general health checkups, eye checkups, vision glasses and old age supporting equipment like walking sticks, and the like.About 7 per cent of the population is in primary school going age (5-9) needing supportive activities like supply of school uniforms and books, transport to school, tuitions for children having learning deficiency and supporting mid-day meal program and the like.About 18 per cent of the population aged 10-19 is potential entrants into higher studies and labour force. They can be trained in vocational centers taking local needs of the industry into consideration. About 62 per cent of the population is in the working age group (15-59). Many of them are in need of employment, especially females. Therefore, feasible welfare schemes like milk dairy, poultry, sheep rearing, piggery and the like should be encouraged through self-help groups (SHGs).About 52 per cent of females in reproductive ages and 6 per cent of children in less than 5 years of age are in need of reproductive and child health (RCH) care.

Table 3.30: Percentage distribution of population by age and sex in buffer zone, Survey 2023.

Age	Male	Female	Total
0- 4	5.6	6.0	5.8
5- 9	6.4	6.5	6.5
10-14	9.3	7.8	8.6
15-19	9.4	8.6	9.0
20-24	8.1	7.4	7.8
25-29	7.1	7.4	7.2
30-34	6.8	6.9	6.8
35-39	7.2	6.9	7.1
40-44	7.7	7.2	7.5
45-49	6.7	6.5	6.6
50-54	5.5	6.0	5.7
55-59	4.7	4.8	4.7
60-64	4.7	4.6	4.7
65-69	4.2	5.4	4.7
70-74	3.3	3.9	3.6
75-79	1.7	2.0	1.8
80+	1.6	2.1	1.8

3.9.1.2 Social Status

The percentage distribution of population by caste from census 2011 and survey 2023 has been presented in **Tables 3.31A** and **3.31B**. The SCs and STs are socially disadvantage groups of population needing special attention to integrate them in the main stream of socioeconomic development. So, CSR activities have to give special focus to these groups for micro level planning.

It is generally not desirable to describe trends in caste composition of population because the caste composition of SC and ST groups keep changing by adding new castes in each census and also conversions to other denomination. The percentage of SC population in the buffer zone is 2.9 per cent according to census and 2.2 according to the survey 2023. The percentage of SC population is not uniform across villages. It varies from 0.1 per cent in Bainguinim and 12.9 per cent in Maulinguem North. The SC population is not listed in 9 villages, followed by less than one per cent in 12 villages; between one and 5 per cent per cent in 25 villages, and more than 5 per cent in 10 villages.

The percentage of ST population in the buffer zone is 2.1 per cent according to census and 1.1 according to the survey 2023. The percentage of ST population is not uniform across villages. It varies from 0.1 per cent in Vainguinim and 38.2 per cent in Piligao. The ST population is not listed in 21 villages, followed by less than one per cent in 17 villages; between one and 5 per cent in 9 villages and between 5 and less than 10 per cent in 6 villages and more than 15 per cent in 3 villages.The percentage of SC and ST population trends are similar between census and projections 2023.

Comparison with district: While the percentage of SC is very similar between buffer zone and (2.9) the North Goa (2.2), the ST population is significantly higher in North Goa (6.9) than buffer zone (2.1).Secondly, while the concentration of SC population is more than 5 per cent in 10 villages, the concentration of ST population is more than 5 per cent in 9 villages.

Inference focusing need assessment: There is substantial SC population only in small number villages and the concentration of ST population is in many villages. So, health camps, water supply and sanitation facilities and the like have to be organized in those villages.

Table 3.31A: Percentage Distribution of Population by Broad Caste Groups in Buffer Zone, Census 2011 and Projected 2023.

Village	% SC	% ST	% Others	Total
Alorna	5.9	0.2	94.0	100.0
Cansarvornem	2.4	0.0	97.6	100.0
Ozorim	3.4	0.0	96.6	100.0
Dargalim	5.0	0.0	95.0	100.0
Tuem	4.9	0.1	95.0	100.0
Oxel	0.3	0.0	99.7	100.0
Nadora	0.0	0.0	100.0	100.0
Pirna	1.8	0.0	98.2	100.0
Assonora	1.8	0.2	98.0	100.0
Sircaim	2.2	0.1	97.7	100.0
Tivim	3.2	0.2	96.6	100.0
Assagao	3.4	0.5	96.1	100.0
Paliem	0.9	0.0	99.1	100.0
Punola	5.1	8.9	86.0	100.0
Ucassaim	0.0	0.7	99.3	100.0
Nachinola	3.8	1.7	94.6	100.0
Corjuem	9.2	2.0	88.8	100.0
Calvim	0.0	5.0	95.0	100.0
Olaulim	4.4	0.6	95.0	100.0
Pomburpa	0.5	0.3	99.2	100.0
Mapusa (M Cl)	4.1	0.4	95.5	100.0
Salvador do Mundo (CT)	3.2	2.4	94.5	100.0
Aldona (CT)	3.3	3.2	93.5	100.0
Caraim	0.0	2.0	98.0	100.0
Navelim	1.6	26.0	72.4	100.0
Goltim	0.5	16.0	83.5	100.0
Malar	0.3	4.7	95.0	100.0
Ella	1.2	7.2	91.7	100.0
Bainguinim	0.1	0.7	99.3	100.0
Jua (CT)	0.9	2.0	97.0	100.0
Bicholim (M Cl)	2.2	0.5	97.3	100.0
Mencurem	5.3	0.0	94.7	100.0
Dumacem	0.0	0.0	100.0	100.0
Salem	3.1	0.0	96.9	100.0
Adwalpale	8.1	0.0	91.9	100.0
Sirigao	0.0	0.0	100.0	100.0

Mulgao	4.3	0.0	95.7	100.0
Ona	5.5	0.0	94.5	100.0
Maulinguem North	12.9	0.1	87.0	100.0
Curchirem	0.0	0.0	100.0	100.0
Sarvona	1.6	1.0	97.4	100.0
Maem	1.0	0.0	99.0	100.0
Vainguinim	0.0	0.1	99.9	100.0
Aturli	0.0	0.0	100.0	100.0
Naroa	4.4	9.2	86.4	100.0
Piligao	1.7	38.2	60.2	100.0
Amone	0.5	0.0	99.5	100.0
Podocem	0.6	0.0	99.4	100.0
Poriem	0.3	0.0	99.7	100.0
Tivrem	1.0	6.5	92.5	100.0
Candola (CT)	0.5	15.1	84.5	100.0
Vazare	5.0	0.0	95.0	100.0
Ambadgaon	0.7	0.1	99.2	100.0
Matane	1.6	0.1	98.4	100.0
Ayee	8.5	1.3	90.2	100.0
Kasai	3.8	0.8	95.3	100.0
Buffer Zone	2.9	2.1	95.0	100.0
North Goa	2.2	6.9	90.9	100.0
Projections 2023				
Buffer Zone	2.0	3.0	94.9	100.0
North Goa	2.8	5.1	92.1	100.0

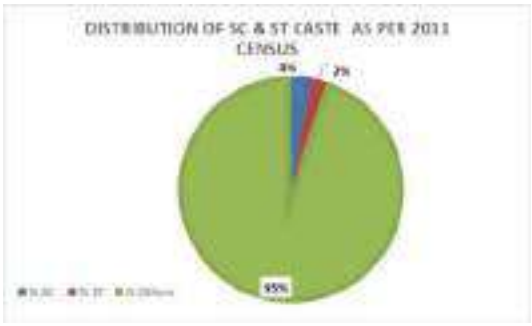


Fig.3.14 Percentage distrubtuion population by board caste groups as 2011 census

Table 3.31B: Percentage Distribution of Survey Population by Broad Caste Groups in Buffer Zone, Survey 2023.

Village	% SC	% ST	% Others	Total
Buffer Zone	3.5	1.1	95.4	100.0

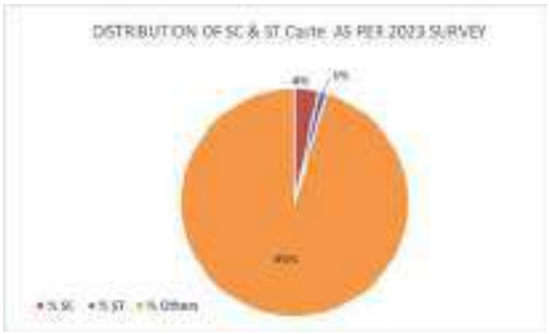


Fig.3.15 Percentage distrubtuion population by board caste groups as per 2023 projections

3.9.1.3 Educational Status

Literacy status: The literacy rates from the census 2011 and survey 2023 have been presented in **Tables 3.32A** and **3.32BG**. The literacy rates are defined as percentage of literates to the population aged 6+. This is according to the definition of census and the same is being followed across India. Literacy is considered to be a social as well as economic measure. It is said that literacy helps society to integrate with the ongoing developmental process. Percentage of literacy among males and females is steadily growing over many years, but the percentage of male literacy is always higher than females with a wide margin. However, the difference between male and female literacy rates are narrowing in the recent years.The literacy rates in buffer zone are about 90 per cent in buffer zone according to the census 2011 (87.5) and the survey 2023 (91.6). The literacy rates range from 70.6 per cent in Nhaichiad to 95.8 per cent in Caraim indicating significant variation.

The literacy rates are between 70 to less than 80 per cent in 6 villages, followed by between 80 and less than 90 per cent in 22 villages and more than 90 per cent in 28 villages. As expected, the literacy rates are higher among males than females. The difference is less than 5 percentage points in 9 villages followed by, between 5 and 10 percentage points in 26 villages and more than 10 percentage points in the rest 23 villages.

Comparison with District: The literacy rates are lower in the district than in the buffer zone. The female literacy rates are lower than males both in the district and in the buffer zone.

Inference focusing need assessment: The project proponent can think of supplying school uniforms, books and proving transport to school which will discourage school dropouts, especially female children. Also, there is a need for generating employment for educated youth entering into labor force.

Table 3.32A: Literacy Rates in Buffer Zone, Census 2011 and Projected 2023.

Village	Male	Female	Total
Alorna	92.7	81.2	87.0
Cansarvornem	87.9	74.6	81.9
Ozorim	86.1	78.0	82.3
Dargalim	95.6	85.1	90.4
Tuem	92.8	83.1	88.1
Oxel	95.8	87.7	91.6
Nadora	96.4	87.2	92.0
Pirna	92.7	83.8	88.2
Assonora	95.7	91.0	93.3
Sircaim	94.6	89.3	92.0
Tivim	94.2	87.7	90.9
Assagao	96.2	90.9	93.6
Paliem	94.3	86.6	91.0
Punola	92.7	92.5	92.6
Ucassaim	91.9	84.3	87.9
Nachinola	90.9	86.4	88.6
Corjuem	92.8	87.5	90.0
Calvim	87.4	76.5	81.3
Olaulim	92.6	82.9	87.3
Pomburpa	96.2	89.1	92.6
Mapusa (M Cl)	94.4	89.6	92.0
Salvador do Mundo (CT)	93.5	89.3	91.4
Aldona (CT)	94.0	88.2	90.9
Caraim	97.9	93.5	95.8
Navelim	92.3	83.7	87.7
Goltim	96.3	88.5	92.1
Malar	97.3	87.8	92.5
Ella	93.3	86.8	90.1
Bainguinim	92.6	88.4	90.5
Jua (CT)	91.3	91.9	91.6
Bicholim (M Cl)	94.6	88.9	91.9
Mencurem	91.7	78.3	84.9
Dumacem	95.5	88.0	91.8
Salem	93.7	83.3	88.5
Adwalpale	92.7	77.7	84.9
Sirigao	97.0	86.4	91.8
Mulgao	95.2	87.1	91.3
Ona	93.6	80.5	86.9
Maulinguem North	87.6	70.8	79.2
Curchirem	84.0	68.0	76.0
Sarvona	92.5	86.9	89.8
Maem	94.3	85.0	89.7
Vainguinim	97.8	91.6	94.6
Aturli	92.6	79.5	86.2
Naroa	93.5	79.7	86.6
Piligao	94.1	82.4	88.1
Amone	96.4	86.4	91.4

Podocem	90.5	77.0	83.7
Poriem	90.0	77.2	83.8
Tivrem	93.4	88.5	91.0
Candola (CT)	94.1	86.3	90.3
Vazare	85.0	58.7	72.0
Ambadgaon	86.1	60.0	72.9
Matane	82.9	56.7	70.6
Ayee	87.4	65.7	76.6
Kasai	93.8	84.1	89.1
Buffer Zone	93.5	85.9	89.7
North Goa	93.4	85.6	89.6
Projections 2023			
Buffer Zone	97.0	95.0	96.1
North Goa	96.3	92.7	94.6

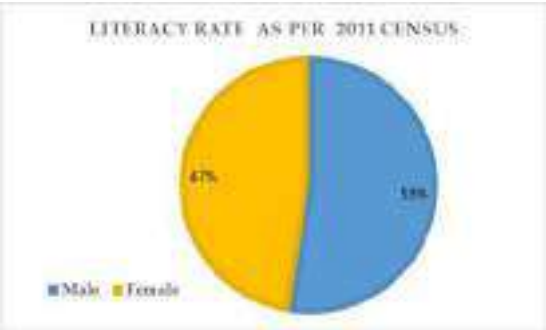


Fig.3.16. Percentage distrubtuion of literacy rate population as per 2011 census

Table 3.32B: Literacy Rates in Buffer Zone, Survey 2023.

Village	Male	Female	Total
Literacy rates	95.4	90.2	92.9
Mean years of schooling	8.6	8.5	8.6

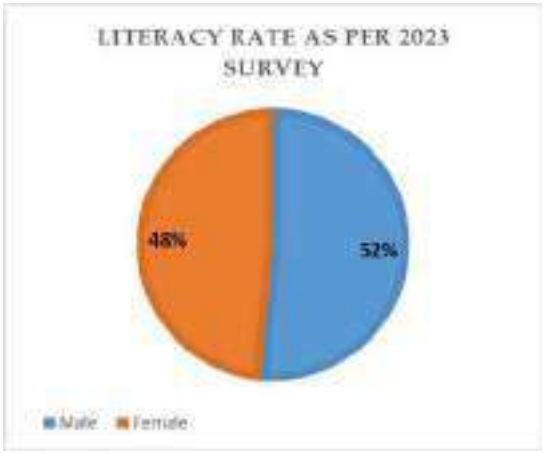


Fig.No.3.17 Graph showing Literacy rate as per 2023 survey

3.9.1.4 Employment

The labor force participation rates (percentage of workers to the total population) from the census 2011 and survey 2023 have been presented in **Tables 3.33A** and **3.33B**. The labor force participation rate is indicative of economically active population. It is known that only the able persons without any stigma to work outside home are available to participate in the labor force. The rest depend upon the working population for a living. As the work is getting complex with industrialization, simple manual work does not suffice until workers acquire special skills to get employment. The skills generally are being acquires at home and by schooling and vocational training in institutions. Any secular trend in labor force participation cannot be described because female participation is uncertain and entry into and exit from labor force is frequent. Also, the definitional changes of 'worker' is itself influence the female labor force more than male. Therefore, it is not advisable to describe trend in labor force participation.

The labor force participation is marginally lower (38.5 per cent) according to census than the survey 2023 (39.5 per cent) in buffer zone. The labor force participation rates vary among villages from 31.9 per cent in Oxel to 53.0 per cent in Olaulim.

This is due to large variation between male and female participation rates. The total participation rates will be higher when female participation rates are also higher. The male labour force participation rates vary from 46.1 per cent in Calvim to 64.9 per cent in Ambadgaom with a difference of about 19 percentage points. Whereas, the female labor force participation rates vary from 12 per cent in Sirigao to 49.0 per cent in Olaulim, a difference of 37 percentage points. The levels of work participation rates in 2023 are lower according projections.

The male work participation rates are higher (about 57 per cent) than female (about 22 per cent) in buffer zone according to census and also survey. The work participation is also higher among males than females in all villages.

Comparison with district: The work participation rates are almost similar in the buffer zone and the district.

Inference focusing need assessment: In general, female labor force participation is lower than males. Some welfare programs like milk dairy and poultry etc., can be designed. Villages having low labor force participation among males/females can be selected for implementation of welfare programs.

Table 3.33A: Labor force Participation Rates (% workers) in Buffer Zone, Census 2011 and Projected 2023.

Village	Male	Female	Total
Alorna	54.6	25.5	40.3
Cansarvornem	60.6	16.8	40.7
Ozorim	56.3	18.5	38.7
Dargalim	59.6	26.0	43.0
Tuem	54.7	24.8	40.2
Oxel	52.5	13.2	31.9
Nadora	57.4	20.4	39.5
Pirna	57.2	17.7	37.2
Assonora	58.1	32.4	45.0
Sircaim	56.7	18.8	38.0
Tivim	55.2	20.0	37.7
Assagao	56.1	26.3	41.4
Paliem	54.1	19.7	39.1
Punola	58.0	19.8	39.5
Ucassaim	52.8	19.4	35.2
Nachinola	58.2	27.3	42.7
Corjuem	47.3	21.2	33.7
Calvim	46.1	22.0	32.8
Olaulim	57.5	49.0	53.0
Pomburpa	54.9	22.5	38.8
Mapusa (M Cl)	58.3	22.4	40.6
Salvador do Mundo (CT)	56.9	24.9	41.1
Aldona (CT)	52.2	20.1	35.1
Caraim	53.4	13.1	33.7
Navelim	52.7	18.3	34.2
Goltim	51.1	21.3	35.1
Malar	55.0	25.2	40.1
Ella	57.9	19.0	38.6
Bainguinim	61.3	29.9	45.6
Jua (CT)	55.8	16.5	35.2
Bicholim (M Cl)	56.2	17.9	37.7
Mencurem	55.3	27.7	41.2
Dumacem	55.1	27.5	41.2
Salem	54.4	13.6	34.1
Adwalpale	59.6	26.6	42.6
Sirigao	52.6	12.4	32.8
Mulgao	55.3	17.4	36.9
Ona	52.4	21.8	36.8
Maulinguem North	52.2	16.6	34.7
Curchirem	56.1	24.0	40.2
Sarvona	57.7	16.2	37.8
Maem	55.7	20.7	38.1
Vainguinim	53.0	15.3	33.9
Aturli	55.1	24.5	39.8
Naroa	59.2	19.6	39.5
Piligao	55.8	19.9	37.5

Amone	54.6	13.2	33.9
Podocem	63.0	31.0	46.9
Poriem	53.4	22.2	38.4
Tivrem	58.0	21.8	40.3
Candola (CT)	57.8	24.4	41.5
Vazare	60.5	35.3	47.9
Ambadgaon	64.9	15.0	39.7
Matane	60.7	22.4	43.0
Ayee	61.6	18.2	40.5
Kasai	53.6	13.3	34.1
Buffer Zone	56.5	21.2	39.0
North Goa	57.4	22.1	40.1
Projected 2023			
Buffer Zone	59.0	19.5	39.5
North Goa	57.8	18.9	38.5

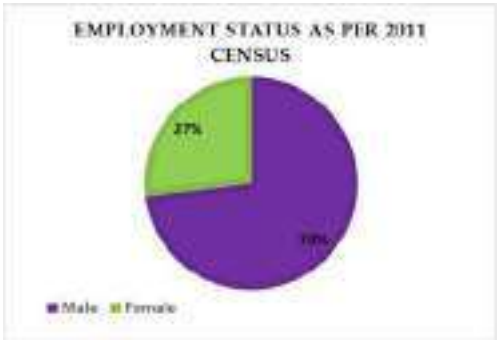


Fig.No.3.18. Graph showing Employment status as per 2011 census

Table 3.33B: Labor force Participation Rates in Buffer Zone, Survey 2023.

Village	Male	Female	Total
Buffer zone	59.2	20.3	40.5

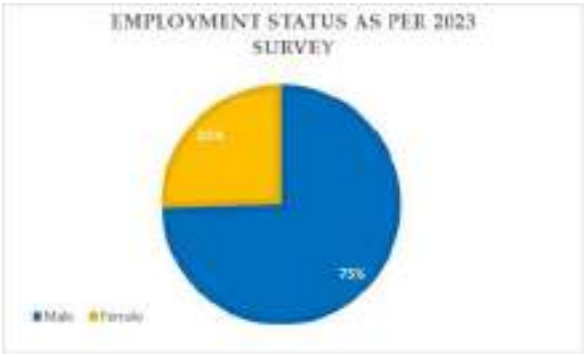


Fig.No.3.19. Graph showing Employment status as per 2023 Survey

3.9.1.5 Industrial status

The percentage distribution of workers by industry according to the census 2011 is presented in **Table 3.34**. These data indicate the predominant industry providing employment in the region. Generally, there is underemployment in the agriculture sector pushing labor force to non-agriculture sector, mostly to service sector. Thus, the work participation in primary sector is declining and other sectors (secondary and tertiary) growing. The same is being observed in the North Goa and buffer zone. The declining trend in agriculture to some extent can be mitigated by appropriate interventions by CSR activities. The local population do not dependent on agriculture. Of all workers, only 12 per cent in buffer zone and 9 per cent in the North Goa are engaged in agriculture sector. About 87 per cent of cultivation depends upon rain and the rest 13 per cent on irrigation under small dams, tanks and bore wells. Therefore, cultivation depends upon rainfall and vagaries of weather. This may negatively impact household income.

Comparison with district: Although, the population depends upon non-agricultural occupation in both buffer zone and in the district, the projections indicate a declining trend in work participation in agriculture sector in buffer zone and in the district.

Inference focusing need assessment: There is a need to revamp agriculture by supplying seeds of high yielding varieties.

Table 3.34: Percentage distribution of workers in Buffer zone and in Rural District by industry, Census 2011 and Projected 2023.

Census 2011	Male	Female	Total
Buffer zone			
Cultivators	5.8	8.6	6.5
Agriculture laborers	4.0	8.3	5.1
Household industry	2.9	2.9	2.9
Others	87.4	80.3	85.5
Total	100.0	100.0	100.0
District			
Cultivators	3.9	7.0	4.7
Agriculture laborers	3.6	6.2	4.3
Household industry	2.5	3.2	2.7
Others	90.0	83.6	88.3
Total	100.0	100.0	100.0
Projections 2023			
Buffer Zone			
Cultivators	5.6	5.0	7.3
Agriculture laborers	1.5	1.9	1.4
Household industry	2.6	2.9	1.8
Others	90.3	90.2	89.5
Total	100.0	100.0	100.0

District			
Cultivators	1.7	1.3	2.6
Agriculture laborers	1.3	1.4	0.9
Household industry	2.3	2.5	1.9
Others	94.7	94.8	94.6
Total	100.0	100.0	100.0

3.9.1.6 **Village level industrial status**: The percentage of workers in secondary and tertiary sectors of economy is presented in **Table 3.35**. These data indicate the village economy. Mining and other related activities had brought in the non-agriculture activities in the villages. The activities are mostly related to transportation of Iron Ore and petty shops. The percentage of workers in non-agriculture sector varies across villages in the buffer zone. It ranges from 22.3 per cent in Ambadgaon to 98.6 per cent in Mapusa town. The percentage of workers engaged in non-agriculture sector is less than 50 per cent in 3 villages

Comparison with district: The percentage of workers engaged in non-agriculture sector is lower in buffer zone than in the district.

Inference focusing need assessment: The dependence on agriculture is very low in buffer zone. Some welfare programs for farmers and agriculture laborers and vocational training for youth should be initiated.

Table 3.35: Percentage of workers engaged in secondary and tertiary sectors by village, Census 2011 and Projected 2023.

Village	Total
Alorna	64.5
Cansarvornem	83.6
Ozorim	75.9
Dargalim	82.9
Tuem	83.4
Oxel	88.4
Nadora	86.7
Pirna	79.6
Assonora	88.6
Sircaim	89.6
Tivim	88.2
Assagao	93.4
Paliem	87.9
Punola	92.7
Ucassaim	94.2
Nachinola	90.0
Corjuem	86.4
Calvim	83.3
Olaulim	54.2

Pomburpa	88.5
Mapusa (M Cl)	98.6
Salvador do Mundo (CT)	97.3
Aldona (CT)	94.2
Caraim	92.6
Navelim	84.8
Goltim	89.4
Malar	83.5
Ella	92.3
Bainguinim	95.8
Jua (CT)	98.3
Bicholim (M Cl)	98.2
Mencurem	85.2
Dumacem	82.8
Salem	73.4
Adwalpale	78.6
Sirigao	91.7
Mulgao	88.6
Ona	91.7
Maulinguem North	88.3
Curchirem	57.1
Sarvona	89.4
Maem	80.0
Vainguinim	83.7
Aturli	76.9
Naroa	80.1
Piligao	90.8
Amone	87.2
Podocem	80.4
Poriem	73.4
Tivrem	90.1
Candola (CT)	96.1
Vazare	24.6
Ambadgaon	22.3
Matane	56.1
Ayee	49.9
Kasai	77.2
Buffer Zone	88.3
North Goa	91.0
Projections 2021	
Buffer zone	91.3
North Goa	96.5

3.9.1.7 Information on agriculture situation

The buffer zone is not having high concentration of economically and socially weaker section of the population like SCs and STs. Many of them are dependent on secondary and tertiary sectors because of lack of land to cultivate.

Only 36 per cent of the total area is under cultivation. The percentage distribution of households by size of land holdings from the survey 2023 is presented in **Table 3.36**.

Many households reported having land. Of them, 32 per cent have no land to cultivate, 50 percent less than one hector, 15 per cent one to less than 2.5 hectors and 4 per cent more than 2.5 hectors. According to the socioeconomic and caste census (SECC) 2011, about 51 per cent of rural households are owning cultivable land in North Goa.The North Goa did not depend on agriculture. According to the socioeconomic and caste census (SECC) 2011, the percentage of rural household owning is only 49 per cent, and only 35 per cent is irrigated land in the total cultivable land. The percentage of landless households (51 per cent) is deriving major part of household income from non-agriculture sectors. According to the SECC 2011, about 4 per cent of the total rural households deriving income working as cultivators, 15 percent as manual laborers and the rest other occupations. About 60 per cent of the work force are engaged government sector (15 per cent), public sector (3 per cent) and private sector (42 per cent). Locally, mining related activities provide major opportunity for employment. Therefore, local mining industry and allied activities will supplement the local economy.

Inference for need assessment: The mining industry and other supporting industry in buffer zone will have impact in providing indirect and indirect employment for the local population.

Table 3.36 : Percentage Distribution of Households by Size of Land Holdings and Caste, Survey 2023.

Land holdings	SC	ST	Others	Total
No land	75.0	100.0	31.6	34.0
< 1 Ha	25.0		49.5	48.0
1.0 to <2.5 Ha			14.7	14.0
2.5+ Ha			4.2	4.0
Total	100.0 (4)	100.0 (1)	100.0 (95)	100.0 (100)

3.9.1.8 ANNUAL HOUSEHOLD INCOME FROM VARIOUS SOURCES

The estimated average household income per annum is more than Rs 100,550. Of the total household income, about 70 per cent is contributed by non-agriculture sector and 30 per cent by the agriculture sector. According to the SECC 2011, about 39 per cent of rural households are getting monthly income of rupees less than 5,000, about 32 per cent between rupees 5,000 and less than 10,000 and about 22 per cent above rupees 10,000. Therefore, the household's income is not high.

3.9.1.9 INFORMATION ON FAMILY BUDGET

The family expenses are mostly on food items (67 per cent), followed by on children schooling, on transport, and others (9 per cent), on entertainment (7 per cent), on personal hygiene (6 per cent), on health care (6 per cent), and on other emergencies (5 per cent).

3.9.1.10 SAVINGS

The respondents often reported that the savings are very low, lower than one percent. Often there is a need to borrow to supplement the family expenses.

3.9.1.11 FAMILY AMENITIES AND ASSETS

Household amenities: The percentage of households having various amenities from the census 2011 is presented in **Table 3.37**. People living conditions can be assessed by household amenities. Any deficiencies in amenities can be recommended to the project proponent to incorporate into CSR activities.

People always would be aspiring for comfortable living with all amenities. Therefore, percentage of households having amenities will grow steadily. In general, households have good amenities in buffer zone. It is observed that about 96 per cent of all households are living in good or livable house, 97 per cent living in house having one or more than one room, 84 per cent are living in their own house (because of towns in the buffer zone); 78 per cent have treated tap water supply within the house, 96 per cent use electricity for lighting, 76 percent have some type of latrine facility within the house, 89 per cent use some type of bath room facility within the house, 65 per cent have some type of drainage facility, 74 per cent use LPG/NPG for cooking. The variations in the percentage of household amenities are significant across villages.

Comparison with district: The percentage of households having amenities is similar between buffer zone and the district.

Inference focusing need assessment: Generally, the living conditions of the population are better as many households have amenities. However, the coverage of protected tap water and LPG/NPG for cooking is low and needs to be addressed. People use open well water in rural Maharashtra.

Table 3.37: Percentage of households living in good house with amenities, Census 2011.

Village	Percentage of households living in/having/using								
	Good or liveable house	House having at least one room	Own house	Treated tap water	Electricity as main source of lighting	Any type of latrine within house	Any type of bath room	Any type of drainage	LPG/ NPG for cooking
Alorna	95.2	97.8	97.1	87.5	96.7	48.9	63.5	31.2	29.8
Cansarvornem	96.3	94.5	93.4	84.2	96.0	54.4	79.8	9.9	14.0
Ozorim	94.1	95.7	95.7	74.2	96.7	59.1	91.3	25.6	67.0
Dargalim	98.2	97.7	94.7	77.9	97.5	75.1	85.8	36.2	59.2
Tuem	98.0	96.7	96.3	91.7	97.5	66.2	92.3	25.8	70.5
Oxel	99.4	99.2	96.4	90.2	98.1	76.4	93.8	86.1	91.5
Nadora	98.4	98.7	95.0	93.4	99.0	77.7	86.7	48.5	90.4
Pirna	97.9	99.3	92.8	69.4	98.4	67.2	91.0	29.1	67.8
Assonora	98.8	96.3	83.3	93.4	97.5	78.6	89.8	69.5	87.6
Sircaim	99.2	96.9	93.2	87.6	98.8	94.5	94.5	71.7	92.6
Tivim	97.0	97.0	80.5	83.1	97.4	77.4	88.1	66.2	83.0
Assagao	90.4	97.7	86.5	68.4	98.4	82.2	92.8	59.2	86.2
Paliem	98.9	99.3	90.4	82.3	98.5	76.4	93.0	64.2	93.0
Punola	99.3	100.0	98.6	89.0	100.0	89.0	95.2	99.3	99.3
Ucassaim	97.8	97.4	94.8	28.3	97.4	86.1	90.4	89.1	87.4
Nachinola	99.1	97.5	77.7	90.6	99.5	96.8	95.1	94.1	92.1
Corjuem	98.8	99.2	96.7	69.7	98.6	90.2	92.1	64.1	79.0
Calvim	100.0	99.1	100.0	95.7	99.1	100.0	100.0	99.1	98.3
Olaulim	96.5	99.4	97.7	41.1	99.4	80.0	94.9	93.7	93.7
Pomburpa	96.6	98.5	95.1	62.4	98.5	82.3	93.0	69.1	86.9
Mapusa (M Cl)	96.9	96.9	77.5	89.4	98.4	88.8	97.5	93.2	85.9
Salvador do Mundo (CT)	95.4	97.7	81.4	81.6	98.6	86.6	93.8	41.0	89.3
Aldona (CT)	99.0	98.7	93.2	65.8	97.6	92.1	98.0	84.2	86.8
Caraim	96.1	98.0	96.1	31.4	100.0	72.5	84.3	2.0	72.5
Navelim	100.0	98.9	94.3	90.0	98.6	85.4	82.9	17.8	88.6
Goltim	98.7	97.2	91.2	85.5	99.8	92.9	97.5	0.5	90.1
Malar	97.6	98.6	93.2	90.8	99.5	78.0	83.5	39.3	90.0
Ella	90.2	86.5	48.2	77.8	94.8	59.7	83.8	6.3	71.8
Bainguinim	85.0	98.6	71.1	73.1	91.9	84.4	89.9	79.5	81.8
Jua (CT)	97.1	99.1	90.5	96.3	99.0	88.3	96.9	13.7	91.0
Bicholim (M Cl)	97.4	97.3	68.4	87.1	96.3	84.4	95.9	87.4	82.1
Mencurem	99.7	99.3	98.3	77.6	97.3	65.1	95.6	89.5	70.5
Dumacem	100.0	100.0	74.3	50.0	74.3	40.5	97.3	77.0	14.9
Salem	93.0	96.8	92.8	84.4	97.4	69.9	88.4	94.8	42.7
Adwalpale	99.1	97.8	91.0	42.9	96.9	66.4	90.1	95.1	49.4
Sirigao	98.0	99.4	99.2	96.1	99.4	84.3	92.5	95.6	81.5
Mulgao	98.5	96.2	76.3	73.6	91.5	76.4	81.1	78.5	63.7
Ona	98.2	100.0	95.8	80.7	95.2	39.2	90.4	98.2	59.6
Maulinguem North	97.5	98.8	94.7	55.3	92.2	20.0	53.1	57.2	27.8
Curchirem	97.7	96.8	98.6	54.1	87.9	16.9	22.7	7.0	12.8
Sarvona	98.7	92.7	71.0	88.8	96.1	73.7	88.1	65.1	65.3
Maem	98.0	94.5	91.8	65.8	94.8	70.2	84.6	63.7	67.8
Vainguinim	99.4	98.7	91.8	76.7	95.0	71.1	86.2	69.2	77.4
Aturli	97.1	100.0	96.2	49.1	99.1	44.3	94.3	25.5	53.8

Naroa	95.9	96.4	91.8	54.9	91.3	53.3	71.3	49.4	60.7
Piligao	99.3	98.8	96.0	69.3	91.4	54.7	74.1	62.5	55.0
Amone	97.2	96.2	91.6	95.3	99.3	87.5	92.8	83.5	83.0
Podocem	92.3	99.6	78.4	95.3	93.2	51.7	72.9	80.9	47.9
Poriem	93.6	99.0	92.7	91.1	92.8	38.7	49.3	23.5	41.2
Tivrem	98.9	98.8	79.3	88.9	96.8	79.0	95.4	94.5	73.5
Candola (CT)	97.8	97.8	75.4	80.3	98.3	75.8	92.0	67.6	79.6
Vazare	91.5	99.7	96.9	4.1	82.7	17.9	78.3	3.5	2.2
Ambadgaon	97.9	99.3	99.3	0.0	77.3	22.0	98.9	0.0	0.0
Matane	52.3	99.8	96.8	0.2	70.8	20.4	61.3	0.5	0.7
Ayee	98.1	100.0	96.2	67.0	85.0	30.0	93.6	1.3	4.0
Kasai	95.1	95.1	78.3	13.3	94.1	71.0	85.9	25.2	34.4
Buffer Zone	96.4	97.1	83.7	78.3	96.4	76.2	89.5	64.7	73.6
North Goa	97.1	96.7	81.3	80.7	97.1	78.7	89.3	64.2	74.0

3.9.1.12 Household assets: The percentage of households having various assets from the census 2011 is presented in **Table 3.38**. Most of the assets presented relate to communications and transportation facilities. The data will help in assessing the peoples' mobility and their awareness of developmental activities. This will help the households in utilizing welfare programs effectively. Also, it is easy for the project proponent in implementing CSR activities.

Transport and communication facilities are needed when the local economy is being integrated with market economy. Therefore, transport and communication facilities are growing rapidly. It is observed that about 84 per cent of all households have a bank account; 31 per cent have radio or transistor, 81 per cent have television, 31 per cent have laptop with or without internet connection, 87 per cent have landline or mobile phone; 23 per cent have bicycle, 56 per cent have scooter or motorcycle or moped and 23 per cent have car or jeep or van. The variations in the percentage of household assets are significant across villages.

Comparison with district: The percentage of households having any assets is similar between buffer zone and the district.

Inference focusing need assessment: The households are having better communication facilities by having telephone or mobile phone, highly mobile by having scooter or motor cycle or moped or bicycle, car or jeep or van, and well connected with outside by having transistor or radio, TV and computer with or without internet.

Therefore, the population in buffer zone can easily be integrated with many development programs planned by project proponent.

Table 3.38: Percentage of households having the following assets, Census 2011.

Village	Percentage of households having							
	Bank account	Radio or tran-sistor	Television	Computer or laptop with or without internet	Landline or mobile or both	Bicycle	Scooter or motorcycle or moped	Car or jeep or van
Alorna	86.4	12.2	63.3	17.9	76.6	22.5	38.8	7.4
Cansarvornem	87.1	3.3	76.1	12.2	83.5	19.1	62.1	7.7
Ozorim	56.3	12.0	64.7	12.3	72.4	18.7	39.9	7.4
Dargalim	95.2	18.9	79.7	21.1	90.1	20.3	53.5	13.6
Tuem	98.3	8.2	82.7	17.3	86.2	20.3	49.9	7.7
Oxel	94.5	12.3	90.5	18.7	92.6	25.9	62.2	19.1
Nadora	96.3	17.9	82.1	18.3	90.3	20.6	54.5	15.9
Pirna	95.1	14.9	78.6	15.4	85.4	30.1	53.8	10.3
Assonora	97.8	25.5	86.5	30.9	91.7	18.3	49.5	20.3
Sircaim	95.6	23.2	87.3	23.5	89.1	13.3	53.8	20.1
Tivim	91.2	38.1	82.6	34.3	91.2	23.4	56.1	26.6
Assagao	81.4	48.1	88.6	26.4	94.4	31.8	72.6	31.4
Paliem	85.2	42.4	81.5	29.9	91.2	28.4	64.9	23.6
Punola	98.6	22.6	95.2	32.9	94.6	18.5	81.5	33.6
Ucassaim	81.7	60.0	84.3	32.1	83.9	33.0	59.1	23.0
Nachinola	93.3	47.5	93.9	28.8	95.6	23.7	75.2	30.9
Corjuem	93.8	31.0	86.0	45.4	92.2	17.1	53.8	21.6
Calvim	98.3	67.5	84.6	100.0	95.8	40.2	55.6	11.1
Olaulim	94.9	57.1	86.9	21.7	89.1	37.1	47.4	20.6
Pomburpa	89.3	48.3	89.6	39.0	86.1	20.3	61.7	22.0
Mapusa (M Cl)	89.8	45.7	90.8	42.4	95.1	26.8	65.4	36.4
Salvador do Mundo (CT)	93.2	48.2	89.9	44.4	95.9	30.4	71.3	40.1
Aldona (CT)	92.9	42.6	88.7	29.8	89.0	25.0	56.7	25.0
Caraim	84.3	45.1	86.3	53.0	94.2	27.5	60.8	17.6
Navelim	95.7	66.2	86.8	24.9	90.8	22.8	63.3	22.1
Goltim	96.8	43.3	89.4	22.6	91.2	15.9	63.8	30.6
Malar	95.1	20.1	87.5	16.8	87.5	23.6	56.1	18.7
Ella	82.0	34.4	77.5	30.2	92.1	17.6	51.4	26.3
Bainguinim	87.3	46.0	83.2	47.7	94.2	25.7	59.8	46.8
Jua (CT)	91.1	55.5	86.9	20.3	89.2	23.7	58.3	20.5
Bicholim (M Cl)	83.8	25.2	82.9	38.5	93.4	23.6	58.9	25.0
Mencurem	100.0	19.0	79.0	27.5	90.9	19.3	58.3	11.9
Dumacem	71.6	16.2	63.5	16.2	79.8	37.8	50.0	9.5
Salem	92.3	8.6	75.1	11.9	78.1	22.8	43.5	10.1
Adwalpale	87.3	7.1	71.3	18.2	52.5	19.8	42.6	11.7
Sirigao	95.0	11.9	83.4	22.4	89.5	15.2	66.0	15.7
Mulgao	79.6	28.3	70.9	34.5	90.4	24.6	52.4	22.8
Ona	80.7	43.4	75.3	16.2	80.1	33.1	54.2	13.3
Maulinguem North	28.1	6.6	60.9	7.5	48.5	8.1	25.9	6.9
Curchirem	25.3	10.0	42.9	11.1	51.1	17.2	22.3	6.0
Sarvona	62.1	15.6	79.4	26.2	93.0	20.7	54.9	18.7
Maem	74.4	18.9	76.3	31.1	84.6	27.3	50.4	13.6
Vainguinim	86.2	28.9	71.1	25.8	75.5	40.9	45.3	15.7
Aturli	54.7	8.5	88.7	14.1	89.7	26.4	61.3	7.5
Naroa	63.9	19.0	71.1	27.5	82.4	19.0	49.2	14.5
Piligao	88.4	14.6	71.1	19.3	75.4	15.3	45.5	14.0

Amone	72.4	10.6	78.9	19.7	86.1	16.8	54.3	15.9
Podocem	58.9	9.3	69.9	16.9	82.6	9.7	39.0	12.3
Poriem	62.8	11.6	62.1	15.2	66.4	12.2	37.4	7.9
Tivrem	91.9	28.3	82.3	49.6	91.9	18.2	53.2	20.3
Candola (CT)	83.7	22.1	82.6	40.6	90.0	16.7	58.4	20.3
Vazare	41.5	16.4	37.1	1.6	40.0	27.4	28.9	3.1
Ambadgaon	27.8	0.0	32.1	12.3	24.6	2.5	9.4	0.0
Matane	34.8	7.0	29.5	8.4	30.9	14.4	17.2	0.9
Ayee	30.8	15.5	39.7	1.4	52.0	22.5	23.3	2.4
Kasai	77.4	7.8	67.3	11.0	82.0	20.8	37.9	8.6
Buffer Zone	84.1	30.6	81.1	30.6	87.4	23.0	55.8	23.0
North Goa	87.2	32.2	81.7	31.4	88.8	23.3	56.6	24.8

3.9.1.13 RESPONDENT'S PERCEPTION ABOUT THE PROPOSED MINING PROJECT

Mining and related activities willgenerate direct well as indirect employment. The local economy became vibrant because of mining in terms of all-round cash flow and service activity earlier. Therefore, mining is going to be a dominant regional economic activity.

3.9.1.14 EMPLOYMENT AND INCOME

Occupation and income status: In general, non-agriculture income is the dominant economies in the buffer zone as well as in district. Of the total 3114 hectares of land area, 41 per cent is under net area sown and 6 per cent is under forest. The agriculture is dominated by rice cultivation and mango gardens. The percentage of workers age 10+ engaged in various activities from the survey 2023 has been presented in **Table 3.39.**

About 6 per cent of the population is engaged in agriculture sector as cultivators and another 6 per cent as agriculture laborers. While 11 per cent of the population is employed in public or private sectors, professionals, bank employee. Another 11 per cent is working in mining related activities like truck drivers, cleaners, garage workers, petty shop owners.

Inference focusing need assessment: The buffer zone is in the middle of many mining leases. Mining and mining related activities are the main industrial activity in the region. Therefore, mining related activates are the major source of direct and indirect employment.

Table 3.39: Percentage distribution of workers (age 10+) by occupation in Buffer Zone, Survey 2023.

Industry and occupation, buffer zone	Male	Female	Total
Housewife	0.0	43.2	20.7
Student	23.8	23.7	23.7
Not working	18.4	12.6	15.7
Disabled	0.0	0.0	0.0

Retired	3.4	1.6	2.5
Cultivators	6.3	5.3	5.8
Agriculture Laborers	6.8	4.2	5.6
Professionals	5.8	0.2	3.1
Employed (private or public)	8.7	3.7	6.3
Bank employee	1.9	0.5	1.3
Drivers, cleaners, garage workers	7.8	0.0	4.0
Truck business	5.3	0.0	2.8
Traditional occupation	1.5	1.1	1.3
Self-employed Hotel	4.4	2.1	3.3
Self-employed other business	3.9	2.1	3.0
Mine workers	1.9	0.0	1.0
Total	100.0 (206)	100.0 (190)	100.0 (396)

3.9.1.14 DATA RELATING TO HISTORICALLY, CULTURALLY, AND ECOLOGICALLY IMPORTANT PLACES IN CORE AS WELL AS BUFFER ZONE.

There are no historically, culturally, and ecologically important places in core. The following places of historical & cultural importance lie in the buffer zone

Namuzgah/Idgah – 3.72 Km
Fort at Corjuem- 0.664 km
Fort at Colvale - 5.6 km

3.9.1.15 INFORMATION ON NOTIFIES TRIBAL SETTLEMENTS, IF ANY.

Notified tribal settlements are not there in buffer zone.

3.9.1.16 DETAILS OF PRIVATE LANDS WITH OWNERSHIP IN THE CORE AREA INDICATING FINANCIAL LOSS ANNUALLY.

The mining lease area is a private land

3.9.1.17 HEALTH STATUS OF THE POPULATION IN THE STUDY AREA.

Morbidity status: The percentage of morbidity episodes have been presented in **Table 3.40.** Morbidity data have been collected from Primary Health Center in buffer zone. The reference period is three months prior to date of survey. Morbidity data in a small geographic area will not show the general pattern.

Despite that, an attempt has been made to get the local morbidity episodes which are useful for the purpose of providing health care facilities and medicines to store.Morbidity pattern is changing from communicable diseases to chronic diseases everywhere. Many diseases like Cholera, Tetanus, Filariasis, Pleurisy, Whooping cough, Poliomyelitis and Pregnancy related diseases have not been reported in the last three months. Rarely reported diseases, less than one per cent, are Leprosy, AIDS, Malnutrition, Cancer,

Epilepsy, STD, Tuberculosis (TB), Malaria, Burns, Dengue fever, Heart disease, Mental disorder, Pneumonia, Goitre, Disease of thyroid gland, Measles, Jaundice, Food poisoning, Cough cold with fever, Fever not classified elsewhere, Gout or any joint problems accompanied by fever, Typhoid/paratyphoid and Piles.Often reported diseases, one to 5 per cent, are Gastroenterities, Dysentery, Disease of ENT, Vomiting, Skin diseases, Gastroenteritis, Disease of mouth, teeth, gums, Arthritis, Rheumatism-pain, Disease of Kidney, Accidents, Asthma, Bronchitis, Diabetes, Throat infection and Blood Pressure. Very often reported diseases (more than 5 per cent) are Anemia, Disease of eye, Cough and fever, Cough cold without fever and Influenza.

Inference focusing need assessment: The possibility of any health hazards due to toxic elements does not arise because iron ore does not contain and toxic elements. The management is taking enough care to minimize occupational health hazards like noise induced hearing loss, any occupational lung diseases due to inhalation of dust. There are few cases of hearing loss mostly associated with old age.The percentage of pneumonia episodes is very negligible (0.1143 per cent). The percentage of Asthma or Bronchitis is 3.6985 per cent because of vices like consumption of tobacco, especially among males. The number of skin allergy cases is 2.1989 per cent because of lack of personal hygiene. Dental hygiene seems to be low. The project proponent can organize dental check-up. The most commonly recorded cases are pertaining to Influenza, fever with or without cold, followed by Blood Pressure and Diabetes.

Table 3.40 : Number of Patients suffering from the following Diseases during previous 3 months Buffer zone and around 2023.

Morbidity	% patients visited doctor or clinic
Cholera	0.0000
Typhoid/paratyphoid	0.8809
Gastroenteritis	2.2662
Gastroenterities, Dysentery	1.2037
Tuberculosis (TB)	0.0740
Leprosy	0.0067
Tetanus	0.0000
Dengue fever	0.0874
Jaundice	0.1950
Malaria	0.0807
Filariasis	0.0000
STD	0.0403
AIDS	0.0067
Cancer	0.0336
Goitre, Disease of thyroid gland	0.1681

Diabetes	3.7657
Blood Pressure	4.7071
Disease of Kidney	3.1807
Heart disease	0.0874
Asthma, Bronchitis	3.6985
Pleurisy	0.0000
Influenza	20.5837
Pneumonia	0.1143
Whooping cough	0.0000
Poliomyelitis	0.0000
Measles	0.1748
Epilepsy	0.0336
Piles	0.9145
Disease of eye	6.4959
Disease of ENT	1.3113
Gout or any joint problems accompanied by fever	0.4371
Arthritis, Rheumatism-pain	3.0529
Skin diseases	2.1989
Disease of mouth, teeth, gums	2.5957
Throat infection	3.9137
Malnutrition	0.0067
Anemia	5.4267
Pregnancy related diseases	0.0000
Food poisoning	0.2219
Accidents	3.4026
Burns	0.0807
Mental disorder	0.0941
Vomiting	2.0308
Cough and fever	11.7141
Cough cold without fever	11.8755
Cough cold with fever	0.2421
Fever not classified elsewhere	0.2421
Others	2.3536
Total	100.0000 (14871)

The data on medical laboratory facilities are presented in Table 3.41. The villagers have to travel to Bicholim to avail various lab facilities.

Table 3.41: Distance of medical laboratories conducing following tests from the study area

Medical test	**Distance By road**
X-ray	Bicholim CHC about 10.2 Kms
Pulmonary functions test	Bicholim CHC about 10.2 Kms
Testing of hearing	Bicholim CHC about 10.2 Kms
Identifying tuberculosis	Bicholim CHC about 10.2 Kms
Blood test	Bicholim CHC about 10.2 Kms
Urine test	Bicholim CHC about 10.2 Kms

3.9.1.18 SUMMARY OF SOCIO-ECONOMIC AND DEMOGRAPHIC SURVEY, AND NEED ASSESSMENT STUDY:

Socio-economic and Demographic Status

Population size of village varies in buffer zone. There are more males than females according to census and survey in buffer zone and in the district, but the sex ratio is balanced.The SC and ST population is very small, concentrated only in small number of villages.The literacy rates are high both in buffer zone and in the district. There is significant variation in literacy rates across villages and between males and females.

Agriculture sector is not an important economy because villages largely depend upon tertiary sector (service) and secondary sector (industrial) in both buffer zone and in the district.The local economy was characterized by labor force participation in mining and mining related activities in the past. In general, local population is upbeat about the revival of mining industry as it will revive local economy.

The general morbidity pattern is found that mining related diseases are not high, but chronic diseases have to be monitored.

Skinand oral hygiene needs awareness.

Eye diseases have been reported to be over 6 per cent so vision aids are needed. These are not mining activities related but age induced issues.

The households, in general, are having better amenities to live comfortably. However, protected tap water for drinking and the use of LPG/NPG for cooking need to be addressed.

The possession of assets indicates households have good communication facilities, highly mobile and well connected with outside world.

Therefore, population is open to receive new ideas and modern lifestyles.

The population in buffer zone can easily be integrated with many development programs under CSR activities.

INDIRECT ASSESSMENT OF COMMUNITY NEEDS

- About 17 per cent of the population is elderly (60+) needing health and other elderly assisting programs. Some feasible welfare programs such as general health checkup, eye checkup, providing vision glasses and old age supporting equipment like walking sticks, and the like can be planned.
- About 7 per cent of the population in school going age group 5-9 should be considered for some feasible welfare programs like supply of school uniforms and books, transport, tuitions and supporting mid-day meal program and the like.

- About 16per cent of the population in the age group 10-19, who are going to enter into labor market, can be made self-employable by organizing vocational training programs through CSR activities.
- About 60 per cent of the population is in the working age group 15-59. Many of them are in need of employment, especially females.
- The project proponent can formulate feasible female oriented self-employment schemes like milk dairy, poultry, sheep rearing, piggery and the like.
- The general literacy rates are high in buffer zone. Some villages in buffer zone are having marginally low literacy rates. School going children in these villages can be supported by providing school uniforms, books, transport and the like to boost literacy levels and discouraging school dropouts.
- There is unemployment in the buffer zone as elsewhere. This is because local industry and economy are unable to keep pace with fast growing working population to provide jobs. The solution for this is vocational training courses to meet local industrial need. Such an attempt can be made.
- To rejuvenate primary sector, agriculture related activities like milk diary, poultry, sheep rearing and piggery can be encouraged and farmers can be supported by supplying high yielding varieties and the like.
- Oral hygiene, especially among children is low needing regular check up of oral hygiene.

Direct Assessment of Community Needs

1) Employment
2) Health care
3) Tree plantation
4) Vocational training centers
5) Construction and maintenance of temples
6) Construction village roads and maintenance

3.10 TRAFFIC DENSITY MEASUREMENT:

The traffic survey is essential to realistically and accurately assess the prevailing traffic volumes and travel characteristics by undertaking classified volume count. The objective of traffic volume count survey is to assess the traffic intensity on the most vulnerable section of the road under question.

The iron Ore will be transported from mine to Sinqurerim Jetty Via MDR 02 width of the Road is 7.0m The total distance is 4.83km out of which 0.62Km is public road

The analysis of traffic counts provides an estimate of average daily traffic (ADT). In order to convert recorded vehicles into a common scale, the passenger car units (PCU) equivalent factor as per IRC: 64 has been adopted. The following tables reveal ADT (Average daily Traffic) in terms of number which translates into PCU (Passengers Cars Units). Twenty-Four hrs. Continuous volume count was manually undertaken during May-2023 at following routes

Time	Motor Cycle		Passenger Car		Agricultural tractor, Light Commercial Vehicle		Truck or Buses		Agricultural tractor Trailer, Truck Trailer	
	To	From	To	From	To	From	To	From	To	From
00:00:00	3	2	2	3	0	0	0	0	0	0
01:00:00	2	3	3	4	0	0	0	0	0	0
02:00:00	4	2	4	5	0	0	0	0	0	0
03:00:00	3	2	6	6	0	0	0	0	0	0
04:00:00	1	3	5	2	0	0	0	0	0	0
05:00:00	15	10	4	3	0	0	0	0	0	0
06:00:00	20	17	5	4	0	0	0	0	0	0
07:00:00	16	22	5	5	0	0	0	0	0	0
08:00:00	22	16	3	8	2	0	0	1	0	0
09:00:00	22	18	2	6	1	0	0	2	0	0
10:00:00	15	10	4	7	0	1	1	1	0	0
11:00:00	13	17	3	5	0	2	0	0	0	0
12:00:00	22	22	0	6	0	4	0	1	0	0
13:00:00	13	10	4	3	1	2	0	0	0	0
14:00:00	10	21	2	4	1	0	3	2	0	0
15:00:00	8	16	3	5	0	0	2	0	0	0
16:00:00	10	22	0	0	1	0	1	2	0	0
17:00:00	12	18	8	4	2	3	0	0	0	0
18:00:00	22	20	2	8	0	0	0	0	0	0
19:00:00	23	15	3	5	2	4	0	0	0	0
20:00:00	10	11	4	6	0	0	1	0	0	0
21:00:00	8	3	5	0	0	0	0	0	0	0
22:00:00	7	6	4	0	0	0	0	0	0	0
23:00:00	5	4	5	9	0	0	0	0	0	0
Total	286	290	86	108	10	16	8	9	0	0

PCU factor

Type of Vehicle	PCU Factor	No. of Vehicles /Day	No. PCU/ Day
Motor Cycle	0.5	576	288
Passenger Car	1	194	194
Agricultural tractor, Light Commercial Vehicle	1.5	26	39
Truck or Buses	3	17	51
Agricultural tractor Trailer, Truck Trailer	4.5	0	0
Total			572

As per guidelines for capacity of roads in rural areas of IRC, recommended design series volumes of road 6000 PCU/day.

Present Traffic

Road	V (Volume in PCU/day.)	C (Capacity in PCU/day.)	Existing V/C Ratio	LOS
Mine To Jetty	572	6000	0.095	A Excellent

Chapter-4
ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

4.1 ENVIRONMENTAL IMPACTS

The mining activities proposed will have both positive and negative effects on the surroundings. This change is called an impact. The impact could be either useful or detrimental to the environment. The net impact could be determined by evaluating the impact on various components.The components with adverse impact due to certain unavoidable reasons have to be nullified, kept to the minimum or brought to have positive effects by taking suitable corrective measures. With a proper understanding of cause and effect and designing suitable measures, it is possible to create better environment.The proposed project will have a bearing on the socio-economic aspects as well as on the environment components due to mining and other incidental activities. The impact depends upon the magnitude, mechanization and method of mining, extent of infrastructural facilities, environmental profile and characteristics of environment.

The impact prediction due to the project has been made in respect of the parameters considered in the presentscenario. The quality parameters of ambient air, water, socio-economics aspects, inventory of flora due to mining operations in the buffer zone during Study period is available. These help in prediction of the impact more correctly. The Environmental Impacts can be broadly categorized into Primary and Secondary Impacts. If the impact is directly due to the Project Activity, it is termed as Primary Impact. In case, the impacts are indirectly induced, then it is called Secondary Impact.Environmental impacts due to project location, possible accidents, project design, project construction, regular operations, final decommissioning, or rehabilitation of a completed project are discussed in this Chapter.

4.2 IMPACT DUE TO PROJECT LOCATION & PROPOSED MITIGATIVE MEASURES FOR THE PROJECT

The Block II Sirigao-Mayem Mineral Block Mine is located in, Mayem & Sirigao villages, of Bicholim Taluka, North Goa District, Goa State over an area of 171.2472 Ha.

4.2.3 IMPACTS ON LAND ENVIRONMENT

IMPACTS ON LAND USE DUE TO MINING ACTIVITY

The land within the Mineral Block is a non forest land. Due to proposed mining activity in this area, there will be change in the ground profile in the form of pit and waste dumps. The ore bearing area will be mechanically mined-out upto the ultimate pit limit maintaining required bench height and width with due consideration towards the slope stability. Assonora river is at a distance of 0.56 km from the lease boundary.

There is a minimum difference of +6.0m between the river HFL and pit water overflow. Proper mitigative measures will be taken to avoid siltation of water cources.

Vegetation Loss:

The proposed Mining Block is already stripped off the major vegetative cover to win the ore. Once the lease is executed some vegetative cover shall be removed. The secondary growth vegetation of Acacia auriculiformis is found within the proposed working area.

4.2.3.1 IMPACT DUE TO WASTE GENERATION OF THE MINING ACTIVITIES

The project proponent intends to produce a maximum quantity of 1.0 MTPA of Iron Ore. The overall overburden to ore ratio is 1:0.81. The total quantity of material handling which shall be generated in the plan period is given in the Table No.4.1 below

Table No.4.1

S.No.	Particulars	Quantity in Tonnes
1	ROM	3590000
2	Waste	2925360
3	Total handling	6515360

The hard material generated during the next five years of mining plan period will be utilized for environmental protective measures like creation of bunds, retention walls, etc.

Table No. 4.2: Proposed dumping of the waste/overburden for the plan period

SI. No.	Year	Dump Id	Type of Dump	Proposed Area (ha)	Height (m)
1	Year1	Backfilling (Pit No.1)	Waste	3.36	40.00
2	Year2	Backfilling (Pit No.1)	Waste	1.77	10.00
3	Year3	Backfilling (Pit No.1)	Waste	6.58	30.00
4	Year4	Backfilling (Pit No.1)	Waste	3.50	10.00
5	Year5	Backfilling (Pit No.1)	Waste	5.73	10.00

MITIGATION MEASURES

PROPOSED PROTECTIVE MEASURES:

During the plan period appropriate protective measures will be undertaken to prevent any surface run-off from the working area, dumping and backfilled areas.

- Gap plantation will be carried out on the already reclaimed waste dumps to further strengthen the green cover and prevent soil erosion.
- Bunds will be constructed all along the toe of the backfilling benches followed by trenches which would be connected to series of settling ponds.

- Garland drains will be made to channelize the rain water to the settling ponds so as to minimize erosion.
- Native forest and horticultural plant species will be used for afforestation activity. Some of the plant species which would be planted are Cashew, Kokum, Avla, Arjun, Bayo, Bamboo, ber, Glyricidia, Ficus, Mango, terminalis species etc.
- Entire rain water that is encountered in the mining area will be properly channelized through trenches into the mining pit
- The accumulated water into the mining pit will be treated with lime and flocculent if required for faster settling of suspended solids

By taking all these protective measures, suspended solids in the runoff water will be reduced considerably.

Table.No.4.3: **The various protective measures that will be undertaken are as follows:**

Plan Period	Plantation			Retaining Wall (m)	Garland Drains (m)
	Area (Ha.)	No. of Sapling	Name of species		
I	0.00	00	Mix of forest and horticulture Species like, Ficus species, Terminalia Sp., Cassia Sp. Bamboo Sp. Cashew, Mango ,Jambul Aonla ,etc.	195	585
II	1.41	2100		--	585
III	2.00	3000		--	415
IV	1.00	1500		--	0
V	1.00	1500		--	0
Conceptual Stage	92.10	1,84,000		--	--

4.2.4 IMPACT DUE TO POSSIBLE ACCIDENTS & PROPOSED MITIGATIVE MEASURES

The impact due to possible accidents on the Environment and the mitigative measures are as proposed below.

4.2.4.1 IMPACT DUE TO ACCIDENTS CAUSED BY VEHICLES USED IN MINING OPERATIONS

The accidents on mines involving men and machinery may lead to damage to vehicles, Spillage of Diesel & Oil, Injury to employees

MITIGATION MEASURES ON THE LAND ENVIRNMENT

Safety will be given prime importance in the mining operations. All the employees working on the mines will be provided with safety training and awareness about various risks and hazards in the mines.

Following measures would be taken to prevent accidents:

1. Haulage roads will be maintained regularly
2. Proper illumination on the roads and mine
3. Regular maintenance of all the mining machinery to meet the requirement of environmental standards
4. Speed limit of 20km/ hr will be implemented in the mine, sign boards will be displayed at regular intervals at the mines
5. Proper wide roads and gradient will be maintained
6. Proper Personal Protective Equipment (PPE) will be provided to all employees

In case of accidents the vehicles / machinery will be taken to work shop and repaired. Any diesel and oil, which shall be spilled are cleared, collected and places of spillage shall be cleaned immediately. The Waste Diesel and oil are stored in the airtight containers and handed over to GSPCB authorized dealers.Treatment and rest shall be provided to injured persons until restoring the normal health condition to enable them to get back to work to function effectively.

4.2.4.2 IMPACTS DUE TO LAND SLIDE

IMPACT

Opencast mining particularly in areas of heavy rainfall is vulnerable to landslides causing loss of human life, property and deforestation.

MITIGATION MEASURES

A proper and scientific geological study is conducted to study the strata before commencement of mining operations and maximum care shall be taken to avoid the slope failures. Mining will be carried out by forming benches with maximum height of 6 m. The width of the benches shall be more than the height.

The slope of the benches shall be maintained at 65^0 with overall pit slope of 28^0. Hence, there are no possibilities of failure of mine bench slopes.

4.3 IMPACTS DUE TO PROJECT DESIGN AND PROJECT CONSTRUCTION, REGULAR OPERATIONS AND PROPOSED MITIGATIVE MEASURES, FINAL DECOMMISSIONING OR REHABILITATION OF COMPLETED PROJECT.

4.3.1 LAND USE

During the mining operations, the land use shall be altered to win the ore. The current land use and conceptual Land use are given in the Table 4.4 and Table 4.5 below.

Table No: 4.4 Current Land use

Pre Mining Use	**AREA** (Ha)
Barren / Waste land with small bushes & shrubs	2.30
Land under Agriculture / Crops	0.00
Land covered with Plants	0.00
Land under Grass Cover	0.00
Land under Public Infrastructure / Utilities (water bodies, roads, railways, electric lines, telephone lines etc.)	12.07
Land under Habitation & temples	11.4
Land under Monuments & places of Historical Importance	0.00
Degraded by Pits & Excavation	81.70
Degraded by Dumps & Material Staking	40.83
Covered under Mine Infrastructure (plants, shades, buildings etc.)	0.27
Land under Forest	0.000
Any Other, please specify below	22.6772

Table No. 4.5 Land Use at the Conceptual Stage

Post mining land use	**AREA** (Ha)
Barren / Waste land with small bushes & shrubs	2.30
Land under Agriculture / Crops	0.00
Land covered with Plants	0.00
Land under Grass Cover	0.00
Land under Public Infrastructure / Utilities (water bodies, roads, railways, electric lines, telephone lines etc.)	8.38
Land under Habitation & temples	11.40
Land under Monuments & places of Historical Importance	0.00
Degraded by Pits & Excavation	106.65
Degraded by Dumps & Material Staking	21.78
Covered under Mine Infrastructure (plants, shades, buildings etc.)	0.00
Land under Forest	0.00
Any Other, please specify below	20.7372
	171.2472

Mitigation measures for mined out land and mine closure

The land degraded within the Mineral Block by mining, waste dumping, backfilling and other infrastructures is reclaimed by afforestation. At conceptual stage the area of 92.10 Ha will be reclaimed by planting 1,84,000 plants and fruit bearing trees like Cashew, Bamboo, Arjuna, Alva etc which will be beneficial to the society and also for immigration of avifauna.

Retaining walls with drains are provided at the toe of the dump. Dumps will be rehabilated by planting local fruit bearing trees.The Progressive Mine closure Plan is enclosed as **Plate. No 19** respectively.

Mine Closure will be carried out considering the following aspects:

1. Compensate the damage to vegetation due to opening and operation of the mine.
2. Prevent the spread of fugitive dust and noise generated due to mining and allied activities.
3. Help stabilize the slope of waste dump and control soil erosion
4. Increase green cover and improve aesthetics
5. Attract birds to re-colonize the area when the mine is abandoned

4.4 IMPACTS DUE TO OPERATIONS & PROPOSED MITIGATIVE MEASURES

The Sirigao -Mayem Mineral Block is a e-auctioned mineral block, and shall be operated by taking all precautionary measures to reduce the impact of mining operations on Air, Water, Noise , Soil , Land use and Biological environment.

The impacts on Land environment is evaluated in detail in section 4.11

4.5 IMPACT ON AIR ENVIRONMENT & PROPOSED MITIGATIVE MEASURES

The various activities proposed to be carried out in the Mine viz., loading & unloading, transportation, Crushing and screening at plant etc., are likely to generate dust, which will have impact on Air Environment.

4.5.1 IMPACT ON AIR QUALITY

The proposed mine with its capacity of 1.0 million TPA of ROM, is likely to generate dust, NO_2 and SO_2. The impact on air quality of integrated mining complex depends on the magnitude of iron ore extraction operations and transportation & handling. The intensity of operation is directly related to the rate of production of ore and waste from the mine and its dry size classification.

The ambient air quality monitoring results show that in the villages around the Mineral Block, PM_{10} concentrations are within the prescribed limits (CPCB standards) However, at present the only source of pollution is due to domestic activities and vehicular movement in the surrounding villages.

Once the mining operation starts, it is anticipated that marginal increase in the particulate levels of the core and the buffer zones will occur. Dust suppression measures are, therefore, of utmost importance. Vehicular movements within the mine site will add marginally to NO_2 and CO concentrations. Monitored values of SO_2, NO_2 and CO in the ambient air are reported to be low in the study area. It is proposed that the Lessee ensures regular maintenance of vehicles so that the emission levels remain within the stipulated limits.

As adequate dust suppression measures will be provided, the dust particles will not be transported to villages in the downwind direction of the impact area.PM levels will be higher within the active operational areas (mine area) due to excavation and transportation, however, the buffer zone is not likely to be affected with dust problems, if proper dust suppression and mitigation measures are taken up. Air pollution sources at the proposed opencast mine can be classified into four categories, viz., Point Source, Area Sources, Line Sources and instantaneous Point Sources as described below:

Point Source/Single Source: These are stationary sources, which emit air pollutants into the atmosphere from a certain fixed point. In the proposed mine, the following sources or activities form the point sources, which emit particulate matter.

Mining: Top OB/Ore benches would be developed in horizontal slicing pattern; hence hydraulic excavator along with matching dumpers would be deployed.

Loading & unloading of waste/ore: The loading of Waste/Ore is proposed by excavators. These activities are likely to contribute air pollution in the form of dust/ particulate matter during discharge of material from bucket and gaseous pollutant like SO_2, NO_2 and hydrocarbons due to combustion of diesel in the loading machinery. The generated waste/ore will be transported by dumpers and unloaded at the designated locations i.e. at backfilling site or mineral stack site.

During unloading operation of the waste/Ore, air pollution in the form of dust (PM) and gaseous pollutants namely SO_2, NO_2 and hydrocarbons due to consumption of diesel in dumpers is anticipated.

Crushing and Screening activity: The mine have the crusher of the capacity of 200tph and Screening with 200tph . The ore will be crushed and screened. The Goan ore has inherent moisture of about 11% and hence the generation of dust is minimum.All the point sources where there is likely hood of dust generation (PM) water tanker would be deployed for sparying water continously.

Line Sources: These are normally mobile sources, which emit pollutants in the area through which they pass. The following are the sources of air pollution falling under this category.

Transportation: Surface transport consists of transport of overburden and Iron Ore. Overburden will be transported by dumpers to respective backfilling site. Haul roads have been provided for movement of dumpers. Transportation also includes movement of iron ore to the nearest jetty.

The traffic on the haul roads is likely to contribute towards increase in dust and gaseous pollutants concentration in the mining area.

Dozing: Dozing is envisaged during mining operations. The dozing activity is likely to contribute to air pollution in the form of PM, SO_2, NO_2 and hydrocarbons due to use of diesel operated machines.

Area Sources/Multiple Sources: The total mine area with all mining activities like operation of equipment/machinery, active mine pit, mineral stock yard and backfilling locations and haul roads constitute the area source, which lead to increase in air pollution in and around mine lease area.The size of the dust particles emitted into the atmosphere plays a major role in deciding the distance to which they may be transported. Particles of larger size fall fairly rapidly and closer to their source because of gravitational settling.The composition of these particles largely depends on the composition of the mineral being processed i.e. iron Ore in this case.Prediction of fugitive dust level in the surrounding area is carried out with the help of AERMOD. This AERMOD model for area sources uses the steady state Gaussian plume equation for a continuous source. The model was developed by 'Envitrans'.

4.5.2 AIR QUALITY PREDICTION THROUGH MATHEMATICAL MODELLING– IMPACT OF MINING OPERATIONS ON ENVIRONMENT - AIR QUALITY PREDICTION THROUGH MATHEMATICAL MODELLING.

Prediction of fugitive dust level in the surrounding is carried out with the help of AERMOD. This model for area sources uses the steady state Gaussian plume equation for a continuous source.

Isopleths representing PM10, PM2.5, SO2 & NOx are presented herewith along with ground-level concentrations at core and buffer zone to estimate the total impact load.

4.5.2.1 *AIR QUALITY PREDICTIONS THROUGH MATHEMATICAL MODELLING FOR BLOCK-II SIRIGAO-MAYEM MINERAL BLOCK*

Air Pollution Modeling:

Air quality models are the primary tools for relating emissions to air quality impacts. Models, in turn, require acceptable input data for emissions, surface topography, meteorological parameters, receptor configurations, baseline air quality and initial boundary conditions for each modeling scenario. Since the quality and reliability of model outputs can never be any better than the inputs, input of the quality data is very important.

Prediction of impacts on air environment has been carried out using mathematical model based on a steady state Gaussian plume dispersion model designed for area sources for short term. In the present case, AERMOD dispersion model based on steady state Gaussian plume dispersion, designed for area sources for short term and developed by United States Environmental Protection Agency [USEPA] has been used for simulations from point sources.

Pollutants Considered for Computation:

The model simulations are done for the air pollutant arising from the mining operations, namely, PM_{10}, $PM_{2.5}$, SO_2& NO_X. GLCs for PM_{10}, $PM_{2.5}$, SO_2& NO_X have been computed using hourly meteorological data.Modeling is done for maximum production & development to know the GLC. The maximum production of 1.0 MTPA is expected to be achieved from this project. Hence for this model purpose the study details are as follows:

EMISSION SOURCES:

Pollution source type from the activities of Block- II Sirigao-Mayem Mineral Block are as follows:

ACTIVITY

A. Excavation of Ore & Waste
B. Ore & Waste transportation

SOURCE TYPE

Open pit: Area

Line: Point

Quantification of particulate emissions has been carried out by the emission factor technique. Emission factor is a statistical average of the rate at which a pollutant is released during an activity.

This factor when multiplied by the level of that activity in a given situation will give the overall effect. Particulate emissions have been predicted by using standard equations given in "Indian Mine and Engineering Journal" and suggested by USEPA for mining & allied activities. Equations for various activities are:

Activity A. Excavation of Waste & Ore

B. Ore & Waste transportation

Emission factor is calculated by the following empirical formulas

Equation for Excavation of Waste and Ore

23.6 kg/hr particulate matter for every 1000 Tonnes per hour material handling

Equation for Transportation of ore and waste

0.2 kg/vehicle/km.

A. Excavation of Waste & Ore:

The maximum production and development of Block -II Sirigao-Mayem Mineral Block 21,63,100 MTPA.

Particulars of activity	**Total**
Excavation of Waste & Ore (T/A)	2.1631 (MTPA) or 21,63,100 T/annum
Excavation of Waste & Ore in TPD taking 251 working days	8617.9 Tones/day
Material excavated/tph(6hrs)	1436.32 tones/hr
Dust emission kg/hr during excavation	33.89 Kg/hr 9.41 g/sec.

B. Ore & Waste transportation:

Dust emission from the transport vehicles plying for the movement of Iron ore & waste are estimated using the empirical value of
0.2 kg/vehicle/km.

From Excavation of ore and waste transport

DT = Tv x 0.2 x d

DT = Dust emission in kg/hr

Tv = No. of transport vehicles plying in one hour

Waste & Ore Excavated – TPH

Vehicle capacity for transportation: 20 T

Lead: **3Kms**

Maximum no of Trips per hour

Dust emission due to excavation:

- 20 T Dumpers utilizing 1436.32 tonnes/hr =71.816

Using empirical formula 0.2 kg/vehicle/km.

- 71.816 x 0.2 x 3 = 43.09 kg/hr or 11.96 gm/sec

From transport of ROM from mine to outside the lease

DT = Tv x 0.2 x d

DT = Dust emission in kg/hr

Tv = No. of transport vehicles plying in one hour

Ore to be Transported outside 10,00,000 Tpa

Ore to be transported outside Nos: 10,00,000/251 days / 6 hrs

=664 T/hr

Capacity of the Transportation Trucks: 10.5 T

No of vehicles plying per hour: 664/10.5 =63.23

Lead:6.6 Kms

Waste generated in Kg/hr= 63.23 x 0.2 x 6.6

=83.46 Kg/hr = 23.18 gms/sec

far less than the established emissions. Considering the above, the emission rates are derived and used in the model.

Total diesel consumption: 18,00000 kg per annum

Total Diesel Consumption for inside Machinery 863 kg/hr

Total Diesel Consumption for Truck:- 332 Kg/hr

Gases Emissions

SO_2emission is calculated based on the hourly fuel consumption of each equipment and the sulphur content in the fuel as provided by the fuel supplier.

Excavation

The daily max consumption of Fuel is 863 Kg/hr and assuming the Diesel fuel emits 100 mg/kg of fuel consumed, the emission rate will be 0.023g/s

Transportation & Miscellaneous

The daily max consumption of Fuel is 332 Kg/hr and assuming the Diesel fuel emits 100 mg/kg of fuel consumed, the emission rate will be 0.009gm/s

NO_X emission is calculated based on hourly fuel consumption of each equipment and the Nitrogen oxides content in the fuel as provided by the fuel supplier.

Excavation

The daily max consumption of Fuel is 863 Kg/hr and assuming the Diesel fuel emits 200 mg/kg of fuel consumed is 0.047 g/s

Transportation & Miscellaneous

The daily max consumption of Fuel is 332 Kg/hr and assuming the Diesel fuel emits 200 mg/kg of fuel consumed, the emission rate will be 0.0184 gm/s.Based on the above, the expected emission rate due to various operations in this project without control measures is calculated and is given below: Emission rate and Emission sources without control measures

ACTIVITIES/ POLLUTANTS	PM10	PM2.5	SO2	NOX
Excavation	9.41	2.35	0.023	0.047
Transportation & Miscellaneous	31.15	7.78	0.009	0.0184
Total (gms/sec)	40.56	10.13	0.032	0.0654

EMISSION SOURCE COORDINATES:

The center of mine was considered (0, 0) in the mathematical modeling.

MATHEMATICAL MODEL FOR POLLUTANTS DISPERSION:

In the present case Aermod model has been used to predict the impacts. This model for area sources uses the steady state Gaussian plume equation for a continuous source.Further the model has following specialties:

- Simulates dispersion from single/multiple/area/line/volume sources. Allows calculations to be made at a user specified regular rectangular/radial grid or at specified special receptors.
- Provides estimates of concentrations for any averaging time period for the entire period of input meteorology.
- Allows calculations to be underwritten for source groups as selected by the user. Uses Pasquill-Gifford or Briggs dispersion curves (for urban areas) as selected by the user, to derive the plume spread parameters. Adjustsdispersion curves to account for user specified information on aerodynamic roughness. Adjusts for wind speed variation with height, using user specified default urban/rural power law coefficients. Simulates dispersion from buoyant, non-buoyant point sources, non- buoyant area, non-buoyant volume sources and non-buoyant line sources.
- Simulates dry deposition using a simple tilted plume model with user specified reflection coefficients. Simulates building wake effects.

- Can include the effects of exponential decay. Uses Briggs' 1975 plume rise algorithm to calculate plume height.

4.5.2.2 METEOROLOGICAL CONDITIONS USED IN PREDICTIONS:

The hourly meteorological data has been generated at the site for Summer season of 2023 (Mar to May-2023) and the same has been used in the predictions.

4.5.2.3 RESULTS AND DISCUSSIONS:

Ground level concentrations (GLC) have been computed. Its details are given below:

The results of the Peak GLC's for various environmental parameters with control measures are given below:

Sl.No	Parameters	Peak incremental concentration µg/m³
1	PM-10	192.78
2	PM-2.5	48.13
3	SO2	0.22
4	NOX	0.44

The Isopleths of PM 10, PM2.5, SO2 & NOX concentrations is given in Figure 4.1 to Fig No.4.4

It is observed that the peak incremental concentration for PM_{10}, $PM_{2.5}$, SO_2& NO_X is occurring very near the source only. At away places from the active source, the values are getting reduced due to wind dispersion and distance effects.However, various mitigation measures as mentioned above will be strictly enforced in this project during working and the GLC values will be brought down substantially less. The predicted concentrations at Receptors i.e Villages within the buffer zone area where baseline data was collected and Aermod was run by selecting this village as receptors.The predicted concentrations of PM_{10}, $PM_{2.5}$, SO_2 & NO_X is given in the table

Table:4.6 predicted concentrations

Sl no	Location	PM10 (µg/m3)			PM 2.5(µg/m3)		
		Baseline	Increment	Total	Baseline	Increment	Total
1	A1 Core Zone Within Mineral Block	50	26.74	76.74	27	6.68	33.68
2	A2, Sirigao Village	53	8.86	61.86	33	2.21	35.21
3	A3, Mulgao village	56	9.53	65.53	34	2.38	36.38
4	A4, Sircaim village	53	3.86	56.86	31	0.96	31.96
5	A5, Calvim village	48	3.65	51.65	29	0.91	29.91
6	A6, Sinquirem wada	53	4.93	57.93	35	1.23	36.23
7	A7, Advalpal Village	54	2.53	56.53	29	0.63	29.63
8	A8, Lamgao Village	43	9.57	52.57	27	2.39	29.39

Sl no	Location	SO2 (µg/m3)			NOX (µg/m3)		
		Baseline	Increment	Total	Baseline	Increment	Total
1	A1 Core Zone Within Mineral Block(Sirigao Village)	12	0.02	12.02	16	0.05	16.05
2	A2, Sirigao Village	13	0.02	13.02	18	0.03	18.03
3	A3, Mulgao village	13	0.01	13.01	18	0.02	18.02
4	A4, Sircaim village	12	0.01	12.01	16	0.01	16.01
5	A5, Calvim village	12	0.01	12.01	17	0.01	17.01
6	A6, Sinquirem wada	12	0.01	12.01	21	0.02	21.02
7	A7, Advalpal Village	9	0.00	9.00	14	0.01	14.01
8	A8, Lamgao Village	11	0.01	11.01	17	0.02	17.02

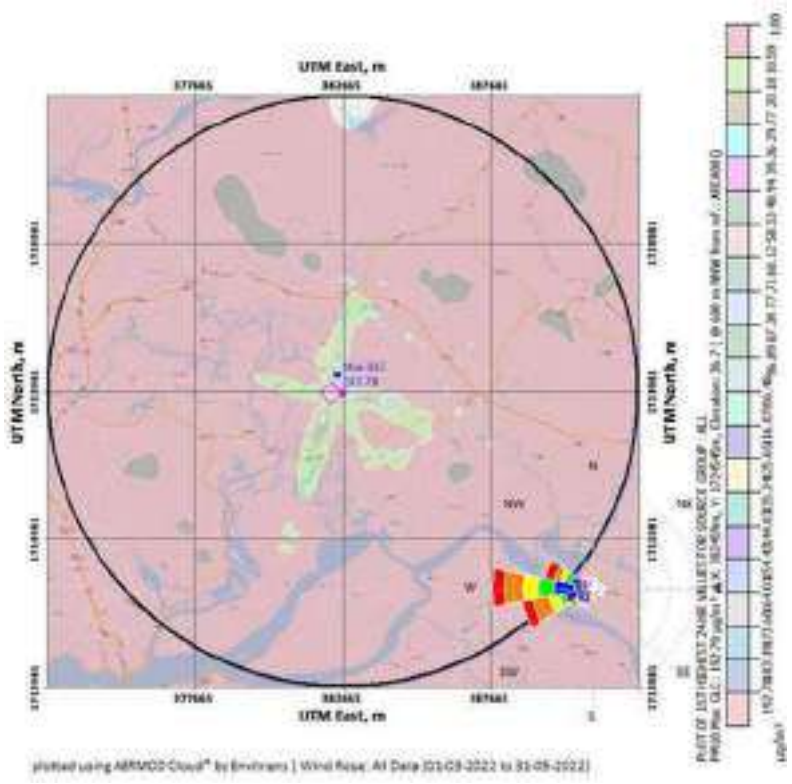


Fig.4.1 PM10 Prediction

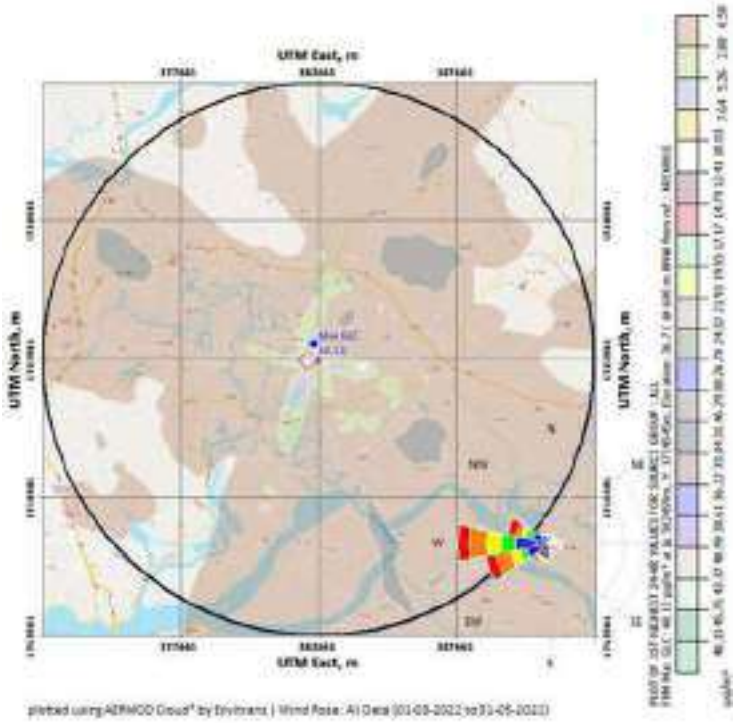


Fig.4.2 PM2.5 Prediction

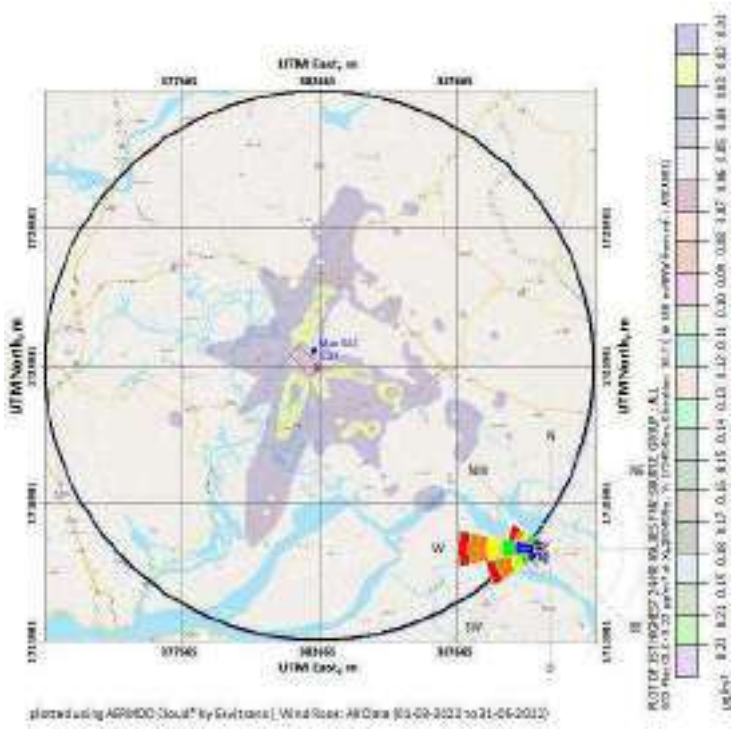


Fig.4.3 SO_2 Prediction

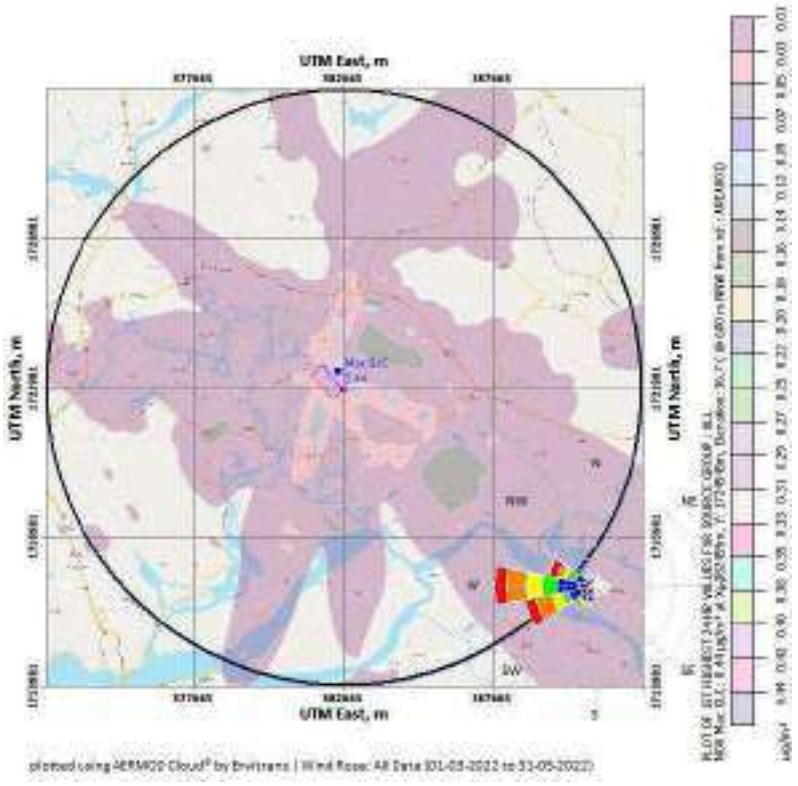


Fig.4.4 NO_x Prediction

Table.No.4.7 Proposed Impacts and Mitigative measures of Air pollution

Sl. No.	Impact ofActivities in Mines	Air Pollutants	Mitigative measures undertaken
1	Ripping& Dozing	PM_{10}& $PM_{2.5}$	No drilling & Blasting involved during mining operations and well maintenance of ripper and dozer machines.
1	Loading & unloading	PM_{10}& $PM_{2.5}$ SO_2& NO_2	Continuous Water spray over the areas using water sprinklers, proper maintenance of machinery & equipment as per manufactures specification, avoiding over loading of trucks
2	Haul Road	PM_{10}& $PM_{2.5}$, SO_2& NO_2	Water spray on mine haul roads. It is proposed about 200 KLD of water for dust suppression, speed restriction, proper Maintenance of roads, proper maintenance of machinery & equipment as per manufactures specification, all the HEMM will be with air-conditioned cabins
3	Mining area	PM_{10}& $PM_{2.5}$, SO_2& NO_2	7.5m Wide green belt surrounding Mineral Block. Proper maintenance of machinery & equipment. Introducing the state-of-the-art dust suppression system, Fixing permanent pipe sprinklers along the

			haul road wherever possible. 50m wide safety barrier shall be maintained from nearby habitations
4	Transportation	PM_{10}& $PM_{2.5}$, SO_2& NO_2	No overloading of trucks, speed restriction, all the trucks will be covered with tarpauline before going out on public road, plantation along the road side proper maintenance of machinery & equipment as per manufactures specification, PUC for transport vehicle, maintenance of surrounding transport. Wheel washing system for transportation trucks will be erected at the exit point of the lease area.
5	Waste Handling	PM_{10}& $PM_{2.5}$	The waste generated will be utilized for backfilling the exhausted pits. A whell loader will be deployed for spreading and compression of the material.

4.5.3 AIR QUALITY PREDICTION –IMPACT OF TRAFFIC ON ENVIRONMENT

The ore will be transported from Mine to Sinqurerim Jetty via MDR 02 The total distance is 4.83km out of which 4.21km is dedicated route and 0.62Km is public road Ore will be transported through trucks which are fully covered by tarpaulin , so dust generated from movement of vehicle is intrinsic in nature. The regular maintenance of the road and regular dust suppression will be carried out. The wheel washing system will be placed at exit of the mine. The junctions and mine exits will be washed on daily basis at night time

4.6 IMPACT OF NOISE LEVEL & VIBRATION ON ENVIRONMENT

During the mine operation phase, noise will be generated from all sources. With increasing distance from the source, the noise level decreases due to wave divergence. Additional decrease also occurs due to atmospheric effects and interaction with objects in the transmission paths.Machinery / equipment proposed to be deployed in mining complex are used as input as noise generating sources. Noise generation is assumed 1 m above ground and spreading on a flat terrain devoid of any barriers.

Noise attenuation effects due to barriers like shrubs, bushes and trees, absorption by air, wind, temperature and humidity shall also reduce the noise levels. The noise level will remain well within the prescribed CPCB standards and thus the impact of the project operation on the ambient noise level of study area will be insignificant.No impact of vibration will be there on environment as there is no drilling and blasting involved in the mining.

4.6.1 MITIGATION MEASURES

4.6.1.1 CONTROLLINGNOISELEVELOFMACHINERIES-ENGINEERING CONTROLS

The following mitigation measures will be adopted to control noise.

No drilling operations generatinghigh noise level and blasting operations generating impulsive noise are completely avoided.

The Mineral Block is enclosed by wide green barrier.

Following management measures will be adopted to control noise levels:

1. Reduction of noise level at source is achieved by proper maintenance of machinery and the equipment. Interruption of noise path from the source to the receiver is achieved by the development of wide green belts in-between.
2. Provision of acoustic cabins for operators deployed on HEMM
3. Vehicular traffic within the mine is restricted by reducing the number of trips, using heavy duty dumpers of capacity 20 T within the ML.
4. Selection of new low-noise equipment from the manufactures failing which use of additional retrofits if available.
5. Green belt developed acts as an acoustic barrier.

4.6.1.2 USE OF PROTECTIVE EQUIPMENT- ADMINISTRATIVE CONTROL

As part of a hearing protection the proponent shall consider:

- Defining hearing protector areas
- Issuing of hearing protection equipment to individuals
- Cleaning, maintenance and replacement of hearing protectors
- Training and education of people wearing hearing protectors.
- Provision of job rotation in noisy areas that will reduce personal exposure
- Setting targets for noise levels in existing work areas
- Training on noise impact and consequences
- Including Noise aspects in work agreements with contractors

4.7 IMPACTS ON WATER AND PROPOSED MITIGATIVE MEASURES

Impact on Surface Water

Sirigao-Mayem Mineral Block study area fall under Mondovi River basin of Talukas Bicholim, Bardez, Sattari, Sanguem, Tiswadi & Ponda. The catchment area of Mondovi River is 1580 Sqkm. The Sahyadri hill ranges in the east forms the main watershed.

The streams originating here flow in west and north west direction to join the Arabian Sea.The study area drainage pattern is dendritic and sub dendritic

Main River in study area Aerial Distance

Mandovi River - 4.56km at Pilgao Village

Assonara River –0.56 kms

The impact on the surface waterbodies is envisaged during monsoon season due discharging of mine runoff in the surrounding water bodies in the streams. In case the mine runoff is not treated / managed properly, it may lead to siltation of water bodies.

Impact on Ground water

The mining operations shall intersect the ground water table as the deepest mine workings in the mining plan period is -33 mts. Average depth of Ground water level within the mine is about 10m bgl. Therefore, it requires major pumping operations. Average annual rainfall in the area is about 3917 mm. The total monsoon water either drains outside the lease area through natural valleys and surface runoff from the operational area is collected in the mining pits.The average depth of water table varies from 37m to 45m below ground level respectively in Lamgao village, 2m to 27m below ground level in Mandrekarwada,4 to 58m below ground level in Mulgao village. No leachable heavy/toxic metals/elements are present in the ore and the wastes. The suspended solids content in the surface water samples are also well within the limits and therefore there shall be no effect on aquatic life.

These, clearly establish that the Taluk in general and study area of Sirigao-mayem Mineral Block is in **SAFE** category from ground water development point of view.

MITIGATION MEASURES

The proposed mitigative measures are.

1. Boulder walls will be provided at the foot of the dump to arrest the flow of silt.
2. There are already existing garland drains of about 2000m around the styablized dumps to minimize the ersosion.
3. Mining: Garland drains to divert rain water to settling pond for settling of suspended solids. Construction of rubble walls to arrest suspended solids. Collecting the rainwater in a sump at the bottom of the Mine Pit to settle the suspended solid particles.

4. There are already stabilized dumps which is fully reclamined with afforestation and garland drains so that the rain water is diverted to flow to already exisiting settlings ponds which are about 14 nos
5. The entire surface runoff water is diverted into the mine pit and allowed to settle.
6. There shall be no generation of industrial waste water from Mining Operations
7. Ground Water Intersection: Detailed hydrogeological report is given vide **Appendix No. 1**

The detailed evaluation of impact using BEE's methodology is undertaken which is a weighing scaling checklist under the ***section 4.11***

4.8 ANTICIPATED IMPACTS ON BIOLOGICAL ENVIRONMENT

Identification of all potential environmental impacts due to a project is an essential step of Environmental Impact Assessment. In general, Mining is carried out over a long period till the ore gets exhausted. The impact on biodiversity would be high if the project is located close to a sensitive area. So, impact of biological environment was assessed based on the ground observation and distance of receptors from the project. The impact will be assessed on a scale of 1 to 10, if the scale 1 indicate higher chances of impact on biodiversity and 10 score will be least impact on biodiversity as given in the Table 4.8.

Table 4.8. Significance of Impact on Biological Environment (Score 1 higher impact and 10 – least impact on biodiversity)

Issues	**Observations**
Proximity to national park / wildlife sanctuary/ reserve forest/mangroves/ coastline/estuary/sea	Mandovi River (4.56 km) upstream river riparian vegetation is closer to the core area (<5 km range): Eco-sensitive scale ranges 1(High sensitive area). Amthane dam (7.2km) (> 5 km range) Eco-sensitive scale ranges 8 (less sensitive area).
	Mangrove ecosystem nearest North north west, South west west and south region <5 km Eco sensitive scale range 1
	Salim Ali Bird Sanctuary <10 km from core area Eco-sensitive scale would be 8. (Less sensitive area).
	Assonora, Bicholim,Mapuca and Mandovi river aquatic life and riparian vegetation, eco-sensitive scale ranges 1 (high sensitive areas)
Activities of the project affects the breeding/nesting sites of birds and animals	Migratory bird species may be affected due to the Mining activity due to noise, dust and ground vibrations from the vehicles etc. Yellow wattled lapwing and Red wattled lapwing's birds prefers the ground for their nesting may be impacted. Eco-sensitive scale would be 8

	The butterfly may get affected due to host plant availability and due to dust deposition on the host plant nearby area. Eco-sensitive scale would be 8
	Fishes and crabs may be affected due to downstream soil erosion to the Assonora, and Mandovi river and its aquatic species. Eco-sensitive scale would be 8
Located near an area populated by rare or endangered species	The fauna's species is given in chapter 3, from the given species list dominate species are locally resident and seasonal migratory species. Eco-sensitive scale would be 10
Proposed project restricts access to waterholes for wildlife.	There is possibility of wild boars venture into the core areas for water/foraging. Eco-sensitive scale would be 9
Proposed mining project impact on surface water quality that also provide water to wildlife	No such water effectively used for wildlife, the large proportion of water utilized itself for native species plantations and land stabilization process. Eco-sensitive scale would be 9
Proposed mining project increase siltation that would effect nearby Biodiversity area.	There are chances of soil erosion, proper garland trench and followed by settling ponds avoids damages to aquatic biodiversity at the downstream orders. Eco-sensitive scale would be 8
Risk of fall/slip or cause death to wild animals due to project activities	By chance any such incident or wild animals are reported inside the mine; local forest department would be informed and with their support the animal will be rescued, emergency contact number of forest department would be made available in the mine office. Eco-sensitive scale would be 8
The project release effluents into a water body that also supplies water to a wildlife	No such effluents coming from Block area. Eco-sensitive scale would be 10
Mining project effect the forest based livelihood/ any specific forest product on which local livelihood depended	The proposed ML, have no such non-timber forest product depending communities. There is small hamlet of them who are depending upon Agriculture.
	Many village households will be employed in the mines for various types of technical as well as non-technical jobs. Eco-sensitive scale would be 9
Project likely to effect migration routes	No such wildlife corridors. Eco-sensitive scale would be 10
Project likely to effect flora of an area, which have medicinal value.	No such significantly important medicinal value species within the mine area. Eco-sensitive scale would be 10
The project likely to affect wetlands, fish breeding grounds, marine ecology	There is very less chance of soil erosion to the nearby rivers Assonora, and Mandovi. There will be proper mine EMP to be followed to not to let out any sedimentation from the mine lease area. Eco-sensitive scale would be 7

Outside the mine areas degraded landscape were colonized by fast growing, exotic species such as Acacia auriculiformis, Chromolina sp., and L. camara species, which suppress the native species and effects the soil seed bank for future establishment of native forest.

The common threats observed in the buffer zone are grazing, invasive and exotic species proliferation and fuel wood collection by local communities. The given study site receives higher precipitation level (ranges 3500-3917 mm), such intensive rainfall, may contributes proportionally higher turbidity due to the adding up of soil erosion; irrespective of how much precautions been taken. These may affect both lentic and lotic ecosystem and also riparian vegetation.

Further transportation / vehicle movement act as a barrier for many elusive / cryptic mammals and also often road transportation may kill many cold-blooded animals like snakes, lizards, frogs and butterflies.

Network of electric line not only cause mechanical injuries but makes many species prone to electrocution to wide span winged birds, flying foxes, macaque and panthers some time become prone to electrocution.

MITIGATION MEASURES

The proposed project, threats may arise as a result of developmental activities in the buffer zone of the mine area. As mentioned in the MoEF&CC guidelines eco-sensitive zones need to be identified around the protected area, which acts as a wildlife corridor or as a shock absorber. The likely disruptive activities include road construction, mining, and dumping of excavated material and human population pressure on land and biological resources of the sanctuary.

The mine lease area is close to the aquatic ecosystem may cause significant impacts on downstream aquatic and riparian ecosystem. The flora and faunal conservation point of view, we are hereby suggesting biodiversity conservation and management plan for the region with the following objectives in mind:

- Sustainable development of natural ecosystems and areas which may hold potentially important species from the conservation and/or economic significance;
- Preservation of natural habitats in the core and buffer zone and identification of areas that require special attention;
- Special efforts for in-situ or ex-situ conservation of rare/endangered/threatened (RET) plant species;

- Mitigation of biotic and/or abiotic pressures/influences on the habitats;
- To improve habitat conditions by taking up afforestation with bamboo and fruit yielding species, which attract faunal diversity and soil conservation measures;
- To create awareness regarding conservations, and ensure people's participation in the conservation efforts.

The following areas require special attention with reference to conservation and management of flora and fauna:

- Development of ex-situ area for conservation of RET plant species
- Riparian areas buffer area with protection and restoration of river bank vegetation
- Downstream and upstream areas of river from the mine site.
- The nearby forest should be free from fire, fuel wood collection, poaching, invasion of weeds, grazing pressure etc., which are the main limiting factors affecting wildlife habitats and their corridors directly. These threats will cause the following problems in the region.
- Human–Wildlife conflicts
- Reduction in food availability for herbivores
- Soil erosion and water shortage in summer
- Create imbalance in tropic level and food chain
- Disease propagation from livestock to mammals
- Reduction in area of wilderness needed for the wildlife
- Frugivorous birds replace insectivorous birds
- Lack of pollinators and fruit dispersal agents

The detailed evaluation of Impact on Biological environment is given under section 4.11

4.9 SOCIOECONOMIC IMPACT OF BLOCK-II SIRIGAO MINERAL BLOCK (ANTICIPATED IMPACT)

4.9.1 Impact on human habitations

a) Displacement of population in the core block area.

There are 2 villages within the Mineral Block namely Sirigao and Mayem villages. The mining operations and habitat are co-existing since many decades and there is no issue as the mining operations shall involve no drilling and blasting and sufficient barrier of 50mts from habitations shall be maintained. No Population has to be displaced because of mine. Household income from agriculture being low, farmers are looking for income from other sources. The mining is the only other source providing direct or indirect employment for local people rejuvenating household income.

b) Impact on population in buffer zone. The villages covered over the 10 kms of Mineral Blockis given in the Fig 4.5 below

Fig No: 4.5 Village Map

Sl. No	Villages Names within 2 km radius	Impact of mining on the nearby population	Mitigative Measures
1	**Sirigao**	***Environment Pollution***: **Air:** The major impact on the nearby villages within 2 kms radius is Air pollution in which the pollutants like PM10, PM2.5, SO2 & NOX are predicted by using Aermod in which the incremental values were observed are about PM10- 76.74 **µg/m3** at Core area, PM2.5 -36.38**µg/m3** at Mulgao village, SO2 – 13.02**µg/m3** at Mayem village& NOx- 21.02 **µg/m3**at Sinquirem village **Major Health Impact due to dust on Habitation:** Respiratory diseases due to dust Skin diseases due to pollution/ dust etc	***Air Pollution***: Dust Suppression: Water sprinkling during loading and unloading and on the haul roads to control dust emission, Tarpaulin covering of trucks during transportation. Plantation of trees on the either side of the haul roads to minimize dust emission Green belt area: Sirigao Village(Within Mineral Block): 11.4 Ha (50m wide) No R & R is proposed Mayem: No habitation (50 m barrier shall be provided) Archeological monuments : Corjuem Fort :High conopy planataion(local species like Cashew , Avla, Arjuna, Bamboo etc) shall be carried out .
2	**Mayem**		
3	**Corjuem**		
4	**Ponolem**		
5	**Mulgao**		
6	**Sircaim**		
7	**Assonora**		
8	**Aldona**		
9	**Lamgao**		

		Water : Majorly water pollution will be the suspended matter which flow from the mine during rainy season into the nearby nallahs. There is one water body nearby 1. Assonora river – 0.56kms	***Water Pollution*** : Construction of garland drains through out the mining area and dumps to divert the flow into settling ponds to reduce the runoff of sediments .
		Noise: The noise impact from the HEMM and due to transportation of the vehicles	***Noise Pollution***: No drilling and blasting involved in the mining. Maintenance of vehicles to reduce the noise.

Sl. No	**Villages Names within 5 km radius**	**Impact of mining on the nearby population**	**Mitigative Measures**
1	Moitem	***Environment Pollution*** : **Air**: The impact on the villages within 5 kms will have less impact on Air quality in which the pollutants like PM10, PM2.5, SO2 & NOX . **Major Health Impact due to dust on Habitation :**Respiratory diseases due to dust Skin diseases due to pollution/ dust etc	***Air Pollution***: Dust Suppression : Water sprinkling on the haul roads to control dust emission , Tarpauline covering of trucks during transportation , Plantation of trees on the either side of the haul roads to minimize dust
2	Advalpale		
3	Assonara		
4	Sircaim		
5	Mulcaon		
6	Lamgao		
7	Bicholim		
8	Aldona		
9	Nachinola		
10	Olaulim		
11	Calvim		
12	Ambnem		
13	Caraim	***Water*** : There are surface water bodies Mandovi River -4.56kms Mayem lake- 3.6 kms No major impact due to mining activity on the water bodies .	***Water Pollution*** : Construction of garland drains, check dams and settling pond to prevent the sediments runoff in the nearby water bodies .
14	Aturli		
15	Vainguinem		
16	Ona	**Noise** : The noise impact shall from the HEMM and due to transportation of the vehicles	***Noise Pollution*** : No drilling and blasting involved in the mining , Maintenance of vehicles to reduce the noise.

Already, the State and the Central Governments have been implementing many rural developmental and welfare programs. In addition to these programs, the mining authorities are planning CSR welfare schemes by spending considerable money.

Therefore, the CSR activity will have positive impact on village economy and will foster socio-economic development. Under CSR activities, mining authorities are tentatively planning welfare measures like provision of drinking water, health care like medicines, first aid, heath camps , basic medicines, education and training by providing school uniforms, rain wear, notebooks etc, recreation facilities by donating to sports and to social and cultural organizations and infrastructural facilities like proving street light fixtures, , etc.

- The welfare programs may bring some changes in the community and in the individual lifestyles. They have been listed below. The list is not complete and mutually exclusive. Use of latest technology in agriculture thus making it less labour intensive
- Employment in non-agriculture sector will increase,
- The literacy rates will improve,
- Money circulation will increase,
- Standard of living will improve,
- Aspirations among people will increase, and
- Infrastructural facilities like transport and communication will improve.
- There are some aspects which will not change because of mining activity. They are listed below:
- Water quality will remain the same,
- Human settlements will not be disturbed,
- Common property resources, in particular, grazing land will not decline.

4.9.2 LIVELIHOOD

In general, along with mining agriculture sectors will also fluorish. Cash flow in the local market will have greater impact on cash transfers. Income from non-agriculture is going to be the significant source of household economy.

4.9.3 ECONOMICS.

Local economy will become vibrant because of mining activities. The village economy will be rejuvenated because of money flow and monetization of economy.

4.9.4 INFRASTRUCTURE

The mining authorities are going to spent large amount of money in development of infrastructural facilities and this will have positive impact on quality of life.

4.9.5 *IMPACT ON THE CROPPING PATTERN AND THE CROP PRODUCTION IN THE BUFFER ZONE.*

It is observed from the informal meetings, focus group discussions and in-depth interviews that mining will have least impact on agriculture yield.

4.9.6 COMPENSATION FOR LOSS OF LAND AND CROPS.

The project is a fresh grant of mining lease and as such there are no compensation claims towards the company. There would be a structured system of grievance redressal for any external complaints. Advise will be taken from zonal agriculture office as well as Agricultural consultants to improve the agriculture in the surrounding areas.

4.9.7 IMPACT ON THE COMMUNITY RESOURCES SUCH AS GRAZING LAND.

The mining activities will have least impact on the common property resources.

4.9.8 MITIGATION MEASURES.

The some of the following tentative mitigating measures are being implemented with well designed plan of action and adequate budget. This list is not exhaustive, but only suggestive.

- Supply of drinking water to villagers,
- Construction and renovation of schools,
- Construction and renovation of temples,
- Self-employment program (such as tailoring, wire netting, doll making, cane furniture, etc.) for women members of SHGs,
- Vocational training schools for general or self-employment,
- Afforestation or tree plantation, either fruit bearing or timber or any forest plant,
- Health, safety and medical facilities like first aid and basic medicines provided by their medical facility.
- Education and Training (transport facility for students, educational aids to students), and
- Direct employment for locals for both skilled and unskilled workers.

4.10 IMPACT ON LOCAL TRANSPORT INFRASTRUCTURE DUE TO THE PROJECT PROPONENT SHALL CONDUCTIMPACT OF TRANSPORTATION STUDY AS PER INDIAN ROAD CONGRESS GUIDELINES.

The iron Ore will mine to Sinqurerim Jetty Via MDR 02 width of the Road is 5.0m. The total distance is 4.83km out of which 0.62Km is public road.

Fig.No.4.6 Transport route The Iron Ore will mine to Sinqurerim Jetty Via MDR 02 width of the Road is 5.0m

Sl.No	ROM	Quantity TPA	Tones /Day	Trips per Day	Mode of Transport
1	Iron ore	10,00,000	3984.06	379.4	Road
Total Trips per day				380	

Transportation route works only 251 days in year & capacity of truck is 10.5 ton

To & from

380 * 2 = 760

Converting the Trips per Day to PCU for Tippers

Total PCU = 760 * 3= 2280 PCU

Additional Load due to transport of is 2280 PCU

Total Load (present Load + Additional Load) PCU per day

Total = 572+2280 = 2852PUC per day

Road	V (Volume in PCU/day.)	C (Capacity in PCU/day.)	Existing V/C Ratio	LOS
Mine To Jetty	2852	6000	0.475	C Good

Sl.No	V/C Ratio	LOS
1	0-0.2	A Excellent
2	0.2-0.4	B very good
3	0.4-0.6	C Good
4	0.6-0.8	D Fair/ Average
5	0.8-1.0	E Poor
6	1.0 above	F Very Poor

4.11EVALUATION OF IMPACTS

For the purpose of evaluation of quality of the environment at Block- II Sirigao-Mayem Mineral BlockProject, Battelle Environmental Evaluation System (BEES) methodology has been adopted. This methodology is the most commonly adopted method for evaluation, through a weighing-scaling checklist. The checklist for the present opencast iron ore project would consist of 48 selected parameters identified for this purpose.

All these parameters have been assigned importance weight by the experts in different fields. The resultant importance weight points i.e., Parameters Importance Unit (PIU) are presented in Fig.4.7 by indicating the numbers in the parenthesis.

Typical functional relationships also called value function graphs have been developed for various parameters. The Environmental Quality (EQ) is represented on a scale of 0 to 1, 0 representing poor environmental quality and 1 representing good environmental quality. An Index is obtained in Environmental Impact Unit (EIU) for each alternative and baseline environmental conditions (i.e., EIU with EMP (Environmental Management Plan) EMP & EIU without EMP).

$$EIU_j = \sum_{i=1}^{n} (EQ)_{ij} \times (PIU)_i$$

Where,

EIUj = Environmental Impact units for Jth alternative

EQij = Environmental Quality Scale for ith factor

PIUi = Parameter Importance Unit for ith factor

All the parameters identified for this project have been distributed in four major categories viz., All the parameters identified for this project have been distributed in four major categories viz.,

1) Biological Environment
2) Environmental Pollution
3) Aesthetics
4) Human Internet

ENVIRONMENTAL IMPACT (1000)

Biological Environment (300)

TERRESTRIAL		(200)
.	Natural Vegetation	(40)
.	Crops	(30)
.	Species diversity	(30)
.	Foodweb Index	(20)
.	Rare & Endangered Plant species	(30)
.	Pest Species	(20)
.	Soil Microbiology	(30)
AQUATIC		(100)
Natural vegetation		30
Foodweb Index		10
Species diversity		15
Rare and endangered Species		10
Ground water Characteristics		20
Pests species		15

Environmental Pollution (450)

WATER		(100)
.	Temperature	(10)
.	pH	(15)
.	B.O.D	(15)
.	D.O	(10)
.	Nutrients	(10)
.	T.D.S	(10)
.	Turbidity	(10)
.	Feacal Coliform	(10)
.	Toxic substances	(10)
AIR		(150)
.	SPM	(70)
.	SO_2	(40)
.	Nox	(40)
LAND		(140)
.	Landuse Pattern	(80)
.	Soil erosion	(30)
.	Soil chemistry	(30)
NOISE		(60)
.	Community noise	(15)
.	Occupational noise	(45)

Aesthetics (100)

.	Topographic character	(20)
.	Appearance of Water body	(10)
.	Odor	(10)
.	Landscape	(10)
.	Sound	(10)
.	Visual quality Of air	(20)
.	Natural fauna	(10)
.	Green belt	(10)

Human Interest (150)

.	Economy output	(20)
.	Employment	(25)
.	Housing	(15)
.	Education	(15)
.	Drinking water supply	(15)
.	Sanitation	(10)
.	Transportation & Communication	(15)
.	Community health	(20)
.	Occupational health	(15)

FIG.NO. 4.7 ASSIGNED WEIGHTS FOR ENVIRONMETAL PARAMETERS

4.11.1 Biological Environment:

(A) Terrestrial Environment:

The impacts of Iron Ore mining activities are presented in Table No.4.9. Natural vegetation in the core zone is very scanty.

The tree species found within the core zone represent the dry-deciduous type. Due to mining activities community structure of the forest is changing. Diversity of plant species and foodweb Index of the area reduces to certain extent.

However, if the proposed reclamation of the mining area using proper re-vegetation techniques and development of green belt around the ultimate pit limit, there shall be an improvement in the species diversity and foodweb Index.

(B) Aquatic Environment:

The existing quality of natural vegetation in the aquatic environment is good. However, due to the temporary dumping of overburden from the mines may lead to soil erosion ultimately affecting the turbidity and chemical characteristics of surface water. This in turn will alter the aquatic natural vegetation by way of change in species diversity. With the provision of proper environmental management measures there shall be reduction in soil erosion. This in turn will improve the natural vegetation by improving the species diversity, foodweb Index and surface water characteristics.

There are no rare and endangered aquatic species reported in the study area. There are no aquatic weeds reported in the surface waters. Hence no change in these parameters are anticipated.

In general, due to various mining activities, adverse impacts are anticipated in terrestrial and aquatic components of the Biological Environment. However, with the implementation of the EMP, which is being proposed, there will be significant improvement in the parameters of biological environment (Table No.4.9).

Sensitivity: Public (C4)

Table No.4.9 ENVIRONMENTAL EVALUATION: BIOLOGICAL ENVIRONMENT

Environmental Parameters	PIU/ EQU EIU	Baseline (A) EIU	Without EMP (B) EIU	With EMP (C) EIU	Change In EIU (C-B)	Change In EIU (B-A)	NET Change EIU (C-A)
TERESTRIAL							
Natural vegetation	40	28	20	32	12	-8	4
Crops	30	15	12	18	6	-3	3
Species diversity	30	15	12	18	6	-3	3
Foodweb Index	20	12	10	14	4	-2	2
Rare and endangered & Plant Species	30	21	18	21	3	-3	0
Pests species	20	14	10	16	6	-4	2
Soil microbiology	30	21	15	24	9	-6	3
Sub-Total	**200**	**126**	**97**	**143**	**46**	**-29**	**17**
AQUATIC							
Natural vegetation	30	21	15	22.5	7.5	-6	1.5
Foodweb Index	10	6	5	6.5	1.5	-1	0.5
Species diversity	15	10.5	7.5	9	1.5	-3	-1.5
Rare and endangered	10	8	8	8	0	0	0
Species	20	12	10	12	2	-2	0
Ground water							
Characteristics	15	10.5	7.5	9	1.5	-3	-1.5
Pests species							
Sub-Total	**100**	**68**	**53**	**67**	14	**-15**	**-1**
Total	**300**	**206**	**160**	**224**	**64**	**-46**	**18**

4.11.2 ENVIRONMENTAL POLLUTION:

Due to the continuity of the mining activities of the project the following four components are affected. Viz.,

Air

Water

Land

Noise & Vibration

Air Environment: In the proposed opencast mine operations like ripping, dozing, loading, transportation and unloading operations of overburden and iron ore may deteriorate the air quality. The baseline levels of ambient air quality in the buffer zone villages are well within the permissible limits. However, the dust concentrations in the fugitive sources are likely to increase during mining operations. The concentration of NOx and SO2 are very much below the permissible limits.

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Reduction in dust concentration is anticipated by green belt development and water spraying on all the haul roads and at the screening plant.

Water Environment:

Major Parameters which represent the water environment are BOD, DO, Total Solids (TS), Turbidity, Faecal coliforms, toxic metals, pH, temperature and nutrients.

The water flowing through the overburden dumps will carry suspended solids, dissolved metals and nutrients, which will affect the quality of the groundwater as well as surface waters.

Provision of rubble walls, garland drains, settling ponds and plantations of trees, etc., on the inactive benches will arrest soil erosion to a great extent. This will improve the surface and ground water quality.

Land Environment:

Excepting the mining lease area, there will not be any adverse effect on the land in the buffer zone area. With the measures proposed under EMP there will not be any effect of land degradation other than the mining lease area.

Noise:

The sources of noise in mining area are due to ripping, dozing, loading, haulage and unloading of ore and waste using shovels, unloading of overburden using dumpers and transportation of ore.

Sensitivity: Public (C4)

Table No.4.10 ENVIRONMENTAL EVALUATION OF ENVIRONMENTAL POLLUTION

Environmental	PIU/EQU	Baseline (A)	Without EMP	With EMP (C)	Change In	Change In	NET Change
Parameters		**EIU**	**(B) EIU**	**EIU**	**EIU (C-B)**	**EIU (B-A)**	**EIU (C-A)**
WATER							
Temperature	10	7.5	5.5	6.5	1	-2	-1
pH	15	11.25	8.25	9.75	1.5	-3	-1.5
B.O.D	15	11.25	9.75	10.5	0.75	-1.5	-0.75
D.O	10	8	6.5	7.5	1	-1.5	-0.5
Nutrients	10	7	5	7	2	-2	0
T.D.S	10	8	6	7.5	1.5	-2	-0.5
Turbidity	10	7	5	6.5	1.5	-2	-0.5
Faecal Coliform	10	9	6	7	1	-3	-2
Toxic Substances	10	8	6	7.5	1.5	-2	-0.5
Sub-Total	**100**	**77**	**58**	**69.75**		**-19**	**-7.25**
AIR							
PM10	70	56	35	49	14	-21	-7
SO2	40	32	20	28	8	-12	-4
NOx	40	32	20	28	8	-12	-4
Sub-Total	**150**	**120**	**75**	**105**		**-45**	**-15**
LAND							
Land use pattern	80	52	44	48	4	-8	-4
Soil erosion	30	21	18	19.5	1.5	-3	-1.5
Soil Chemistry	30	21	18	19.5	1.5	-3	-1.5
Sub-Total	**140**	**94**	**80**	**87**	**7**	**-14**	**-7**
NOISE							
Community	15	12	9	9	0	-3	-3
Noise		0	0	0	0	0	0
Occupational	45	36	27	31.5	4.5	-9	-4.5
Noise		0	0	0	0	0	0
Sub-Total	**60**	**48**	**36**	**40.5**	**4.5**	**-12**	**-7.5**
TOTAL	**450**	**339**	**249**	**302.25**		**-90**	**-36.75**

4.11.3 AESTHETIC ENVIRONMENT

The topography of the mining area i.e., gently hilly terrain shall alter to certain extent due to excavation of ore and dumping of overburden. The development of proposed green belt around the ultimate pit limit and afforestation of backfilled areas will enhance diversity of vegetation. The visual quality of water any change slightly. The aesthetic parameters with EMP and without EMP have been presented in Table No.4.11.

Sensitivity: Public (C4)

TABLE NO.4.11 Environmental Evaluation Of: Aesthetic Environment

Environmental Parameters	PIU/EQU	Baseline (A) EIU	Without EMP (B) EIU	With EMP (C) EIU	Change In EIU (C-B)	Change In EIU (B-A)	NET Change EIU (C-A)
Topographic Character	20	17	13	16	3	-4	-1
Appearance of Waterbody	10	7	5	6	1	-2	-1
Odour	10	9	7	9	2	-2	0
Land scape	10	9	5	8	3	-4	0.5
Sound	10	8	6	7.5	1.5	-2	-0.5
Visual Quality Of air	20	16	12	15	3	-4	-1
Natural founa	10	8	5	8	3	-3	0
Greenbelt	10	7	6	9	3	-1	2
Total	**100**	**81**	**60**	**80.5**	**20.5**	**-22**	**-1**

4.11.4 HUMAN INTEREST

Operation of mining and associated activities will result in some socio-economic impacts, of direct consequence and some of indirect nature. The social status of the people will improve due to increased income for workers as a result of increase in employment opportunities. There will be occupational problems due to the mining activity, but these problems can be contained by adopting all the measures suggested in EMP.

Education and sanitation status will improve in this are due to this project. The respective score for all the human-interest parameters are presented in Table No.4.12.

Table No.4.12 Environmental Evaluation Of Human Interest

Environmental Parameters	PIU/ EQU	Baseline (A) EIU	Without EMP (B) EIU	With EMP (C) EIU	Change In EIU (C-B)	Change In EIU (B-A)	NET Change EIU (C-A)
Economy output	20	5	11	18	7	6	13
Employment	25	12	16	22	6	4	10
Housing	15	5	10	13	3	5	8
Education	15	9	10	13	3	1	4
Drinking Water Supply	15	7	9	13	4	2	6
Sanitation	10	6	8	9	1	2	3
Transportation & communication	15	10	10	14	4	0	4
Community Health	20	12	13	16	3	1	4
Occupational Health	15	9	7.5	13	5.5	-1.5	4
Total	**150**	**75**	**94.5**	**131**	**36.5**	**19.5**	**56**

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The Net Environmental Impact of Block-II Sirigao - Mayem Mineral Blockfor biological category is +18. This is due to the increased plantation and proper land use as envisaged in the EMP.

The Net Impact under environmental pollution category is -36.75. This -ve impact is due to mining operations and transportation activities. The dust levels are bound to increase. The noise levels also will increase due to the operation of various mining equipment and screening plants.

The Aesthetic category -1 minor impacts due to change in appearance of water, diversity of vegetation and marginal change in visual quality. The human-interest parameters show +ve impact of +56 due to increased job opportunities, transportation, medical facilities etc.,

The summary of environmental evaluation is presented vide Table No.4.13

Table No.4.13 SUMMARY OF ENVIRONMENTAL EVALUTION

Environmental Parameters	PIU/EQU	Baseline (A) EIU	Without EMP (B) EIU	With EMP (C) EIU	Change In EIU (C-B)	Change In EIU (B-A)	NET Change EIU (C-A)
Biological Environment	300	206	160	224	64	-46	18
Environmental Pollution	450	339	249	302.25		-90	-36.75
Aesthetic	100	81	60	80.5	20.5	-22	-1
Human Interest	150	75	94.5	131	36.5	19.5	56
Total	**1000**	**701**	**563.5**	**737.75**	**121**	**-138.5**	**+36.25**

It is observed that the estimated change in EIU from baseline to the project without EMP is -138.5. the overall change in EIU due to the project with EMP over the baseline is a +ve of +36.25. The total Net impact is therefore +ve for this project.

With a view to analyse subjectivity and uncertainty in decision making for the continuation of this mining project, two evaluation scenarios with equal and unequal PIUs are considered. The results are tabulated in table No.4.14. the project evaluation scores with assigned set of PIUs and those with equal PIUs have been analysed. The current evaluation score with unequal PIUs is+36.25 units whereas with equal PIUs (Hypothetical Evaluation) the score is +86.63. Therefore, the continuity of project contributes positively.

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Table No.4.14 SCENARIO A : UNEQUAL PIUs (CURRENT EVALUATION)

Environmental Parameters	PIU/EQU	Baseline (A) EIU	Without EMP (B) EIU	With EMP (C) EIU	Change In EIU (C-B)	Change In EIU (B-A)	NET Change EIU (C-A)
Biological Environment	300	206	160	224	64	-46	18
Environmental Pollution	450	339	249	302.25		-90	-36.75
Aesthetic	100	81	60	80.5	20.5	-22	-1
Human Interest	150	75	94.5	131	36.5	19.5	56
Total	**1000**	**701**	**563.5**	**737.75**	**121**	**-138.5**	**+36.25**

ENVIRONMENTAL EVALUATION WITH EQUAL PIUs

SCENARIO B : EQUAL PIUs (HYPOTHETICAL EVALUATION)

Environmental Parameters	PIU/EQU	Baseline (A) EIU	Without EMP (B) EIU	With EMP (C) EIU	Change In EIU (C-B)	Change In EIU (B-A)	NET Change EIU (C-A)
Biological Environment	250	171.667	133.3	186.67	53.33	-38.33	15.00
Environmental Pollution	250	188.33	138.3	167.92	29.58	-50.00	-20.42
Aesthetic	250	202.500	150	201.25	51.25	-52.5	-1.25
Human Interest	250	125.000	157.5	218.3	60.80	32.50	93.30
Total	**1000**	**687.50**	**579.17**	**774.13**	**194.97**	**-108.333**	**+86.63**

Sensitivity: Public (C4)

Chapter-5

ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

Sensitivity: Public (C4)

5.0 ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

5.1 ALTERNATIVE TECHNOLOGIES

This proposal is for Environmental Clearance under EIA Notification 2006 and as amended from time to time. The proponent proposes to adopt systematic mechanized open-cast mining with HEMM technology for mining the ore, a conventional methodology used worldwide. The project proponent plans to adopt the State of Art technology in mining and procure new-generation HEMM (Heavy Earth Moving Machinery) for mining Iron Ore deposits. Hence, no other alternative technology for mining is considered as the present technology is proven, tested and viable technology.

5.2 ALTERNATIVE SITES

Salgaocar Shipping Company Private Limited has been declared as preferred bidder in the e-auction, to start iron ore mining in Block-II Sirigao-Mayem Block located at Sirigao & Mayem villages, of Bicholim Taluka, North Goa District, Goa State over an area of 171.2472 Ha, to be leased over a period of 50 years after fulfilment of conditions of LOI issued by the Department of Mines and Geology, Government of Goa. The proposed Mining Lease area falls in Toposheet no.48E/14 /of the Survey of India. The Block II Sirigao Mayem Block will be provided with all necessary infrastructural facilities for the production of Iron Ore. The proposed production of 1.00 MTPA is planned within the existing Mining Lease Area. There is no forest land involved in the said Mining Lease. Since the Mining activity is site-specific, seeking an alternative site is not applicable.

Sensitivity: Public (C4)

Chapter-6

ENVIRONMENTAL MONITORING PROGRAM

Sensitivity: Public (C4)

ENVIRONMENTAL MONITORING PROGRAMME

6.0 GENERAL

The monitoring and evaluation of the management measures envisaged are critical activities in implementation of the proposed project. Monitoring involves periodic checking to ascertain whether activities are performed according to the plan. This provides necessary feedback for project management to check the efficacy of environmental performance. The purpose of the environmental monitoring plan is to ensure that the envisaged purpose of the project is achieved.

To ensure the effective implementation of the proposed mitigation measures, the broad objectives of monitoring plan are:

- To evaluate the performance of mitigation measures proposed in the EMP.
- To evaluate the adequacy of the Environmental Impact Assessment
- To suggest improvements in the environmental management plan, if required
- To enhance environmental quality.
- To undertake compliance monitoring of the proposed project operation.

A separate department, the "Environment Management Department (EnMD) shall be constituted to carry out day to day environmental monitoring/ inspection requirements at the project site.

6.1 FREQUENCY & LOCATIONS OF ENVIRONMENTAL MONITORING

A comprehensive monitoring programme is given under

Table 6.1: Monitoring Schedule for Environmental Parameters

S.No.	Particulars	Frequency of Monitoring	No of Locations	Sampling	Parameters Required to be Monitored
Air Quality					
1	Ambient Air quality in and around the Mine	Twice a week	4	24 hours continuously	$PM_{2.5}$, PM_{10}, SO_2 & NO_2
Water Quality					
2	Water Quality around the Mine **Surface Water**	Once in a Month	4 - Surface water 2 - Pit discharge water	Grab Sampling	As per IS: 2296 As per IS : 422E
	Ground Water	Once in Quarter	5	Grab Sampling	As per IS: 10500
Noise Level Monitoring					
3	Ambient Noise levels & work place Noise monitoring	Once in a Quarter	4 in core area 6 in buffer area	Continuous for 24 hours with 1-hour interval	Noise Level

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S.No.	Particulars	Frequency of Monitoring	No of Locations	Sampling	Parameters Required to be Monitored
Soil Quality					
4	Soil Quality around the Mine	Once in a year	4	Grab Sampling	IS: 2720

6.2 TECHNICAL ASPECTS

6.2.1 METHODOLOGIES

Environmental monitoring is required to know the Quality of Ambient Air, Water and Noise Levels during the operation phase of the proposed project and take required corrective measures, in case of any non-compliance with the norms stipulated by regulatory authorities. The methodologies adopted for environmental monitoring will be in accordance with the CPCB guidelines.Environmental Monitoring will be done in accordance with National Ambient Air Quality Monitoring Series: NAAQS/2003-04, Guidelines for Ambient Air Quality Monitoring, Central Pollution Control Board, April, 2003, Guidelines for The Measurement Of Ambient Air Pollutants Central Pollution Control Board May, 2011, Minars/27/2007-08, Guidelines For Water Quality Monitoring, Pollution Control Board Methods of Monitoring and Analysis, Annex IV of guidelines. A planned monitoring program to evaluate the effectiveness of various/specific aspects of technological/ mitigation measures shall be drawn.

6.2.2 DATA ANALYSIS

The procedures that will be followed for analyzing the parameters are indicated below:

- Water samples will be analyzed for various parameters as per IS: 3025
- $PM_{2.5}$ & PM_{10} will be analyzed as per IS: 5182 Part 24 & Part 23 using APM 550 for PM2.5 & APM460 for PM10, SO_2& NO_2 as per IS: 5182 Part II & Part VI respectively using APM460 instruments.
- SO_2 samples will be analyzed using improved West-Gaeke method for air samples with the help of spectrophotometer.
- NO_2 samples will be analyzed using / modified (Na-As) method for air samples with the help of spectrophotometer.

6.2.3 MICROMETEOROLOGY

A micro-meteorological station will be set-up at an approximately central location of the mine lease. The site selected shall be free from obstructions to ensure free movement of air. An "Automatic Weather Station" will be installed at least 5 m above the ground.

The following attributes will be measured at one-hour interval continuously round the clock:

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- Wind Speed
- Wind Direction
- Air Temperature
- Relative Humidity

Precipitation will be recorded on a daily basis. The data will be recorded automatically on a data logger.

6.2.4 Air Quality

Air quality will be monitored at 4 locations on a regular basis. All monitoring stations shall be monitored in the up-wind and down-wind w.r.t. the Mineral Block. The number of stations may be increased if directed by State Pollution Control Board (SPCB) or the Regional Office of MoEF&CC. The locations shall be selected in consultation with the Regional Officer of SPCB. Selected parameters of National Ambient Air Quality Norms [PM_{10}, $PM_{2.5}$, SO_2& NO_2,] shall be monitored. Ambient air and Core zone stations will be monitored on 24 hourly bases and shall be collected twice a week at all the stations. The fugitive dust samples shall be collected as per IBM and DGMS guidelines.

6.2.5 Work Zone Air Quality

Work-zone air quality shall be monitored at various strategic locations (mine faces, crushing plant, loading-unloading points, screening plant, and haulage road). 8 hourly samples shall be collected at each of the locations twice a month.

6.2.5.1 Ground water levels

Water levels in wells at varying distances all around the project area shall be monitored every month.

6.2.5.2 Surface and Ground water quality

Surface water samples shall be collected at 4 different locations which includes upstream & downstream of nearby rivers/streams. Two locations in mine pit discharge points. Samples shall be collected once a month. The parameters listed in IS: 2296 & 422(E) shall be monitored.Ground water samples shall be collected at 5 different locations around the mine site. Samples will be collected once on a seasonal basis. The parameters listed in IS: 10500 shall be monitored.

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6.2.6 Ambient Noise

Ambient noise levels shall be monitored at 10 locations in the surrounding villages including the habitation near transportation route. Noise levels shall be recorded at one-hour intervals continuously for 24 hours at each of the locations once in a season. The frequency of monitoring may be altered if directed by the concerned statutory authorities.

6.2.6.1 Work zone Noise

Work-zone noise levels shall be monitored at various strategic locations (mine faces, crushing plant, loading-unloading points, mine workshop(s), mine office, etc.). Additional locations may be covered if directed by concerned statutory authorities (SPCB, MoEF&CC, and DGMS). Noise levels shall be recorded at one-hour intervals continuously for 8 hours at each of the locations once a month.

6.2.7Occupational Health and Safety

An Occupational Health Centre (OHC) for Mayem-Sirigao Mineral Block shall be established. A systematic programme for medical check-up at regular intervals will be followed at the Occupational Health Centre (OHC) for all workers to ascertain any changes in health condition due to the working conditions.All workmen employed in hazardous working conditions will be provided with adequate Personnel Protective Equipments (PPE).

6.2.8 Plantation and green belt development

Green belt development vis-a-vis safety zone management and progressive plantation in and around the project site shall be developed. The data on area of green cover, survival rate etc. shall be compiled for periodic review.Annual plans for plantations/Gap filling plantations are made. The fulfillment of the plan shall be monitored by the EnMD every six months. Any abnormal death rate of planted trees will be investigated. Watering of the plants, manuring, weeding will be carried out regularly

6.3 REPORTING SCHEDULE

The environmental monitoring report will be sent to Goa State Pollution Control Board on a monthly basis and MoEF&CC & CPCB on a six-monthly basis. Copies of the reports will be maintained at the Mine and will be made available to the concerned inspecting authorities like Indian Bureau of Mines (IBM), GSPCB, MOEF &CC etc.

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6.4 EMERGENCY PROCEDURE

As there is no point source of emission and no generation of any industrial effluent, the possibility of emission/waste water discharge exceeding the norm & leading to emergency situation is not envisaged.

6.5 DETAILED BUDGET & PROCUREMENT SCHEDULES

The budgetary allocation for Environmental Monitoring, Green Belt & occupational health is around Rs.20.1 lakhs per annum. A third-party laboratory recognized by CPCB, MoEF&CC shall be engaged to monitor all the environmental parameters. Half yearly compliance report in respect of stipulated prior environmental clearance terms & conditions will be submitted on 1st June and 1st Dec of each calendar year to MoEF&CC.

Table.No.6.2 Budget allocation

Sl. No	Particulars	Budget Allocated (In Rs lakhs)
1	Environmental Monitoring	12
2	Green Belt Plantation	8.1
3	Occupational Health	2
	Total	22.1

Table.No.6.3 Proposed Monitoring of Environmental Issues

Environmental Issue	Mitigation Measure	Approximate Location	Responsibility
Solid Waste Generation, OB Dumping & Backfilling	Overburden generated during mining operations will be backfilled in the exhausted part of the pit	Backfilled areas	Minesmanager/ Technical services
SlopeFailure	Slope stability studies will be carried out, and regular examination of ore and overburden benches will be taken up for looking slope failures	Quarry benches	Minemanager/ Technical services
Maintenanceof Storm Water DrainageSystem	The drain/ trenches will be cleaned periodically.	Drainagenetwork within the lease area.	Operations
Green Belt and Progressive Afforestation	Plantation will be carried out on backfilled area and on stabilized dumps.	Planting trees inthe dumps	Mines manager
Occupational Health	Regular Health checkup of all the workers will be carried out.	Workers atMine site	Mines manger

The Proposed Environmental monitoring of Air, water & Noise which is proposed in table.No.6.1 shall be carried out by third party and the Environmental officer shall be responsible

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Chapter-7

ADDITIONAL STUDIES

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7.0 ADDITIONAL STUDIES

7.1 PUBLIC CONSULTATION

This EIA & EMP Report has been prepared in compliance with the EIA Notification dated 14th September 2006 and the Terms of Reference (ToR) issued by the Goa State Environment Impact Assessment Authority vide letter No F.No 115/3/2023-24/GSEIAA/Project-Prop/166 dated 18.10.2023. The public hearing was conducted on 19.06.2024 at Bicholim Gymkhana, Smt. Hirabai Zantye Memorial Hall, Near Shantadurga High School, Bicholim, Bicholim Taluka, North Goa district, Goa and the proceedings of the same, were recorded by Goa State Pollution Control Board and hard copy of the proceedings of the public hearing were received by Project proponent on the same day. The input on various mining parameters, mineral block area, production quantities mining technology, waste generation, handling & storing etc. have been taken from the mining plan approved by Indian Bureau of Mines, for the preparation of the EIA Report. The proposed action plan with the budget, to comply with points raised in public consultation is presented in the Final EIA Report. Advertisement Press notification regarding the date, time and venue of the Environmental public hearing for Block II Mayem-Sirigao Mineral Block on 31.05.2024 in Gomantak, Heraldo. The details are given below

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Action Plan on issues raised during Public heaing					
Sl. Nos.	**Activities**	**Response by the Project Proponent (PP)**	**Year-1**	**Year-2**	**Year-3**
1	Local Employment	The Mine shall provide direct Employment of about 24 people which include Mine official and supervisors and and indirect employment of about 108 personnel which includes skilled, semi skilled and unskilled labours in contractual works and transport. Job prefernce will be given to the qualified surrounding villagers depending on the requirements, production, output and skills.	Employment will be given as per project requirements		
2	Health care for the local villagers	Providing facilities for Medical Requirements.	2,00,000	2,40,000	2,90,000

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3	Support for the education & infrastructure development to the local schools and colleges	Transportation to students, Books, Uniforms , etc.	2,00,000	2,40,000	2,90,000
4	Maintenance of the local temples	Mining Operation will be carried out in accordance with the approved Mining Plan and no Drilling and Blasting will be involved. Approved Mining Plan of Block II and Draft EIA & EMP report safe guards Lairai temple and nearby habitation by maintaining safety buffer zone of 50 Meter from the periphery of nearest habitant. Providing repair and maintance work of roads during Annual festival(Jatra)	5,00,000	5,00,000	5,00,000
5	Environment protection Measures to avoid pollution on the nearby plantation and crops/Field	Following Measures will be taken to Minimize Environmental Pollution.	36,25,000	37,60,000	38,50,000
		1. Rain water will be accumulated in Mining Pit through various channel and settling pond .			
		2. Construction and repair of Existing check dams & , Retaining walls.			
		3. Green Belt Plantation on Backfilling and along the periphery of Block.			
		4. Retaining wall around dump area to reduce soil erosion.			
		5. Control of dust emission from Mining Operation and through ore transporataion			
Total Cost			**45,25,000**	**47,40,000**	**49,30,000**

The detailed response for the public hearing comments are enclosed as **Annexure No.9**

7.2 RISK ASSESSMENT

Salgaocar Shipping Company Private Limited has developed the management system to accomplish the objectives set out in the health and safety policies. It is oriented towards the provision and maintenance of a healthy, safe, and sustainable work environment; to the satisfaction of the stake holders, in accordance with legislation, by providing adequate training to staff to ensure competency and pro-actively reducing the risk of accidents or environmental issues. The proposed operations, storage and handling of raw materials have been studied to identify & assess the Risks (Hazards) and prepare Emergency Preparedness and Response Plan & Disaster Management Plan for natural calamities. Based on the Hazard Identification and Analysis, the major emergency scenarios have been predicted to estimate the consequence of failure.

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In the proposed open-cast mining operations at Sirigao Mayem Mine, the following Risks are identified as shown under:

1. Pit slope failure
2. Waste Dump slope failure
3. Water Inundation
4. Fire

1. Pit slope failure

In order to cope up with dangers due to open cast slope failure. The proposed workings are designed/planned leaving 7.5m safety zone from the lease boundary, as well as 50m safety zone from the public roads, Nallas, railway line and more than 100m from the habitations. The design parameters of the working pit are planned giving utmost importance towards safe, scientific and sustainable mining. The overall pit slope will be maintained at 28^0. The individual bench Slope will be at 67^0. The height of benches will be at 6m and width more than the height. Working bench width will be kept at 3 times the width of the dumper. The haulage road will be maintained at 1:16 gradient. All the existing drainage system within the mineral block area will be cleaned/ de-silted regularly to ensure proper flow of rain water, to minimize development of hydrostatic pressure during rainy season.

Physical examination and systematic monitoring of benches using instruments such as inclinometers, total station etc. will be carried out regularly, as precautionary/safety measure for early detection of crack/slope failure and associated hazards. It is also proposed to undertake pit slope stability study by an institute of repute. The formations being hard laterite and ore, the possibility of slope failure is almost nil.

2. Waste Dump slope failure

There are two stabilized dead dumps within the Mineral block area, the dumps have been rehabilitated by plantation. However, gap filling plantation have been proposed on these dumps to maintain and strengthen the existing green belt. As these dumps are completely stabilized and rehabilitated by plantation. Slope failure is nil.

It is proposed to carryout backfilling in the exhausted part of the Pit No. 1 of the mineral block. There are no proposals for surface dumping.

3. Water Inundation

The area receives around 90% of the rainfall during the monsoon season, Inundation of mine pit may occur due to excessive rains, due to cloud burst, improper drainage, and poor overflow arrangements. This may cause drowning of workmen & equipments.

Sensitivity: Public (C4)

The streams originating here flow in west and north-west direction to join the Arabian Sea. The study area drainage pattern is dendritic and sub dentric which is in shown Plate No.11. The nearest river is Assnora is at a distance of 0.56kms, and forms tributary of River Mandovi. The HFL of Assonora river is 3.5m MSL.

There are two pits in the Sirigao-mayem Mineral block area, namely Pit No.1 & Pit No.2. The rain water falling within the mineral block area will be channelized to the mine pits. The highest water level in Pit No. 1 is 9.5m MSL and the highest water level in Pit No.2 is 11.0m MSL. The water accumulated above these level flows through a series of settling ponds and filter beds and joins the nallas outside the mineral block area. There is a minimum difference of +6.0m from the HFL of Assnora river , as such there would be no flooding in the mineral block area.

4. Action plan to prevent fire

In the mining premises any other equipment which may generate sparks of any kind would be used only with prior permission of concerned authorities where there is a risk of fire. Fire extinguishers shall be kept at engine rooms, generators, workshops etc. Automatic fire extinguishers will be installed on all the Heavy earth-moving Machinery. A competent person shall examine all equipment, material and arrangement provided for firefighting at least once in a month and record of the examination shall be maintained in a register.

Fire extinguisher shall be examined by a competent person at least once in 3 months.

Risk Management

No impact of HFL to mine site.

Storage of explosives

No explosives shall be used.

7.2.1 EMERGENCY SCENARIOS & CONTROL MEASURES

Table 7.1: Risks, Cause & Control Measures

S. No.	Activity/ Scenario	Risk	Cause	Control Measure
1.	Removal of Mineral	Landslide	Loose Soil Angle of Bench being steep	The following safety measures will be followed and the same will be ensured for the proposed project also. Bench height of 6 m with individual bench slope of 67^0 and overall slope angle of less than 28^0 maintained. Inactive slopes will be terraced and mulched and planted with grasses, legumes and bush variety of species

Sensitivity: Public (C4)

S. No.	Activity/ Scenario	Risk	Cause	Control Measure
2.	Movement of Mineral, Top Soil/Wastes etc., in trucks	Accident causing injuries to human/ /damage to properties	Operating vehicle in reverse direction Loss of control of trucks while driving Speeding Overtaking Overloading Not using hand brake Drink & Drive	Providing awareness training to truck drivers on safe driving, clearly explaining DOs & DON'Ts and also providing refresher training every year. Providing and ensuring use of appropriate Personal Protective Equipment. Periodical Alcohol Checks of the divers.
3.	Fire Accident	Causing injuries to human/ /damage to properties	Electrical Short Circuit	Ensuring the storing of inflammable materials separately. Resistricting smoking to only smoking zone area allotted. Keeping Fire Extinguishers near the storage area. Automatic fire extinguisher system for HEMM.
4.	Water inundation	Threat to life of mine operators Damage to mining machinery/ trucks	Heavy rain/ flood Intersection of ground water table	No impact of HFL or water inundation on mine site.

7.2.2. EMERGENCY PREPAREDNESS & RESPONSE PLAN

7.2.2.1OBJECTIVES OF EMERGENCY PREPAREDNESS & RESPONSE PLAN

The Emergency Preparedness and Response Plan is aimed to ensure safety of life, protection of environment, protection of equipment and restoration of production in this same order of priorities.For effective implementation of Emergency Preparedness and Response Plan, it is widely circulated and personnel are trained through mock drills.To tackle the consequences of a major emergency inside the mine, an Emergency Preparedness and Response Plan has been formulated.The objective of the Emergency preparedness and Response Plan is to make use of the combined resources of the Mine and the outside services to achieve the following.

- Control and bring the emergency situation to a safe condition
- Safeguard employees
- Effect the rescue and medical treatment of causalities
- Minimize damage to property and the environment
- Secure the affected areas
- Preserve subsequent records and equipment for subsequent enquiry to identify the cause and circumstances leading to emergency.

Sensitivity: Public (C4)

Emergency Actions & Emergency Warning

Communication of emergency has been made familiar to the personnel inside the Mine.

Evacuation of Personnel

In the event of an emergency, unconnected personnel will have to escape to assembly point. If necessary, persons will be evacuated by rescue teams.

All Clear Signal

At the end of emergency, after discussing with Incident Controller and Emergency Coordinators, the Site Controller will order an all clear signal.

7.2.2.2 EMERGENCY ORGANIZATION

The Emergency Organization is having a senior executive, who has control over the affairs of the Mine, designated as Site Controller. Normally the Mine Manager is the Site Controller. There is an Emergency Control Centre (ECC), which is the location of the Site Controller during emergency. The team under Site Controller consists of Emergency Coordinators who are responsible for firefighting, rescue, rehabilitation, transport and support services. Shift in-charge is the reporting Officer, who will bring the incident to the notice of the Site Controller.

EMERGENCY FACILITIES

Emergency Control Centre

Mine Manager Room is identified as Emergency Control Centre. The following information and equipment are available at the Emergency Control Centre (ECC).

- Telephone
- Emergency lamp / torchlight
- Plan indicating locations of hazard inventories, assembly points, rescue location vulnerable zones, and escape routes.
- Hand Tools, Wind Direction, Wind Velocity Indications
- Public Address Megaphone, Hand bell, Telephone Directories.
- Address with Telephone Numbers of Emergency Coordinators
- Important addresses, telephone numbers such as experts from outside, government agencies, neighboring industries etc.

Sensitivity: Public (C4)

7.2.2.3 EMERGENCY COMMUNICATION

Whoever notices an emergency situation such as fire, landslide etc., will inform Shift in charge, who in turn will inform the emergency situation to the Incident Controller and the Site Controller.

Site Controller will verify the situation from the the shift incharge and will take a decision about implementing on Site Emergency. Simultaneously, the emergency warning system will be activated on the instructions of the Site Controller.

7.3 EMERGENCIES

The emergencies that could be envisaged in the Mine are as follows:

- Fire
- Drowning
- Dump slide / bench collapse
- Fall of person

7.3.1 FIRE

Fire Fighting Facilities

The details of firefighting facilities maintained at the Mine are

- Carbon dioxide
- Dry Chemical Powder(DCP)
- Soda acid type
- Fire buckets

7.3.1.1 Emergency Medical Facilities

General first aid materials for dealing with fire burns etc. are maintained in the first aid center as well as in the emergency control room. Private medical practitioners help will be sought or even Government Hospital approach will be taken for emergency help, if required. A part from Mine first aid facilities, external facilities will be augmented. Names of Medical Personnel and their contact details Medical facilities available nearby is maintained and will be updated regularly.

Necessary specific medicines for emergency treatment of burns are kept in first aid boxes. First Aid Kit will be kept at Emergency Control center. The help of nearby Mines in this regard will be taken on mutual support basis.

Sensitivity: Public (C4)

7.3.1.2 FIRE PROTECTION

The details of firefighting equipment's provided are Carbon dioxide, DCP, Soda acid type, Fire buckets. Regular inspection of Fire Extinguishers to ensure replacement of refills and the working condition of the extinguishers are being ensured

7.3.2 DROWNING

7.3.2.1 PROTECTIVE MEASURES NEEDED

1. Safety equipment such as nylon/jute ropes, wireless sets, mobile phones, life buoys, life jackets
2. Personal Protective Equipment
3. First Aiders

7.3.2.2 *EMERGENCY RESPONSE PLAN*:

a. Work Person: Work person accompanying the victim shall throw the life buoy tied tothe rope/lifeline towards the drowning person. If he finds thatthis help is not yielding any result, he shall give a wireless message to the Supervisor or Shift Engineer.

b. Shift Engineer: As soon as the information is given to the Shift Engineer, he shall inform the Shif tin-charge and Land Transport In-charge as applicable through wire less message/phone and ask for ambulance.

c. Land Transport In-charge: Land transport in-charge will arrange for the ambulance.

d. Shift In-charge: Shall inform the Mines Manager and will rush to the site.

e. Doctor/Nurse/FirstAider: After receiving the information will rush to the site with ambulance with the First Aid Kit and give necessary First Aid to the victim.

f. Mines Manager: Will rush to the site and make additional arrangement to deal with the emergency if required.

7.3.3 DUMP SLIDE / BENCH COLLAPSE

7.3.3.1 Protective Equipment's:

1) Safety equipment's such as wire ropes and wireless sets/mobile phones
2) First Aiders
3) Personal Protective Equipment

Sensitivity: Public (C4)

7.3.3.2 Emergency Response Plan:

1. Work Person: Work Person or Operator whose dumper is stuck up while dump collapse shall inform the supervisor.
2. As soon as the information is given to the Supervisor / Engineer, the same will be also communicated to the Shift In-charge and Land Transport In-charge as applicable on wireless set and ask for Extra Tow Chains.
3. Spotter: Who is near the site shall immediately put the wire rope to the dumper and the Dozer which is available near the spot.
4. Shift In-charge: Shall inform the Mines Manager and rush to the site along with extra Tow Chains and wheel loader if required.
5. Mines Manager: Shall rush to the site and make additional arrangements like dump cutting with ripper dozer, making access road, additional excavator, etc. to deal with the emergency if required

7.3.4 FALL OF PERSON

7.3.4.1 EmergencyResponsePlan:

- WorkPerson: Work person accompanying the victim shall throw rope towards the fallen person.
- If this does not help or fallen person is severely injured, he shall give a wireless message to the shift engineer or shift in-charge or land transport office. If the injured person has been pulled up, immediate first-aid shall be provided
- Shift Engineer: As soon as the information is received by the ShiftEngineer, the engineer shall inform Shift In-charge & LandTransport office on wire less set and ask for ambulance.
- Land Transport In-charge: Land transport In-charge will arrange for the ambulance.
- ShiftIn-charge: Shall in form the Mines Manager and will rush to the site.
- Doctor/Compounder/First Aider: After receiving the information will rush o the site with ambulance withthe FirstAid Kitand give necessary First Aid to the victim.
- Mines Manager: Will rush to the site and make additional arrangements to deal with the emergencyif required.
- The General Emergency Preparedness Plan(EPP) in place for the mine shall be followed by Mines Manager.

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7.4 DISASTERS

A disaster is catastrophic situation in which suddenly, people get into a situation of helplessness and suffering and as a result, need protection, clothing, shelter, medical and social care and other necessities of life. Disasters from natural phenomena like earthquakes, cyclones, storms, floods, landslides etc., are considered here.There can be no set criteria for assessing the gravity of a disaster in the abstract as it depends, to a large extent, on the physical, economic and social environment in which it occurs.

However, all disasters call for immediate action, whether at the local, national or international level, for the rescue and relief of the victims. This includes the search for the dead and injured, medical and social care, removal of the debris, the provision of temporary shelter for the homeless food, clothing and medical supplies, and the rapid re-establishment of essential services. The disasters due to natural phenomena are to be handled in a proper manner with the help of local administration immediately on occurrence. Further supports required, depending upon the severity, are to be provided by District/State/National Level Authorities. The resources available in the mine will be extended to the maximum possible extent by the project proponent in the event of occurrence of any such natural disasters to provide rescue, first aid, ambulance service, medicines, shelter & food, to the affected people.

7.5 OCCUPATIONAL HEALTH & SAFETY

The Occupational Health & Safety Practices will be followed during mining operations.

The Occupational Health and Safety (OHS) Plan aims to

- ensure that all known safety factors are considered in the operation and maintenance of HEMM and trucks
- allocate sufficient resources to maintain safe and healthy conditions at work place
- ensure that adequate OHS knowledge is imparted to all employees
- provide necessary protective equipment and safety appliances and ensure their proper use
- make the employees aware of the mine operations and the potential hazards
- train the employees to take preventive steps in a proactive manner and execute the work safely and understand occupational health issues
- review all operations and methods of work for making necessary changes from the safety point of view in the light of experience and up to date knowledge
- provide appropriate facilities for first aid and prompt treatment of injuries and illness at work

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- ensure that adequate publicity is given to OHS matters
- ensure proper precautions are taken to prevent fire and provide appropriate firefighting facilities
- publish instructions and notices in the local language to employees
- prepare safe operating procedure for all operations
- ensure regular inspection by a competent person at regular intervals for identifying any deviations in safety and occupational health related matters
- provide rrelaxation facilities to workers with good ventilation & air circulation
- ensure Good Housekeeping Practices
- provide enclosure for noise generating sources
- isolate diesel storage areas
- rotate employees in specific areas to avoid continuous exposure

7.5.1 OCCUPATIONAL HEALTH RISKS

The principal Occupational Health Risks associated with the project are likely incidence of tuberculosis, silicosis, hearing loss, accidents due to inundation of mine working pits, fire and slope failure. The order of severity on health status of workers in mining is tuberculosis, silicosis, respiratory diseases and hearing loss.

7.5.2 PRECAUTIONARY MEASURES

a. Dust

As dust is a major pollutant, that can cause a heath disorder, the following precautionary measures are followed.

- Sprinkling of water on the haul roads and working places
- Maintenance of the mining machinery and vehicles used as per the manufactures specifications to ensure their efficient operation
- Ensuring usage of Personal Protective Equipment like respiratory masks, ear plugs, helmet, safety shoes by the employees
- Development of wide green belt proposed to attenuate the spread of dust and also the noise generated from mining operations

b. Noise

Workmen and staff exposed to higher sound levels will be provided with ear plugs/mufflers of approved type by DGMS to guard them against any hearing impairment is being followed to ensure noise levels are within limits.

Sensitivity: Public (C4)

c. Injuries

By ensuring that all employees are following safe operating procedure and using the required Personal Protective Equipment, the risk of injuries due to accidents can be prevented.

7.5.3 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The following Personal Protective Equipment (PPE) are provided to the Mine employees

- Industrial Safety Helmets
- Zero power plain goggles with cut type filters on both ends
- Cylindrical type earplugs/Earmuffs
- Industrial safety shoes with steel toe

7.5.4 TRAINING

All the workers shall be imparted initial vocational training (Induction) as per the statute to make them familiar with their jobs covering the occupational hazards involved, need to use Personal Protective Equipment, following safe operating procedures and the safety precautions to be taken while doing their jobs. Awareness programme for the workers on work related health hazard, HIV prevention etc. are being conducted. They shall also be given refresher training as per statute after completing one year of service.

7.5.5 OCCUPATIONAL HEALTH SURVEILLANCE

Impact of mining on health shall be assessed by a trained doctor in occupational health and the tests conducted include general health checkup, spirometry, audiometry and vision test in addition to X-Ray and ECG examination.

In order to evaluate the impacts on mining on the health of workers, baseline health studies shall be carried out on every worker at the time of joining duty. Medical examinations will be conducted for employees every 5/year/3years/1years depending upon their age.

7.5.6 PIT SAFETY COMMITTEE

The pit safety committee headed by Mines Manager consists of

Mines Manager	-	1
Geologist	-	1

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Mine Foreman	-	1
Mining Engineer/Environmental Officer	-	1
Workers	-	2

The functions of the Safety Committee are:

- Ensuring remedial measures against the unsafe conditions and practices in the mine as pointed out by the workmen or Inspectors or otherwise brought to the notice of the committee
- Planning safety and health measures including related codes of practice and making appropriate recommendations before commencement of any new section of the mine or introduction of any new mining technique
- Ensuring investigation of accidents that take place in the Mine and making appropriate recommendations
- Ensuring meeting at least once in 30 days to consider the matters placed before it and any other matter that may be raised by the members and making such recommendations as it may deem fit.
- Serving as a forum of communication on safety and occupational health matters

7.5.7 BUDGET

An annual budget of Rs. 2 lakhs will be allocated for safety and occupational health activities.

7.6 R & R ACTION PLAN

This proposed project has habitation within the Mineral Block Area. The ultimate pit limit is more than 100m from nearest habitiation, and 50 m safety barrier is maintained. No Rehabilitation & Resettlement Plan is proposed.

7.7 CARE AND MAINTENANCE DURING TEMPORARY DISCONTINUANCE

7.7.1 Precautions to be taken

An emergency plan for the situation of temporary discontinuance due to court order or due to statutory requirements or any other unforeseen circumstances may indicate measures of care, maintenance and monitoring of status of discontinued mining operations expected to re-open in near future.

Although no temporary closure is planned or expected, the following protective measures would be taken to deal with the unforeseen circumstances which may be created due to temporary closure of the mine.

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1. All heavy earthmoving mining machineries deployed in various blocks of iron ore mine will be withdrawn and brought to the safe place so that these do not get buried due to bench collapse, if any, and get damaged during discontinuance. These will be subjected to preventive maintenance.
2. The entries to the pits in various blocks will be fenced off with display of notice boards at the fence prohibiting entry into the pits by unauthorized persons.
3. Pit boundaries would be fenced and high berms will be provided to prevent cattle from entering the pit.
4. At the entrance and strategic points in the mine areas, sentries and watchman would be deployed to guard the sensitive/important mine area, explosive magazine and other sensitive stores and services.
5. They would be provided with mobile phones / walky-talkies to contact mine authorities/police/fire station etc. for help during emergency.
6. The mine area would be kept well illuminated during night time.
7. Audible warning sirens would be established at strategic points to be used during emergency so that prompt help can be received from proper sources and protective measures are immediately taken by all personnel available.
8. Managerial, supervisory and competent persons of the mine would be engaged elsewhere in other mines of the company as per the needs.

***7.7.2* Economic repercussions of closure of mine and manpower retrenchments. Manpower retrenchment, compensation to be given, socio-economic repercussions and remedial measures consequent to the closure of mines should be described, specifically stating the following:**

It is too early to discuss the socio-economic repercussions and remedial measures consequent to the closure of mines. However, the workers shall be employed from surrounding areas who are basically agricultural labourer. In case of closure, they will go back to their family occupation.

7.7.2.1 Number of local residents employed in the mine, status of the continuation family occupation and scope of joining the occupation back:

Most of the workers shall be employed from the surrounding areas who are basically dependent upon agriculture activity. In case of closure, they will go back to their family occupation.

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7.7.2.2 Compensation given or to be given to the employees connecting with sustenance of himself and their family members:

As they are daily wage employees, they will get compensation as per the government rules.

7.7.2.3 Satellite occupations connected to the mining industry number of persons engaged therein continuance of such business after mine closes:

There can be no satellite occupation connected to the mining industry.

7.7.2.4 Continued engagement of employees in the rehabilitated status of mining lease area and any other remnant activities:

Not Applicable.

Sensitivity: Public (C4)

Chapter-8
PROJECT BENEFITS

Sensitivity: Public (C4)

8.0 PROJECT BENEFITS

Project benefits are attributed in various ways as under:

1) Environment
2) Employment
3) Social
4) Economic benefits

8.1 SOCIO-ECONOMIC DEVELOPMENT

The proposed project area is non forest land over an area of 171.2472Ha, with indigenous species including fruit and flower varieties, it promotes immigration of avifauna into this area.

No Rehabilitation or Resettlement is involved and it is a non-forest land. There are 56 villages/towns - 50 villages and 6 census towns (CT), in the buffer zone. Of these, 56 villages/towns, 45 villages and 6 towns are located in 6 talukas of North Goa and 5 villages in Dodamarg taluka of Sindhudurg district in Maharashtra. The total population of these villages is 197452. Due to the proposed mining activity, no significant adverse changes are visualized in the traditional way of life of the people residing in the villages in the buffer zone.

This mine shall provide employment for about 132 people by direct and indirect employment which includes mine officials, skilled, semi-skilled and unskilled labour and indirect employment, in contractual works & transport. Preference shall be given to local people for employment to support and benefit the surrounding communities.

The company is conscious of its obligations to society at large & is bound to contribute in overall socioeconomic development of the area in the coming years by increasing its efforts towards overall development of the proposed project area, fostering positive impacts on the local communities and their well being.

8.2 ENVIRONMENTAL BENEFITS

Mining project will be beneficial for environment in many ways which are as following:

- At the conceptual stage total mined out area will be 106.65 Ha out of which 92.10 Ha area will be backfilled & reclaimed and about 14.55 Ha is converted into water reservoir. The water reservoir will be helpful for recharging the ground water promoting sustainable water management.

Sensitivity: Public (C4)

- At end of life of mine, total Greenbelt/Plantation of over 21.15 Ha will be developed by planting 1500 saplings/ Ha This plantation will not only enhance the environmental quality of the area but also create an aesthetically pleasing landscape.
- The mining project will implement rainwater harvesting techniques, capturing rainwater into the pit, which will then be stored and treated. The treated water will be discharged to nearby villages for agriculture purposes, contributing to better water availability and supporting agricultural activities in the region

8.3 EMPLOYMENT BENEFITS

This mine shall provide employment to about 132 people by the way of direct employment which includes mine officials, skilled, semi-skilled and unskilled labor.

Apart from this, there will be employment by way of indirect works such as truck drivers, machinery operators of contractors, road maintenance, garage, watch & ward, canteen etc.

8.4 SOCIAL BENEFITS

SSCPL will undertake activities for the upliftment of the social community through community development in various ways as given under:

i. Education
ii. Health & Family Welfare Programme
iii. Infrastructure Development
iv. Social Welfare & Skill Development Activities
v. Sustainable Livelihood

8.4.1 Education

- Providing support to schools/educational institutions to promote various activities towards development of children.
- Providing support to Anganwadi centers/schools for building/ upgrading infrastructure (by undertaking or supporting construction work or equipping them with furniture, books, notebooks, musical instruments, etc.) to enhance the learning environment.
- Offering Scholarship to underprivileged and meritorious students for undertaking/ continuing technical and professional courses.
- Imparting employability training, vocational courses and skill development.
- Providing School bus for transportation to educational institutes

Sensitivity: Public (C4)

8.4.2 Health & Family Welfare Programmes

- Organising specialized helath camps to cater to the healthcare needs of the villagers.
- Supply of drinking water through installation of water tanks and construction / repairing of existing water systems.
- Awareness program on AIDS disease and their preventive measures.
- Extending support to the community health centers by providing ambulances and essential hospital equipment when needed.

8.4.3 Infrastructure Development

- Development of community halls and centers at nearby villages.
- Construction of retaining wall, stone pitching, pond desilting work
- Construction of various structures like school boundary in nearby villages.
- Promoting Infrastructure development of parks & Nurseries to encourage recreational spacesand environmental conservation.

8.4.4 Social Welfare & Skill Development Activities

- Promotion of Art and Culture by associating with various agencies through sponsorship, support, contribution, etc.
- Facilitating repair work at nearby temples to preserve cultural heritage.
- Empowering women through skill development programs, including computer education, embroidery works, self defence training and sponsoring sports activities for school children.
- Promoting environmental conservation by providing saplings/ plants for villagers / nearby localities / schools for plantation

Proposed CSR Expenditure (Rs.in lakhs) from year 2023-27

Sl.No	Sector /Activities	1st year	2nd year	3rd year	4th year	5th year
I	Health Care	2,00,000	2,40,000	2,90,000	3,50,000	4,20,000
2	Hygeine & Sanitation	1,50,000	1,80,000	2,10,000	2,60,000	3,10,000
3	Skill Development	2,00,000	2,40,000	2,90,000	3,50,000	4,20,000
4	Education	2,00,000	2,40,000	2,90,000	3,50,000	4,20,000
5	Green Energy	3,00,000	3,60,000	4,30,000	5,15,000	6,10,000
6	Rain water harvesting	2,00,000	2,40,000	2,90,000	3,50,000	4,20,000
	Total	12,50,000	15,00,000	18,00,000	21,75,000	26,00,000

Sensitivity: Public (C4)

8.5 ECONOMIC BENEFITS

By this E-auctionedfield project, the country will receive revenue in terms of taxes, royalties, DMF etc., Thus, this proposal will have positive impacts on the country' economy, state economy, sustainable socio-economic environment of the region.

The PP shall extend social benefits like drinking water, health care measure and educational benefits to the neighboring villagers in addition to their own employees. Further, this project is expected to yield a positive impact on the socio-economic environment of the region. It helps in sustainable development of this area including further development of physical infrastructural facilities.

Sensitivity: Public (C4)

CHAPTER-9
Environmental Cost Benefits

Environmental Cost Benefit Analysis is not recommended at the Scoping stage

Sensitivity: Public (C4)

Chapter-10

ENVIRONMENTAL MANAGEMENT PLAN

ENVIRONMENTAL MANAGEMENT PLAN

10.0 OBJECTIVE

The major objectives and benefits of utilizing Environmental Impact Assessment in project planning stage itself, is to prevent losses to Environmental Resources. Environmental Management includes protection/mitigation/ enhancement measures as well as suggesting post project monitoring programme.

The mining activity in the study area needs to be intertwined with judicious utilization of non-renewable resources and environmental degradation should be confined within the assimilative capacity. The assimilative capacity of the study area is the maximum amount of pollution load that can be discharged in the Environment without affecting the designated use and is governed by dilution, dispersion, and removal of possible pollutants generated during the operation. The Environment Management Plan (EMP) is required to ensure Sustainable Development. Hence, it needs to be comprehensive plan for which the Industries, Government, Regulating agencies and more importantly the population of the study are contented.The Environmental Management Plan will address the possible impacts on the Environmental attributes in the region viz., Air Quality, Water Quality, Land Use, Ecology and Public Health and the control measures that will be put in place to protect the Environment in and around the study area.

Environmental Management Plan aims at controlling pollution at the source level to the maximum possible extent with the available and affordable technology followed by treatment measures before they are discharged.Environmental Management Plan aims at the preservation of ecosystem by considering the pollution abatement facilities at the inception stage. For the proposed Iron Ore Mine, the pollution abatement has become an integral part of planning and design.

10.1 ENVIRONMENTAL MANAGEMENT CELL

The Environmental Management Cell (EMC) will be headed by Agent followed by Mine Manager. The Mine Manger will assisted by Environment Officer, Mining Engineer, Foremen and Surveyor

ENVIRONMENTAL MANAGEMENT CELL

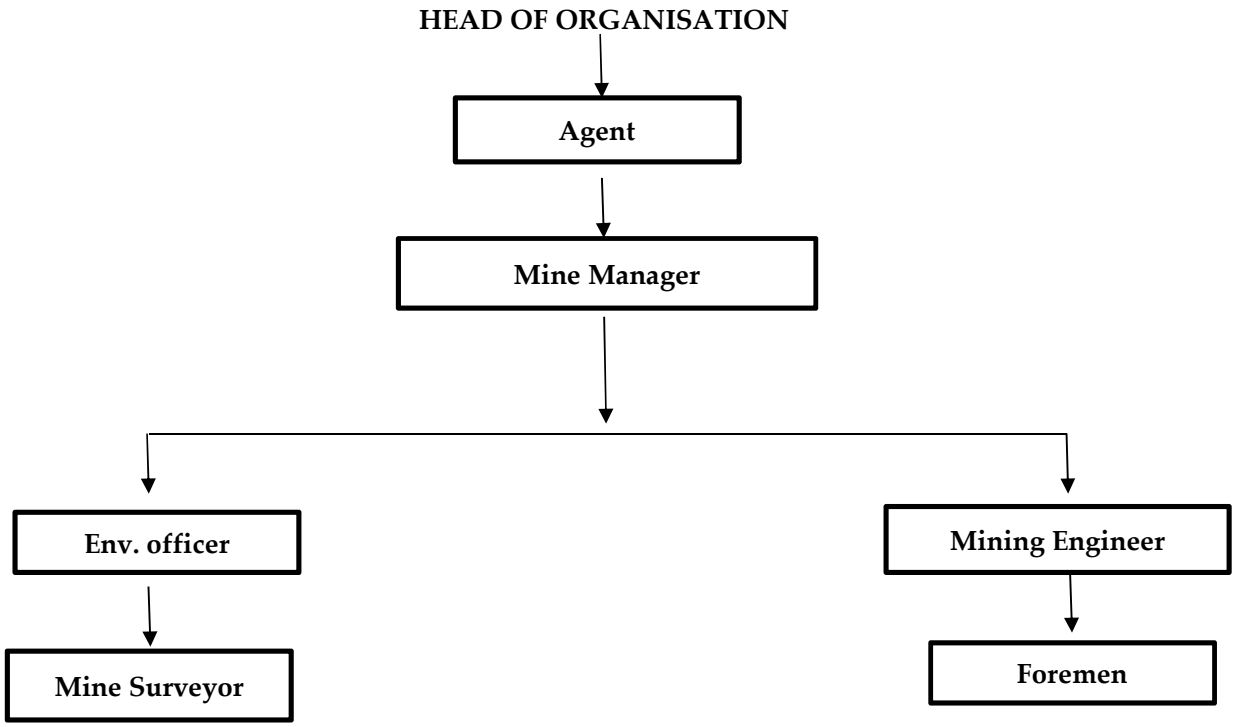


Fig No.10.1 Environmental Management Cell

A built-in mechanism for reporting on compliance of the Environmental/ Forest and other related aspects have been evolved. As per guidelines of MoEF&CC, New Delhi. The Environment Management Plan (EMP) which includes works like storm water management (drainages, settling ponds, trenches, desilting etc.), will be planned jointly by a team comprising of mines manager, surveyor, geologist and environment officer. The team will meet frequently to assess the progress of the EMP so that the storm water management jobs are completed well before the onset of monsoon and plantation is carried out in monsoon. The status will be reviewed by senior management on weekly basis.

For successful implementation of the environmental management plan other agencies will also be involved by mines, if required (for regulatory requirement or technical support). The coordinating agencies, which may be involved for specific environmental and project related activities, are given below: -

i. Interaction with State Pollution Control Board for legal compliance, new updates in environmental law, awareness etc.

ii. Interaction with State Agriculture and forest department for engagement w.r.t plantation

The Environment Management Cell will also coordinate to carry out environment monitoring as stipulated by the authorities. The monitoring will be undertaken by an Environment Laboratory recognized by MoEF&CC. The monitoring data will be regularly submitted to the authorities like GSPCB, regional office of MoEF&CC.

10.2 HEALTH SAFETY & ENVIRONMENT POLICY:

The project proponent Salgaocar Shipping Company Private Limited will give utmost importance towards Occupational health, safety and environment management. The health, safety and environment policy is listed below:

1) provide comprehensive training programs to all personnel involved in mining operations to ensure they are aware of potential hazards and equipped to mitigate risks effectively.
2) Prevent injury and ill-health to employees by eliminating risks associated with occupational hazards and providing a safe and healthy work environment.
3) Implement regular health checkups of employees
4) Conserve natural resources by adopting environment friendly and energy efficient technologies.
5) Employees and local community representatives will be educated on the nature of our impacts, how we manage them and our environment obligations.

10.3 SYSTEM OF COMPLYING WITH LEGAL REQUIREMENTS AND REVIEWING BY MANAGEMENT/ BOARD MEMBERS

- The departments for ensuring and implementing compliance are identified.
- The Checklist is disseminated to the Head of departments (HODs) and lower level for understanding and ensuring compliance requirements;
- Responsibility is fixed on a particular person in each department for ensuring compliance; and
- Person responsible for ensuring compliance, reports the compliance status to the HOD on monthly/periodically basis.

10.4 TRAINING

Employees will be provided with trainings, as per job requirements, on various aspects like environment management, natural resource conservation, reporting of environmental incidents, legal requirements, environmental monitoring, waste management; general environment awareness etc. The training will be provided by internal as well as external resources.

10.5 ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Impact Assessment revealed that the study area will not be adversely affected and is likely to get new economic boost. The Block- II Sirigao-Mayem Mineral Block is newly auctioned mine and it will be operated by taking all precautionary measures to reduce the impact of mining operations on all environmental components such as Air, Water, Noise, Soil, Ecology and Biodiversity and Human Settlements and ensuring all control measures to comply with the prescribed standards. The proposed production of Iron Ore within the exiting Block Area will be carried out following the Open Cast conventional type of mining, which involves no drilling and blasting. All the necessary environment protective measures will be implemented.

Further, regular Environmental Monitoring will be conducted during life of the mine in the project site and in the surroundings to control the pollutants level from the mining activity within the permissible limits.

10.5.1 AIR POLLUTION CONTROL

Control of Fugitive Emissions

- Regular water sprinkling on haul roads & loading points will be carried out.
- Development of green belt/plantation around the lease boundary, roads, dumps etc.
- Maintaining the mine haul roads in good condition and implementing speed limit to ensure prevention of dust pollution.
- Heavy Earth Moving Machinery with air-conditioned cabins will be used to provide pollution free atmosphere to the operators.
- Ambient Air Quality Monitoring will be conducted on regularly basis to assess the quality of ambient air.
- Use of Personal Protection Equipment's (PPE) like dust masks, ear plugs etc. by the mine workers.

Table : 10.1 Air PollutionManagementandControl

Potential Impact	Action	Parameters for Monitoring	Timing
Air Emissions	All equipments are operated within specified design parameters.	Random checks of equipment	During site clearing &Operationofmine
	Vehicle tripstobeminimized totheextentpossible	Vehicle logs / automatic vehicle monitoring system/ Increase thecapacityofvehicle	During Operationofmine
	Ensure regular checks of vehicularpollution	Pollution under control certificateofvehicle	During operation of mine.
	Covering of Vehicles transportingtheminedmineral	No. of Trucks with covering / Random checks oftrucksonroads	During operation of mine.
	Plantation of trees on the boundary of lease area, these will reduce dust and noise in the vicinity area.	No. of Saplings per year and area covered by plantation	During operation of Mine till closure as per approved mining plan
	Regularwatersprayingshallbe Done	Quantity of water requirement shall be monitored	During operation of mine.
	Ambientairqualitywithinthe premises oftheproposedunitto bemonitored. Continuous Ambient Air Quality Monitoring CAAQM) station shall be set up near the mine office inside the lease within after execution of lease deed.	The Ambient Air Quality shallconform tothe standards	As per CPCB guidelines during operation of Mine

10.5.2 WASTEWATER MANAGEMENT

- No wastewater will be generated due to the mining operations.
- Domestic wastewater generated from the domestic usage shall be treated in septic tank and soak pit arrangement.

10.5.2 WATER MANAGEMENT

- The environment protective structures within the Block II Sirigao-Mayem Mineral Block implemented by earlier lessee are still in good and effective condition. The project proponent after execution of the lease shall continue to utilize the existing protective structures and shall put additional structures to arrest the silt content.
- The surface runoff generated during monsoon season shall be diverted and channelized through ERW pipes, garland drains and a series of settling ponds (14nos), filter beds, and check dams before final discharge.

- There are 2 rehabilated dumps within the mineral block. Plantation has been carried out with local native plant. The bottom of the dump is already provided with garland drains of 2000m
- The garland drains/trenches are proposed on the backfilling benches.
- The water stored in the pits will be utilized for various mining operations like water sprinkling, plantation of trees etc.

The proposed Year wise construction of Garland Drains during the plan period given below: **Table No.: 10.2**

Year	Garland Drains (m)
1st	585
2nd	585
3rd	415
4th	0
5th	0

Water Conservation Measures:

The project proponent shall take all the necessary steps to conserve water and reduce the specific water consumption as given below:

- Channelizing the rain water into mine pits and harvest the rainwater.
- Use of harvested rainwater for dust suppression and vehicle wheel washing etc.
- To carry out water footprint study to become water positive
- Use of water tankers with special nozzles to make optimum use of water and covering more areas with less water
- Feasibility of using lignin based or other environment friendly dust suppressants to reduce the water consumption for dust suppression
- Use of fixed dust suppression systems like sprinklers, fog guns etc. which will further reduce water consumption as well as reduce fuel consumption for plying water tankers.
- Monitoring of specific water consumption on monthly basis and take annual specific water consumption reduction targets

10.5.4 NOISE POLLUTION CONTROL

- The ambient noise levels will be maintained below 75 dBA during daytime & below 70 dBA during night time by taking all required measures.
- No Drilling and Blasting is involved.
- All the HEMM are provided with air conditioned, noise proof cabins
- Providing protective devices like acoustic wool, earplugs and earmuffs to the workmen in noise prone zones in the mine
- Greenbelt all along the lease boundary and all along the haulage roads

Table : 10.3 Noise Pollution Management and Control

Potential Impact	Action	Parameters for Monitoring	Timing
Noise	List of all noise generating machinery onsite along with age to beprepared.Equipment to be maintained in good working order.	Equipment logs, noise reading	Duringmining operations.
	Generation of vehicular noise	Maintenance records of vehicles	During transportation.
	Implement good working practices (equipment selection and siting)to minimize noise and also reduce its impacts on human health(earmuffs, safedistances andenclosures).	Site working practices records,noise level readings and record of PPE's issued.	During Mining operations
	Noise to be monitored in ambientair nearthelease boundaries.	Noise levels	Asper prescribed standardsand requirement
	TheNoise level should not exceed the Permissible limit both during day and night time.		
	All equipment operated within Specified design parameters.	Random checks of equipmentlogs/manuals	Duringmining operation
	Vehicle trips to be minimized to the extentpossible	Vehiclelogs	Duringmining operation
	Plantation of dense hedges on the boundary of lease area,these will reduce dust and noise in the vicinity area.	No of Saplings perYear	During Each year from operations till closureasper approved miningplan

10.5.5 PROTECTIVE MEASURES FOR GROUND VIBRATIONS/AIR BLAST CAUSED BY BLASTING:

No drilling and blasting is involved.

10.5.6 SOLID & HAZARDOUS WASTE MANAGEMENT

The solid waste generated are Overburden and Intercalated waste. The maxium waste quanty generated is during 3rd year is 1463100 tonnesof waste will be generated. If any mineral reject generated shall be stacked separately and overburden waste shall be backfilled in the designated backfilling sites. The lateritic waste shall be used for the erection of bunds as safety barriers and all along the road passing through the block Area.Overburden waste backfilled during the plan period is given below:

Table No.:10.4 Overburden waste backfilled

Year	Dump Id	Type of Dump	Proposed Area (ha)	Total Dump Quantity tonnes
Year1	Backfilling (Pit No.1)	Waste	3.36	291360
Year2	Backfilling (Pit No.1)	Waste	1.77	212600
Year3	Backfilling (Pit No.1)	Waste	6.58	1463100
Year4	Backfilling (Pit No.1)	Waste	3.50	468500
Year5	Backfilling (Pit No.1)	Waste	5.73	489800

The following environment management measures are undertaken to prevent soil erosion

- Backfilling will be carriedout over the exhausted part of the pit.
- The wastes and ore generated are non-toxic, no heavy metals are present and is also non-acidic in nature. The possible pollutants in the water are the suspended solids which will arise from erosions within the mining areas and dumps. Rainwater directly falling over the pit area will be allowed to settle in the pit itself thereby helping in groundwater recharge. During the rainy season, the pumped out water from the pit is passed through settling pit to remove the solid suspensions, such that clear water shall leave the Mineral Block.
- Provision of boulder walls at the toe of the waste dump to arrest erosions
- Provision of garland drains around the dump yard and diversion of water to sedimentation pits to separate the soil particles
- Connecting the drains along the roads to sedimentation pit to separate the soil particles
- Conversion of mined out pit (as and when it happens) into rainwater harvesting reservoir
- Engineering control structures like check dams, retaining walls, gully plugs and settling tanks will be constructed to store the run-off water.

Hazardous waste:

The mine shall generate minor quantities of Hazardous waste due to maintenance of plants and machineries. Hazardous waste authorization will be obtained from GSPCB for proper collection, storage and disposal of hazardous waste. The quantity of hazardous waste likely to be generated are namely spent oil (0.5TPA), waste residue contaminated with oil (0.5 TPA), Filters contaminated with oil (0.5TPA). The hazardous waste will be properly segregated and stored at dedicated place and disposed to recyclers duly recognized by GSPCB.

10.5.7 LAND RECLAMATION / ECORESTORATION

The plantation will comprise of saplings of native species which are generally grown in the state of Goa. Fruit bearing trees like cashew, mango, jamun, avla which attract lot of birds and can generate revenue to the locals in future will be given preference. The plantation would be a mix of various forest and fruit tree species. Technical advice would be taken from state forest and agriculture departments. The saplings will be procured from various nurseries like forest department nursery nurseries developed by locals. A small inhouse nursery will be developed in due course.

10.5.7.1 Plantation along mining lease boundary

The Block-II Sirigao-Mayem Mineral Block is already having a 7.5m wide green belt all along the mine block boundary except the areas where the mine block shares a common boundary with adjoining mine block. A 50m green belt exists towards the habitation within the lease and the same would be further strengthened and maintained. A density of 1500 saplings per ha will be maintained.

10.5.7.2 Plantation around Office Building & Road

Avenue Plantation is provided around the built-up areas and in open spaces. Extensive plantation would also be done along the sides of connecting roads.

10.5.7.3 Plantation on Dump Slopes

The 2 dumps within the mineral block area are rehabilated with plantation. Gap filling plantation will be carried out to strengthen the existing green belt.

10.5.7.4 Plantation on Backfilled areas

Plantation on the mining benches will be taken up once the active pit is closed for mining. The abandoned pit, after backfilling and levelling, a layer of lateritic material will be spread.

Grass seed/ seedlings will be planted on the soil layer to stabilize the soil. Plants selected for plantation on mining benches should be draught hardy, with fast growth rate and with glabrous/ pendulous leaves.Garland drains sloping along the mining benches to facilitate flow of water from higher benches to the next lower benches shall be constructed.

The mining operations will change the land use of the area and will create pits, waste dumps etc. At the conceptual stage around 106.65 ha of area will be degraded due to pits and excavation, around 21.78 ha due to dumping and material stacking and around 0.86 ha with for utility services. The entire block area at the end of mine life shall be restored in such a way that it compliments with the surrounding areas and nature at large. The project proponet has a lot of experience in scientific mining and mine reclamation. The company will adopt following practices for carrying out scientific and systematic eco-restoration of the mines, namely:

i. Concurrent mining and mine reclamation activities
ii. Associating with various technical departments of state government like Forest department, Agriculture department, Fisheries department, Water Resource department etc.
iii. Identifying all the stakeholders and engaging with them in a structured manner throughout the life of the mine. This will help to identify the issues, concerns of the stake holders and satisfying them in a systematic method. It will also help to take inputs form the stakeholders in eco-restoration in the mines
iv. Regular Biodiveristy Assessment and preparing and implementing of Biodiversity Management Plan which help the company to achieve a No Net Loss w.r.t biodiversity.
v. Converting of mining pits into water reservoirs, pond with other ecotourism facilities like water sports, boating, fishing etc.
vi. Converting the mining infrastructure like office buildings, workshops etc. into public utility infrastructure like school, training centre, medical centre etc.

The objective of the Eco restoration would be to create a positive land scape which will help the community or the mining employees to generate revenue even after the mining operations close. Develop vast tracts of scientifically developed green belts, water bodies and other infrastructure.

Develop the place into a ecotourism area which will attract lot of tourists.At the conceptual stage around 92.10 ha of land will be brought under plantation and around 14.55ha under water bodies.

Before the commencement of the monsoon, the side slopes of mining benches will be covered with a layer of soil by means of mechanical binders like coir net / blanket and sprinkle with water. Seeds of grass and scrub of indigenous variety will be sprinkled on the soil covering the bench side slopes.

Table.10.5. Green belt planning next 5 years

Plan Period	Plantation			Retaining Wall (m)	Garland Drains (m)	Expenditure (Rs)
	Area (Ha.)	No. of Sapling	Name of species			
I	0.00	00	Mix of forest and horticulture Species like, Ficus species, Terminalia Sp., Cassia Sp. Bamboo Sp. Cashew, Mango ,Jambul Aonla ,etc.	585	195	00
II	1.41	2100		585	--	210000
III	2.00	3000		415	--	300000
IV	1.00	1500		0	--	150000
V	1.00	1500		0	--	150000
Conceptual Stage	92.0	1,84,000		--	--	

Potential species for green belt listed in Table 10.6

Table 10.6 List of Species suggested for future Greenbelt development

S.No	Botanical Name	Family	Common Name	S/T	Habitat	Height
Shrubs - < 5m (1st tier of Plantation)						
1	*Citrus limon*	Rutaceae	Lemon	T	Shrub	3m
2	*Duranta repens*	Verenaceae	Golden Dew Drop	T	Shrub	3m
3	*Hibiscus rosasinensis*	Malvaceae	China Rose/ DasavaLa	T	Shrub	3m
4	*Nerium indicum*	Apocynaceae	Oleander/Chandaatha	T	Shrub	5m
Trees 5 - 10m (2nd tier of Plantation)						
6	*Acacia nilotica*	Mimoseae	Gum Arabic/ Babli	T	Tree	8m
7	*Bauhinia varigata*	Caesalpinaceae	Kachnar/ Arisinantige	T	Tree	5m
8	*Annona squamosa*	Annonaceae	Setha palla	T	Tree	6m
9	*Butea monosperma*	Fabaceae	Flame of the Forest/ Muttuga	T	Tree	10m
10	*Gardeniajasminoides*	Rubiaceae	Cape jasmine/ Suvasane Malle	T	Tree	5m
11	*Moringa oleifera*	Moringaceae	Drumstick Tree/Guggala	S	Tree	10m
12	*Pithecellobium dulce*	Mimosaceae	Manilla Tamarind/Seeme hunase	T	Tree	8m
13	*Thevetia peruviana*	Apocynaceae	Mexican oleander	T	Shrub	6m
14	*Phyllanthus emblica*	Phyllanthaceae	Ambla	T	Shrub	7m
Trees >10m (3rd tier of Plantation)						
15	*Aegle marmelos*	Rutaceae	Maredu / Bilva	T	Tree	12m
16	*Albizia lebbeck*	Mimoseae	Siris tree	T	Tree	20m

17	*Albizia procera*	Mimoseae	White siris/Belari	T	Tree	20m
18	*Alstona scholaris*	Apocynaceae	Devil Tree/ Aelele Haale	T	Tree	15m
19	*Azadirachta indica*	Meliaceae	Neem/ Turakabevu	T	Tree	20m
20	*Bambusa vulgaris*	Poaceae	Yellow Bamboo	T	Perennial grass	15m
21	*Cassia fistula*	Caesalpinaceae	Golden Shower/ Kakke	T	Tree	12m
22	*Delonix regia*	Caesalpinaceae	Flame Tree/ Kempu torai	T	Tree	15m
23	*Ficus benghalensis*	Moraceae	Banyan tree/ Aaladamara	T	Tree	20m
24	*Ficus religiosa*	Moraceae	Peepal/ Arali	T	Tree	20m
25	*Mangifera indica*	Anacardiaceae	Mango/ Mavinamara	S	Tree	15m
26	*Polythia longifolia*	Anonaceae	Ashok/Ubbina	S	Tree	15m
27	*Wrightia tinctoria*	Apocynaceae	Alae mara	T	Tree	12 m
28	*Hardwickia binata*	Fabaceae	Small leaves	T	Shrub	6m
29	*Syzygium cumini*	Myrtaceae	Neredu/ Neereedu	T	Tree	20m
30	*Tectona grandis*	Verbenaceae	Teak	T	Tree	20m

Note: T : Tolerant , S: Sensitive to Pollution

vii) Post Plantation Care

Post plantation care is very important and will be an integral part of mine management. A dedicated cell in the mine will be made to take care of post plantation, which include, regular watering, deweeding, manuring, protective measures etc. Diseased and dead plants shall be uprooted and replaced by fresh saplings. Regular monitoring on survival rate and remedial action shall be done in an organized and planned manner.

viii) Plan for Reduction of Impact on Fauna

- No mining activity during the nights
- No Drilling & blasting operations proposed
- Deep pits and artificial water holes should be fenced within the Mineral Block, which will avoid wildlife accidents.
- A strict wildlife vigilance team to avoid any poaching and illegal activity.
- Providing sufficient number of water holes in the buffer zone forests along with salt licks as per the requirement of forest officials
- Educating local people about the importance of flora and fauna particularly of endangered wildlife to maintain the ecological balance & observation of wildlife protection weeks.
- Prevention of forest fires – during the fire season, adequate number of fire watchers will be engaged to detect and extinguish fire incidence. Field staff shall be provided with proper communication system for obtaining assistance from fire brigade and villagers for combating fire at a short notice.

10.6 MANGROVE CONSERVATION AND MANAGEMENT

MANGROVE FOREST RESTORATION

Mangrove forest restoration management strategy has been devised to compensate the degraded and lost ecosystem. It has the potential to increase the mangrove resource base, provide employment to local populations, protect fragile tropical coastlines and enhance biodiversity and fisheries productivity.

Mangrove Restoration through planting of mangrove propagules and saplings is recommended when:

- There is limited waterborne propagules due to lack of nearby parent trees or hydrological connection which inhibit dispersal;
- There is need to introduce valuable specific species which have been lost in the area
- Degradation due to human encroachments in the mangrove habitats

1. Natural Regeneration: This approach uses natural occurring mangrove propagules (or seeds) to restock degraded sites. In this case, regeneration is from direct, freely falling and dispersed mangrove propagules, where species composition of the regenerated forest depends on the species types and combinations of the adjacent forest from where propagules are dispersed. In the family Rhizophoraceae for example, propagules furnished with pointed hypocotyls fall freely from the parent and can plant themselves into the mud.

2. Artificial Regeneration: Artificial regeneration entails direct planting of desired propagules and saplings (of less than 1.2 m high), and rarely small trees (of up to 6 m high) of chosen species are used at the designated restoration site.

Use of propagules and nursery-raised saplings is the most common method of mangrove restoration. The techniques of mangrove planting have not been perfected for many species. Most mangrove restoration projects have used families, Rhizophoraceae and Avicenniaceae.

3. The listed mangrove species (Table 10.7) for restoration at Assonora & Mandovi river wherever it has been degraded due to illegal shrimp farming or agricultural practices, to be identified with the help of the local forest department, and the proponent will collaborate with the forest department to carry out the mangrove restoration.

Table 10.7. List of species recommended for mangrove species restoration

Scientific Name	Family	Vernacular name
Rhizophora mucronata Lamk.	Rhizophoraceae	Kandal
Rhizophora apiculata Blume	Rhizophoraceae	Kandal
Ceriops tagal (Perr.)V B. Rob	Rhizophoraceae	kirkiri
Avicennia marina (Forsk.) Vierh	Avicenniaceae	Tivar
Avicennia officinalis L	Avicenniaceae	Tivar
Sonneratia alba J. Smith	Sonneratiaceae	Chipi
Aegiceras corniculatum (L.) Blanco.	Myrsinaceae	Sugandha
Lumnitzera racemosa Willd.	Combretaceae	
Acanthus ilicifolius L.	Acanthaceae	Marandi
Excoecaria agllocha L.	Euphorbiaceae	Huri

10.7. WILDLIFE MANAGEMENT AND CONSERVATION PLAN

The project area does not involve any forest area for mining purpose. Wildlife management needs to considered multifaceted factors such as food-web, resources competitions, anthropogenic factors, forest fragmentation, and sociological issues such community livelihoods, culture, ethics and forest dependency etc.

Total of 27 species of fauna falls under Schedule I category of Amended Wildlife Protection Act 2022. The details of each species ecology and conservation issues given below.

Table.10.8 List of Scheduled I Wildlife species

Sl. No.	Common Name	Scientific name	Family	IUCN / WPA
	MAMMALS			
1	Common leopard*	*Felidae*	Panthera pardus	LC/I
2	Smooth coated Otter*	*Aonyx cinereus*	Mustelidae	LC/I
3	Wild Gaur*	*Bos gaurus*	Bovidae	VU/I
4	Pangolin*	*Pholidota*	Manidae	LC/I
5	Bonnet macaque	*Macaca radiate*	Cercopithecidae	LC/I
6	Hanuman Langur	*Semnopithecus*	Cercopithecidae	LC/I
	REPTILES			
1	Crocodile*	*Crocodylus palustris*	Crocodylidae	VU/ I
2	Cobra	*Naja Naja*	Elapidae	LC/I
3	Russell's Viper*	*Daboia russelii*	Viperidae	LC/I
4	Common Indian monitor lizard	*Varanus bengalensis*	Varanidae	LC/I
5	Indian rat snake*	*Ptyas mucosa*	Colubridae	LC/I
	BIRDS			
1	Besra*	*Accipiter virgatus*	Accipitridae	LC/I
2	Black Eagle	*Ictinaetus malayensis*	Accipitridae	LC/I
3	Brahminy Kite	*Haliastur indus*	Accipitridae	LC/I

4	Brown wood owl*	*Strix leptogrammica*	Strigidae	LC/I
5	Chestnut Bittern	*Ixobrychus cinnamomeus*	Ardeidae	LC/I
6	Common hill Myna	*Gracula religiosa*	Sturnidae	LC/I
7	Cotton teal	*Megalaima haemacephala*	Anatidae	LC/I
8	Crested Goshawk	*Accipiter trivirgatus*	Accipitridae	LC/I
9	Crested Serpent Eagle	*Spilornis cheela*	Accipitridae	LC/I
10	Crested tree swift	*Hemiprocne coronata*	Hemiprocnidae	LC/I
11	Forest Eagle Owl	*Bubo nipalensis*	Strigidae	LC/I
12	Indian Peafowl	*Phasianidae*	Pavo cristatus	LC/I
13	Oriental Honey Buzzard*	*Pernis ptilorhynchus*	Accipitridae	LC/I
14	Shikra	*Accipiter badius*	Accipitridae	LC/I
15	Small minivet	*Pericrocotus*	Campephagidae	LC/I
16	White-bellied Sea-Eagle	*Accipitridae*	Haliaeetus leucogaster	LC/I

CONSERVATION PLAN OF WILDLIFE:

(i) Water holes for habitat improvement:

Animals and birds need a regular water source for their daily consumption. As the area receives copious amount of Avg. 3917 mm rainfall annually. During hot summer wild animals and birds stray outside forest in search of water source for quenching thirst. It is therefore proposed to construct water holes/check-dams in the forested area at buffer zone at convenient points.These water holes would be sufficient to store the water to meet drinking requirement of animals and birds.

The water holes should be provided with cement concrete bedding, side walls with stone pitching and grass should be grown in gap for gripping while animals enter into the water holes.These water holes shall be cleaned at regular intervals to remove leaf litter, de-silting and refilling water. Few shades shall be provided around water holes for animal resting during summer season. Fruit bearing trees shall be grown around water holes to provide nesting and food for birds and shade for wild animals.

(ii) Noise levels

During mine operation noise levels will increase due to Machinery movement of HEMM. Wildlife is sensitive to higher noise levels like human beings. To reduce the noise levels during mining operations the following steps are proposed.

- Use of well-maintained loading machines with sharp bucket teeth
- Well maintained roads. No over speeding of vehicles

(iii) Air Quality:

The ambient air quality in the buffer zone shall be maintained within the CPCB limits in respect of PM_{10}, $PM_{2.5}$ SO_2, NO_2 and CO emissions. For this the following steps are proposed.

- Regular sprinkling of water on roads
- No overloading to avoid spillage; trucks shall be covered with tarpaulins.
- Creation of green belt around the mine area and avenue plantation with thick foliage to arrest dust.

(iv) Green Belt Development

- The area shall be earmarked for green belt development to mitigate the effects of air and noise pollution from the project activity. Kindly refer the Progressive Mine Closure Plan given vide Plate No.19
- The species proposed to be planted shall be selected based on the criteria prescribed by CPCB as "Guidelines for Developing Greenbelts" and also in consultation with local forest department.

(iv) Training staff and Awareness activity:

All the mine workers and staff shall be provided with training and awareness in conservation of wildlife and develop a liking for wildlife conservation by celebrating Environment Day involving local village people and school students.

The villagers shall also be made aware of wildlife conservation by conducting meetings using pamphlets, audio and video means. Various biodiversity/ wild life awareness activities like quiz, drawing, painting competitions and essay writing for school students shall be conducted. Villagers will be rewarded for protecting and preventing wood theft and tree cutting and helping Forest Dept. Guards in catching Poachers. Conservation activities for protection of flora & fauna shall be implemented in consultation of Forest Department officials.

(v) Watch towers:

One machan (watch tower) shall be erected near the water reservoir to prevent any poaching in the area.

(vi) Fund for wildlife conservation:

The wild life conservation plan will be implemented by forest department and financially supported by the project proponent. The budgetary allocation of funds towards wildlife conservation shall be 6 Lakhs for five years .The habitat management in and around the study area include planting suitable fodder species to enable wild herbivores to thrive. Following steps will encourage the native fauna to return to the areas:

- A dense green belt consisting of shrubs and trees of different species must be created around the mine area and also along the roads which will act also as a dust and noise barrier.
- Awareness programs amongst the local people as well as mine staff, regarding the importance of wildlife, their habits and habitats, should be organized so that stray and displaced fauna (due to degradation and de-fragmentation of their habitat) is not killed.
- Rock fill dams and check dams shall be constructed in the forest area of buffer zone to prevent the soil erosion. This will be able to store sufficient quantity of filtered water in the area and will act as water holes for the faunal life present in the region.
- The green cover loss due to construction of roads and heavy vehicular movements will restrict the animal movements to the adjoining areas. Therefore, development of a green belt and massive afforestation program of local species and shade giving plant species in the forest area along with approach road shelter for them.
- Conducting awareness program for the local people/school children as well as project staff emphasizing the importance of regional biodiversity and need for their conservation for posterity.
- Fire lines should also be cleared along permanent features like roads, nallahs and footpaths at suitable intervals to prevent forest fire from spreading, in case it breaks out.
- People should be trained with forest fire fighting measures and equipped with necessary materials like rakes, shovels, billhook, bucket etc. and suitable dresses.
- A dedicated fund shall be allocated in the project cost to carry out these steps and would be apart from what the local forest department traditionally practices.

Table No 10.9 Proposed Year-wise budget for Wildlife Conservation Measures

Rs. In '000

Sl. No.	Particulars	1st Year	2nd Year	3rd Year	4th Year	5th Year
1	Construction of water holes and maintenance	100	50	50	50	50
2	Fruit bearing and shade giving trees around water holes	50	20	20	20	20
3	Erection of watch towers	25	20	20	20	20
4	Provision of salt licks	25	20	20	20	20
	Total	**200**	**100**	**100**	**100**	**100**

10.8 Environmenatal Management Plan Budget

Table. No. 10.10 EMP Cost.

Sl. No.	Environmental Management Plan	Capital Cost	Recurring Cost (at average Rs. /Annum)
1	Environment Monitoring Program Cost	--	12,00,000/-
2	Greenbelt Development	3,00,000	1,50,000/-
3	Dust Suppression	--	12,00,000/-
4	Environment protective measures	17,00,000	37,00,000/-
5	Health check-ups of workers	--	2,50,000/-
6	Personal Protective Equipment's (PPE's)	--	4,00,000/-
7	Fire Safety		6,00,000/-
Total		**20,00,000/-**	**75,00,000/-**

The project proponent shall assess the health conditions of the workers as per DGMS guidelines to abate the likely adverse impacts relating to occupational health. However, workers in the mines will not be exposed to any extreme or hazardous environment. Noise, Climatic conditions, water and other such parameters which will be maintained well within the limits. Air may get slightly affected. The projected level of damage will also be within the permissible limits but slight damage to the health cannot be over ruled as the process (of damage to the health) is irreversible one due to mine air pollution. Regular monitoring the health of the workers shall be undertaken.

10.9 ENVIRONMENTAL MONITORING STRATEGY

The monitoring of various environmental parameters is necessary which forms part of the environmental protection measures. Monitoring is an important feature because the efficiency of control measures can only be determined by monitoring.

For analysis of Environmental Parameters and monitoring, the services of an approved and recognized laboratory is being utilized.

A budgetary allocation of Rs. 12 lakhs/annum have been earmarked for Environmental monitoring. A comprehensive monitoring programme is given under.

Table 10.11 : Monitoring Schedule for Environmental Parameters

S.No.	Particulars	Frequency of Monitoring	Sampling	Parameters Required to be Monitored
Air Quality				
1	Ambient Air quality in and around the Mine	Twice a week	24 hours continuously	PM2.5, PM10, SO2 & NO2
Water Quality				
2	Water Quality around the Mine	Once in a Month	Grab Sampling	As per IS: 10500
Noise Level Monitoring				
3	Ambient Noise levels in and around the Mine	Once in a Quarter	Continuous for 24 hours with 1 hour interval	Noise Level
Soil Quality				
4	Soil Quality around the Mine	Once in a year	Grab Sampling	IS: 2720

10.10 OCCUPATIONAL SAFETY AND HEALTH PLAN

10.10.1 HEARING IMPAIRMENT.

The most significant occupational health hazard is noise induced hearing loss. There are no reported cases of hearing loss due to noise pollution as per the observation of local doctors. However, mining authorities will conduct periodic health checkups by in-house medical team for any hearing impairment of workers. This is according to health plan policy and such policy will continue as long as mining is in operation.

10.10.2 SKIN DISEASES.

According to local doctors, 2.2 per cent of the patients have suffered from skin diseases, which is because of lack of personal hygiene rather than dust pollution due to mining. The mining authorities will take enough precautionary measures to minimize the dust pollution.However, mining authorities will conduct periodic health checkups to detect any skin allergies among mining workers and the population, especially school children.

10.10.3 EYE DISEASES.

According to local doctors, patients suffering from eye related problems are absent. The eye infections are generally not related to dust pollution due to mining. It is mostly due to general infection and old age. The mining authorities will take adequate precautionary measures to minimize the dust pollution.

However, mining authorities will conduct periodic health checkups by in-house medical team for eye diseases among mining workers and school children. This is according to health plan policy and such policy will continue as long as mining is in operation.

10.10.4 JOB STRESS BECAUSE OF WORKING IN ACCIDENT PRONE PLANT ENVIRONMENT

The job stress is expected to be low because of incentives like providing food in work place, weekly holidays and recreational facilities. This is according to health plan policy and such policy will continue as long as mining is in operation.

10.10.5 RESPIRATORY DISEASES

Iron ore does not contain toxic elements. Hence, the possibility of any health hazards due to toxic elements does not arise. The most significant occupational health is lung diseases due to inhalation of dust. However, management is taking enough care to minimize these occupational health hazards. The percentage of Pneumonia episodes is 0.11 is very low. The percentage of Asthma or Bronchitis is moderately high (3.7). The Pneumonia and Asthma episodes are because of vices like consumption of tobacco and alcohol, especially among males.

However, mining authorities will conduct periodic health checkups by in-house medical team for any respiratory infections among mining workers and villagers.

10.10.6 MATERIALS LIKE ASBESTOS, SILICA, CHROME DUST ETC. ARE HAZARDOUS TO MINE WORKERS.

The hazardous materials are not used on the mining site. However, mining authorities will take care not to use any hazardous material either for construction or for any other use. This is according to health plan policy and such policy will continue as long as mining is in operation.

10.11 OCCUPATIONAL SAFETY

10.11.1 Provision of rest shelter for workers with facilities of drinking water.

Rest room with fresh drinking water and toilets facilities with running water for wash are provided on the work site for all workers. Canteen and Dispensary/OHC shall also be provided.

10.11.2 ***Awareness of safety and ensure using personal protective equipment (PPE) by workers.***

All workers will be made aware of safety measures to be followed on the work site. The awareness programmes will be conducted by professionals who have graduated in the industrial safety. All the workers are given helmet, gum boots, safety shoes and working dress. The safety gears will be replaced periodically.

10.11.3 ***Regular maintenance of testing of equipment.***

The safety and testing equipment will be maintained regularly.

10.11.4 ***Periodic medical examination of all workers.***

Periodic medical check-up of all the employees will be carried out regularly. The mine also will have a dedicated OHC .

10.11.5 ***Safety measures of risk assessment in underground mining.***

There is no underground mining activity.

10.11.6 ***Conduct of mock drill.***

Mock drill will be regularly conducted for all the emergency situations identified, like fire, land slide, drowning etc.

10.11.7 ***Safe storage of handling of explosives.***

No explosives will be used.

10.12 ***SOCIO-ECONOMIC CONDITIONS OF THE REGION***

10.12.1 Medical assistance.

Medical facilities in the state of Goa are very well developed. Occupational Health centre will be established in the mine. Regular health check-ups of workers will be conducted. Medical camps would be conducted in surrounding villages. This will be continued with adequate annual budget. This is according to health policy of the company.

10.12.2 Primary education

Budgetary provision will be made to support educational scheme/assistance towards development of children, to upgrade educational infrastructure in existing schools, to provide scholarships to underprivileged and meritorious students and impart employability training, vocational courses and skill development.

10.12.3 Animal husbandry

Animal husbandry will be included as a welfare program with proper budgetary allocation in the course of time.

10.12.4 Rural water supply

All the villages are connected with government water supply. In case of any such requirement, support will be provided to strengthen the government system.

10.12.5 Agriculture improvement

It is also proposed to support the agriculture by providing various inputs like good quality seeds, manure to the farmers. Assistance will be given in creating awareness on latest agricultural techniques among the farmers with help of experts and agriculture department.

10.12.6 Vocational training.

Vocational training will be included in the welfare programs in future. It is going encourage self-employment and contribute to economic growth of the region.

10.12.7 Assistance in utilizing government programs.

The assistance of primary health centers in providing primary health care to the surrounding villages and referring patients to the government health facilities. This policy will continue in future.

10.12.8 Employment

The mining project will create lot of direct and indirect employment opportunities in the surrounding villages. Apart from direct employment in the mines, a lot of employment will be generated due to allied activities such as transportation of ore etc.

10.12.9 Communication and Accessibility

All villages are well connected by roads leading to taluka or district headquarters. Mining authorities will provide street light fixtures to Panchayats.

Chapter-11

SUMMARY & CONCLUSION

11.0 SUMMARY AND CONCLUSION

This Chapter provides the concise summary of the Key Project Parameters along with overall justification for implementation of the project and explanation of how the possible impacts have been mitigated as required under the generic structure of Appendix III of the EIA Notification 2006. Further, the conclusion on the studies undertaken is also included in the Chapter.

11.1 INTRODUCTION

Salgaocar Shipping Company Private Limited (SSCPL), declared as the preferred bidder by Directorate of Mines & Geology, Government of Goa, for Block-II Sirigao - Mayem Mineral Block, located in Mayem & Sirigao villages of Bicholim Taluka, North Goa District, Goa State. SSCPL intends to obtain prior Environmental clearance from SEIAA for the production of 1.0 MTPA of Iron Ore.The Government of Goa, in pursuant to the Mines and Minerals (Development and Regulation) Act 1957, and the Mineral (Auction) Rules, 2015, issued notice inviting tender dated 30.09.2022 to commence the auction process of iron ore mineral blocks for grant of mining lease. The e-auction was conducted for the mineral blocks in accordance with the Tender Document. Salgaocar Shipping Company Private Limited was declared as the preferred bidder under Rule 9(9) (iii) of auction Rules, for Block-II Sirigao - Mayem Mineral Block, located in Mayem & Sirigao villages of Bicholim Taluka, North Goa District, Goa State.

11.2 PROJECT DESCRIPTION

The Block-II-Sirigao-Mayem mineral block is located in Sirigao & Mayem villages of Bicholim Taluka of North Goa District, Goa State, over and an area of 171.2472Ha. The Sirigao-Mayem mineral block area comes under Toposheet No. 48E/14 of Survey of India, bounded by latitudes $15^0$35’20.233” N to $15^0$36’21.621”N and longitude $73^0$53’40.069”E to $73^0$54’50.014”E. The State Highway SH-1 is at a distance of 2.19kms, the nearest Railway station is Tivim Railway station, at a distance of 6.0 kms, and the nearest airport is Mopa Airport at a distance of 23.1 kms

11.3 ENVIRONMENTAL SENSITIVITY

No National Park, Wildlife Sanctuary or Migratory Corridors of Fauna is present inside the Project Site or within 10 Km radius area of the Project Site. Assonora river is about 0.56km from lease area. Few habitats like sirigao-Mayem exists within the Block II Sirigao-Mayem Mineral Block.

11.4 GRANT OF TOR & BASE LINE DATA MONITORING

The SEIAA accorded the TOR for the Project vide TOR letter 115/3/2023-24/GSEIAA/Project-Prop/166 dated 18.10.2023 . The Baseline Data was collected during the period from March to May 2023.

11.5 MINING METHODOLOGY

The proposal of obtaining environment clearance for 1.0 Million tonnes of Iron ore per annum with overall overburden ratio of 1: 0.4074 m^3/tonne. Mining operations will be by way of mechanized opencast method without drilling & blasting, complying with all the statutory requirements using HEMM like Rippers and Dozers, shovels, dumpers, wheel loaders, and tippers. Rippers and Dozers will be used for ripping of hard material and wheel loaders will be used for loading and dozers for levelling.

The Run of Mine (ROM) Iron Ore will be subjected to dry crushing and screening located inside the block area. Finished product (Lumps & Fines)/ROM will be sent to domestic or export markets. The ore transportation from mine to the jetty will be carried out by tippers with the capacity of 10.5 Tonnes.

11.6 PRODUCTION, RESERVES AND LIFE OF MINE

The total reserves and resources of the mineral block are 23.58 million tonnes, out of which the mineable reserves are 14.54 million tonnes. Based on the maximum production of 1.0million tonnes, the life of the mine is expected to be 15 years. Life of the mine may increase, based on the outcome of the proposed exploration during the plan period.

11.7 MANPOWER, WATER & POWER REQUIREMENT

MAN POWER: The Project shall provide direct employment to about 24 people, which includes mine officials, skilled, semi-skilled and unskilled labour and about 108 indirect employment majority of them are locals. Over and above this a lot of employment will be generated in the form of contracts like transportation, plantation, workshops and garages, and allied activities

WATER: The Water Requirement of the Project is estimated to be maximum 221 KLD. Out of this, 1 KLD of the water is required for domestic, 10 KLD for green belt, 10 KLD for wheel washing and the balance 200 KL/Day for dust suppression.

POWER: The estimated overall power requirement including utilities and auxiliary facilities for the proposed mine are indicated below:

- Annual energy consumption: 0.28 MW

11.8 RESETTLEMENT & REHABILITATION

There is no proposal for Resettlement &Rehabilitation during the entire life of the mine.

11.9 DESCRIPTION OF THE ENVIRONMENT

The Block-II Sirigao-Mayem Mineral Block is the core zone for the present EIA study. The area encompassing 10 km radius from the boundary of the core zone has been defined as the buffer zone. The core zone and the buffer zone together constitute the study area. The Baseline Environmental data with respect to Air, Water, Noise and Soil Quality in the study area for the present EIA study is considered for the Summer Season 2023. Sampling and analysis have been carried out by M/s. Environmental Laboratory (Unit of Mineral Engineering Services), Bangalore, Laboratory accredited by NABL and recognized by CPCB/MoEF&CC.

11.9.1 AMBIENT AIR QUALITY

For Ambient air quality 8 stations have been fixed covering all the directions, the frequency of monitoring is 2 days/ week for 3 months and the parameters covered were as per CPCB NAAQS guidelines.The statistical analysis of Ambient Air Quality is as follows, the maximum values of SO_2, NO_2, PM_{10} & $PM_{2.5}$ in the core zone station were found to be 12,16,50 & 27 $\mu g/m^3$ and in the Buffer zone villages the maximum values were found to be 13, 21, 56 & 36 $\mu g/m^3$. All other parameters like CO, O_3, NH_3, Pb, As, Ni, Benzene(C_6H_6), &Benzo(a)Pyrene (BaP), are also sampled and results of analysis were found to be well within the limits of NAAQ's.

11.9.2 NOISE LEVELS

For noise quality 9 stations including one station in core zone and 8 in buffer zone villages were sampled and Leq during day & night are observed. The Leq value during day time in the core zone station were found to be 46.0 dB(A) and during night time the noise levels were found to be 38.7 dB(A). In the buffer zone villages the noise levels were found to be in the range of 44.5 to 61.2 dB(A) and during night time the noise levels were found to be in the range of 35.9 to 44.9 dB(A) . The noise levels both in the core zone and buffer zone were found to be within the limits of Noise Quality Standards for Industrial, Commercial and Residential areas.

11.9.3 WATER QUALITY

Water Quality Monitoring was done by grab sampling once in a season for 5 surface Water and 8 Ground Water samples. IS: 3025, APHA, & IS:1622 standards are used for analysis. Thus, the analysis results are compared to IS standards IS:2296 & IS:10500:2012. The results of few surface water samples shows high TDS, Total hardness, Sulphates, and Chlorides. This is mainly because of the influence of creek water. The open well samples were found to have pH slightly acidic in nature. This is possibly due to the occurrence of lateritic ore. Whereas other parameters are well within permissible limits of respective standards.

11.9.4 SOIL QUALITY

Soil Quality Monitoring at 5 locations including one from the Mine Block and others from nearby village agricultural fields are collected and analyzed, during the study period for Physical Parameters and chemical parameters. They are all observed to be fit for cultivation.

11.10 LAND ENVIRONMENT

The existing major land use of study area covering 10 km radius are 7.49% of water bodies, 0.88% reserve forests, 3.36% of mangroves, 9.01% of agriculture land, 23.91% of scrub land and 14.72% of Settlement area. After the ore is exhausted in the pits the broken-up land will be backfilled and will be progressively afforested and rehabilitated with local species like Cashew, mango, Jamun, Cocum, Terminalia etc. All the efforts will be taken for maximum survival and growth of the plants. Some of the areas will be developed as water bodies.

11.11 BIOLOGICAL ENVIRONMENT

The Mine area is located at the distance of around 8.56 km from the Salim Ali Bird Sanctuary, hence, there is very less chance of threat to the sanctuary and mangrove ecosystem, however, mine management could work with downstream riparian and mangrove forest and assist ecologically restoration as per the EMP suggested species.

FLORA

Total 34 species were recorded within core area, of which 21 species trees (5/ ha), and 7 species shrubs (13 /ha), and 6 species herbs (115/ha) recorded

FAUNA

Total 22 species were observed within the core area, of which 12 species are birds, 3 species of mammals , 4 species of reptiles & 4 species of butterflies

FLORA & FAUNA IN BUFFER AREA

FLORA

Overall 66 species of trees, 19 species of shrubs, 31 species of herbs recorded in reserve forest and riparian habitats. 16 species of plants recorded from the mangrove estuary nearby Assonora and Mandovi

FAUNA

Overall, 216 species recorded from both primary observation and secondary publications and reports, in case of fauna Mammals (16 species), Reptiles (13 species) frogs and toads (16 species), Birds (132), butterflies (27) and aquatic fishes and crabs (12) were reported from the region.

Total of 22 species of fauna falls within the category of Wildlife Protection Act 2022 under Schedule I. In case of conservation of flora and fauna as per suggested EMP, greenbelt shall be developed all along the boundary, unused areas, inactive dump slopes and roadside of core and buffer areas. The proposed biodiversity management plan will be implemented through State Forest Department.

The dominant species in the reserved forest were Anacardium occidentale, and Acacia Auriculiformis, which have been promoted significantly on both private and degraded government land. The Mango and Coconut orchards is significantly promoted by farmers on agricultural bunds and house backyards. There are no endangered or endemic species of flora or fauna in the core zone.

11.12 SOCIO-ECONOMIC ENVIRONMENT

There are 56 villages/towns - 50 villages and 6 census towns (CT), in the buffer zone. Of these, 56 villages/towns, 45 villages and 6 towns are located in 6 talukas of North Goa and 5 villages in Dodamarg taluka of Sindhudurg district in Maharashtra.

Usually, villagers grow coconuts, cashew, or mango in the small piece of land. In the absence of mining activity agriculture and tourism are the only sources of employment. The infrastructure and amenities available in the study area denotes the economic well-being of the region.

It is observed that good infrastructure facilities are available in the project study area, which consists of education, health care, drinking water facilities, communications, transportation, etc. Due to the proposed mining activity, no significant adverse changes are visualized in the traditional way of life of the people residing in the villages in the buffer zone.

Further people residing in the nearby villages will be benefited by the direct and indirect employment opportunities created by the mining activities along with the various socio economic development activities to be taken up by company. The communication, health and education facilities will improve and thus the mining activity will be beneficial and will have a positive impact in the region.

11.13 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The Block-II Sirigao-Mayem Mineral Block is yet to start mining and shall operate taking all precautionary measures to reduce the impact of mining operations on Air, Water, Noise and Soil and ensuring all control measures to comply with the prescribed standards.

11.13.1 AIR ENVIRONMENT

The impacts on Air Environment is assessed through Aermod Modelling and results show that the cumulative impacts on the surrounding buffer zone villages after commencement of mining operations will be within the permissible limits

Following measures will be undertaken to control the Air pollution/dust generation during the mining activities: -

- Due to high inherent moisture of the ore as well as waste, generation of dust while loading will be minimal. The speed limit of transport vehicles will be enforced.
- Transportation trucks will be loaded to the prescribed capacity and covered with tarpaulin.
- Water Sprinkling system with a fine mist spray will be used for dust suppression along the road as well as stacks.
- The exiting two dumps have been rehabilated already. However gap filling plantation shall be undertaken to strengthen the tree density.
- The latest machinery having air-conditioned cabin will be used for loading and dozing operations.

- Proper maintenance of transport machinery with regular PUC will be done.
- Providing acoustic enclosure and proper exhaust chimney height to DG set.
- Proper dust suppression measures at crushing and screening plant.
- General aspects of air quality management will be included in induction training to be provided to all employees.
- Installation of Wheel wash at mine exit

11.13.2 WATER ENVIRONMENT

Hydrogeological studies were conducted to know the impact of mining activities on Ground water table. The report has been submitted to WRD Goa, for their approval.

11.13.4 NOISE ENVIRONMENT

Maximum noise is produced from the operation of earth moving machineries & movement of dumpers. No drilling and blasting operations are involved. Wide green belt shall be provided surrounding Mineral Block to attenuate noise pollution. Regular maintenance of mining equipment, machinery & all vehicles as per the manufactures recommendations to minimize the Noise generation shall be followed.

Following management measures will be adopted to control noise levels:

- Provision of acoustic cabins for operators deployed on HEMM.
- Selection of new low-noise equipment from the manufacturers failing which use of additional retrofits if available.
- Green belt developed all around the mine and haulage roads act as an acoustic barrier.

11.13.5 IMPACT ON LAND ENVIRONMENT

At end of life of mine, total Greenbelt/Plantation of over 92.0 Ha will be developed by planting 1500 saplings/ Ha which will be beneficial to the Environment & will also create an aesthetic appeal. Local Species shall be planted by mix of fruit bearing trees like Cashew, Jack fruit and forestry species. This water reservoir will serve in augmenting the ground water condition of the region and also the pit discharge water will be supplied to local villagers for agricultural purpose.

11.13.6 IMPACT ON BIOLOGICAL ENVIRONMENT

As there exists schedule I species falling within 10 km radius of the ML, a full-fledged biodiversity assessment study was taken up by the proponent along with wildlife conservation plan with financial outlay to assist the local forest department.

The proponent shall take mitigation steps within Mineral Blockfor immigration of wildlife through massive afforestation. The BEES methodology was employed to evaluate the impact and the impact score obtained was +18. This positive score is due to the massive afforestation the project proponent has proposed to be taken up on the already stripped area.

11.13.7 IMPACT ON SOCIO ECONOMIC ENVIRONMENT

This mine shall provide direct employment to about 24 people, which includes mine officials, skilled, semi-skilled and unskilled labour and about 108 indirect employment opportunities to locals. Over and above this a lot of employment will be generated in the form of contracts like transportation, plantation, workshops and garages, and allied activities. The mining activities help in sustainable development of this area including further development of physical & social infrastructural facilities. The mining activity provides revenue to the state and center in form of taxes and royalty etc.

The project proponent shall assess the health conditions of the workers as per the DGMS guidelines. Noise, air, water quality will be maintained well within the limits. The BEES methodology was employed to evaluate the impact and the score obtained was +36.25. The overall impact score obtained from BEES methodology is +86.63 which shows the project shall be beneficial to the local community and the local Government.

11.14 ADDITIONAL STUDIES

In additional studies, Risk Analysis followed by Disaster Management Plan, which will help in identifying the possible risks and to promote towards preparedness to counter any mishap. Risk analysis and disaster management plan have been prepared and incorporated in EIA Report.

11.15 ENVIRONMENT MANAGEMENT PLAN

A Comprehensive Environment Management Plan including development of Green Belt has been suggested. Identification of all potential environmental impacts of a project is an essential step of Environmental Impact Assessment. These are critically examined, and major impacts are further studied. In the case of mining projects, change in topography and land use, air pollution, water pollution, waste management, biodiversity and socio-infrastructure issues are significant.

The Mine will be operated taking all precautionary measures to reduce the impact of mining operations on Air, Water, Noise and Soil and ensuring all control measures to comply with the prescribed standards. The impact of change of land use will be positive only, as portion of abandoned pit is partly backfilled and afforested and balance portion is left as water reservoir beneficial to local villagers. Development of green belt along the boundary of Mineral Blockwill ensure a better environment. The budgetary cost towards EMP proposed is Rs.50 Lakhs per annum.

11.16 CORPORATE SOCIAL RESPONSIBILITY

The Lessee proposes to undertake a number of activities under the Corporate Social Responsibility Initiative during the operation of Mining Project. The capital CSR Budget has been worked out as per the expressed felt needs of villagers during Rapid Rural Appraisal. The proposed budget for 5 years is to the extent Rs. 93.25 Lakhs and will be spent in villages of study area.

11.17 ENVIRONMENTAL MONITORING PROGRAM

Environmental monitoring is required to know the Quality of Ambient Air, Water and Noise Levels during the operation phase of the proposed project and take required corrective measures, in case of any non-compliance with the norms stipulated by regulatory authorities. The methodologies adopted for environmental monitoring will be in accordance with the CPCB. SPCB and Indian Bureau of Mines requirement.

11.18 EXPLANATION ON HOW ADVERSE EFFECTS ARE MITIGATED

The EIA/EMP Report has established the Base Line Environment of the Project Area and has assessed anticipated impacts of the Project on the overall ecology & environment. Accordingly, general as well as specific mitigation measures for management of the Key Environmental Parameters have been suggested. Further, specific measures towards monitoring and implementation of the Environment Management Plan along with details of the funds required towards implementation of the Pollution Control Measures are also included in the Report. By implementing the suggested Environment Management Plan adverse effects of the Project can be mitigated.

Chapter-12
DISCLOSURE OF CONSULTANTS ENGAGED

DISCLOSURE OF CONSULTANTS

Declaration by ACO and Experts contributing to the EIA Report

I, hereby, certify that I was a part of the EIA team in the following capacity that developed the above EIA.

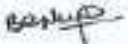
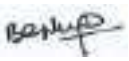
EIA coordinator (EC): M. Sachin Raju

Signature and Date :

Period of involvement: 15.02.2023 to till date

Contact information: 08392267421

Functional area experts:

S. No.	Functional areas	Name of the expert/s	Involvement (period and task**)	Signature and date
1	AP*	M. Sachin Raju	15.02.2023 to Jun 2023	
	Team Member	M.R.Durga Prasad	Mar-2023 to Jun-2023	
2	WP*	M.Sachin Raju	15.02.2023 to Jun 2023	
	Team Member	K. Janaki	Dec-2022 to Jun-2023	
3	SHW*	M.S.Raju	16.09.2022 to Jun 2023	
4	SE	K.N.M.Raju	Jan to Apr-2023	
5	EB	H C Chetan	Jan to Apr-2023	
6	HG	M.C.Reddy	Dec-2022 to Apr-2023	
7	GEO	M.S.Raju	16.09.2022 to Jun 2023	
8	SC	Nagaraja B C	Feb to Apr- 2023	
9	AQ	M. Sachin Raju	16.09.2022 to Jun 2023	
10	NV	M.S.Raju	16.09.2022 to Jun 2023	
11	LU*	Nagaraja B C	Feb to Apr- 2023	
	Team Member	M.R.Durga Prasad	Mar-2023 to Jun-2023	
12	RH	M.S.Raju	16.09.2022 to Jun 2023	

*One TM against each FAE may be shown

**Please attach additional sheet if required

PLATES

DATUM : WGS 84

PROJECTION : UTM Zone 43N

760

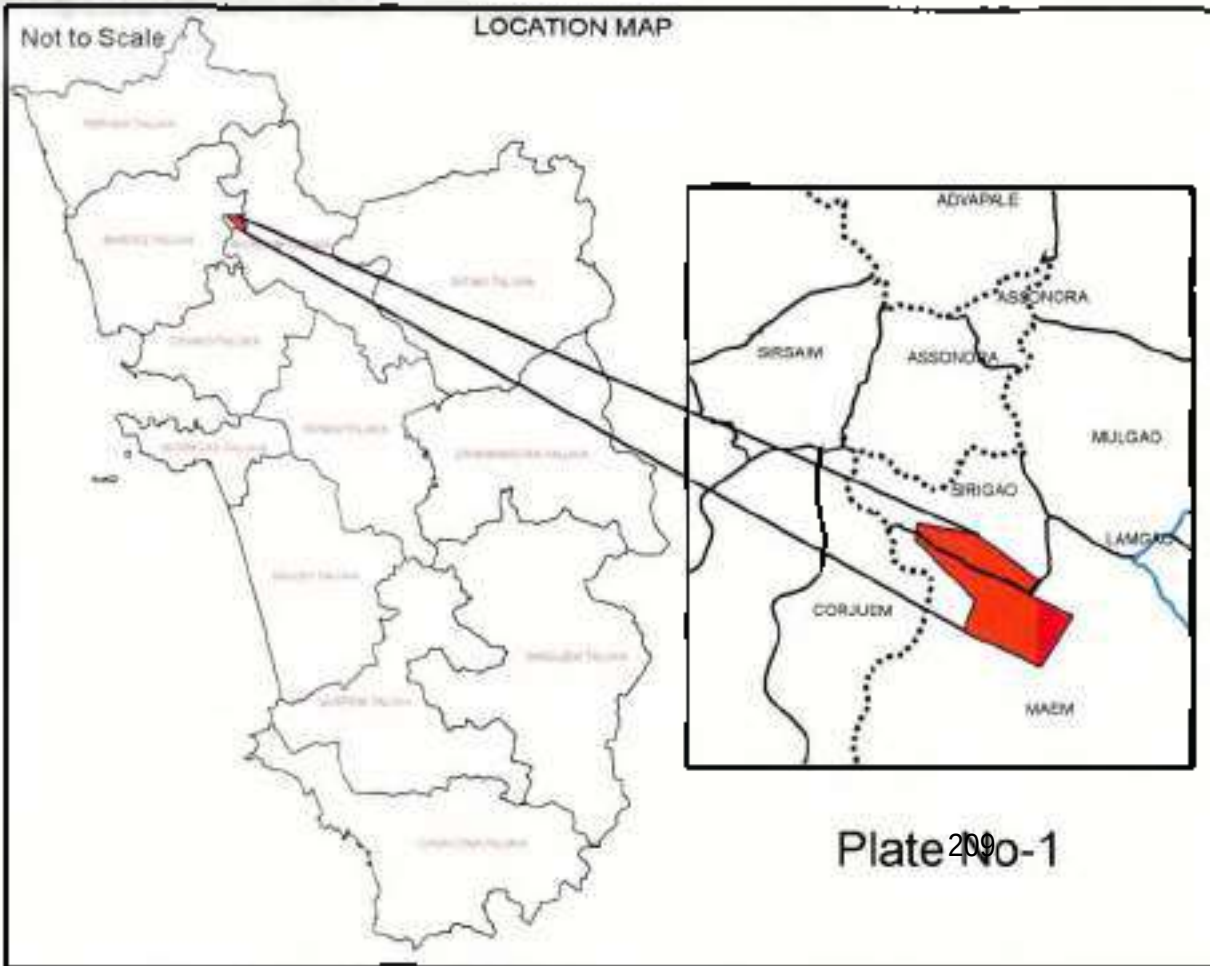
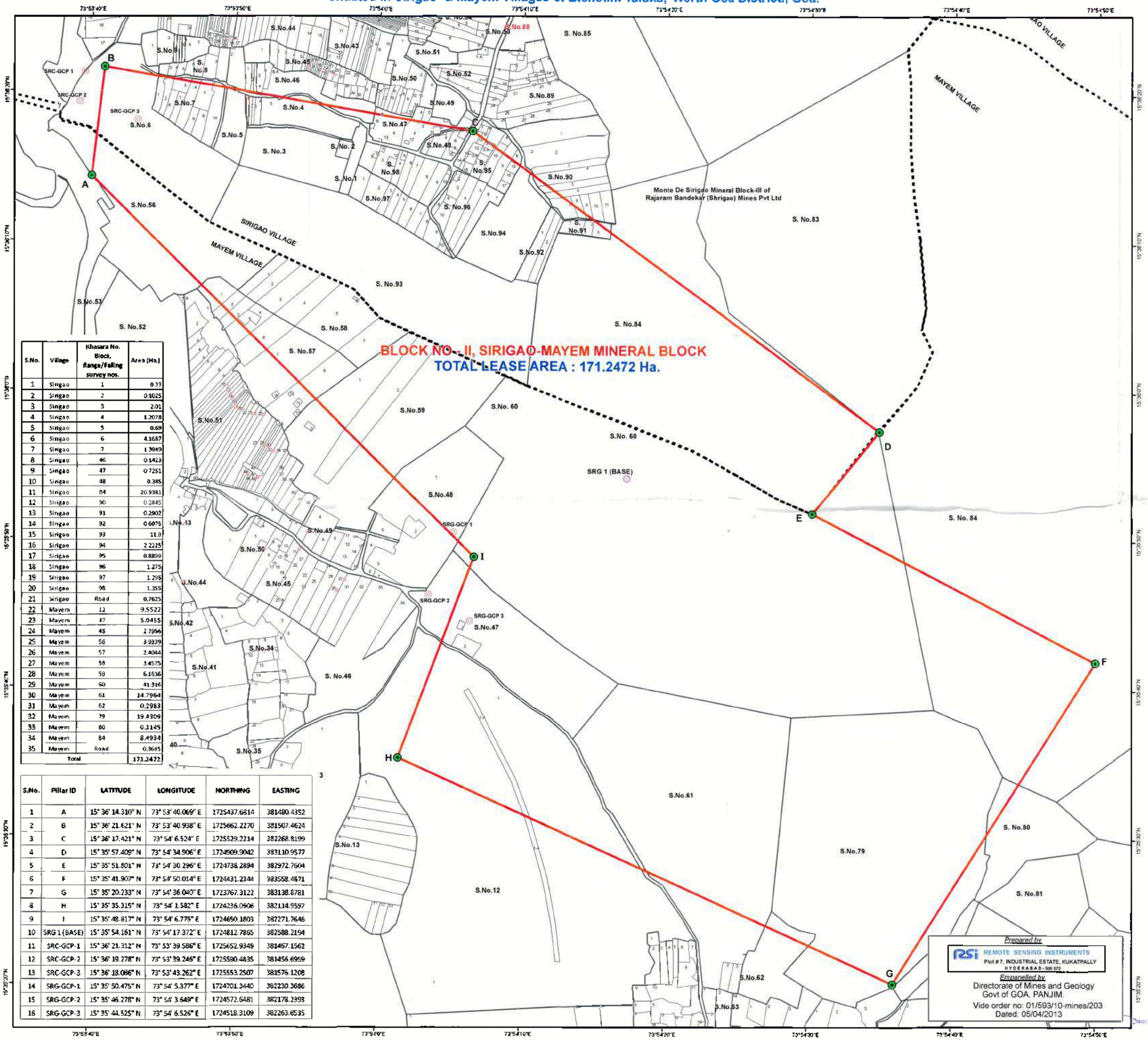


Plate No-1

SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

Plan Showing Mining Lease Boundary of BLOCK NO - II, SIRIGAO-MAYEM MINERAL BLOCK on Georeferenced and Vectorised Cadastral Map situated in Sirigao & Mayem Villages of Bicholim Taluka, North Goa District., Goa.



S.No.	Village	Khasara No. Block, Range/Falling survey nos.	Area (Ha.)
1	Sirigao	1	0.33
2	Sirigao	2	0.1025
3	Sirigao	3	2.01
4	Sirigao	4	1.2078
5	Sirigao	5	0.69
6	Sirigao	6	4.1687
7	Sirigao	7	1.3949
8	Sirigao	46	0.1423
9	Sirigao	47	0.7251
10	Sirigao	48	0.385
11	Sirigao	84	20.9381
12	Sirigao	90	0.2845
13	Sirigao	91	0.2902
14	Sirigao	92	0.6075
15	Sirigao	93	11.8
16	Sirigao	94	2.2225
17	Sirigao	95	0.8899
18	Sirigao	96	1.275
19	Sirigao	97	1.295
20	Sirigao	98	1.355
21	Sirigao	Road	0.7625
22	Mayem	12	9.5522
23	Mayem	47	5.0455
24	Mayem	48	2.7956
25	Mayem	56	3.9339
26	Mayem	57	2.4044
27	Mayem	58	3.4575
28	Mayem	59	6.1636
29	Mayem	60	41.316
30	Mayem	61	14.7964
31	Mayem	62	0.2983
32	Mayem	79	19.4309
33	Mayem	80	0.3145
34	Mayem	84	8.4934
35	Mayem	Road	0.3685
Total			171.2472

S.No.	Pillar ID	LATITUDE	LONGITUDE	NORTHING	EASTING
1	A	15° 36' 14.310" N	73° 53' 40.069" E	1725437.6814	381480.4352
2	B	15° 36' 21.621" N	73° 53' 40.938" E	1725662.2270	381507.4624
3	C	15° 36' 17.421" N	73° 54' 6.524" E	1725529.2214	382268.8199
4	D	15° 35' 57.409" N	73° 54' 34.906" E	1724909.9042	383110.9577
5	E	15° 35' 51.801" N	73° 54' 30.296" E	1724738.2894	382972.7604
6	F	15° 35' 41.907" N	73° 54' 50.014" E	1724431.2344	383558.4671
7	G	15° 35' 20.233" N	73° 54' 36.040" E	1723767.3122	383138.8781
8	H	15° 35' 35.315" N	73° 54' 1.582" E	1724236.0506	382114.9597
9	I	15° 35' 48.817" N	73° 54' 6.775" E	1724650.1803	382271.7646
10	SRG 1 (BASE)	15° 35' 54.161" N	73° 54' 17.372" E	1724812.7865	382588.2194
11	SRC-GCP-1	15° 36' 21.312" N	73° 53' 39.586" E	1725652.9349	381467.1562
12	SRC-GCP-2	15° 36' 19.278" N	73° 53' 39.246" E	1725590.4835	381456.6959
13	SRC-GCP-3	15° 36' 18.086" N	73° 53' 43.262" E	1725553.2507	381576.1208
14	SRG-GCP-1	15° 35' 50.475" N	73° 54' 5.377" E	1724701.3440	382230.3686
15	SRG-GCP-2	15° 35' 46.278" N	73° 54' 3.649" E	1724572.6481	382178.2393
16	SRG-GCP-3	15° 35' 44.525" N	73° 54' 6.526" E	1724518.3109	382263.6535

Prepared by
REMOTE SENSING INSTRUMENTS
Plot # 7, INDUSTRIAL ESTATE, KUKATPALLY
HYDERABAD - 500 072.
Empanelled by
Directorate of Mines and Geology
Govt of GOA, PANJIM.
Vide order no: 01/593/10-mines/203
Dated: 05/04/2013

N
W E
S

SCALE 1:3,960

0 50 100 200 300 400 500 Meters

GEO-REFERENCED & VECTORISED CADASTRAL MAP OF:

LEASE NAMES: BLOCK NO - II, SIRIGAO-MAYEM MINERAL BLOCK

LESSEE: SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

LOCATION MAYEM & SIRIGAO VILLAGES OF BICHOLIM TALUKA, NORTH GOA DISTRICT, GOA

MINING LEASE AREA AS PER DGPS SURVEY - 171.2472 Ha.

Legend

- DGPS POINT OF LEASE BOUNDARY
- LEASE BOUNDARY AS PER DGPS SURVEY
- SURVEY No BOUNDARY
- SUB-DIVISION OF THE SURVEY No
- TALUKABOUNDARY
- VILLAGE BOUNDARY
- BASE STATION
- GROUND CONTROL POINTS

KEY PLAN OF SIRGAO MINES

DATUM : WGS 84

PROJECTION : UTM Zone 43N

LOCATION MAP

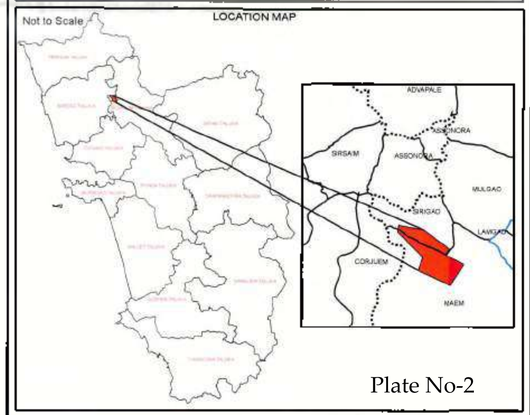


Plate No-2

CERTIFICATE

This is to certify that the Mining Lease Boundary Pillars of Block No - II, Singao-Mayem Mineral Block have been Surveyed by using DGPS (Differential Global Positioning System). The Survey was conducted earlier to comply with IBM Circular No. 2/2010 dated 06.04.2010.

SALGAOCAR SHIPPING COMPANY PVT. LTD.

Sandeep M Naik
(Authorised Signatory)

CERTIFICATE

This is to certify that the Mining Lease Boundary Pillars of Block No - II, Singao-Mayem Mineral Block have been Surveyed by using DGPS (Differential Global Positioning System). The Survey was conducted earlier and this plan is as per requirement of IBM Circular No. 2/2010 dated 06.04.2010.

REMOTE SENSING INSTRUMENTS HYD-7

For Remote Sensing Instruments
Shri. B.V. Ramana Kumar
(General Manager)

Directorate of Mines and Geology - Panaji - Goa

Checked by	Certified by
	Director of Mines & Geology, Directorate of Mines & Geology, Government of Goa, Panaji - Goa.
	Director of Mines and Geology

Key Plan

N
W E
S

Scale 1:100,000

0 2.5 5 Km

Legend

- Mining Lease Area
- 10km buffer Zone

Plate No-3

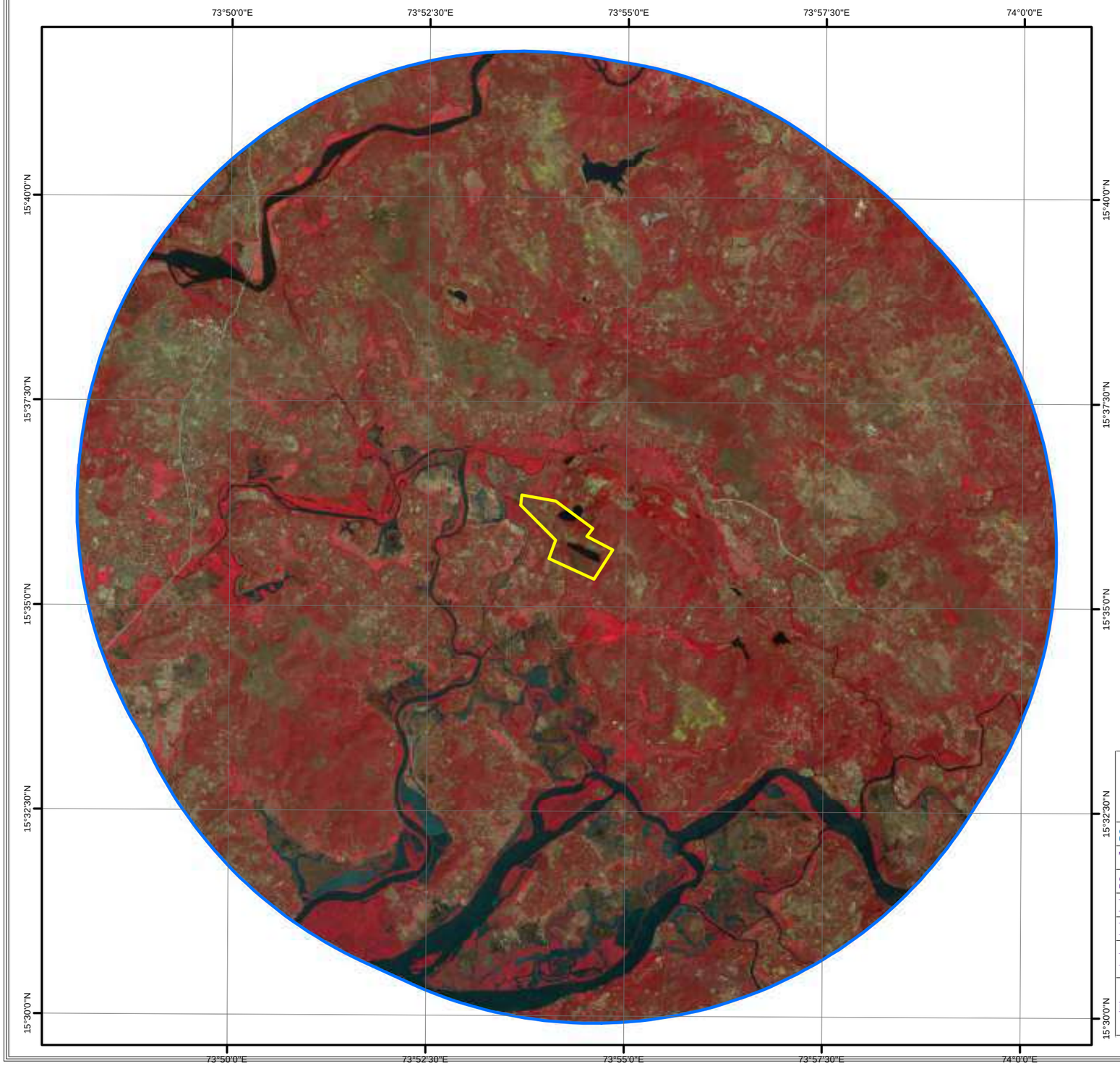
Block II – Sirigao-Mayem Mineral Block

Located at Sirigao & Mayem Villages, Bichololim Taluka North Goa District, Goa

SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

Scale	**1:100000**	
Topo Sheets No.	New	Old
	D43B14, D43B15, D43C2 & D43C3	**48E/14, 48E/15, 48I/2 & 48I/3**
Map Prepared By	**Mineral Engineering Services 25/XXV Club Road, Ballari -58103**	

High Resolution Imagery



N
W E
S

Scale1:100,000

0 2.5 5 Km

Legend

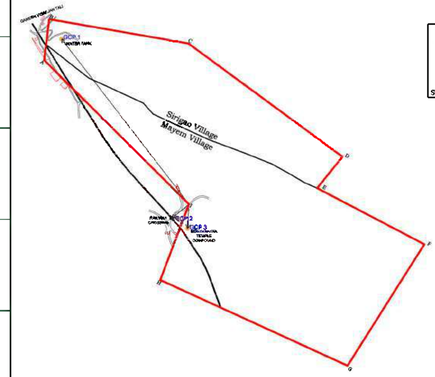
- Mining Lease Area
- 10km Bufferzone

Plate No-4

Block II – Sirigao-Mayem Mineral Block Located at Sirigao & Mayem Villages, Bichololim Taluka North Goa District, Goa	
SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED	
Title	High Resolution Imagery
Scale	1:100000
Data Used	IRS-R2, Mx
Resolution	5m
Date of Pass	01.04.2023 & 08.03.2023
Map Prepared By	Mineral Engineering Services 25/XXV Club Road, Ballari -58103

764

KEY PLAN OF GROUND CONTROL POINTS THE MINING BLOCK-II



SCALE 1:2,000

MONTE DE SHIRGAO MINERAL BLOCK-III OF RAJARAM BANDEKAR (SHIRGAO) MINES PVT. LTD.

PIT No.1 · PIT No.2 · PIT No.3

GCP 1 · GCP 2 · GCP 3

SRG 1

S.No.6 · S.No.7 · S.No.4 · S.No.5 · S. No.3 · S. No.2 · S./No.1 · S.No.47 · S.No.46 · S.No.98 · S. No.95 · S.No.97 · S. No.96 · S.No.56 · S.No.94 · S.No.93 · S. No.58 · S. No.84 · S. No.57 · No.59 · S.No. 60 · S.No.48 · S.No.50 · S.No.47 · S.No.42 · S.No.61 · S.No.62 · S.No.79 · S. No.80

SEASONAL WATER COURSE · KONKAN RAILWAY · QUARRY SAFETY ZONE · DUMP NO. 3 · DUMP NO. 1 · DUMP NO. 2

INDEX

- LEASE BOUNDARY
- CONTOURS
- MINES ROAD
- PUBLIC ROAD
- BORE HOLE
- FACES
- DUMPS
- H.T POWER LINE
- BENCH MARK
- BUILDINGS
- CLD BOUNDARY PILLARS
- ARRESTER WALL
- KONKAN RAILWAY
- SEASONAL WATER COURSE
- HABITANT
- WATER PIPE LINE
- SILL
- 7.5M SAFETY ZONE
- 50M RAILWAY SAFETY ZONE
- 50M SAFETY ZONE FROM HABITANT
- 50M ZONE FROM PUBLIC ROAD
- 50M SEASONAL NALLAH
- TEMPORARY BACKFILLING AREA

GEOLOGICAL LEGEND

- LATERITE
- LUMPY (+60% Fe)
- OVERLYING FORMATION (Below High Tide)
- LOW GRADE ORE (+45 - 51% Fe)
- FRIABLE ORE (+55 - 57% Fe)
- POWDERY ORE (+60% Fe)
- INTERCALATED CLAY
- UNDERLYING FORMATION (Turtlebeam Pebble)
- DIP AND STRIKE
- ULTIMATE PIT LIMIT

UNFC CLASSIFICATION CODE FOR MINERAL RESERVES

- PROVED MINERAL RESERVES (111)
- PROBABLE MINERAL RESERVES (122)
- INFERRED MINERAL RESOURCES (331)
- FEASIBILITY MINERAL RESOURCE (211)

YEARWISE PROPOSED BORE HOLE

- 1 - 15 (III rd YEAR)
- 16 - 31 (IV th YEAR)

TYPE OF LAND WITHIN LEASE AREA AS PER FORM No. I & XIV (AREA IN Ha.)

S.No.	Village	Khasara No. Block, Range/Falling Survey Nos.	Area (Ha.)	
1	Sirigao	1	0.33	PRIVATE LAND
2	Sirigao	2	0.1025	GOVT. LAND
3	Sirigao	3	2.01	PRIVATE LAND
4	Sirigao	4	1.2078	PRIVATE LAND
5	Sirigao	5	0.69	PRIVATE LAND
6	Sirigao	6	4.3687	PRIVATE LAND
7	Sirigao	7	1.3949	PRIVATE LAND
8	Sirigao	46	0.1422	PRIVATE LAND
9	Sirigao	47	0.7251	PRIVATE LAND
10	Sirigao	48	0.385	PRIVATE LAND
11	Sirigao	88	20.9381	PRIVATE LAND
12	Sirigao	90	0.2845	PRIVATE LAND
13	Sirigao	91	0.2903	PRIVATE LAND
14	Sirigao	92	0.6075	PRIVATE LAND
15	Sirigao	93	11.8	PRIVATE LAND
16	Sirigao	94	2.2225	PRIVATE LAND
17	Sirigao	95	0.8899	PRIVATE LAND
18	Sirigao	96	1.275	PRIVATE LAND
19	Sirigao	97	1.295	PRIVATE LAND
20	Sirigao	98	1.355	PRIVATE LAND
21	Sirigao	Road	0.7625	
22	Mayem	12	9.5522	GOVT. LAND
23	Mayem	47	5.0455	GOVT. LAND
24	Mayem	48	2.7856	GOVT. LAND
25	Mayem	56	3.9329	GOVT. LAND
26	Mayem	57	2.4044	GOVT. LAND
27	Mayem	58	3.4575	GOVT. LAND
28	Mayem	59	6.1656	GOVT. LAND
29	Mayem	60	41.316	GOVT. LAND
30	Mayem	61	14.7964	GOVT. LAND
31	Mayem	62	0.2983	GOVT. LAND
32	Mayem	79	19.4309	GOVT. LAND
33	Mayem	80	0.3145	GOVT. LAND
34	Mayem	84	8.4934	GOVT. LAND
35	Mayem	Road	0.3685	
Total			171.2472	

DGPS CO-ORDINATES OF MINERAL BLOCK CORNER PILLARS (MAP DATUM - WGS 84)

S.No.	Pillar ID	LATITUDE	LONGITUDE	NORTHING	EASTING
1	A	15° 36' 14.310" N	73° 53' 40.060" E	1725437.6814	381400.4352
2	B	15° 35' 23.421" N	73° 53' 40.938" E	1725662.2270	381507.4624
3	C	15° 35' 17.421" N	73° 54' 06.534" E	1725529.2214	382268.8199
4	D	15° 35' 57.405" N	73° 54' 34.906" E	1724909.9042	383110.9577
5	E	15° 35' 51.601" N	73° 54' 50.296" E	1724788.2894	382972.7604
6	F	15° 35' 41.907" N	73° 54' 58.014" E	1724493.2344	383558.4671
7	G	15° 35' 20.233" N	73° 54' 36.040" E	1723767.3122	383126.8781
8	H	15° 35' 25.335" N	73° 54' 01.582" E	1724236.0506	382114.9597
9	I	15° 35' 48.817" N	73° 54' 06.775" E	1724950.1993	382271.7646

GROUND CONTROL POINT (MAP DATUM WGS 84)

GROUND CONTROL POINT (GCP)	LATITUDE	LONGITUDE	R.L (M)	REMARKS	DISTANCE FROM BOUNDARY PILLAR	DIRECTION FROM THE BOUNDARY PILLAR
GCP - 1	15° 36' 18.066" N	73° 53' 41.362" E	21.00 M.	WATER TANK NEAR SIRGAO VILLAGE	1139.81 M.	N 36° W
GCP - 2	15° 36' 48.276" N	73° 54' 05.648" E	10.00 M.	RAILWAY CROSSING	116.28 M.	S 45° W
GCP - 3	15° 36' 44.326" N	73° 54' 05.528" E	9.00 M.	SHIVNAYAK TEMPLE COMPOUND	126.19 M.	S 05° E
I	15° 35' 48.817" N	73° 54' 06.775" E	21.00 M.	CORNER BOUNDARY PILLAR		

SCALE 1:2000

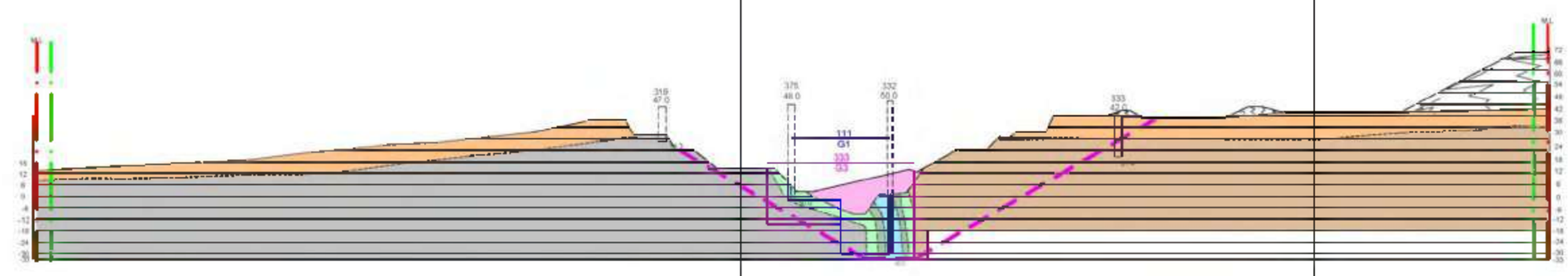
Plate No - 5A

NAME OF THE LEASE:	BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK
LESSEE:	SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED ALTINHO, PANAJI - GOA
TITLE:	SURFACE GEOLOGICAL PLAN
SCALE - 1:2000	Area: 171.2472 — DATE OF SURVEY 01-10-2017 DATE OF Updation: 01-03-2023
PROJECT	BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK SIRIGAO & MAYEM VILLAGE, BICHOLIM TALUKA, NORTH GOA DISTRICT, GOA STATE
Purpose:	Mining Plan

THIS PLAN IS PREPARED BASED ON THE LEASE SKETCH DULY AUTHENTICATED BY THE DMG, STATE GOVERNMENT OF GOA AND CERTIFIED AS CORRECT.

M.S.RAJU
QUALIFIED PERSON

REF.1 REF.2



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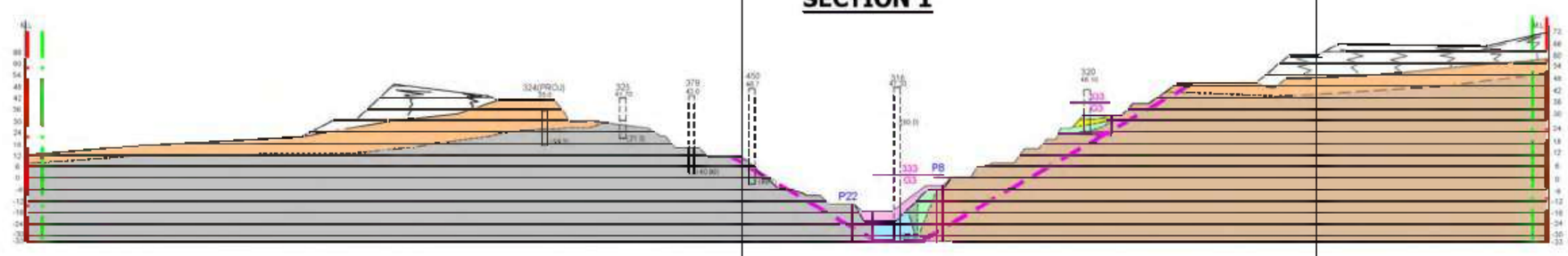

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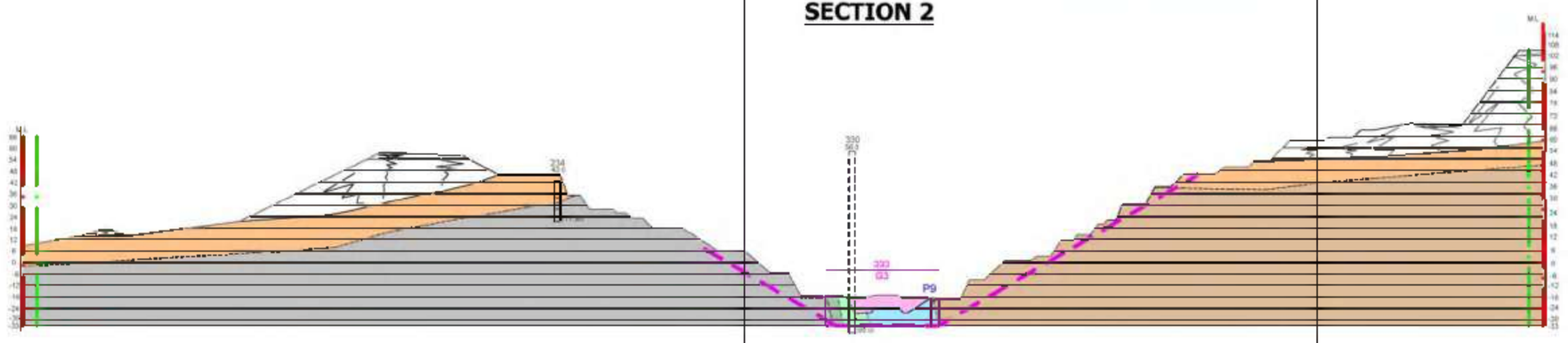

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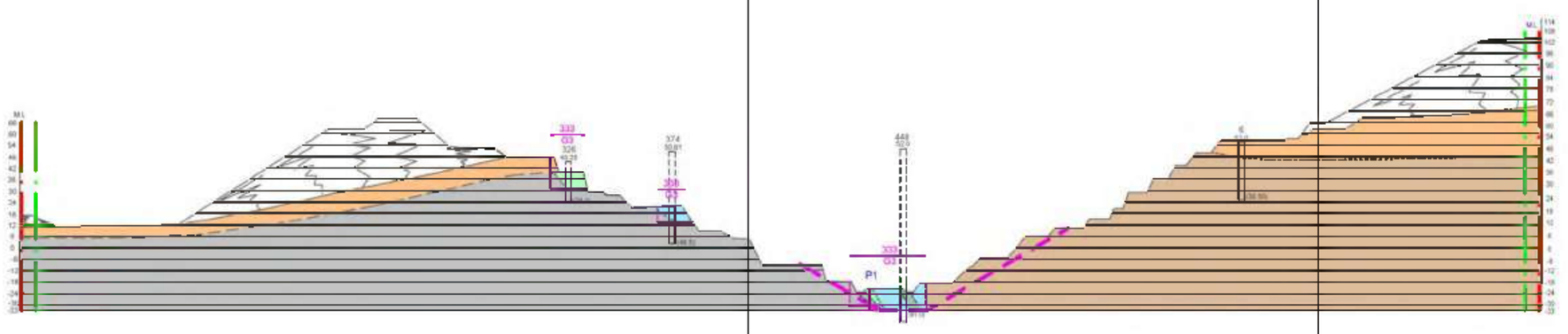

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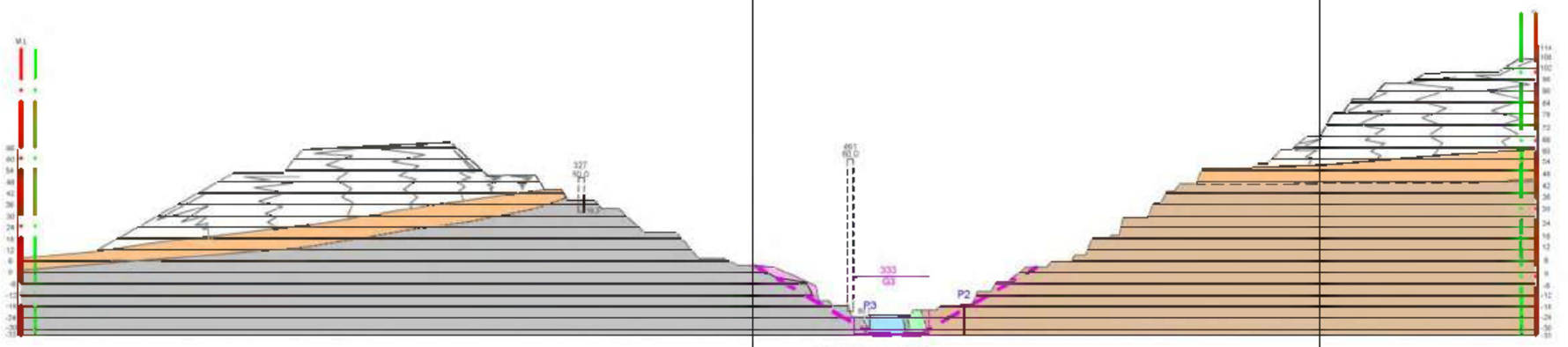

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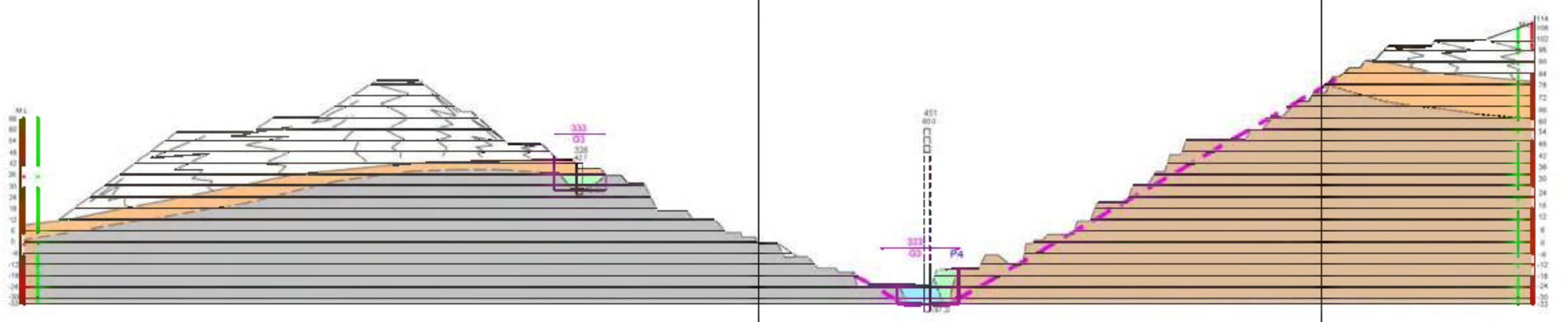

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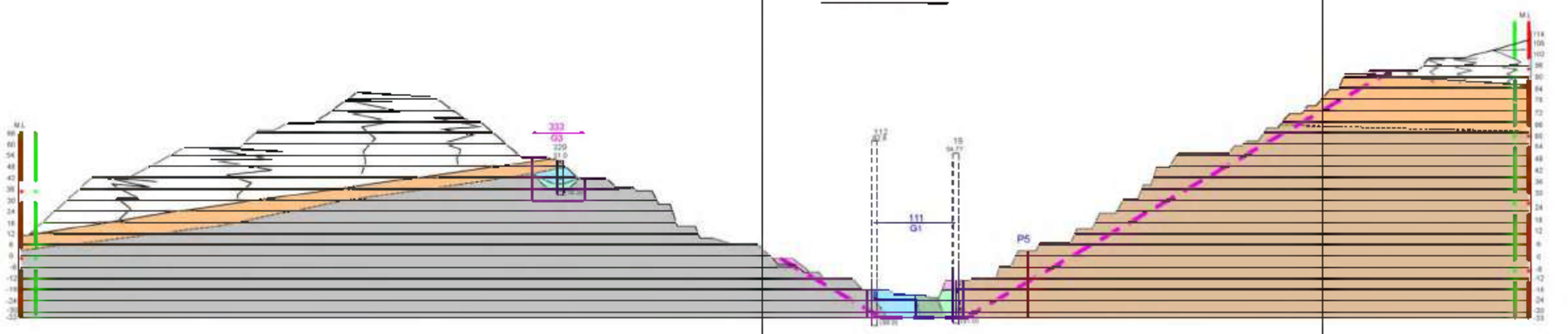


SECTION 7

REF.1 REF.2

PLATE No. 5A

INDEX

- BORE HOLE
- DUMP
- ORE STACK
- BACKFILLING
- PROPOSED BORE HOLES
- LEASE BOUNDARY
- 7.5M SAFETY ZONE
- ULTIMATE PIT LIMIT(UPL)

GEOLOGICAL LEGEND

- LATERITE
- LUMPY (+55% Fe)
- OVERLYING FORMATION (Phyllite/Mafic Phyllite)
- LOW GRADE ORE (+45 ~ 54% Fe)
- FRIABLE ORE (+55 ~ 59% Fe)
- POWDERY ORE (+60% Fe)
- CLAY INTRUSIVES
- INTERCALATED CLAY
- UNDERLYING FORMATION (Phyllite/Mafic Phyllite)

UNFC CLASSIFICATION CODE FOR MINERAL RESERVES

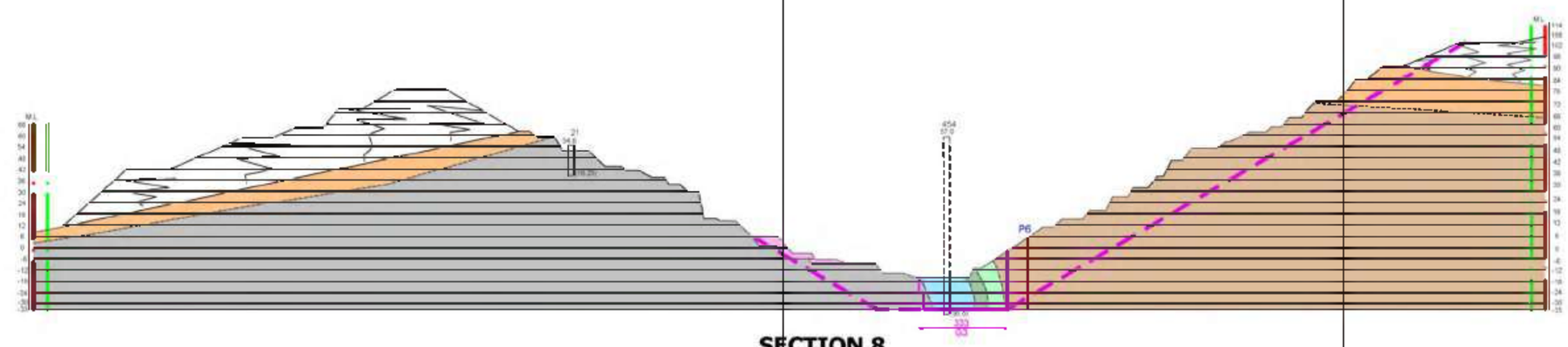
- PROVED MINERAL RESERVES(111)
- PROBABLE MINERAL RESERVES(122)
- INFERRED MINERAL RESOURCE(333)
- INDICATED MINERAL RESOURCE(332)
- FEASIBILITY MINERAL RESOURCE(211)

NAME OF THE LEASE:	**BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK**
LESSEE:	SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED ALTINHO, PANAJI - GOA
TITLE:	**GEOLOGICAL CROSS SECTIONS**
SCALE - 1:2000 / Area: 171.2472	DATE OF SURVEY 01-10-2017 DATE OF Updatation: 01-03-2023
PROJECT	BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK SIRIGAO & MAYEM VILLAGE, BICHOLIM TALUKA, NORTH GOA DISTRICT, GOA STATE
Purpose:	Mining Plan

THESE SECTIONS ARE PREPARED BASED ON THE LEASE SKETCH DULY AUTHENTICATED BY THE DMG, STATE GOVERNMENT OF GOA AND CERTIFIED AS CORRECT.

M.S.RAJU
QUALIFIED PERSON

REF.1 REF.2



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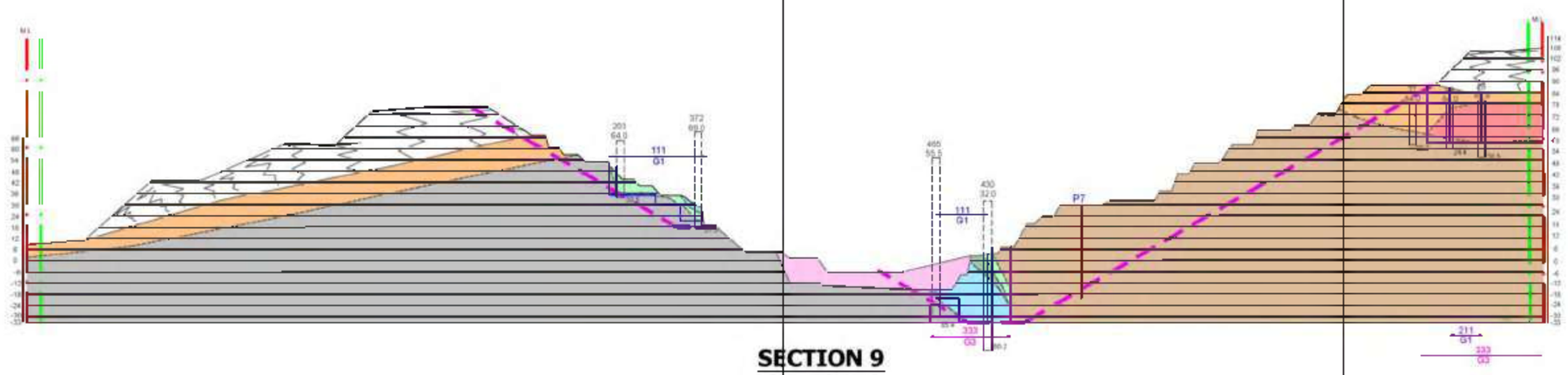

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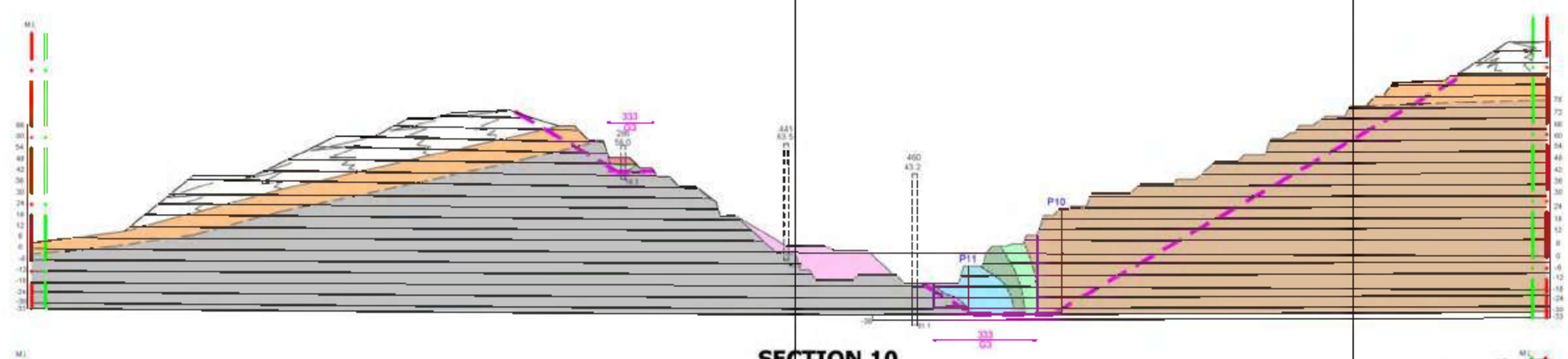

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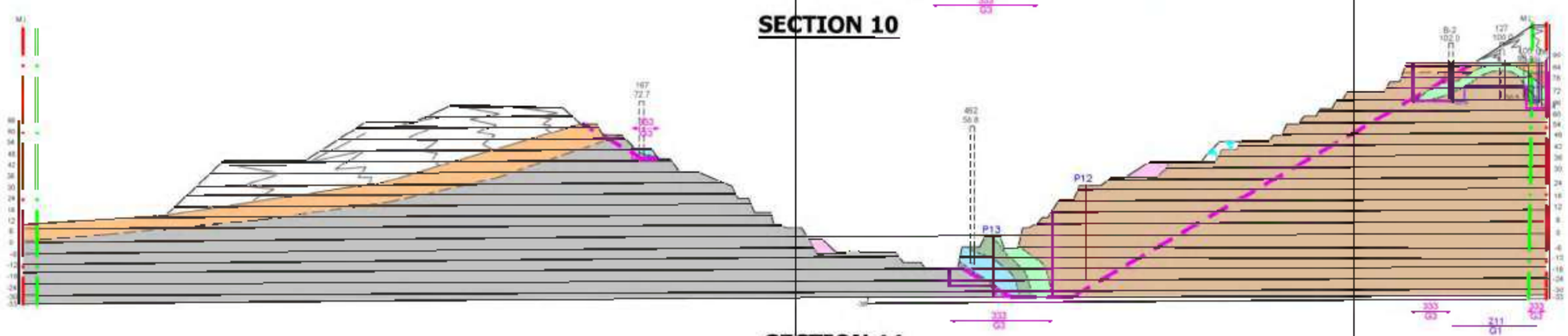

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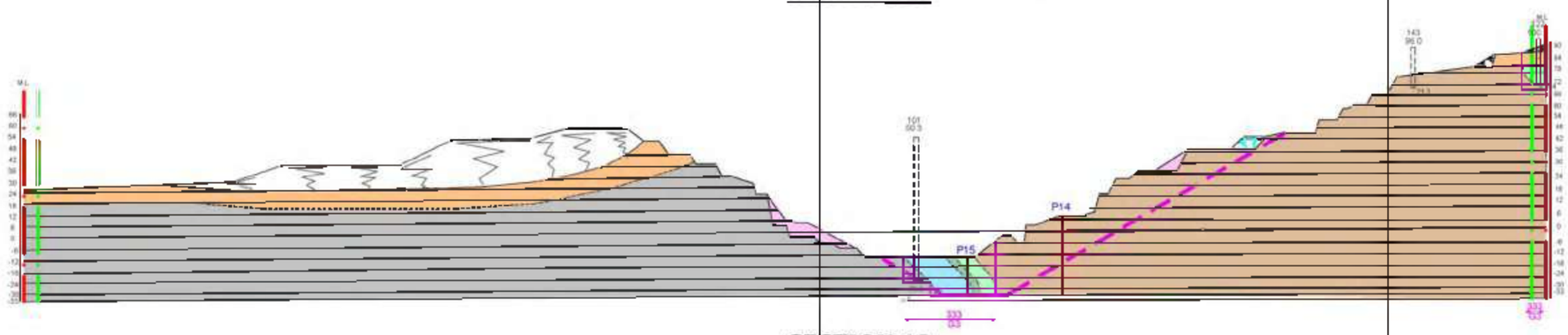

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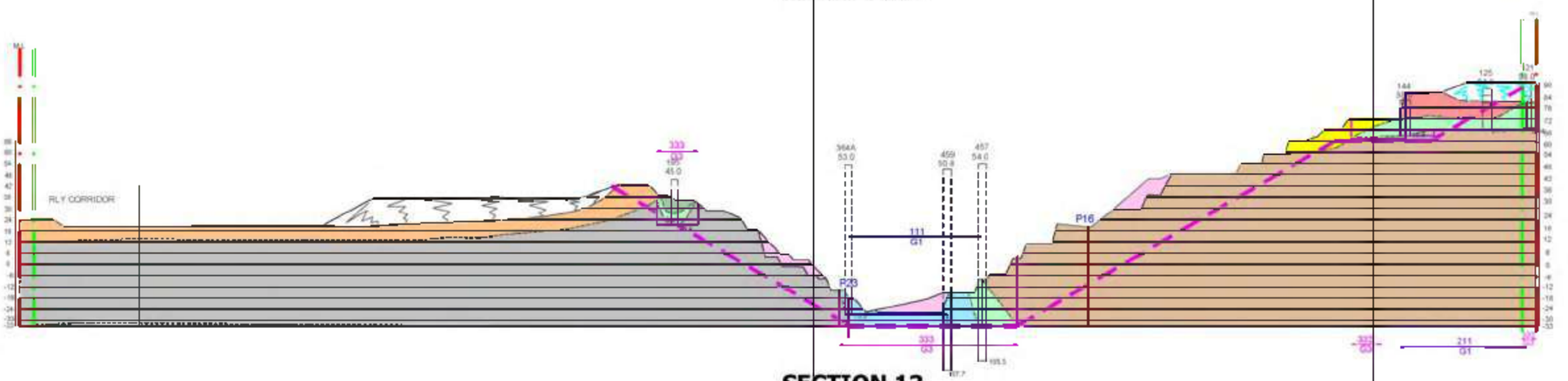


SECTION 13

REF.1 REF.2

INDEX

- BORE HOLE
- DUMP
- ORE STACK
- BACKFILLING
- PROPOSED BORE HOLES
- LEASE BOUNDARY
- 7.5M SAFETY ZONE
- ULTIMATE PIT LIMIT(UPL)

GEOLOGICAL LEGEND

- LATERITE
- LUMPY (+55% Fe)
- OVERLYING FORMATION
- LOW GRADE ORE (+45 ~ 54% Fe)
- FRIABLE ORE (+55 ~ 59% Fe)
- POWDERY ORE (+60% Fe)
- CLAY INTRUSIVES
- INTERCALATED CLAY
- UNDERLYING FORMATION

UNFC CLASSIFICATION CODE FOR MINERAL RESERVES

- PROVED MINERAL RESERVES (111)
- PROBABLE MINERAL RESERVES (122)
- INFERRED MINERAL RESOURCE (333)
- INDICATED MINERAL RESOURCE (332)
- FEASIBILITY MINERAL RESOURCE (211)

PLATE No. 5B

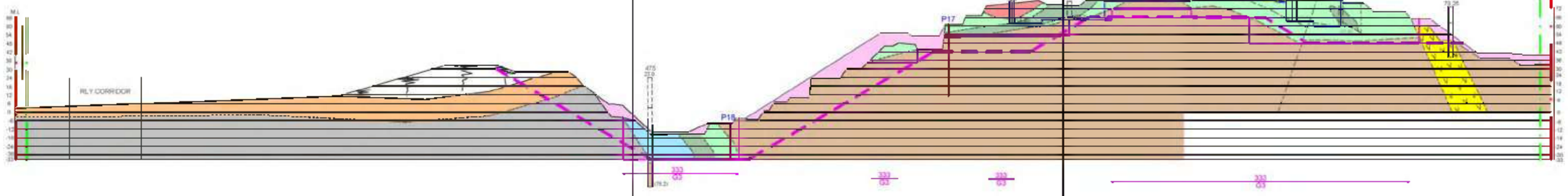
NAME OF THE LEASE:	**BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK**
LESSEE:	SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED ALTINHO, PANAJI - GOA
TITLE:	**GEOLOGICAL CROSS SECTIONS**
SCALE - 1:2000	Area: 171.2472 — DATE OF SURVEY 01-10-2017, DATE OF Updatation: 01-03-2023
PROJECT	BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK, SIRIGAO & MAYEM VILLAGE, BICHOLIM TALUKA, NORTH GOA DISTRICT, GOA STATE
Purpose:	Mining Plan

THESE SECTIONS ARE PREPARED BASED ON THE LEASE SKETCH DULY AUTHENTICATED BY THE DMG, STATE GOVERNMENT OF GOA AND CERTIFIED AS CORRECT.

M.S.RAJU
QUALIFIED PERSON

REF.1

REF.2



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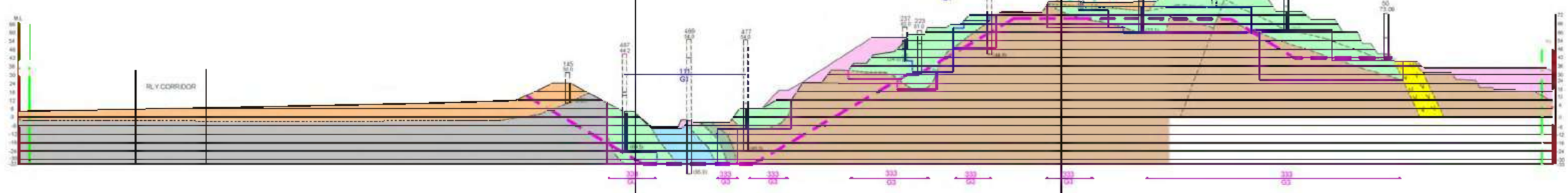

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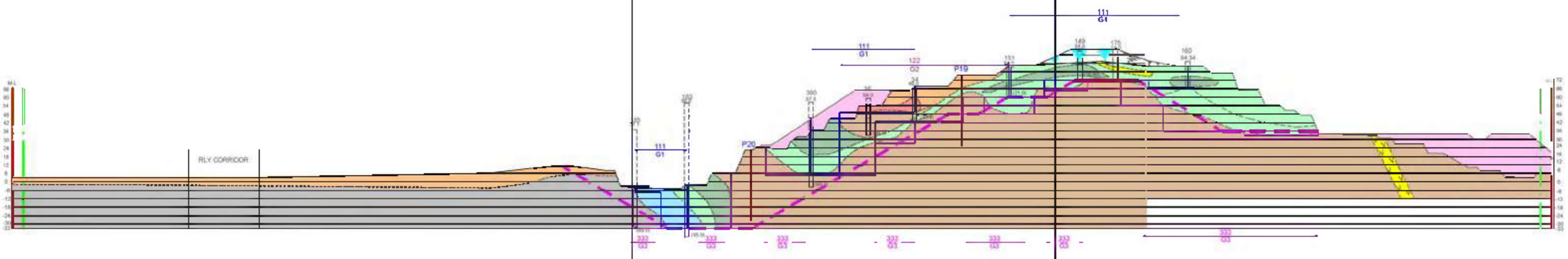

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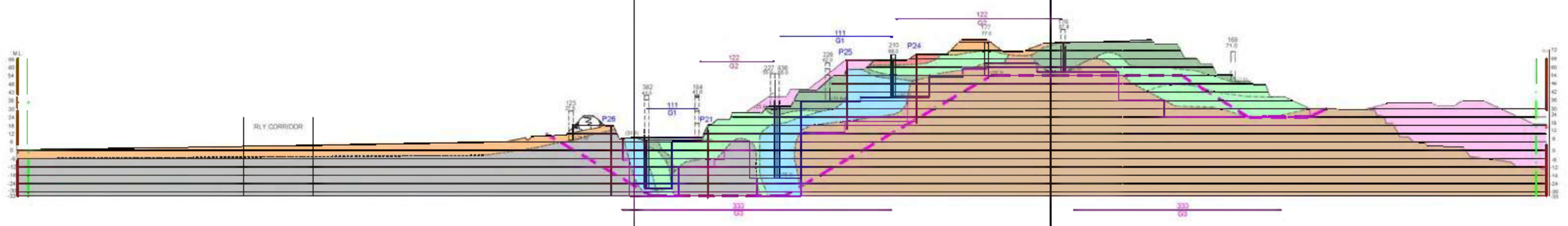

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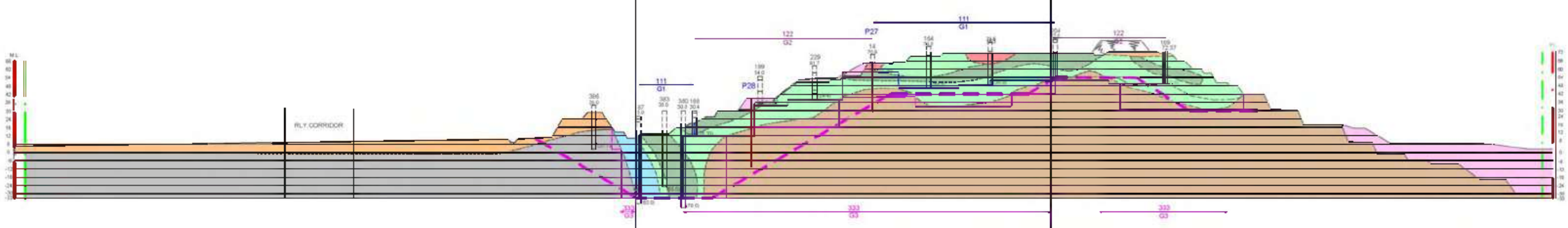

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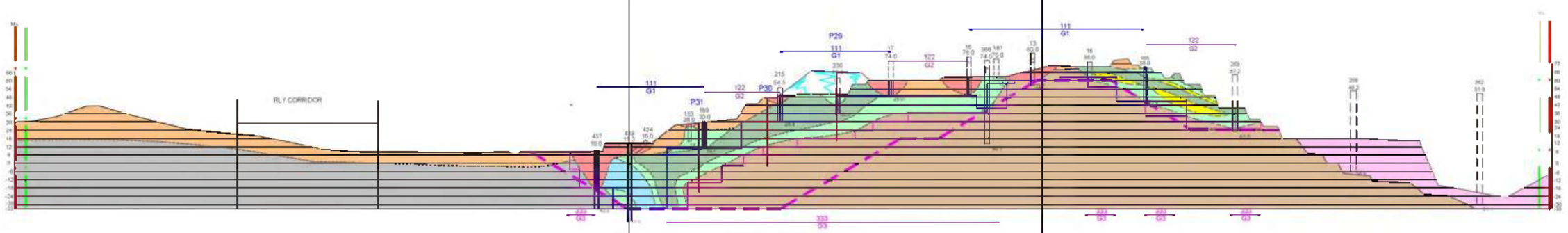


SECTION 19

REF 1

REF.2

PLATE No. 5C

NAME OF THE LEASE:	**BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK**
LESSEE:	SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED ALTINHO, PANAJI - GOA
TITLE:	**GEOLOGICAL CROSS SECTIONS**
SCALE - 1:2000	Area: 171.2472 — DATE OF SURVEY 01-10-2017; DATE OF Updatation: 01-03-2023
PROJECT	BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK; SIRIGAO & MAYEM VILLAGE, BICHOLIM TALUKA, NORTH GOA DISTRICT, GOA STATE
Purpose:	Mining Plan

THESE SECTIONS ARE PREPARED BASED ON THE LEASE SKETCH DULY AUTHENTICATED BY THE DMG, STATE GOVERNMENT OF GOA AND CERTIFIED AS CORRECT.

M.S.RAJU
QUALIFIED PERSON

INDEX

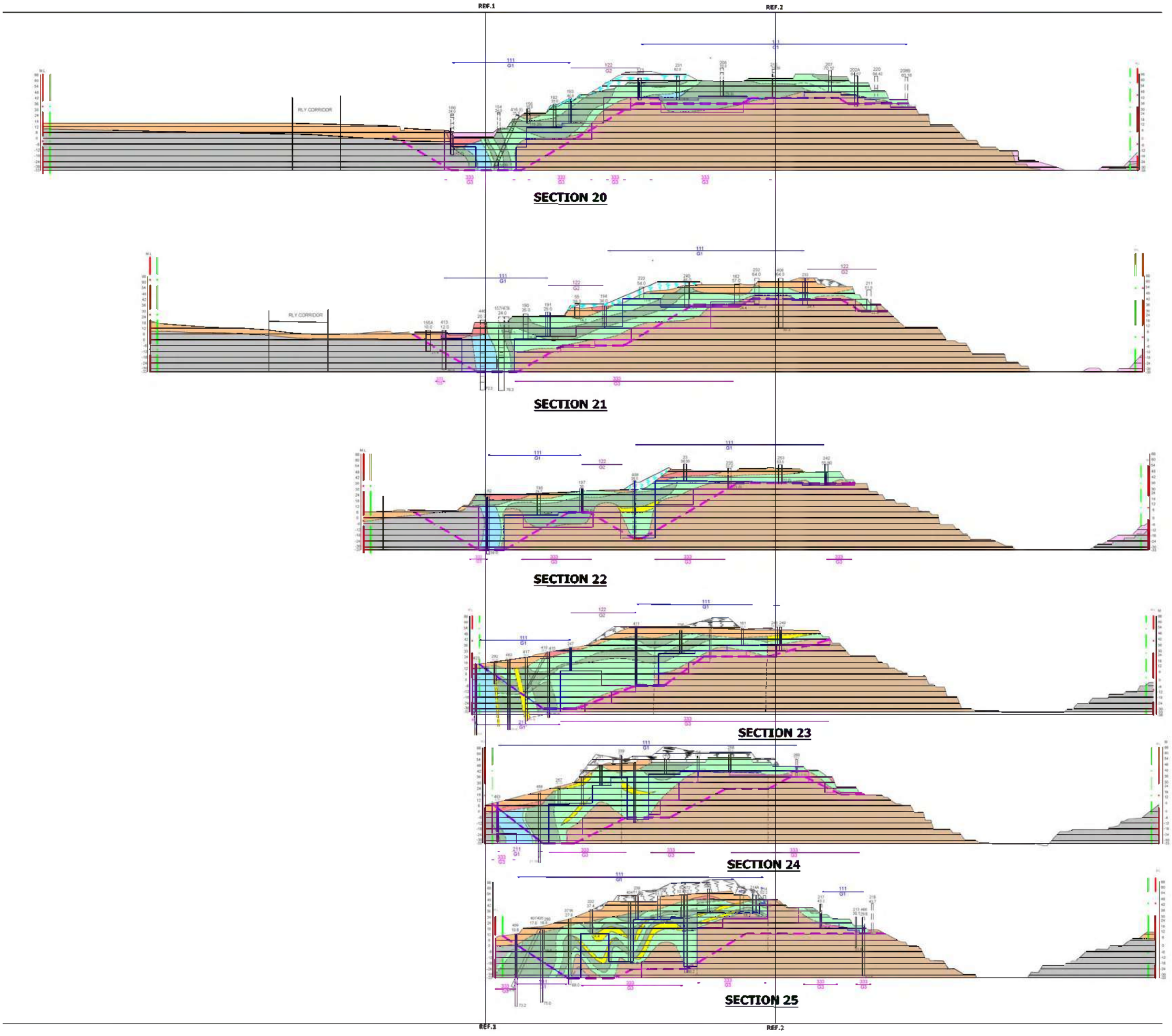
- BORE HOLE
- DUMP
- ORE STACK
- BACKFILLING
- PROPOSED BORE HOLES
- LEASE BOUNDARY
- 7.5M SAFETY ZONE
- ULTIMATE PIT LIMIT(UPL)

GEOLOGICAL LEGEND

- LATERITE
- LUMPY (+55% Fe)
- OVERLYING FORMATION
- LOW GRADE ORE (+45 ~ 54% Fe)
- FRIABLE ORE (+55 ~ 58% Fe)
- POWDERY ORE (+60% Fe)
- CLAY INTRUSIVES
- INTERCALATED CLAY
- UNDERLYING FORMATION

UNFC CLASSIFICATION CODE FOR MINERAL RESERVES

- PROVED MINERAL RESERVES(111)
- PROBABLE MINERAL RESERVES(122)
- INFERRED MINERAL RESOURCE(333)
- INDICATED MINERAL RESOURCE(332)
- FEASIBILITY MINERAL RESOURCE(211)



INDEX

- BORE HOLE
- DUMP
- ORE STACK
- BACKFILLING
- PROPOSED BORE HOLES
- LEASE BOUNDARY
- 7.5M SAFETY ZONE
- ULTIMATE PIT LIMIT(UPL)

GEOLOGICAL LEGEND

- LATERITE
- LUMPY (+55% Fe)
- OVERLYING FORMATION
- LOW GRADE ORE (+45 ~ 54% Fe)
- FRIABLE ORE (+55 ~ 59% Fe)
- POWDERY ORE (+60% Fe)
- CLAY INTRUSIVES
- INTERCALATED CLAY
- UNDERLYING FORMATION

UNFC CLASSIFICATION CODE FOR MINERAL RESERVES

- PROVED MINERAL RESERVES(111)
- PROBABLE MINERAL RESERVES(122)
- INFERRED MINERAL RESOURCE(333)
- INDICATED MINERAL RESOURCE(332)
- FEASIBILITY MINERAL RESOURCE(211)

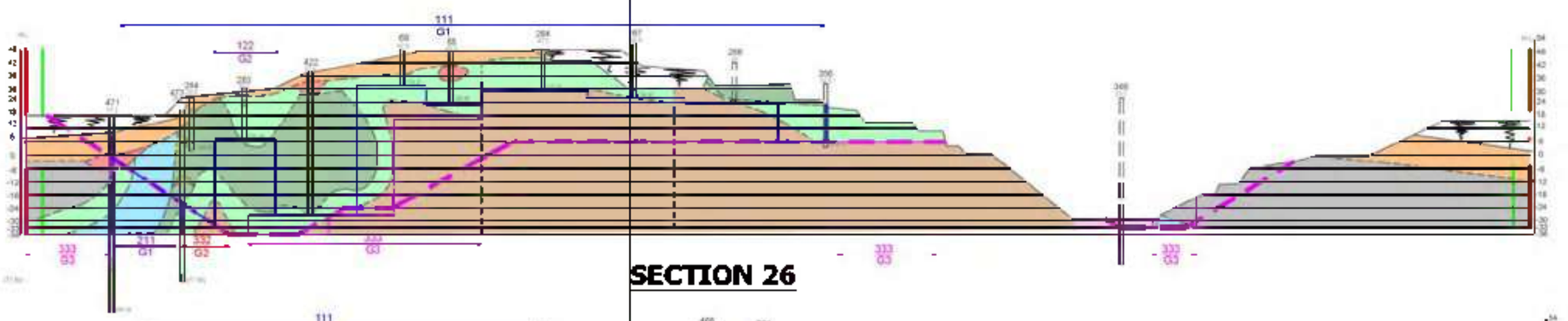
PLATE No. 5D

NAME OF THE LEASE:	**BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK**
LESSEE:	SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED ALTINHO, PANAJI - GOA
TITLE:	**GEOLOGICAL CROSS SECTIONS**
SCALE - 1:2000	Area: 171.2472 — DATE OF SURVEY 01-10-2017 DATE OF Updatation: 01-03-2023
PROJECT	BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK SIRIGAO & MAYEM VILLAGE, BICHOLIM TALUKA, NORTH GOA DISTRICT, GOA STATE
Purpose:	Mining Plan

THESE SECTIONS ARE PREPARED BASED ON THE LEASE SKETCH DULY AUTHENTICATED BY THE DMG, STATE GOVERNMENT OF GOA AND CERTIFIED AS CORRECT.

M.S.RAJU
QUALIFIED PERSON

REF.1 REF.2



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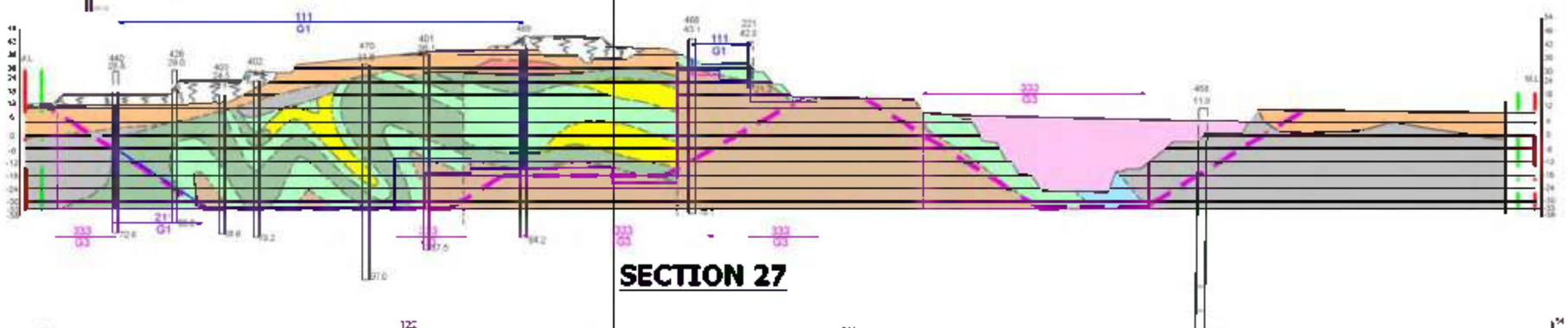

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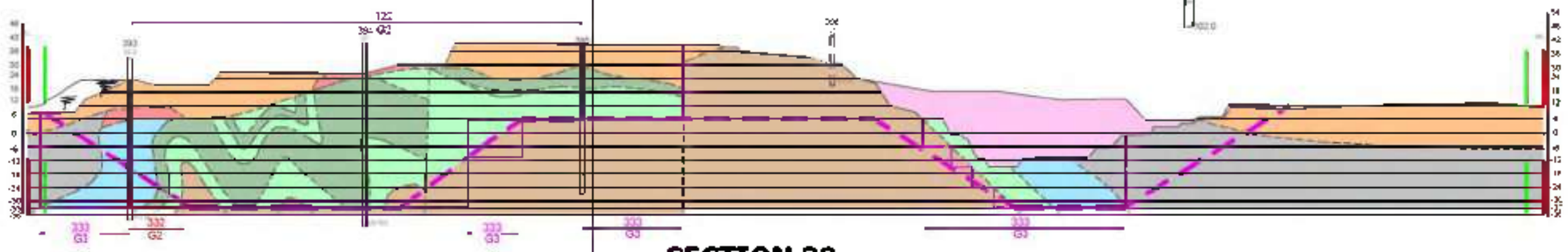

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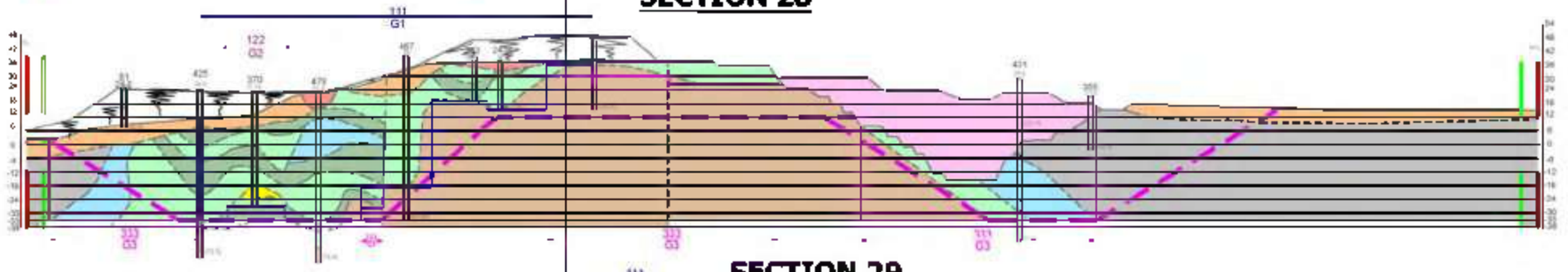

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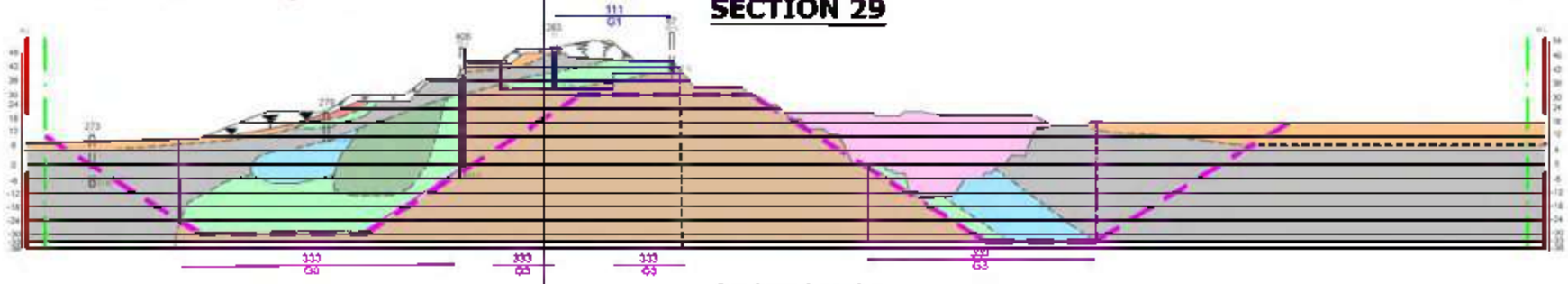

SECTION 30

REF.1 REF.2

INDEX

- BORE HOLE
- DUMP
- ORE STACK
- BACKFILLING
- PROPOSED BORE HOLES
- LEASE BOUNDARY
- 7.5M SAFETY ZONE
- ULTIMATE PIT LIMIT(UPL)

GEOLOGICAL LEGEND

- LATERITE
- LUMPY (+55% Fe)
- OVERLYING FORMATION
- LOW GRADE ORE (+45 ~ 54% Fe)
- FRIABLE ORE (+55 ~ 59% Fe)
- POWDERY ORE (+60% Fe)
- CLAY INTRUSIVES
- INTERCALATED CLAY
- UNDERLYING FORMATION

UNFC CLASSIFICATION CODE FOR MINERAL RESERVES

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- PROBABLE MINERAL RESERVES(122)
- INFERRED MINERAL RESOURCE(333)
- INDICATED MINERAL RESOURCE(332)
- FEASIBILITY MINERAL RESOURCE(211)

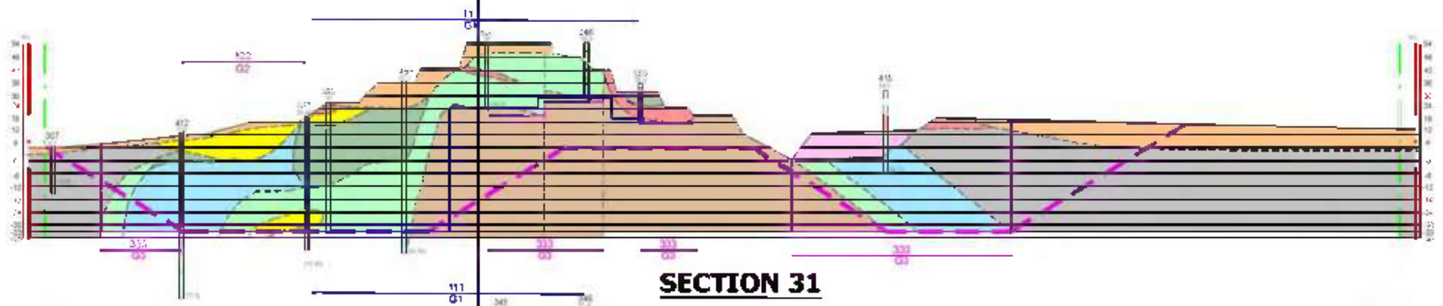
PLATE No. 5E

NAME OF THE LEASE:	**BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK**
LESSEE:	SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED ALTINHO, PANAJI - GOA
TITLE:	**GEOLOGICAL CROSS SECTIONS**
SCALE - 1:2000	Area: 171.2472 — DATE OF SURVEY 01-10-2017 — DATE OF Updatation: 01-03-2023
PROJECT	BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK SIRIGAO & MAYEM VILLAGE, BICHOLIM TALUKA, NORTH GOA DISTRICT, GOA STATE
Purpose:	Mining Plan

THESE SECTIONS ARE PREPARED BASED ON THE LEASE SKETCH DULY AUTHENTICATED BY THE DMG, STATE GOVERNMENT OF GOA AND CERTIFIED AS CORRECT.

M.S.RAJU
QUALIFIED PERSON

REF.1 REF.2



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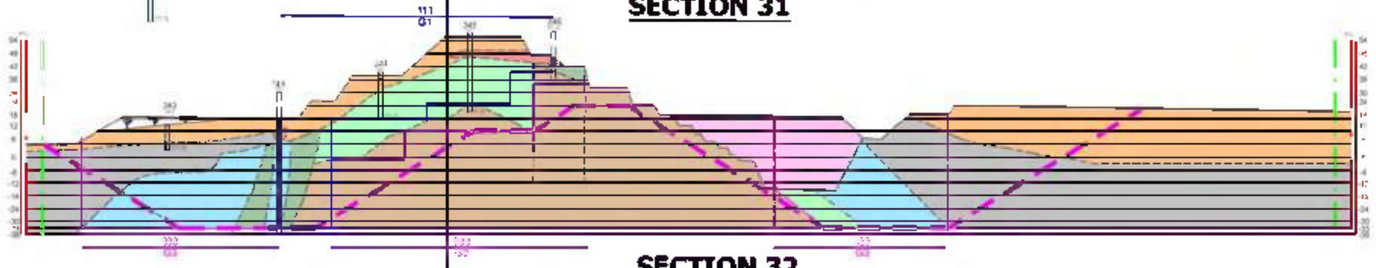

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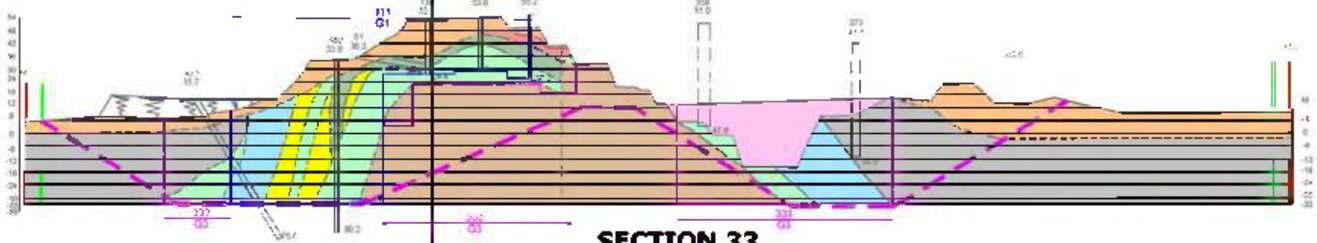

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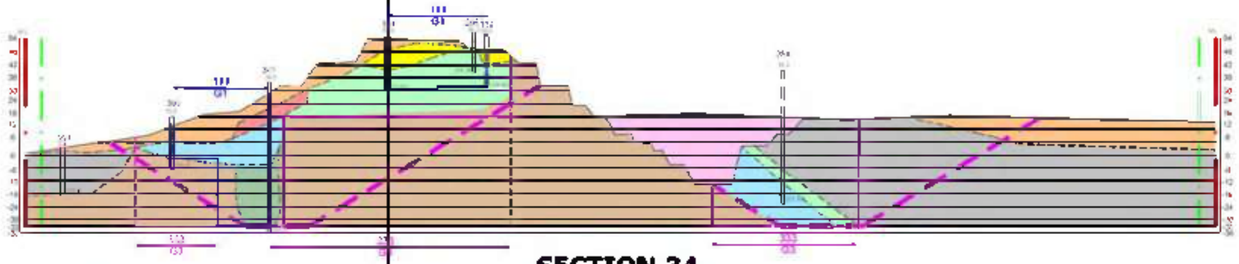

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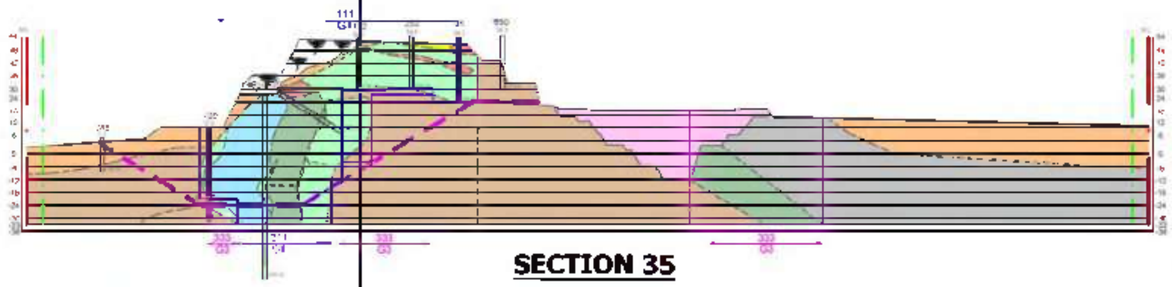

SECTION 35

REF.1 REF.2

INDEX

- BORE HOLE
- DUMP
- ORE STACK
- BACKFILLING
- PROPOSED BORE HOLES
- LEASE BOUNDARY
- 7.5M SAFETY ZONE
- ULTIMATE PIT LIMIT(U.P.L)

GEOLOGICAL LEGEND

- LATERITE
- LUMPY (+55% Fe)
- OVERLYING FORMATION
- LOW GRADE ORE (+45 ~ 54% Fe)
- FRIABLE ORE (+55 ~ 59% Fe)
- POWDERY ORE (+60% Fe)
- CLAY INTRUSIVES
- INTERCALATED CLAY
- UNDERLYING FORMATION

UNFC CLASSIFICATION CODE FOR MINERAL RESERVES

- PROVED MINERAL RESERVES(111)
- PROBABLE MINERAL RESERVES(122)
- INFERRED MINERAL RESOURCE(333)
- INDICATED MINERAL RESOURCE(332)
- FEASIBILITY MINERAL RESOURCE(211)

PLATE No. 5F

NAME OF THE LEASE:	**BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK**		
LESSEE:	SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED ALTINHO, PANAJI - GOA		
TITLE:	**GEOLOGICAL CROSS SECTIONS**		
SCALE - 1:2000	Area: 171.2472	DATE OF SURVEY 01-10-2017 DATE OF Updatation: 01-03-2023	
PROJECT	BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK SIRIGAO & MAYEM VILLAGE, BICHOLIM TALUKA, NORTH GOA DISTRICT, GOA STATE		
Purpose:	Mining Plan		

THESE SECTIONS ARE PREPARED BASED ON THE LEASE SKETCH DULY AUTHENTICATED BY THE DMG, STATE GOVERNMENT OF GOA AND CERTIFIED AS CORRECT.

M.S.RAJU
QUALIFIED PERSON

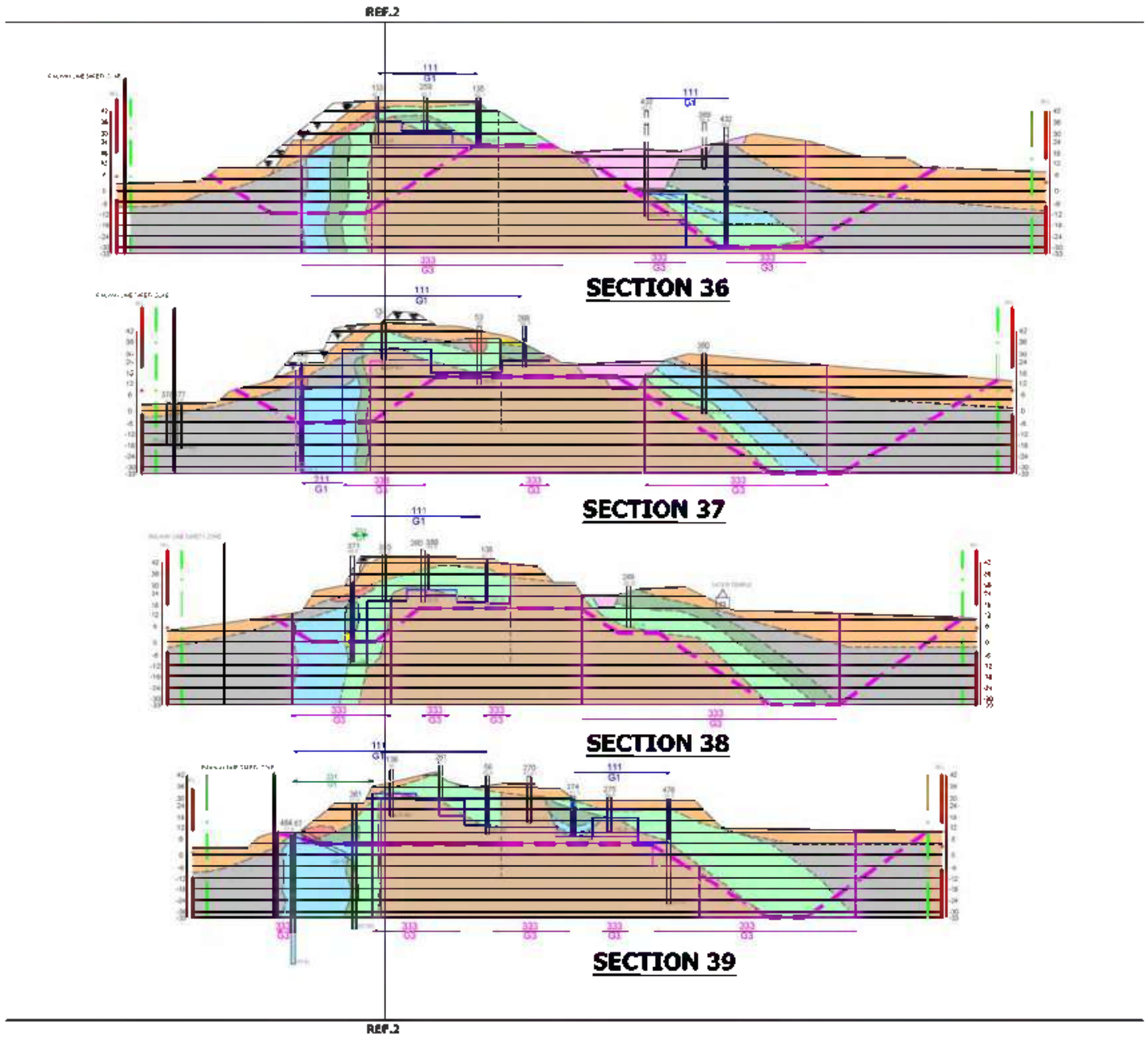

PLATE No. 5G

NAME OF THE LEASE:	**BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK**
LESSEE:	SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED ALTINHO, PANAJI - GOA
TITLE:	**GEOLOGICAL CROSS SECTIONS**
SCALE - 1:2000	Area: 171.2472 — DATE OF SURVEY 01-10-2017 DATE OF Updatation: 01-03-2023
PROJECT	BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK SIRIGAO & MAYEM VILLAGE, BICHOLIM TALUKA, NORTH GOA DISTRICT, GOA STATE
Purpose:	Mining Plan

THESE SECTIONS ARE PREPARED BASED ON THE LEASE SKETCH DULY AUTHENTICATED BY THE DMG, STATE GOVERNMENT OF GOA AND CERTIFIED AS CORRECT.

M.S.RAJU
QUALIFIED PERSON

INDEX

- BORE HOLE
- DUMP
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- BACKFILLING
- PROPOSED BORE HOLES
- LEASE BOUNDARY
- 7.5M SAFETY ZONE
- ULTIMATE PIT LIMIT(UPL)

GEOLOGICAL LEGEND

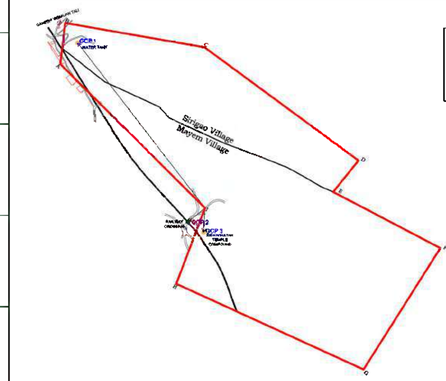
- LATERITE
- LUMPY (+55% Fe)
- OVERLYING FORMATION (Phyllite/Mafic Phyllite)
- LOW GRADE ORE (+45 ~ 54% Fe)
- FRIABLE ORE (+55 ~ 59% Fe)
- POWDERY ORE (+60% Fe)
- CLAY INTRUSIVES
- INTERCALATED CLAY
- UNDERLYING FORMATION (Phyllite/Mafic Phyllite)

UNFC CLASSIFICATION CODE FOR MINERAL RESERVES

- PROVED MINERAL RESERVES(111)
- PROBABLE MINERAL RESERVES(122)
- INFERRED MINERAL RESOURCES(333)
- INDICATED MINERAL RESOURCES(332)
- FEASIBILITY MINERAL RESOURCES(211)

772

KEY PLAN OF GROUND CONTROL POINTS THE MINING BLOCK-II



SCALE 1:2,000

INDEX

- LEASE BOUNDARY
- CONTOURS
- MINES ROAD
- PUBLIC ROAD
- BORE HOLE
- FACES
- DUMPS
- H T POWER LINE
- BENCH MARK
- BUILDINGS
- OLD BOUNDARY PILLARS
- ARRESTER WALL
- KONKAN RAILWAY
- SEASONAL WATER COURSE
- HABITANT
- WATER PIPE LINE
- GARLAND DRAIN
- WATER LOGGED AREA
- 7.5M SAFETY ZONE
- 55M RAILWAY SAFETY ZONE
- 50M SAFETY ZONE FROM HABITANT
- 50M ZONE FROM PUBLIC ROAD
- 50M SEASONAL NALLAH
- TEMPORARY BACKFILLING AREA
- STABILIZED & REHABILITATED DUMP AREA
- MINERAL STORAGE AREA
- SETTLING POND
- BACKFILLED AREA
- PIT AREA

TYPE OF LAND WITHIN LEASE AREA AS PER FORM No. I & XIV (AREA IN Ha.)

S.No.	Village	Khasara No. Block, Range/Failing Survey Nos.	Area (Ha.)	
1	Sirigao	1	0.33	PRIVATE LAND
2	Sirigao	2	0.1025	GOVT. LAND
3	Sirigao	3	2.01	PRIVATE LAND
4	Sirigao	4	1.2078	PRIVATE LAND
5	Sirigao	5	0.69	PRIVATE LAND
6	Sirigao	6	4.1687	PRIVATE LAND
7	Sirigao	7	1.3949	PRIVATE LAND
8	Sirigao	46	0.1422	PRIVATE LAND
9	Sirigao	47	0.7251	PRIVATE LAND
10	Sirigao	48	9.385	PRIVATE LAND
11	Sirigao	88	20.9381	PRIVATE LAND
12	Sirigao	90	0.2845	PRIVATE LAND
13	Sirigao	91	0.2903	PRIVATE LAND
14	Sirigao	92	0.6075	PRIVATE LAND
15	Sirigao	93	11.8	PRIVATE LAND
16	Sirigao	94	2.2225	PRIVATE LAND
17	Sirigao	95	0.8899	PRIVATE LAND
18	Sirigao	96	1.275	PRIVATE LAND
19	Sirigao	97	1.295	PRIVATE LAND
20	Sirigao	98	1.355	PRIVATE LAND
21	Sirigao	Road	0.7625	
22	Mayem	12	9.5522	GOVT. LAND
23	Mayem	47	5.0455	GOVT. LAND
24	Mayem	48	2.7856	GOVT. LAND
25	Mayem	56	3.9329	GOVT. LAND
26	Mayem	57	2.4044	GOVT. LAND
27	Mayem	58	3.4575	GOVT. LAND
28	Mayem	59	6.1636	GOVT. LAND
29	Mayem	60	41.316	GOVT. LAND
30	Mayem	61	14.7964	GOVT. LAND
31	Mayem	62	0.2983	GOVT. LAND
32	Mayem	79	19.4309	GOVT. LAND
33	Mayem	80	0.3145	GOVT. LAND
34	Mayem	84	8.4934	GOVT. LAND
35	Mayem	Road	0.3685	
Total			171.2472	

DGPS CO-ORDINATES OF MINERAL BLOCK CORNER PILLARS (MAP DATUM - WGS 84)

S.No.	Pillar ID	LATITUDE	LONGITUDE	NORTHING	EASTING
1	A	15° 36' 14.310" N	73° 53' 40.060" E	1725437.6814	381400.4352
2	B	15° 35' 23.421" N	73° 53' 40.938" E	1725662.2270	381507.4624
3	C	15° 36' 17.421" N	73° 54' 06.534" E	1725529.2214	382268.8199
4	D	15° 35' 57.405" N	73° 54' 34.906" E	1724909.3042	383120.9577
5	E	15° 35' 51.801" N	73° 54' 30.296" E	1724738.2894	382972.7604
6	F	15° 35' 41.907" N	73° 54' 58.014" E	1724431.2344	383558.4671
7	G	15° 35' 20.233" N	73° 54' 36.040" E	1723767.3122	383126.8781
8	H	15° 35' 25.335" N	73° 54' 01.582" E	1724236.0506	382114.9597
9	I	15° 35' 48.817" N	73° 54' 06.775" E	1724950.1993	382271.7646

GROUND CONTROL POINT (MAP DATUM WGS 84)

GROUND CONTROL POINT (GCP)	LATITUDE	LONGITUDE	R.L (M)	REMARKS	DISTANCE FROM BOUNDARY PILLAR	DIRECTION FROM THE BOUNDARY PILLAR
GCP - 1	15° 36' 18.066" N	73° 53' 41.262" E	21.00 M.	WATER TANK NEAR SIRGAO VILLAGE	1139.81 M.	N 36° W
GCP - 2	15° 36' 48.276" N	73° 54' 05.648" E	10.00 M.	RAILWAY CROSSING	116.28 M.	S 45° W
GCP - 3	15° 36' 44.326" N	73° 54' 05.528" E	9.00 M.	SHIVNAYAK TEMPLE COMPOUND	126.19 M.	S 05° E
I	15° 35' 48.817" N	73° 54' 06.775" E	21.00 M.	CORNER BOUNDARY PILLAR		

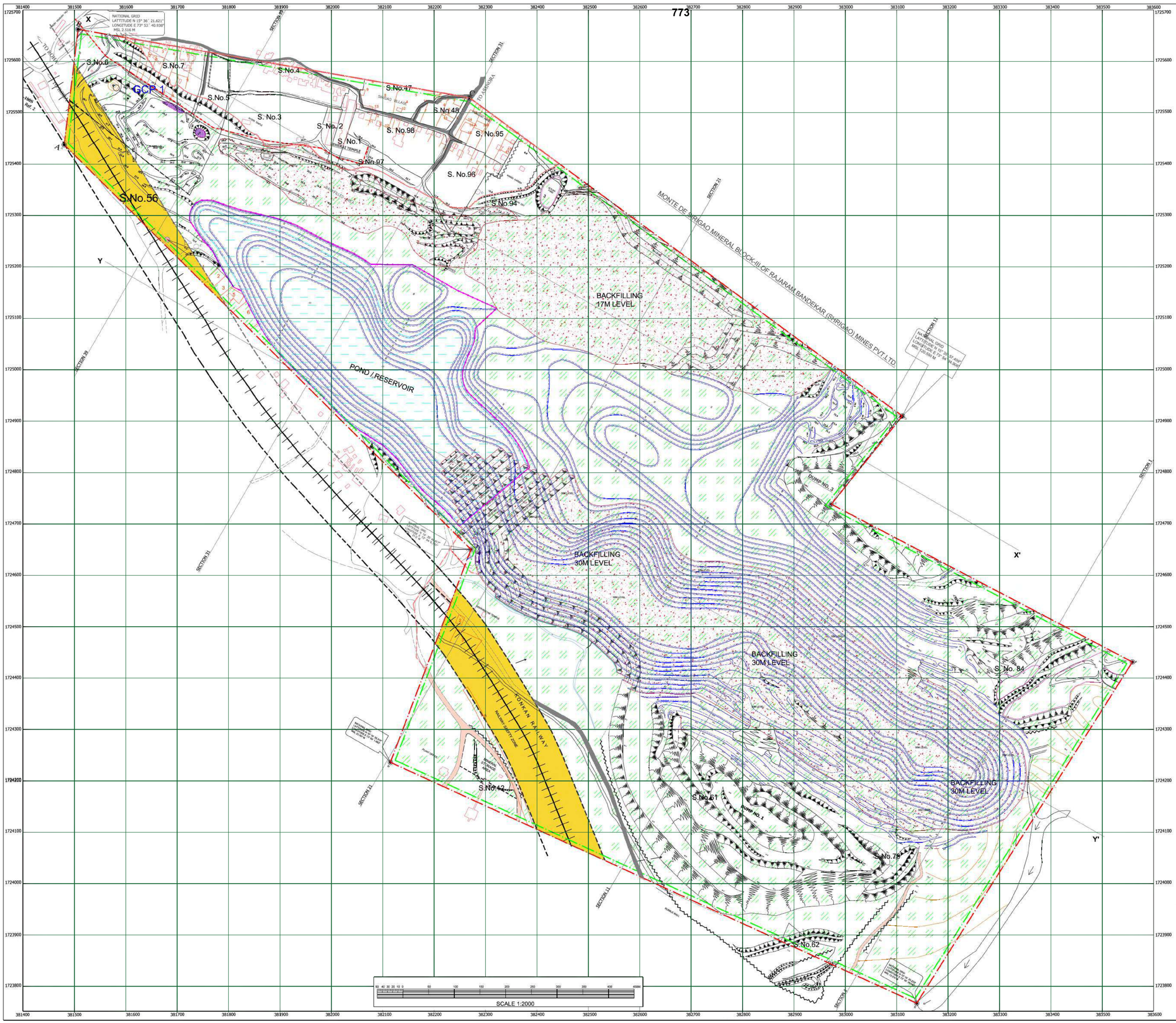
SCALE 1:2000

Plate No-6

NAME OF THE LEASE:	BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK
LESSEE:	SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED ALTINHO, PANAJI - GOA
TITLE:	**SURFACE PLAN**
SCALE - 1:2000	Area: 171.2472 — DATE OF SURVEY 01-10-2017 DATE OF Updatation: 01-03-2023
PROJECT	BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK SIRIGAO & MAYEM VILLAGE, BICHOLIM TALUKA, NORTH GOA DISTRICT, GOA STATE
Purpose:	Mining Plan

THIS PLAN IS PREPARED BASED ON THE LEASE SKETCH DULY AUTHENTICATED BY THE DMG, STATE GOVERNMENT OF GOA AND CERTIFIED AS CORRECT.

M.S.RAJU
QUALIFIED PERSON



CONCEPTUAL LAND USE

PARTICULARS		AREA in Ha.	REMARKS
MINING	VOIDS	41.243	PLANTATION
	BACKFILLING	50.8616	PLANTATION
	POND/RESERVOIR	14.5498	
DUMPING		21.7815	PLANTATION
RAILWAY		7.7300	
HABITAT		11.3961	
ROADS		0.8586	PLANTATION
VIRGIN		22.8266	PLANTATION
TOTAL		171.2472	

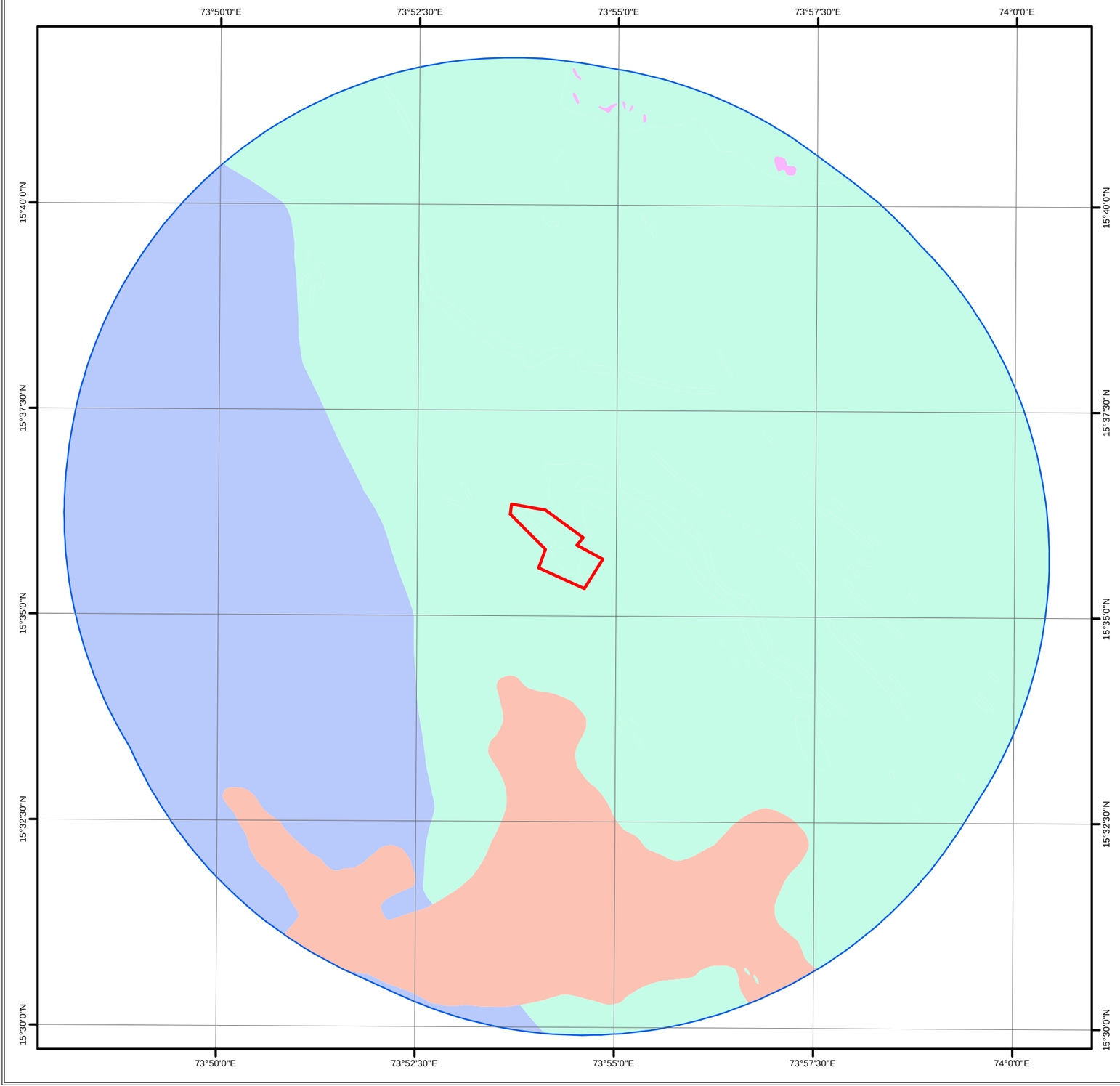
Plate No-7

NAME OF THE LEASE:	BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK
LESSEE:	SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED ALTINHO, PANAJI - GOA
TITLE:	CONCEPTUAL PLAN
SCALE - 1:2000	Area: 171.2472 — DATE OF SURVEY 01-10-2017, DATE OF Updatation: 01-03-2023
PROJECT	BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK, SIRIGAO & MAYEM VILLAGE, BICHOLIM TALUKA, NORTH GOA DISTRICT, GOA STATE
Purpose:	Mining Plan

THIS PLAN IS PREPARED BASED ON THE LEASE SKETCH DULY AUTHENTICATED BY THE DMG, STATE GOVERNMENT OF GOA AND CERTIFIED AS CORRECT.

M.S.RAJU
QUALIFIED PERSON

Map showing Geological Formations of Study Area



Scale 1:100,000

0 2.5 5 Km

Legend

- Mining_Lease_Area
- 10km Bufferzone

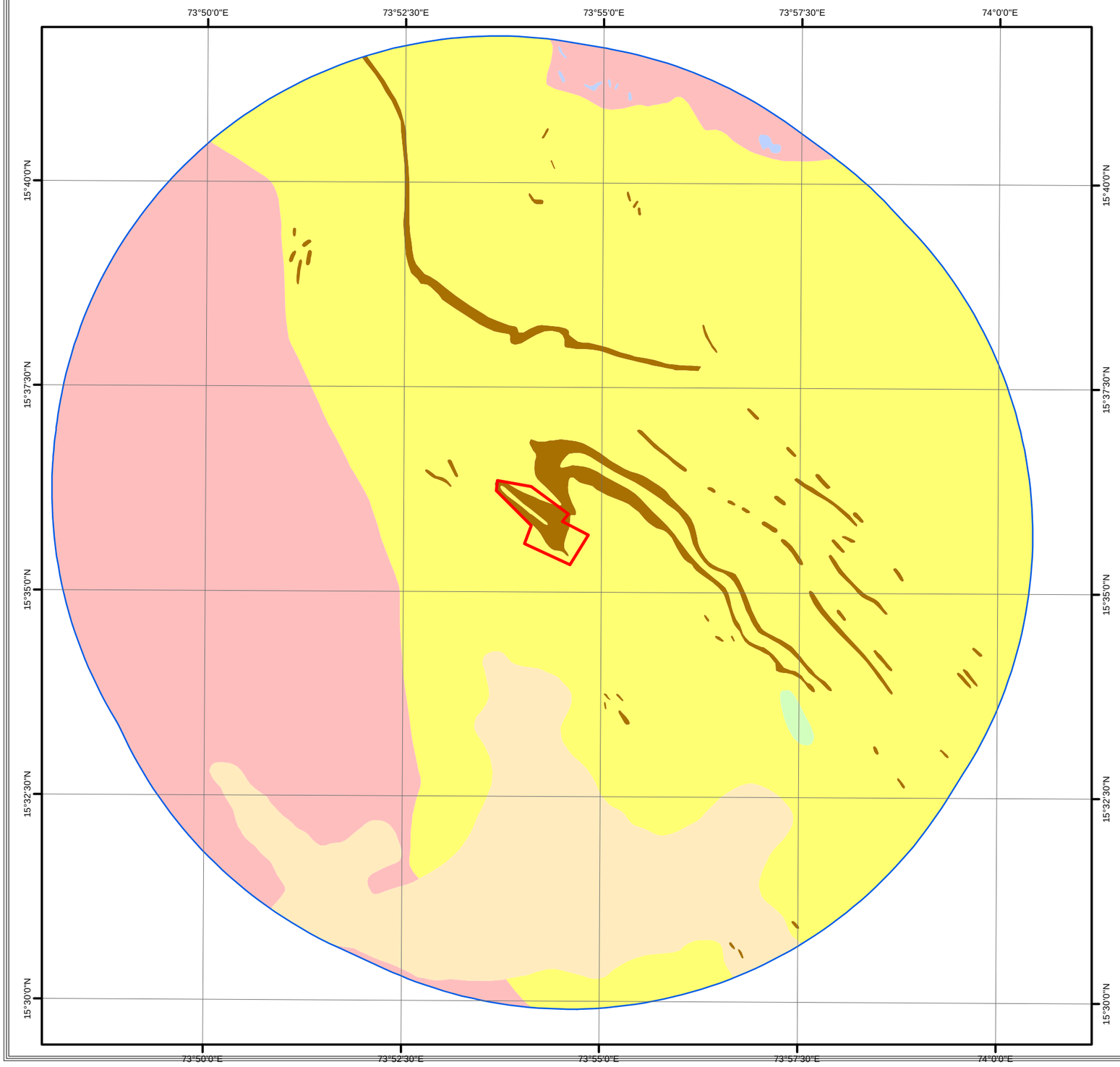
FORMATION

- VAGERI
- BICHOLIM
- SANVORDEM
- BARCEM

Plate No-8

Block II – Sirigao-Mayem Mineral Block Located at Sirigao & Mayem Villages, Bichololim Taluka North Goa District, Goa	
SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED	
Title	Geological Formations
Scale	1:100000
Map Prepared By	Mineral Engineering Services 25/XXV Club Road, Ballari -58103

Map showing Lithology of Study Area



N
W E
S

Scale1:100,000

0 2.5 5 Km

Legend

- Mining_Lease_Area
- 10km Bufferzone

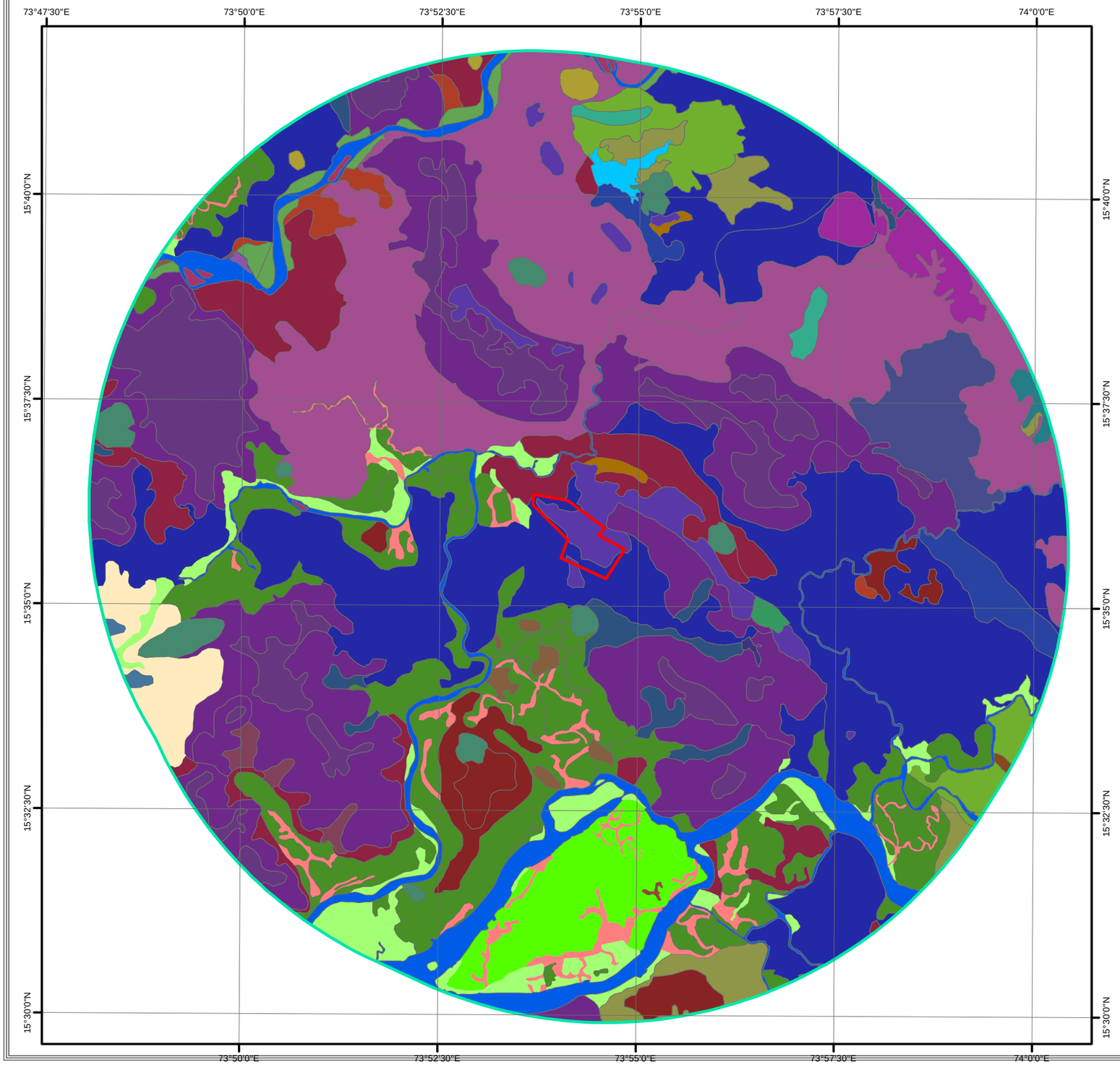
LITHOLOGIC

- ARGILLITE
- BANDED IRON FORMATION
- CHLORITE SCHIST
- CLAYEY SAND (ACTIVE FLOODPLAIN)
- GRAYWACKE
- META-GABBRO

Plate No-8A

Block II – Sirigao-Mayem Mineral Block Located at Sirigao & Mayem Villages, Bichololim Taluka North Goa District, Goa	
SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED	
Title	Lithology
Scale	1:100000
Map Prepared By	Mineral Engineering Services 25/XXV Club Road, Ballari -58103

Geomorophology of Study Area



N
W E
S

Scale1:100,000

0 2.5 5 Km

Legend

- Mining_Lease_Area
- 10km Bufferzone

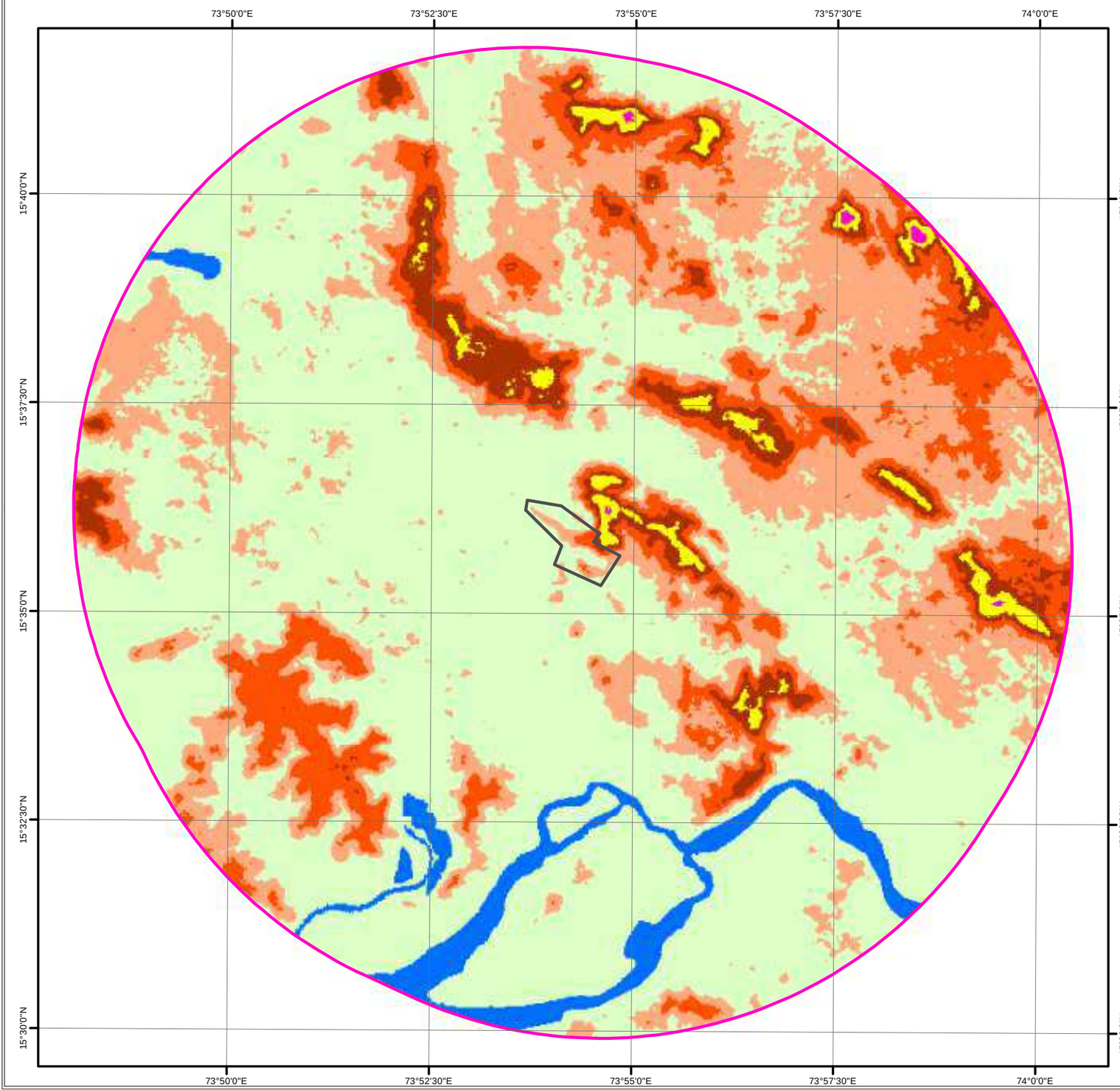
GEOMORPHOL

- Abandoned Quarry
- Active Quarry
- Back Swamp
- Beach Ridge
- Butte
- Channel Bar
- CosOri - Older Coastal Plain
- CosOri - Younger Coastal Plain
- Creek Network
- Dam and Reservoir
- DenOri - Moderately Dissected Hills and Valleys
- DenOri - Pediment-Pediplain Complex
- Estuarine Island
- FluOri - Older Flood plain
- Mangrove swamp
- Marsh
- Mesa
- Mine Dump
- Palaeolevee
- Pediment
- Pediment-Corestone-Tor Composite
- Pediplain
- Plateau Top
- Residual Hill
- Ridge
- Rolling Plain
- Scarp
- StrOri - Low Dissected Hills and Valleys
- StrOri - Moderately Dissected Upper Plateau
- Strike Ridge
- Tidal Flat
- Valley
- Valley Fill
- WatBod - Lake
- WatBod - Others
- WatBod - River

Plate No-9

Block II – Sirigao-Mayem Mineral Block Located at Sirigao & Mayem Villages, Bichololim Taluka North Goa District, Goa	
SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED	
Title	Geomorphology of study
Scale	1:100000
Map Prepared By	Mineral Engineering Services 25/XXV Club Road, Ballari -58103

DEM Data



N
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Scale 1:100,000

0 2.5 5 Km

Legend

- Mining_Lease_Area
- 10km Bufferzone

Dem data.tif

Value

- 0 - 2
- 2.1 - 30
- 30.1 - 60
- 60.1 - 90
- 90.1 - 120
- 120.1 - 160
- 160.1 - 206

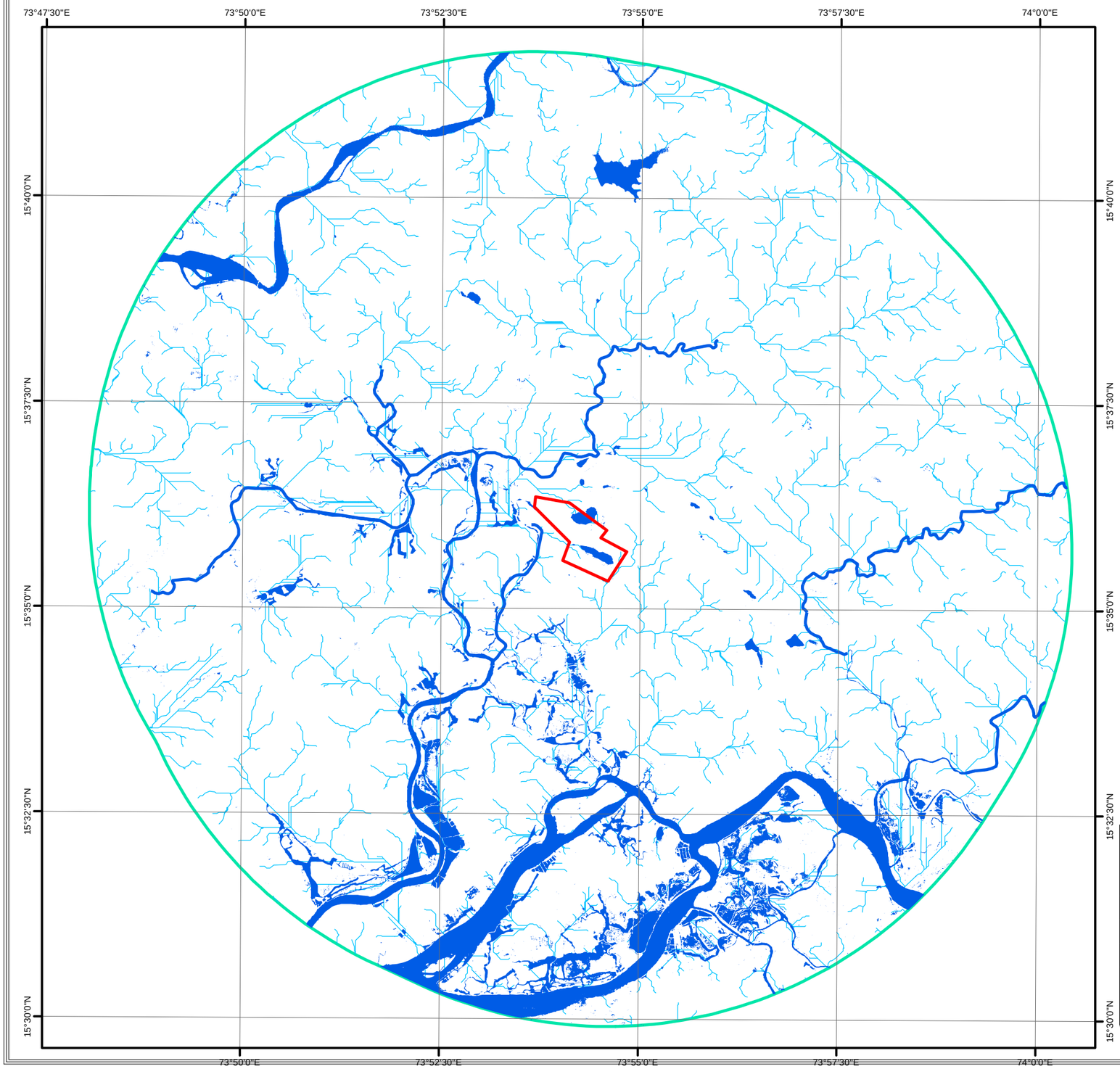
Plate No-10

Block II – Sirigao-Mayem Mineral Block
Located at Sirigai & Mayem Villages, Bichololim Taluka
North Goa District, Goa

SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

Title	DEM Data
Scale	1:100000
Map Prepared By	Mineral Engineering Services 25/XXV Club Road, Ballari -58103

Drainage Map



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Scale1:100,000

0 2.5 5 Km

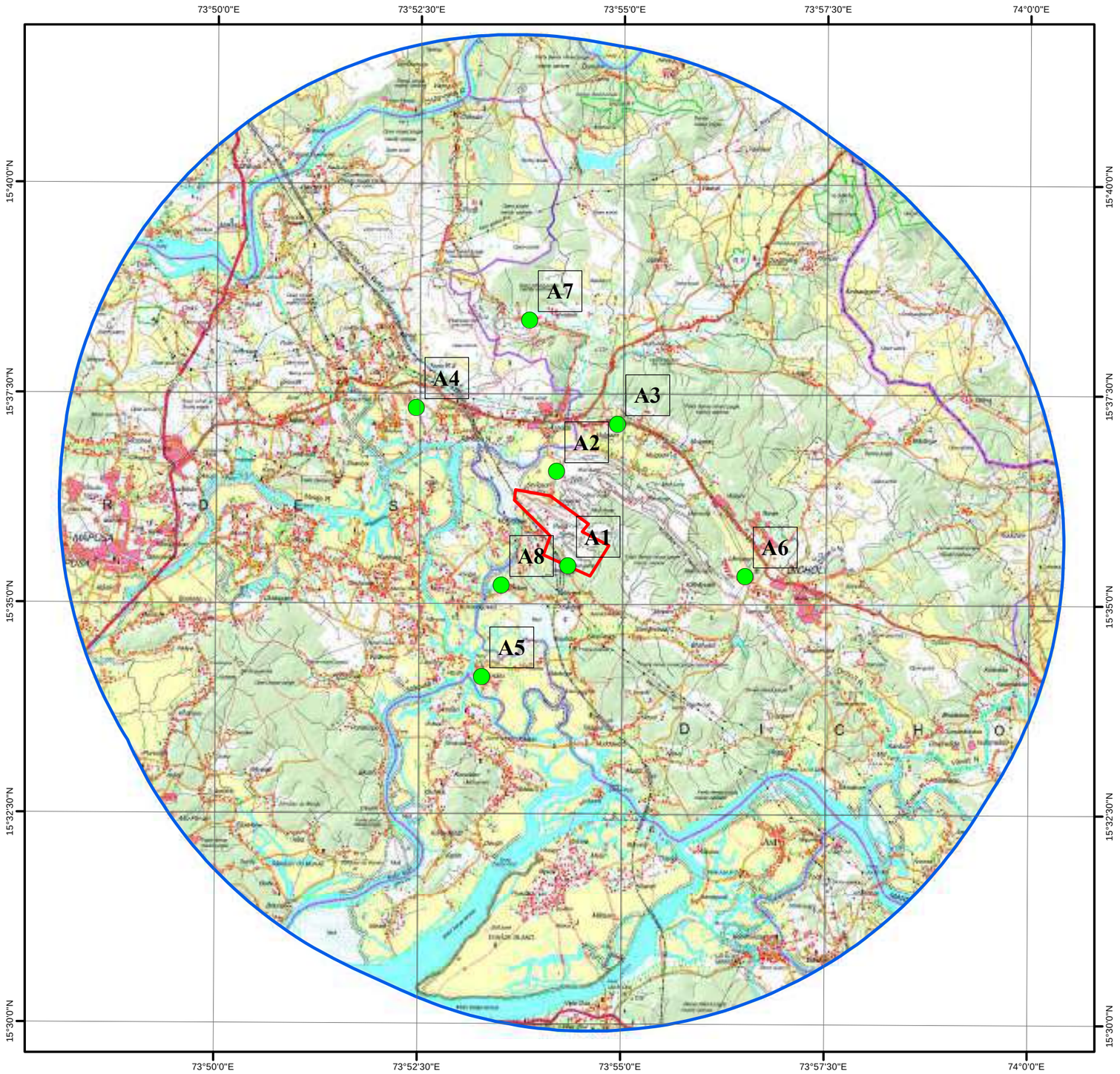
Legend

- Mining Lease Area
- 10km Bufferzone
- River
- Drainage pattern

Plate No-11

Block II – Sirigao-Mayem Mineral Block Located at Sirigao & Mayem Villages, Bichololim Taluka North Goa District, Goa	
SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED	
Title	Drainage Map of Study Area
Scale	1:100000
Map Prepared By	Mineral Engineering Services 25/XXV Club Road, Ballari -58103

Air Monitoring Locations



Scale 1:100,000

0 2.5 5 Km

Legend

- Air Monitoring Locations
- Mining Lease Area
- 10km buffer Zone

Air Monitoring Locations

Code	Location	Distance Km	Directions	Latitude			Longitude		
				D	M	S	D	M	S
A1	With Mineral Block	--	S	15	35	27.12	73	54	20.08
A2	Sirigao Village	0.55	N	15	36	34.91	73	54	11.16
A3	Mulgao village	2.14	NNE	15	37	8.81	73	54	56.00
A4	Sircaim village	2.80	NW	15	37	20.32	73	52	27.60
A5	Calvim village	2.90	SW	15	34	8.20	73	53	16.60
A6	Sinquirem village	1.07	SEE	15	35	3.00	73	53	47.97
A7	Advalpale village	3.80	N	15	38	22.92	73	53	50.90
A8	Lamgao village	3.00	SEE	15	35	18.95	73	56	30.61

Plate No-12

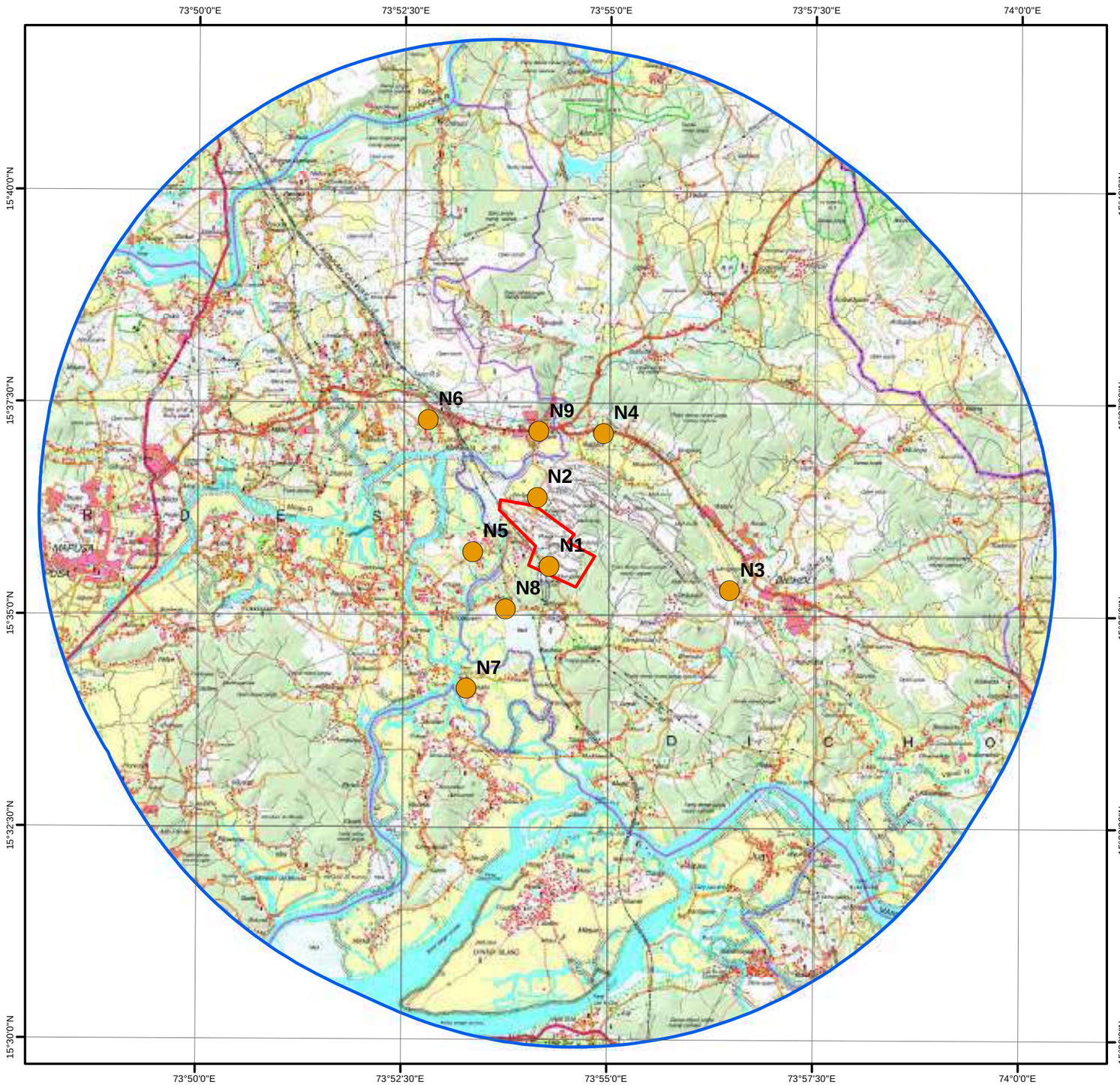
Block II – Sirigao-Mayem Mineral Block

Located at Sirigao & Mayem Villages, Bicholim Taluka
North Goa District, Goa

SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

Title	Air Monitoring Locations
Scale	1:100000
Map Prepared By	Mineral Engineering Services 25/XXV Club Road, Ballari -58103

Key Plan Showing Noise Monitoring Locations



Scale 1:100,000

0 2.5 5 Km

Legend

- Mining Lease Area
- 10km buffer Zone
- Noise Monitoring Locations

Location of Noise Stations										
Code	Location	Distance Km	Directions	Latitude			Longitude			
				D	M	S	D	M	S	
N1	Core zone Within M L Area	--	--	15	35	34.61	73	54	16.81	
N2	Sirigao Village	0.18	N	15	36	23.33	73	54	7.81	
N3	Lamgao village	3.03	SEE	15	35	17.96	73	56	28.53	
N4	Mulgao village	2.1	NE	15	37	8.81	73	54	56.00	
N5	Corjuem village	1.3	W	15	35	44.47	73	53	21.00	
N6	Sircaim village	2.34	NW	15	37	17.83	73	52	47.98	
N7	Calvim village	3.02	SW	15	34	8.2	73	53	16.6	
N8	Sinquirem village	1.07	SW	15	35	4.32	73	53	44.89	
N9	Assonora Village	1.62	N	15	37	10.04	73	54	8.89	

Plate No-13

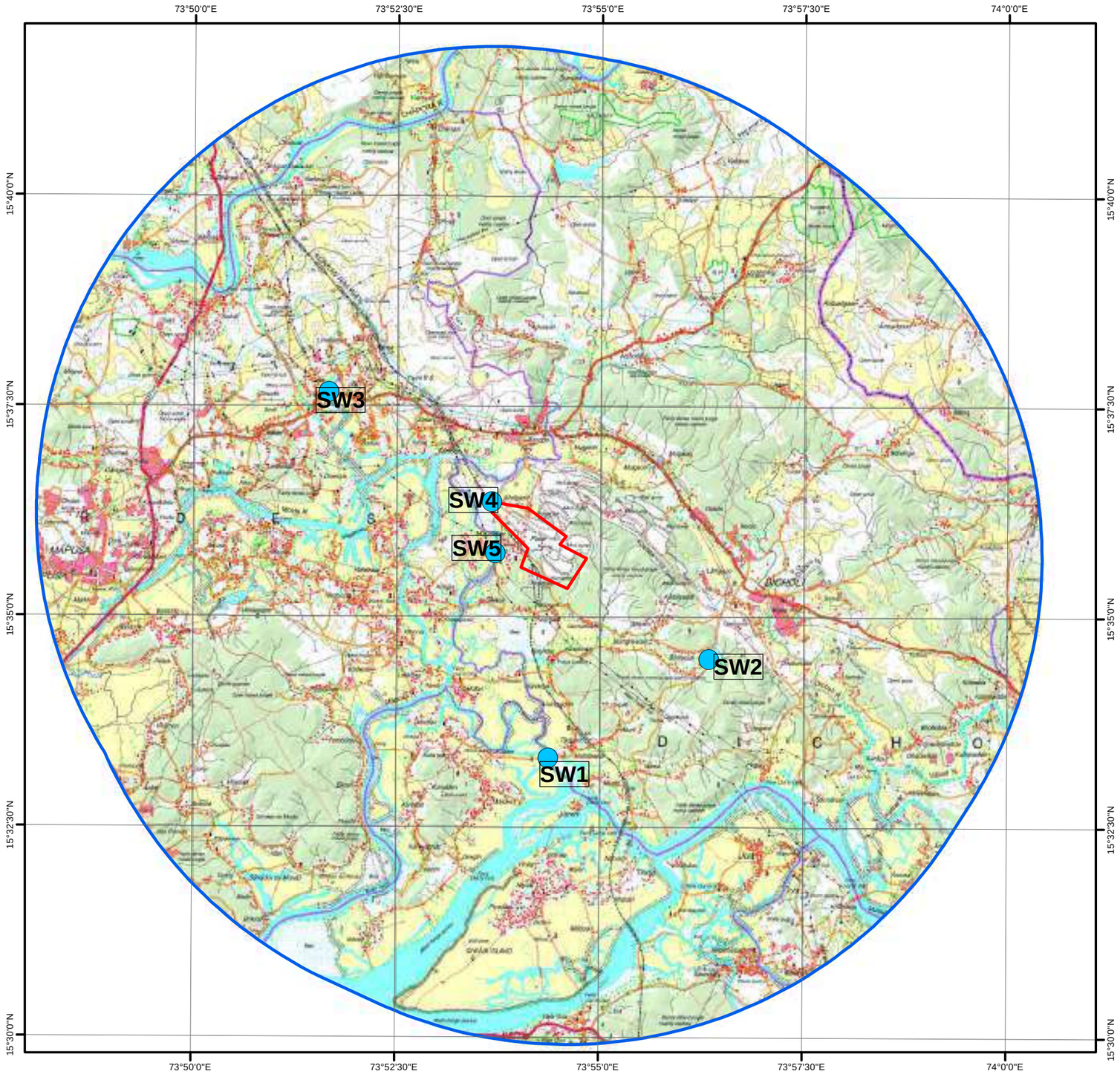
Block II – Sirigao-Mayem Mineral Block

Located at Sirigao & Mayem Villages, Bichololim Taluka
North Goa District, Goa

SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

Title	Noise Monitoring Locations
Scale	1:100000
Map Prepared By	Mineral Engineering Services 25/XXV Club Road, Ballari -58103

Key Plan Showing Surface Water Sampling Locations



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Scale 1:100,000

0 2.5 5 Km

Legend

- Mining Lease Area
- 10km buffer Zone
- surface water sampling locations

Location of Surface Water Sampling Stations

Code	Location	Distance Km	Directions	Latitude			Longitude		
				D	M	S	D	M	S
SW1	Culvert Near Chimulwade Mayem Village	3.9	S	15	33	19.18	73	54	22.25
SW2	Mayem Village	3.46	SE	15	34	30.21	73	56	20.62
SW3	Tivim Nallah water	4.34	SW	15	37	40.28	73	51	39.86
SW4	Assonara nallah Upstream	0.028	NW	15	36	22	73	53	40.08
SW5	Assonara nallah Down stream	0.58	W	15	35	45.39	73	53	42.87

Plate No-14

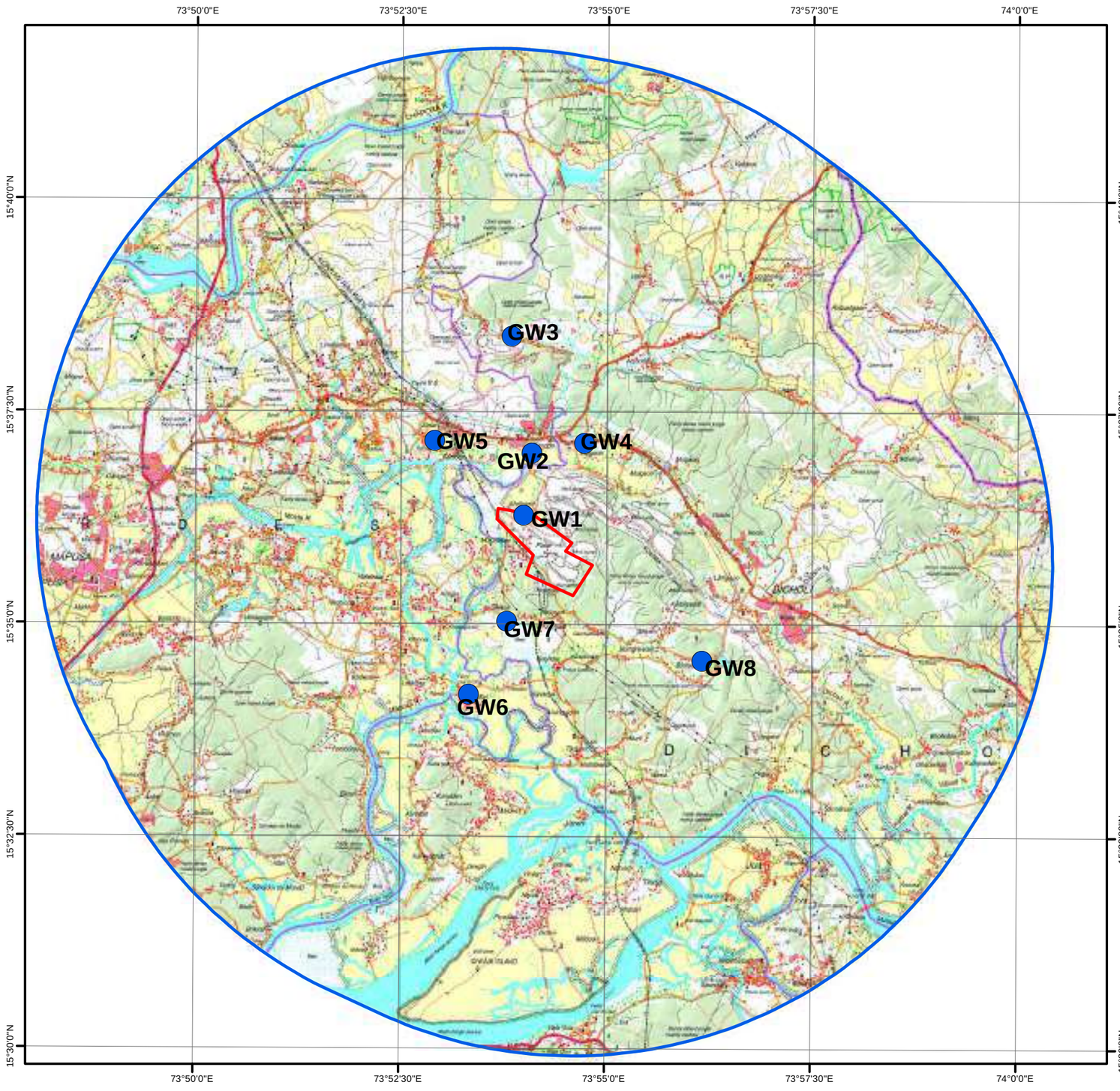
Block II – Sirigao-Mayem Mineral Block

Located at Sirigao & Mayem Villages, Bichololim Taluka
North Goa District, Goa

SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

Title	Surface Water Sampling Locations
Scale	1:100000
Map Prepared By	Mineral Engineering Services 25/XXV Club Road, Ballari -58103

Key Plan Showing Ground Water Sampling Locations



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Scale 1:100,000

0 2.5 5 Km

Legend

- Mining Lease Area
- 10km buffer Zone
- Ground Water Sampling Locations

Location of Ground Water Sampling Stations

Code	Location	Distance Km	Directions	Latitude			Longitude		
				D	M	S	D	M	S
GW1	Sirigao village	--	--	15	36	17.00	73	53	59.86
GW2	Assonora Village	1.30	N	15	37	1.12	73	54	5.43
GW3	Advalpale Village	3.80	N	15	38	23.21	73	53	50.54
GW4	Mulgao village	2.00	NNE	15	37	4.38	73	58	26.90
GW5	Sircaim village	2.00	NW	15	37	9.42	73	52	54.61
GW6	Calvim village	2.90	SSW	15	34	10.26	73	53	20.18
GW7	Sinquirem Village	1.10	SSW	15	35	1.96	73	53	47.56
GW8	Mayem Village	3.12	SE	15	34	34.33	73	56	10.20

Plate No-15

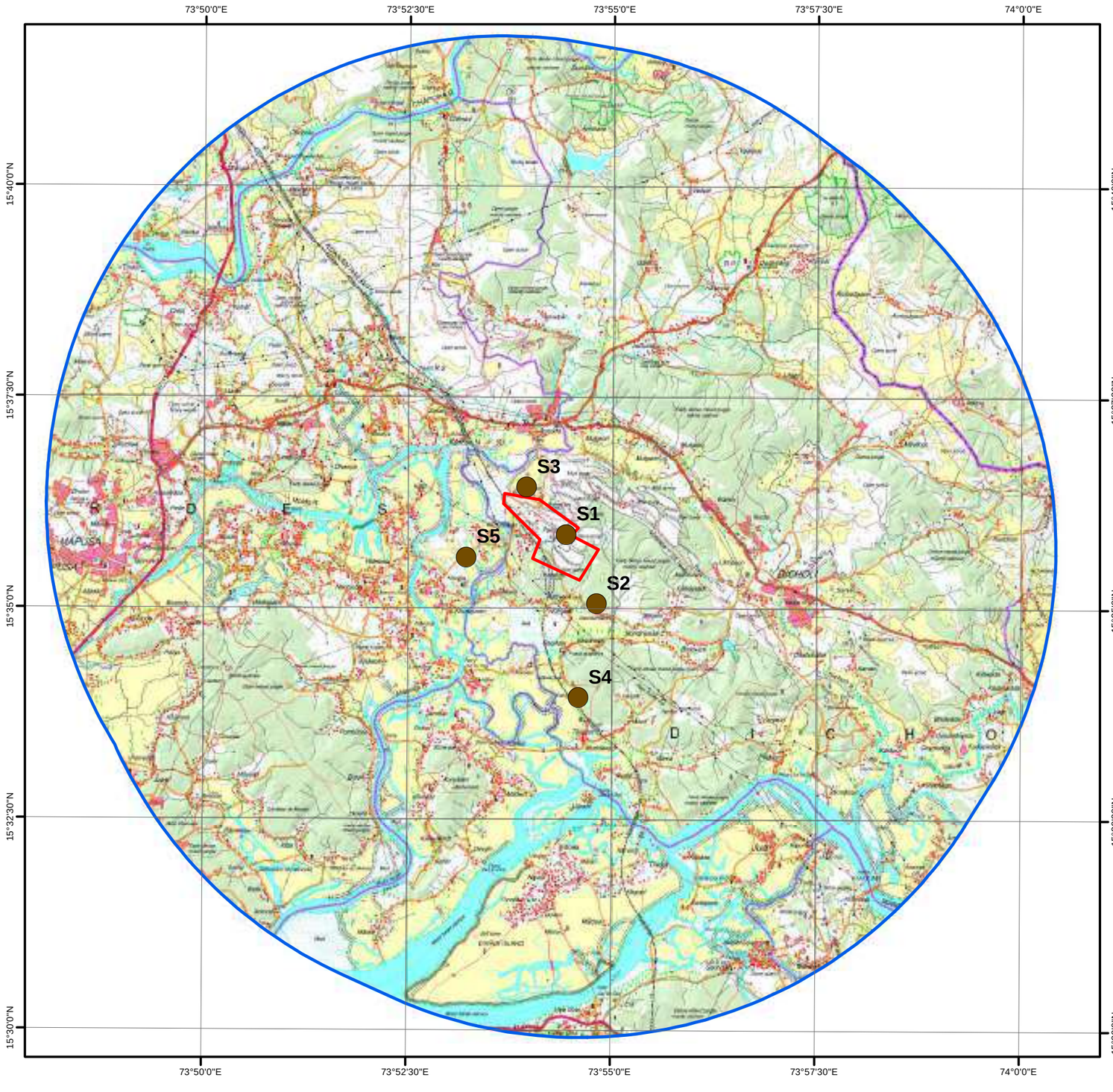
Block II – Sirigao-Mayem Mineral Block

Located at Sirigao & Mayem Villages, Bichololim Taluka
North Goa District, Goa

SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

Title	Ground Water Sampling Locations
Scale	1:100000
Map Prepared By	Mineral Engineering Services 25/XXV Club Road, Ballari -58103

Key Plan Showing Soil Sampling Locations



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Scale 1:100,000

0 2.5 5 Km

Legend

- Soil Sampling Locations
- Mining Lease Area
- 10km buffer Zone

Location of Soil Sampling Stations									
Code	Location	Distance Km	Directions	Latitude			Longitude		
				D	M	S	D	M	S
S1	Dump Soil Within Mineral Block	--	--	15	35	52.41	73	54	26.15
S2	Fairly denese forest Cashew Plantation near Mayem village	0.64	SSE	15	35	3.27	73	54	48.54
S3	Sirigao Village Ag Soil	0.225	NNW	15	36	26.32	73	53	57
S4	Vainginim Village Ag Soil	2.57	SWW	15	33	56.50	73	54	35.54
S5	Corjuem Village Ag Soil	1.45	S	15	35	36.13	73	53	12.80

Plate No-1

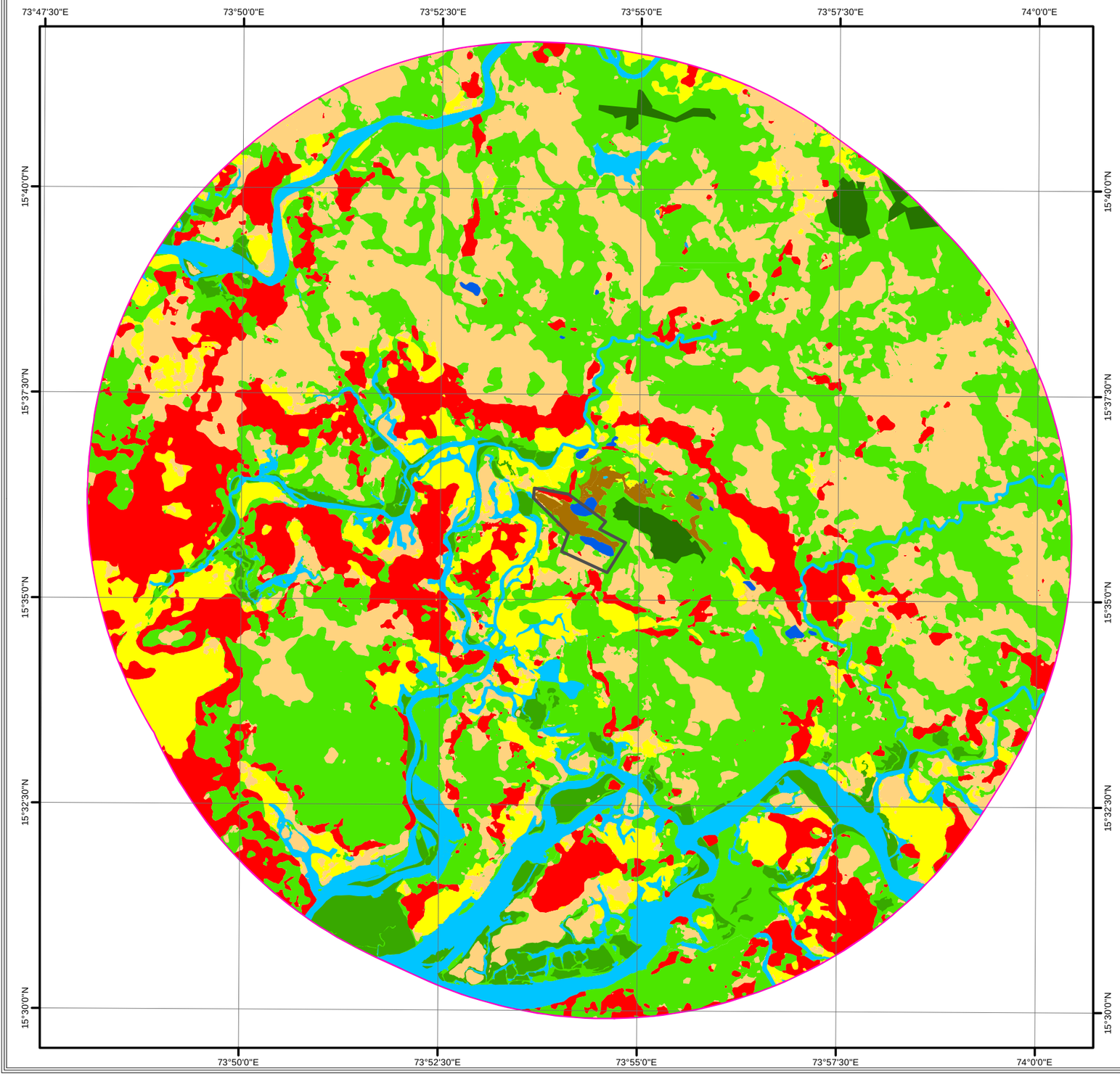
Block II – Sirigao-Mayem Mineral Block

Located at Sirigao & Mayem Villages, Bichololim Taluka
North Goa District, Goa

SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

Title	Soil Sampling locations
Scale	1:100000
Map Prepared By	Mineral Engineering Services 25/XXV Club Road, Ballari -58103

Land Use and Land Cover



Scale 1:100,000

0 2.5 5 Km

Legend

- Mining_Lease_Area
- 10km Bufferzone
- River
- Reserve Forest
- Mangroves
- Vegetation(Kaju/Mango)
- Agricultural Land
- Settlements
- Water Bodies
- Pit Water
- Mine Borken up area include pitwater
- Scrub Land

Plate No-17

Sl.No	Descripition	Area_Ha	%
1	Reserve Forest	330.0	0.88
2	Vegetation	14811.0	39.43
3	Settlements	5530.0	14.72
4	Water Bodies	2815.0	7.49
5	Mangroves	1264.0	3.36
6	Broken up Area & Pit Water Bodies	451.0	1.20
7	Agricultural Land	3384.0	9.01
8	Scrub land	8982.0	23.91
Total		37567.0	100.0

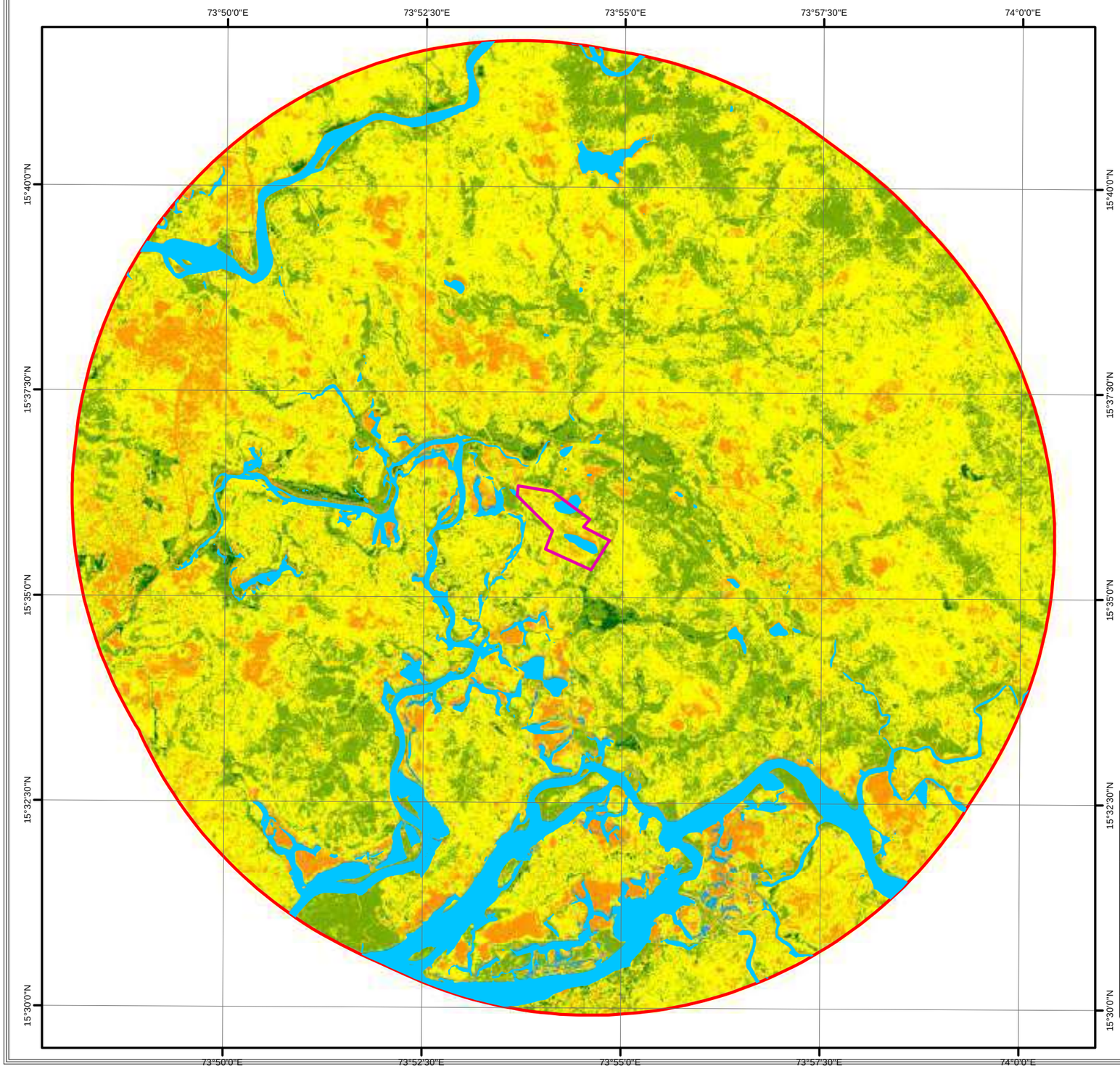
Block II – Sirigao-Mayem Mineral Block

Located at Sirigai & Mayem Villages, Bichololim Taluka
North Goa District, Goa

SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

Title	Land Use Land Cover
Scale	1:100000
Data Used	IRS-R2, Mx
Resolution	5m
Date of Pass	01.04.2023 & 08.03.2023
Map Prepared By	Mineral Engineering Services 25/XXV Club Road, Ballari -58103

Normalized Difference Vegetation Index (NDVI)



N
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Scale1:100,000

0 2.5 5 Km

Legend

- Mining Lease Area
- 10km Bufferzone
- Water_Bodies
- 0.01 - 0.17
- 0.18 - 0.34
- 0.35 - 0.52
- 0.53 - 0.69

Plate No-18

Block II – Sirigao-Mayem Mineral Block Located at Sirigao & Mayem Villages, Bichololim Taluka North Goa District, Goa	
SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED	
Title	Normalized Difference Vegetation Index (NDVI)
Scale	1:100000
Map Prepared By	Mineral Engineering Services 25/XXV Club Road, Ballari -58103

Plate No-19

NAME OF THE LEASE:	BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK
LESSEE:	SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED ALTINHO, PANAJI - GOA
TITLE:	PROGRESSIVE MINE CLOSURE PLAN
SCALE - 1:2000	Area: 171.2472 / DATE OF SURVEY 01-10-2017 / DATE OF Updatation: 01-03-2023
PROJECT:	BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK SIRIGAO & MAYEM VILLAGE, BICHOLIM TALUKA, NORTH GOA DISTRICT, GOA STATE
Purpose:	Mining Plan

THIS PLAN IS PREPARED BASED ON THE LEASE SKETCH DULY AUTHENTICATED BY THE DMG, STATE GOVERNMENT OF GOA AND CERTIFIED AS CORRECT.

M.S.RAJU
QUALIFIED PERSON

ANNEXURES

Government of Goa
Directorate of Mines & Geology
Institute Menezes Braganza, Panaji-Goa
Website: www.dmg.goa.gov.in **e-mail: auction-dmg@goa.gov.in**

No.DMG/25/Auction Cell/LOI-function/2023/2802 Date:13/01/2023

Letter of Intent for Block II - Sirigao-Mayem Mineral block

To,
Salgaocar Shipping Company Private Limited,
Salgaocar Bhavan, Altinho,
Panjim 403001 Goa, India.

***Sub:** Letter of intent with reference to e-auction dated December 15, 2022 for grant of a mining lease for Block II - Sirigao-Mayem Mineral block for Iron Ore mineral in Sirigao & Mayem village, Bicholim Taluka, North Goa District on 171.2472 Hectare Area.*

1. **Background**;

1.1 Government of Goa, pursuant to the Mines and Minerals (Development and Regulation) Act, 1957 (the "**Act**") and the Mineral (Auction) Rules, 2015 as amended from time to time (the "**Auction Rules**"), issued the notice inviting tender dated September 30, 2022 to commence the auction process for grant of mining lease for **Block II - Sirigao-Mayem Mineral block** located in North Goa. The e-auction process was conducted in accordance with the tender document for the said mineral block and **Salgaocar Shipping Company Private Limited** was declared as the 'Preferred Bidder' under Rule 9(9)(iii) of Auction Rules, having quoted a Final Price Offer of **99.25% (Ninety nine point two five percent)**.

1.2 As required under Rule 10(1) of the Auction Rules and the tender document for the said mineral block, **Salgaocar Shipping**

Company Private Limited has made payment of the first instalment, being 20% (twenty per cent) of the upfront payment of Rs. 7,54,44,823 (Rupees Seven Crore Fifty Four Lakh Forty Four Thousand Eight Hundred Twenty Three) through e-Challan (e-Challan No. 202300005994) dated January 3, 2023, which was received at Goa.

2. **Grant of Letter of Intent**

2.1. Accordingly, pursuant to Rule 10(2) of the Auction Rules and the terms of the Tender Document, the Government of Goa is issuing this letter of intent for grant of Mining Lease for **Block II - Sirigao-Mayem Mineral block** for Iron Ore in Sirigao & Mayem village, Bicholim Taluka, North Goa District on 171.2472 Hectare Area to **Salgaocar Shipping Company Private Limited** for a period of 50 (fifty) years.

3. **Conditions**

3.1. This letter of intent and the subsequent grant of aforementioned mining lease shall be subject to the provisions of the Act and the Rules made thereunder, as amended from time to time, and the **Salgaocar Shipping Company Private Limited** shall be designated as the 'Successful Bidder' and subsequently granted the mining lease only upon satisfactory completion of all the requirements under the Acts and Rules made thereunder.

The State Government may impose such other conditions in the Mine Development and Production Agreement (MDPA) and/or Mining Lease as may be considered by the State Government to be in the interest of mineral development and in public interest.

Salgaocar Shipping Company Private Limited shall be bound by (i) the enactment, bringing into effect, adoption, promulgation,

amendment, modification or repeal of any Applicable Laws (including the Act and Rules) occurring at any time, including prior to or after the Bid Due Date; (ii) any amendments made by the State Government to this effect in the Tender Document, the letter of intent, the MDPA and/or the mining lease deed at any time, including prior to or after the Bid Due Date.

3.2. For reference, the requirements under the Auction Rules for designation of **Salgaocar Shipping Company Private Limited** as the "successful bidder" and subsequent grant of the mining lease are reiterated below. It is clarified that the requirements mentioned below are only for reference and in the event of any change in the Act or the Rules made thereunder, the requirements under the modified Act or the Rules made thereunder, as the case may be, shall be applicable.

(a) Designation as the "Successful Bidder":

Salgaocar Shipping Company Private Limited shall be considered to be the "Successful Bidder" upon:

(i) continuing to be in compliance with all the terms and conditions of eligibility;

(ii) payment of the second instalment being 20% (twenty per cent) of the upfront payment;

(iii) furnishing an irrevocable and unconditional performance security to the State Government from an Acceptable Bank and payable at Goa, pursuant to the Auction Rules;

(iv) satisfying the conditions specified in clause (b) of sub-section (2) of Section 5 of the Act with respect to a mining plan ; and

(b) Signing of the Mine Development and Production Agreement

Salgaocar Shipping Company Private Limited shall sign the Mine Development and Production Agreement with the Government of Goa upon obtaining all consents, approvals, permits, no-objections and the like as may be required under applicable laws for commencement of mining operations.

(c) Grant of Mining Lease

Subsequent to signing of the Mine Development and Production Agreement, **Salgaocar Shipping Company Private Limited** shall make payment of the third instalment being 60% (sixty per cent) of the upfront payment and thereafter the Government of Goa shall grant the aforementioned mining lease.

3.3. The State Government reserves the right, but not the obligation, to appropriate and dispose of (whether by way of sale, auction or such other means as the State Government may, in its sole discretion, determine) all or any part of the dumps presently located within the Mineral Block. Provided that such right shall be exercised by the State Government no later than 12 (twelve) months from the date of issuance of this Letter of Intent. It is clarified that the Successful Bidder shall, in accordance with Applicable Law, be entitled to dispose of only such part of the dumps in respect of which the State Government does not exercise the aforesaid right.

4. Validity

4.1. This Letter of Intent shall be valid only if **Salgaocar Shipping Company Private Limited** ensures that the Bid Security is valid until the Performance Security is furnished to the Government of Goa failing which this letter of intent shall become invalid from the

date of expiry of the Bid Security.

4.2. This letter of intent is valid for a period of 3 (three) years from the date of its issuance, within which time all the above conditions must be fulfilled and the Mining Lease deed must be executed between the **Salgaocar Shipping Company Private Limited** and the Government of Goa. In case there is a delay in execution of Mining Lease Deed due to reasons beyond the control of the Preferred Bidder, then it may submit an application to Government of Goa, requesting for further extension

4.3. If the Government of Goa is satisfied that there is a delay in execution of Mining Lease Deed due to reasons beyond the control of the Preferred Bidder and a longer period is required to enable the Preferred Bidder to satisfy all or any of the above conditions, it may extend the validity of this letter of intent for such period or periods as the Government of Goa may specify. Provided that: (a) this letter of intent shall be extended for a maximum period of 2 (two) years; and (b) the total period for which this letter of intent would remain valid must not exceed 5 (five) years from the date of issuance.

Kindly return the duplicate copy of this letter of intent duly signed by authorized signatory in token of having accepted the above terms and conditions. The accepted copy of Letter of Intent along with Board resolution should be submitted latest by **January 27, 2023.**

(Dr. S. Shanbhogue)
Director

Annexure-2

GOA STATE ENVIRONMENT IMPACT ASSESSMENT AUTHORITY
Constituted by the Ministry of Environment, Forest and Climate Change,
Government of India
C/o Department of Environment and Climate Change
4th Floor, Dempo Towers, Patto Panaji Goa - 403001.
e-mail: goaseac@gmail.com

No.115/3/2023-24/GSEIAA/Project-Prop/166 Date: 18/10/2023

To,

Salgaocar Shipping Company Limited.
Salgaocar Bhavan, Plot No. 15,
Althino, Panjim, North Goa,
GOA-403001.

Sub:- Issuance of Terms of Reference - (ToR) for Salgaocar Shipping Company Limited for Block-II – Sirigao - Mayem Mineral Block, over an extent of 171.2472 Ha in Survey No. 1, 2, 3, 4, 5, 6, 7, 46, 47, 48, 84, 90, 91, 92, 93, 94, 95, 96, 97, 98 & Road, 12, 47, 60, 61, 62, 79, 80, 84, Road, 48, 56, 57, 58 & 59 located in Sirigao & Mayem Villages respectively of Bicholim Taluka North Goa District- reg.

Ref : Proposal No: SIA/GA/MIN/428213/2023 dated 06/05/2023.
Project Category: Covered under schedule 1(a).

Sir,

With reference to your **Proposal No.SIA/GA/MIN/428213/2023** matter pertaining to issuance of Terms of Reference (ToR's) for conducting the Environment Impact Assessment (EIA) study in plot / survey No. 1, 2, 3, 4, 5, 6, 7, 46, 47, 48, 84, 90, 91, 92, 93, 94, 95, 96, 97, 98 & Road, 12, 47, 60, 61, 62, 79, 80, 84, Road, 48, 56, 57, 58 & 59 Sirigao & Mayem Villages respectively of Bicholim Taluka of North Goa District, Goa.

The Goa SEAC in its 184th meeting held on 12th July 2023 recommended the said proposal to Goa State Environment Impact Assessment Authority (SEIAA) for grant of ToR.

Further, Goa State Environment Impact Assessment Authority (SEIAA) in its 109th meeting held on 28th July 2023 considered Committee's recommendation and decided to grant ToR.

In this regard it is decided to issue the Standard Terms of reference for conducting EIA study

Accordingly the ToR's is enclosed herewith **(refer Annexure - 1)** to enable the Project Proponent (PP) to initiate EIA study.

Yours faithfully

(Dr. Sneha S. Gite, IAS)
Director (Envt. &CC) &
Member Secretary, Goa-SEIAA

Encl: As Above.

Annexure - I

TERMS OF REFERENCE (TOR)

1. Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to1994.

2. A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.

3. All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.

4. All corner coordinates of the mine lease area, super imposed on a High Resolution Imagery/toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).

5. Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing mineral sand mining history of the area, important water bodies, streams and rivers and soil characteristics.

6. Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.

7. It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/ deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.

8. Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safe guard measures in each case should also be provided.

9. The study rea will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine/lease period

10. Land use of the study rea delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.

11. Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.

12. A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.

13. Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.

14. Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.

15. The vegetation in the RF / PF areas in the study area, with necessary details, should be given.

16. A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wild life in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.

17. Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.

18. A detailed biological study of the study area [core zone and buffer zone (10km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled- I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.

19. Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.

20. Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).

21. R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village (s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.

22. One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.

23. Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.

24. The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.

25. Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.

26. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.

27. Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.

28. Based on actual monitored data, it may clearly be shown whether working will intersect ground water. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.

29. Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.

30 Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. Aschematic diagram may also be provided for the same.

31. A time bound Progressive Green belt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed upfront on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should

have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which hare tolerant to pollution

32. Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.

33. Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.

34. Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.

35. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining may be detailed.

36. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.

37. Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.

38. Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.

39. Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.

40. Details of litigation pending against the project, if any, with direction/ order passed by any Court of Law against the Project should be given.

41. The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.

42. A Disaster management Plan shall be prepared and included in the EIA/EMP Report.

43. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.

44. Besides the above, the below mentioned general points are also to be followed:-

a) Executive Summary of the EIA/EMP Report

b) All documents to be properly referenced with index and continuous page numbering.

c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.

d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/ NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.

e) Where the documents provided are in a language other than English, an English translation should be provided.

f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.

g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.

h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.

i) As per the circular no. J-11011/618/2010-IA.II (I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.

Annexure-2A

GOA STATE ENVIRONMENT IMPACT ASSESSMENT AUTHORITY
Constituted by the Ministry of Environment, Forest and Climate Change,
Government of India
C/o Department of Environment and Climate Change
4th Floor, Dempo Towers, Patto Panaji Goa - 403001.
e-mail: goaseac@gmail.com

No. 115/3/2023-24/GSEIAA/Project-Prop/207 Date: 24/11/2023

CORRIGENDUM

Sub: Corrigendum in ToR issued dated 18/10/2023 -Reg.

Read: No.115/3/2023-24/GSEIAA/Project-Prop/166, dated 18/10/2023.

Ref : Proposal No. SIA/GA/IND1/305890/2023, dated 20/10/2023.

With reference to the above subject matter your application dated 06/05/2023 for Corrigendum in ToR No.115/3/2023-24/GSEIAA/Project-Prop /166 dated 18/10/2023 was discussed in 119th Goa SEIAA meeting held on 18th November 2023. The Authority decided to grant ToR as per the legal name mentioned in the Corrigendum application i.e "Salgaocar Shipping Company Private Limited" in place of "Salgaocar Shipping Company Limited"

Rest of the content of the said ToR letter dated 18/10/2023 remains the same.

(Dr. Sneha S. Gitte, IAS)
Director (Envt. & CC) &
Member Secretary, Goa-SEIAA

To,
Salgaocar Shipping Company Private Limited
Salgaocar Building, Plot No.15,
Altinho, Panaji, North – Goa,
403001.

Annexure-3

By e-mail

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES
OFFICE OF THE REGIONAL CONTROLLER OF MINES, GOA

No. MCDR-MPC0FE/3/2023-GOA-IBM_RO_GOA Dt : 07/08/2023

Shri/M/s SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED ,
plot no. 15, Salgaocar Bhavan Altinho Panaji

Sirigao mayem Mineral Block-II (PB73)

Sub : Approval of Mining Plan in respect of your BLOCK II – SIRIGAO MAYEM MINERAL BLOCK over an area of 171.2472 Ha. situated in Sirigao Village, Bicholim Taluka North Goa District of Goa State submitted under Rule 16(1) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016.

Ref : (i) Online submission/receipt of draft Mining Plan in respect of your aforesaid Block in the MPAS portal on 21.04.2023

(ii) This office scrutiny comments on the examination of draft Mining Plan in respect of your aforesaid Block was sent through MPAS Portal on 06.06.2023.

(iii) Online submission/receipt of modified Mining Plan in respect of your aforesaid Block in the MPAS portal on 20.06.2023, 07.07.2023, and 02.08.2023

Sir,

In exercise of the powers conferred by clause (b) of sub-section (2) of section 5 of the Mines & Minerals (Development & Regulation) Act, 1957 read with Government of India Order No. S.O. 1857(E) dated 18.05.2016; and in the exercise of the powers conferred under sub-rule (3) of Rule 16 of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016, I hereby approve the Mining Plan with Progressive Mine Closure Plan in respect of your Block No. II – Sirigao Mayem Mineral Block over an extent of 171.2472 Ha. situated in Sirigao Village, Bicholim Taluka, North Goa District of Goa State submitted under Rule 16(1) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules 2016. This approval is subject to the following conditions: -

1. That the Mining Plan is approved without prejudice to any other Law applicable to the same area from time to time whether made by the Central Government, State Government, or any other authority, and without prejudice to any order or direction from any court of competent jurisdiction.
2. The proposals shown on the plates and/or given in the document are based on the auctioned Mineral Block/lease map/sketch submitted by the applicant/lessee and are applicable from the date of approval.
3. It is clarified that the approval of the aforesaid Mining Plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines & Minerals (Development & Regulation) Act, 1957 or the Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016 and any other laws including Forest (Conservation) Act, 1980, Environment (Protection) Act, 1986 or the rules made there under, Mines Act, 1952 and Rules and Regulations made thereunder.
4. Indian Bureau of Mines has not undertaken verification of the auctioned Mineral Block / Mining Lease Boundary on the ground and does not undertake any responsibility regarding the correctness of the boundaries of the Mineral Block/leasehold shown on the ground with reference to the lease map & other plans furnished by the applicant.
5. At any stage, if it is observed that the information furnished, or data incorporated in the document is incorrect or misrepresents facts, the approval of the document shall be revoked with immediate effect.
6. If the approval conflicts with any other law or court order/direction under any statute, it shall be revoked immediately.
7. Terms and conditions of the Mine Development and Production Agreement (MDPA), whenever signed with State Govt. shall be complied with. The preferred bidder shall submit a copy of the Mine Development & Production Agreement & Mining Lease deed executed with the State Govt. to this office within 15 days of their execution along with a copy of Performance Security furnished.
8. The preferred bidder has to comply with the terms & conditions laid down in the LOI issued by the State Govt. If any comments are received from the State Govt. then the necessary action as per comments shall be taken immediately
9. It shall be mandatory for the project proponent, abstracting groundwater to obtain a No Objection Certificate from Central Ground Water Authority or the Goa State Ground Water Authority
10. The preferred bidder of the auctioned block shall complete detailed exploration (G1 level exploration) over the potential mineralized area in accordance with Rule 12(4) of MCDR Amendment Rules 2021 (notified dated 03.11.2021) and prepare a detailed feasibility study report conforming to Part IV and V of the Mineral (Evidence of Mineral Contents) Rules, 2015 over the entire area, within five years from the date of commencement of such mining lease.

Yours faithfully,

07/08/2023

(Naresh Kumar Katariya)

Deputy Controller of Mines & OIC

Copy forwarded for kind information to: -

1. The Controller of Mines (SZ), Indian Bureau of Mines, Bangalore.
2. The Director, Directorate of Mines & Geology, Government of Goa, Institute of Menezes Braganza Building, Panaji – Goa, 403001
3. The Director, Directorate of Mines Safety, Goa Region, Agali, Ponda – Goa, 403602.
4. M.S Raju, Plot No. 15, Salgaocar Dhawan, Alqinho – Tiswadi, Goa

07/08/2023

(Naresh Kumar Katariya)

Deputy Controller of Mines & OIC

Sirigao Iron Ore Mine Block-II (PB73)

Approved

Annexure-4

Government of Goa
Directorate of Mines & Geology
Institute Menezes Braganza, Panaji-Goa
Website: www.dmg.goa.gov.in **e-mail: dir-mine.goa@nic.in**

No.03/35/2023/Major/Mines/943 Date:08/07/2024

To,
Salgaocar Shipping Co. Pvt. Ltd.,
Salgaocar Bhavan, Altinho,
Panaji, Goa 403001.

Sub: Clarification regarding no forest area within Block-II Sirigao Mayem Mineral Block-reg.

Ref: Your letter dated 17.10.2023

Sir,

With reference to your letter dated 17.10.2023 on the above cited subject, please find enclosed herewith copy of letter received from Office of the Principal Chief Conservator of Forests, Goa Van Bhawan, Forest Department for further necessary action at your end.

Yours faithfully

(Narayan M. Gad)
Director

Encl: As stated.

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Directorate of Mines & Geology
Inward No. 2678
Dated 20/06/24
Signature

GOVERNMENT OF GOA
Office of the Principal Chief Conservator of Forests
"Goa Van Bhawan"Forest Department
Altinho, Panaji, Pin 403001

Ph: - 0832-2492548, 2492231 **Email: dcfme-forest.goa@nic.in**

No. 6-13(GEN)-2023-24-FD/Vol. XXVII/1003 Dated: 19/06/2024
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To
The Director
Directorate of Mines & Geology
Menezes Braganza Hall, Ground Floor
Panaji-Goa

Sub: Status of land schedule in respect of mining block-II auctioned during the 1st NIT in the State of Goa-reg.

Ref: 1. DMG letter no. 03/35/2023/Major/Mines/2618 dated 06/12/2023
2. This office letter no. 6-13(GEN)-2023-24-FD/Vol. XXVII/978 dated 11.06.2024
3. DMG Letter no. 03/163/2023/Major/Mines/629 dated 12.06.2024
4. This office letter no. 6-13(GEN)-2023-24-FD/Vol. XXVII/1003 dated 13.06.2024

Sir,

In continuation to this office letter dated 13.06.2024, in the above mentioned subject I am directed to inform that the lease boundary of the Mining Block-II of Sirigao-Mayam Mineral Block, as per the Mining Lease Plan shared by your vide letter no. 03/163/2023/Major/Mines/629 dated 12.06.2024, falls outside the Proposed Reserved Forests notified within the Survey No. 84, in Mayem Village of Bicholim Taluka.

Yours faithfully,

Dy. Conservator of Forest
Monitoring & Evaluation

Copy for information to
1. The Dy. Conservator of Forests, Working Plan Division, Goa Van Bhawan, Altinho, Panaji-Goa.
2. The Dy. Conservator of Forests, North Goa Division, Ponda-Goa.

SALGAOCAR SHIPPING CO. PVT. LTD.

Salgaocar Bhavan, Altinho, Panaji, Goa – 403001
CIN: U13100GA1975PTC000223
Tel: +91-832-2460500 Email: - info@smlindia.com

October 17/2023

To,
The Director,
Directorate of Mines and Geology,
Ground Floor of Institute Menezes Braganza
Panaji, Goa.

Dear Sir,

SUBJECT: CLARIFICATION REGARDING NO FOREST AREA WITHIN BLOCK-II SIRIGAO MAYEM MINERAL BLOCK.

Salgaocar Shipping Company Private Limited (SSCPL) has been declared as the Preferred Bidder for **Block - II**, Sirigao - Mayem Mineral Block, situated in Sirigao and Mayem villages of Bicholim taluka in North Goa district, covering an area of 171.2472 Ha and subsequently granted a Letter of Intent vide Letter No: DMG/25/Auction Cell/LOI-Function/2023/2802, dated 13.01.2023, in accordance with Rule 10 (2) of the Auction Rules, for a lease period of 50 (Fifty) years.

In compliance with the conditions outlined in the Letter of Intent, the Preferred Bidder is required to obtain permissions/approvals/NOC's from various Government Authorities to facilitate the execution of the Lease Deed and commence Mining operations from the said Mineral Block. As part of this process, SSCPL has submitted an application before the State Level Environmental Impact Assessment Authority, GOA (SEIAA- GOA) to secure Environmental Clearance for the Project.

During the Tender document phase, we received documents from the State Government, including a Mineral Block summary and land schedule details in the Geological Report of the Mineral Block, which clearly indicate that the Mineral Block area comprises both Private and Government Revenue land. Please find attached the Mineral Block summary, and the land schedule details in the Geological Report for your reference and records as Annexure - 1 and 2

We kindly request your office to clarify the land schedule details of Sirigao - Mayem Mineral Block II by granting the necessary No Objection Certificate (NOC) and report from Deputy Conservator of Forest confirming that there is no forest land involved in the said Sirigao - Mayem Mineral Block II.

We request an early response in the matter, for which we shall be highly obliged.

Thanking You,
Yours Faithfully,
SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED.

SALGAOCAR SHIPPING COMPANY PVT. LTD.

AUTHORISED SIGNATORY

Encl: 1. Mineral Block summary of Sirigao - Mayem Mineral Block-II
2 Land schedule details – Geological Report of Sirigao - Mayem Mineral Block

Received on 17/10/23
Directorate of Mines & Geology
Government of Goa

GOA STATE ENVIRONMENT IMPACT ASSESSMENT AUTHORITY
Constituted by the Ministry of Environment, Forest and Climate Change,
Government of India
C/o Department of Environment and Climate Change
4th Floor, Dempo Towers, Patto Panaji Goa - 403001.
e-mail: goaseac@gmail.com

No. 115/3/2023-24/GSEIAA/Project –Prop/05 Date: 15/04/2024

To,
Salgaocar Shipping Co.Pvt. Ltd.
Salgaocar Bhavan,Altinho,
Panaji- North Goa
403001

Sub: Regarding applicability of Eco-Sensitive Areas of Western Ghats with respect to Block-II Sirigao Mayem Mineral Block having an area of 171.247 Ha located in Sirigao and Mayem village of Bicholim Taluka.

Ref: Your letter dated 05/04/2024.

Sir,

This Authority is in receipt of your letter dated 05/04/2024 with respect to the above mentioned subject matter. The Authority has examined your request seeking clarification regarding applicability of **Eco-Sensitive Areas of Western Ghats with respect to Block-II S irigao Mayem Mineral Block having an area of 171.247 Ha located in Sirigao and Mayem village of Bicholim Taluka.**

The Authority on perusal of Draft notification issued by MoEF&CC dated 06th July clarified that **"Block-II Sirigao Mayem Mineral Block having an area of 171.247 Ha located in Sirigao and Mayem village of Bicholim Taluka,** is not a part of any Eco Sensitive Area of Western Ghats.

This is for your kind information and further necessary action.

Yours faithfully,

15/4/24

(Johnson B. Fernandes)
Director (Environment) &
Member Secretary, Goa-SEIAA

SALGAOCAR SHIPPING CO. PVT. LTD.

Salgaocar Bhavan, Altinho, Panaji, Goa – 403001

CIN: U13100GA1975PTC000323

Tel: +91-832-2460500 Email: - info@smilindia.com

April 05/2024

To,
The Director (Environment) and Member Secretary,
Goa State Environment Impact Assessment Authority,
4th Floor, Dempo Tower, Patto,
Panjim Goa-403001

05/04/2024

Dear Sir,

SUB: REGARDING APPLICABILITY OF ECO-SENSITIVE AREAS OF WESTERN GHAT WITH RESPECT TO BLOCK-II SIRIGAO MAYEM MINERAL BLOCK HAVING AREA OF 171.2472HA LOCATED IN SIRIGAO AND MAYEM VILLAGE OF BICHOLIM TALUKA.

Salgaocar Shipping Company Private Limited (SSCPL) has been declared as a Preferred Bidder for Block - II Sirigao - Mayem Mineral Block located in Sirigao and Mayem village of Bicholim taluka of North Goa District for an area admeasuring 171.2472 Ha and subsequently Government of Goa has accorded Letter of Intent dated 13/01/2023 to SSCPL for the period of 50 (Fifty) years.

We are in process of obtaining Environmental Clearance under Environmental Impact Assessment Notification 2006 and its subsequent amendments for Block -II Sirigao Mayem Mineral Block from Goa State Environmental Impact Assessment Authority (GSEIAA). Pursuant to our application for grant of Environmental Clearance, GSEIAA granted Terms of Reference (ToR) dated 18/10/2023 to SSCPL. Copy of ToR granted by GSEIAA is enclosed herewith as Annexure-I

As per condition No 17 of the ToR, it is mandated that the location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife corridors, Ramsar Sites, Tiger/Elephant Reserves (both existing and proposed) within a 10 Km radius of the Mine lease area must be clearly indicated, supported by a location map duly authenticated by the Chief Wildlife Warden. It also states that necessary clearance as may be applicable to such projects due to proximity of ecologically sensitive areas as mentioned above should be obtained from the Standing Committee of the National Board of Wildlife and copy furnished.

SALGAOCAR SHIPPING COMPANY PVT. LTD.

In light of this requirement, we wish to bring to your notice draft Notification issued by the Ministry of Environment, Forest and Climate Change (MOEF & CC) dated 6th July 2022. According to the said notification, Block II Sirigao Mayem Mineral Block, having an area of 171.2472Ha and situated in Sirigao and Mayem village of Bicholim Taluka, North Goa district, does not fall within the ambit of eco-sensitive areas of the Western Ghats as demarcated by MOEF & CC, as neither Sirigao village nor Mayem village falls in the eco-sensitive areas of the Western Ghats as demarcated by MOEF & CC. Copy of said draft Notification is attached as Annexure II.

Looking to the above, we kindly request you to provide confirmation that Block II Sirigao Mayem Mineral Block, having an area of 171.2472Ha and situated in Sirigao and Mayem village of Bicholim Taluka, North Goa district, does not fall within the ambit of eco-sensitive areas of the Western Ghats as demarcated by MOEF & CC, to ensure that we meet the necessary compliance requirements outlined in the Terms of Reference (ToR) issued by GSEIAA. We shall be highly obliged for an early response in this matter.

Thanking you,

Yours Faithfully,

SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

AUTHORISED SIGNATORY

SALGAOCAR SHIPPING COMPANY PVT. LTD.

Encl:

1. Terms of Reference issued by GSEIAA vide letter No: 115/3/2023-24/GSEIAA/Project-Prop/166 dated 18/10/2023 and subsequent ToR Corrigendum Vide Letter No:115/3/2023-24/GSEIAA/Project-Prop/204 dated 24/11/2023.

2. MOEF & CC Draft Notification dated 6th July 2022.

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Annexure-5

Government of Goa
Office of The Dy. Conservator of Forests
Working Plan Division
"Goa Van Bhavan"
Altinho Panaji Goa – 403 001

No: - DCF(WP)/Tech/Digi/Vol-I/75/2024-25/999 Dated: -05/06/2024

To,
The Director,
Directorate of Mines & Geology,
Institute Menezes Braganza,
Panaji-Goa.

Sub: - Request for authentication of distance of wildlife sanctuaries from boundary of Block-II Sirigao Mayem Mineral Block situated in Sirigao and Mayem village of Bicholim Taluka North Goa District of Goa State.

Ref: -No.03/35/2023/Major/Mines/692 dated 18/06/2024.

Sir,

With reference to the above cited subject, please find enclosed herewith Map showing distance and direction of wildlife Sanctuary from boundary of Block-II Sirigao Mayem Mineral Block situated in Sirigao and Mayem village of Bicholim Taluka (**Annexure-I**).

The boundary of Block-II Sirigao Mayem Mineral Block situated in Sirigao and Mayem village of Bicholim Taluka is located at distance of 18.31 R.Km from the boundary of Madei Wildlife Sanctuary, 8.83 R.Km from the boundary of Dr. Salim Ali Birds Sanctuary, 24.92 R.Km from the boundary of Bondla Wildlife Sanctuary.

This is issued as per your request and may not be treated as NOC for any purpose.

Yours Sincerely,

05/06/24

(Nandakumar B. Parab, IFS)
Dy. Conservator of Forests,
Working Plan Division,
Panaji-Goa.

Encl: - As above.

STATE MAP OF GOA SHOWING 10 KM RADIUS AREA FROM BLOCK II - SIRIGAO-MAYEM MINERAL BLOCK LOCATED AT SIRIGAO & MAYEM VILLAGES OF BICHOLIM TALUKA AND IT'S DISTANCE FROM NEAREST WILDLIFE SANCTUARY

NOT TO SCALE

BLOCK II - SIRIGAO-MAYEM MINERAL BLOCK
SIRIGAO & MAYEM VILLAGE
OF BICHOLIM TALUKA
LAT - 15° 35' 42.275" N & 15° 35' 35.785" N
LONG - 73° 54' 49.729" E & 73° 54' 1.200" E

8.63 KM

18.31 KM

24.92 KM

Dr.SALIM ALI BIRD SANCTUARY

Bondla Wildlife Sanctuary

Mhadei Wildlife Sanctuary

Bhagwan Mahaveer Sanctuary & Mollem National Park

Netravali Wildlife Sanctuary

Cotigao wildlife sanctuary

Legend

- Block II- Sirigao-Mayem Mineral Block Sirigao & Mayem Village Of Bicholim Taluka
- 10 KM Radius Buffer From Block II- Sirigao-Mayem Mineral Block
- Wildlife Sanctuary

SALGAOCAR SHIPPING CO. PVT. LTD.

Salgaocar Bhavan, Altinho, Panaji, Goa – 403001

CIN: U13100GA1975PTC000223

Tel: +91-832-2460500 Email. - info@smiitindia.com

April 05/2024

To,
The Director,
The Directorate of Mines and Geology,
Ground Floor of Institute Menezes Braganza,
Panaji, Goa.

Dear Sir,

SUB: REQUEST FOR AUTHENTICATION OF DISTANCE OF WILDLIFE SANTURIES FROM BOUNDARY OF BLOCK-II SIRIGAO MAYEM MINERAL BLOCK SITUATED IN SIRIGAO AND MAYEM VILLAGE OF BICHOLIM TALUKA NORTH GOA DISTRICT OF GOA STATE.

Salgaocar Shipping Company Private Limited (SSCPL) has been declared as a Preferred Bidder for Block - II Sirigao - Mayem Mineral Block located in Sirigao and Mayem village of Bicholim taluka of North Goa district for an area admeasuring 171.2472 Ha and subsequently Government of Goa has accorded Letter of Intent dated 13/01/2023 to SSCPL for the period of 50 (Fifty) years.

We are in process of obtaining Environmental Clearance under Environmental Impact Assessment Notification 2006 and its subsequent amendments for Block -II Sirigao Mayem Mineral Block from Goa State Environmental Impact Assessment Authority (GSEIAA). Pursuant to our application for grant of Environmental Clearance, GSEIAA granted Terms of Reference (ToR) dated 18/10/2023 to SSCPL. Copy of ToR granted by GSEIAA is enclosed herewith as Annexure-I

As per condition no. 17 of the ToR, it is mandated that the location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife corridors, Ramsar Sites, Tiger/Elephant Reserves (both existing and proposed) within a 10 KM radius of the Mine lease area must be clearly indicated. Furthermore, it is required that this indication be supported by a location map duly authenticated by the Chief Wildlife Warden.

Received (Sd.) 5/4/24
Directorate of Mines & Geology
Government of Goa

1

SALGAOCAR SHIPPING COMPANY PVT. LTD.

In accordance with this directive, we have prepared a map indicating the location of Dr. Salim Ali Bird Sanctuary, which lies at a distance of approximately 8 56 KM from the Block - II Sirigao Mayem Mineral Block Area. Enclosed herewith is the said map as Annexure-II.

We kindly request your esteemed office to facilitate the authentication of this map by the Chief Wildlife Warden. Upon authentication, we seek your assistance in providing us with a copy of the same for compliance with the Terms of Reference (ToR) issued by GSEIAA.

Your co-operation in expediting this matter will be greatly appreciated.

Thanking you,

Yours Faithfully,

SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

AUTHORISED SIGNATORY

SALGAOCAR SHIPPING COMPANY PVT. LTD.

Encl:

1. Terms of Reference issued by GSEIAA vide letter No: 115/3/2023-24/GSEIAA/Project-Prop/166 dated 18/10/2023 and subsequent ToR Corrigendum Vide Letter No:115/3/2023-24/GSEIAA/Project-Prop/204 dated 24/11/2023.

2. Location Map of Dr. Salim Ali Bird Sanctuary with respect to Block II- Sirigao Mayem Mineral Block Area (4 Copies).

Annexure-6

GOVERNMENT OF GOA
OFFICE OF THE EXECUTIVE ENGINEER
& GROUND WATER OFFICER
WORKS DIVISION I
WATER RESOURCES DEPARTMENT
PORVORIM GOA

To,
M/s Salgaocar Shipping Company Private Limited,
Salgaocar Bhavan, Plot No. 15,
Altinho Panaji,
Goa-403001.

Sub:- Issue NOC reg.... Registration of Mine Pit with respect to Block – II, Sirigao Mayem Mineral Block, situated at village Sirigao & Mayem Bicholim Taluka North Goa, Goa.

Ref:- Your letter dated:-31/10/2023

Sir,

The application submitted vide letter dated. 31/10/2023 along with Hydrogeological and impact assessment of Ground Water, prepared by Shri. M.C. Reddy Consultant with NABET & CGWA accreditation and former Regional Director, CGWB is examined by the Ground Water Cell during its 129th meeting held on 20/12/2023.

The NOC/Registration is hereby issued as below with conditions.

FORM – III
[See Rule 3(6)(2)]

Certificate of Registration of an existing well/mine and permission for its continuous use in the Scheduled area under 5(4) of the Goa Ground Water Regulation Act, 2002 (Goa Act 1 of 2002).

*** Well be read as Mine**

Works Division I Water Resources Department Porvorim-Goa

Registration Certificate

No. 2666 **Date:** 15/03/2024

1. Register Number of well/mine: **Block – II, Sirigao-Mayem Mineral Block.**

Location of Mining Block,

a)**Village of Sirigao & Mayem, Taluka Bicholim, North Goa.**

Survey No of Mining Block: **As per Annexure II**

Survey No. 84, 91, 92, 93 & 94 of Sirigao Village and

Survey No. 60, 61 & 79 of Mayem Village.

b) Revenue Village Panchayat: Sirigao & Mayem.

d) Taluka: **Bicholim.**

e) District: **North -Goa.**

Type of well/tank: Mining Pit (Opencast Mine)

Details of well/mine

a) Diameter size of well/mining pits: **Mining Pit 1 730 Mtr X 400 Mtr.**
Mining Pit 2 1070 Mtr X 450 Mtr.

b) Depth of well/tank/mining pits: **Mining Pit 1 80 Mtr Depth**
Mining Pit 2 115 Mtr Depth

c) Year of Construction: **Existing Mining Pits**

d) Year of Commissioning: **2024-25**

Name of occupant and address: - **M/s Salgaocar Shipping Company Private Limited, Salgaocar Bhavan, Plot No. 15, Altinho Panaji, Goa-403001.**

The device used for lifting the Ground Water Pump

Details of power supply

(a) Type of pump: - **Centrifugal Pump (Diesel Operated)**
(b) Horse power - **6 pumps of 100-150 HP and 2 Standby pumps of 100-150 HP**
(c) Pump capacity - **500 M³/Hr.**
(d) E.D. Power supply connection number- **Nil.**

8. (a)Number of hours of pumping allowed per day as required for scientific operation of mine

(b)The quantity of drawl of ground water allowed per day.

(c)The total period of use permissible in each year Full year (12 months)

9. Validity period of registration: 2 (Two) year from date of issue **15/03/2024 to 14/03/2026.**

This is subject to the following conditions

1. The certificate holder should not deviate in any way from specification regarding well, pump etc. mentioned above without approval of Ground Water Officer.

2. The drawal of ground water under this license should not interfere with the normal activities of the locality nor should it cause any traffic hazard.

3. The Ground Water Officer or any person duly authorized by him shall have the right to inspect the place with such assistance as may be necessary to satisfy itself or himself whether the condition of restrictions specified is complied.

4. Installation of Peizometers: The applicant should install Peizometers of type (One DWLR with Telemetry System) for monitoring the Ground Water Levels within the core area of mining lease for observation & monitoring. Slotted pipe is to be fitted against ground water potential zones at depths and blank casing pipes against loose and clayey zones as per formations encountered during drilling.

5. Monitoring the Ground Water level in the buffer zone the established network of existing wells in the buffer zone (as per table 13 of the report), needs to be monitored on monthly basis and submitted to Ground Water Officer (WRD) and CGWB.

6. The project proponent needs to monitor the water quality of the mines seepage and mine discharge through NABL accredited/ Government approved laboratory on monthly basis to WRD and CGWB, Bangalore.

7. The applicant needs to ensure that the water available from the dewatering operations needs to be properly treated and quantity utilized for supply to irrigation/dust suppression/mining process.

8. The applicant needs to install digital water meter for measurement of the quantity of water abstraction, which will be chargeable as per the notification of Ground Water Act 2002.

9. Once the mining activities commence, year wise mine planning including excavation depth, area and mine seepage are to be submitted to WRD/CGWB every year.

10. All activities committed in the report on ground water recharge and rain water harvesting is to be implemented satisfactorily.

11. The NOC/permission/Ground Water clearance is valid for a period of 2 years and further renewal is subject to fulfilling the conditions stipulated in the NOC.

Place: **Porvorim**

Date: 15/03/2024

Signature of the Ground Water Officer

Works Division I, Water Resources Department
कार्यकारी विभाग १, जलसंपदा खाते
पर्वरी-गोवा
Porvorim, Goa

SALGAOCAR SHIPPING CO. PVT. LTD.

Salgaocar Bhavan, Altinho, Panaji, Goa – 403001
CIN U13100GA1975PTC000223
Tel: +91-832-2460500 Email: - info@smilindia.com

October 31/2023

To,
The Assistant Engineer,
Sub Division - III, Work Division- VI,
Water Resources Department,
Mulgao, Dicholim - Goa

SUB: Submission of Hydrogeology and Impact Assessment of Ground Water Report and Application for Registration of Mine Pit, for Block II – Sirigao Mayem Mineral Block of Salgaocar Shipping Company Private Limited.

Dear Sir,

Salgaocar Shipping Company Private Limited (SSCPL) has been declared as a Preferred Bidder for Block - II Sirigao - Mayem Mineral Block located in Sirigao and Mayem villages of Bicholim taluka of North Goa district for an area admeasuring 171.2472 Ha. and subsequently, Directorate of Mines and Geology, Government of Goa has accorded Letter of Intent (LoI) to Salgaocar Shipping Company Private Limited Vide Letter No: DMG/25/Auction Cell/LOI-Function/2023/2802 dated 13.01.2023 as per Rule 10 (2) of Auction rule for the period of 50 (Fifty) years. Copy of LoI annexed herewith as **Annexure-I**.

The Letter of Intent granted by DMG, Govt. of Goa pre-requisites obtaining various consents, approvals, permits, NOC's as may be required under applicable laws for signing of the Mine Development Production Agreement and subsequent execution of Mine Lease Deed.

In view of above requirement, we are submitting herewith **Hydrogeology and Impact Assessment of Ground Water Report**, prepared by NABET & CGWA accredited consultant, along with duly filled application for **Registration of the Mine Pit (Form I)**

We kindly request your good office to process the same and issue us the necessary approvals at the earliest.

Thanking You
Yours Faithfully,
SALGAOCAR SHIPPING CO. PVT. LTD.

AUTHORIZED SIGNATORY

CC: The Executive Engineer, Work Division VI, Water Resources Department, Bicholim Goa

Enclosures:

1. Hydrogeology and Impact Assessment of Ground Water Report
2. Form-I, Application for Registration of Mine Pit.
3. Letter of Intent for Preferred Bidder as Annexure I
4. Land details as Annexure II
5. Surface Plan as Annexure III

Received 31/10/2023

Government of Goa
Office of the Assistant Engineer
Sub-Division V, Work Division VI
Water Resources Department
Mulgao-Goa.

31/10/2023
Office of the Executive Eng
W.D. VI
Water Resources Department
Survey No. [illegible]

Annexure-7

BASELINE DATA FOR ENVIRONMENTAL MONITORING REPORT

SUMMER SEASON, 2023
(March to May, 2023)

PROJECT: BLOCK – II, SIRIGAO-MAYEM MINERAL BLOCK
Sirigao & Mayem villages,
Bicholim Taluka,
North Goa District, Goa

Lessee: M/s. SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED
Salgaocar Bhavan, Altinho,
Panajim-403001
Goa, India

CONSULTANT

MINERAL ENGINEERING SERVICES
(Accredited by QCI-NABET ORG000756)
25/XXV, Club Road, BELLARY-583103, Karnataka. Tel 08392-267421, Mob: 09194483367421,
Email : mes_mesgs@yahoo.co.uk
mesblr25@gmail.com

ENVIRONMENTAL LABORATORY
Unit of Mineral Engineering Services)
(Accredited by NABL & MOEF&CC Under EIP) 1986)
#948, 2nd Cross, Kammanahalli Main Road, St Thomas Town Post, Bangalore-560 084, Karnataka.

LIST OF TABLES

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TEST REPORT

Table No. A

METEOROLOGICAL DATA

Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Location : Sirigao Village
Season : Summer. 2023

Date	Temperature in °C		Relative Humidity in %	
	Min.	Max.	Min.	Max.
01/03/2023	18.2	34.3	19.3	88.8
02/03/2023	19.3	34.4	19.5	89.7
03/03/2023	17.2	34.2	29.4	90.6
04/03/2023	19.5	34.3	34.6	91.8
05/03/2023	19.2	34.5	41.3	92.7
06/03/2023	19.3	34.3	48.5	91.8
07/03/2023	19.4	33.4	43.8	87.8
08/03/2023	19.2	34.5	37.6	92.9
09/03/2023	20.3	35.3	35.3	89.8
10/03/2023	19.2	35.4	30.4	90.7
11/03/2023	19.0	35.3	26.2	91.8
12/03/2023	19.6	35.4	28.5	91.7
13/03/2023	19.3	36.3	31.3	89.6
14/03/2023	21.2	36.5	41.4	89.5
15/03/2023	18.5	36.3	42.2	88.4
16/03/2023	20.2	36.4	41.6	87.5
17/03/2023	21.3	36.3	35.8	77.8
18/03/2023	21.2	36.4	36.7	88.7
19/03/2023	23.4	33.3	34.8	90.6
20/03/2023	20.2	33.3	27.6	87.5
21/03/2023	22.2	36.6	33.3	90.7
22/03/2023	22.5	35.3	30.4	91.8
23/03/2023	21.5	35.8	18.2	89.7
24/03/2023	22.3	35.2	26.3	89.6
25/03/2023	22.2	36.3	26.4	89.8
26/03/2023	22.5	36.5	43.6	96.9
27/03/2023	22.3	36.2	51.8	99.8
28/03/2023	22.4	36.6	47.3	95.6
29/03/2023	22.3	36.5	45.4	89.6
30/03/2023	22.4	36.4	41.5	94.8
31/03/2023	24.5	32.3	39.6	93.7

Govt. Analyst / Authorised Signatory

948, 2nd Cross, St. Thomas Town Post, Kammanahalli, Bangalore - 560 084.
Phone : 080-25432969 Tel/fax : 25432968. E-mail : mesbng@gmail.com, www.envtest.in

Note : This report is subject to the terms and conditions mentioned overleaf

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ISO 45001:2018

TEST REPORT

Table No. B

METEOROLOGICAL DATA

Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa

Location : Sirigao Village

Season : Summer. 2023

Date	Temperature in °C		Relative Humidity in %	
	Min.	Max.	Min.	Max.
01/04/2023	21.3	37.2	43.7	97.7
02/04/2023	22.1	37.4	40.5	95.3
03/04/2023	22.4	37.2	32 6	96.1
04/04/2023	22.6	36.1	37.7	95.4
05/04/2023	23.1	37.3	45.4	93.6
06/04/2023	23.0	36.2	48.5	84.2
07/04/2023	23 2	37.4	47.4	98 6
08/04/2023	23 1	36.3	40.3	98.3
09/04/2023	23.4	36 1	53.4	97 6
10/04/2023	23.5	35.6	56.7	94 5
11/04/2023	21.4	37.3	33.4	91.6
12/04/2023	23.2	36.4	54.7	90.1
13/04/2023	23.1	37.3	46.8	96.3
14/04/2023	24.1	36.2	69 3	94.5
15/04/2023	23.4	32.4	45 5	98.3
16/04/2023	23.3	37.4	36.4	76.6
17/04/2023	19.4	35.6	50 5	90.3
18/04/2023	20.3	36.1	37.4	96.4
19/04/2023	22.1	37.4	48.5	93.8
20/04/2023	22.3	37.3	34.3	89.1
21/04/2023	24.2	37.2	44.6	94.1
22/04/2023	23.4	37.4	31.2	82.2
23/04/2023	23 5	37.6	51.3	89.8
24/04/2023	22.6	37.2	42.8	97.8
25/04/2023	22.4	37.4	45.3	92 3
26/04/2023	23.4	37.5	41.6	97 4
27/04/2023	22.1	37.6	46.3	99 7
28/04/2023	20.1	36.7	59.5	97 3
29/04/2023	22 1	36.3	37.7	95.3
30/04/2023	21 3	37.4	49.6	95 7

Govt. Analyst / Authorised Signatory

948, 2nd Cross, St. Thomas Town Post, Kammanahalli, Bangalore - 560 084.
Phone : 080-25432969 Tel/fax : 25432968. E-mail : mesting@gmail.com, www.envtest.in

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TEST REPORT

Table No. C

METEOROLOGICAL DATA

Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa

Location : Sirigao Village

Season : Summer. 2023

Date	Temperature in °C		Relative Humidity in %	
	Min.	Max.	Min.	Max.
01/05/2023	22 3	37 3	42 5	97.3
02/05/2023	22.5	37 5	39 7	96 3
03/05/2023	23.4	37.3	39.4	98.0
04/05/2023	22.6	37.6	40.6	94.1
05/05/2023	20.3	36.1	50 6	94 0
06/05/2023	22.4	37.1	38 6	95 3
07/05/2023	21.3	36.2	42 3	90 3
08/05/2023	23.4	37.3	55.4	94.1
09/05/2023	23.5	37.4	59.1	91.2
10/05/2023	23.7	36.3	58.3	90.0
11/05/2023	23 4	35 6	38 6	87 8
12/05/2023	21 6	31 3	64.1	95 0
13/05/2023	21.5	33.2	59.3	99.1
14/05/2023	23.0	36.1	55.1	99.1
15/05/2023	22.3	36.3	64.5	99.4
16/05/2023	23 1	37 6	56.3	87.3
17/05/2023	22 6	33 1	51.2	81 0
18/05/2023	21 3	36 0	51.8	98 3
19/05/2023	20.6	35.6	52.3	98.1
20/05/2023	20.4	36.3	50.6	87.0
21/05/2023	19 6	35 7	63 8	99 0
22/05/2023	21 3	31 3	61 5	97 3
23/05/2023	21 5	33 5	62 5	96 0
24/05/2023	22 3	34 3	51 6	98 5
25/05/2023	22 6	34 2	46.0	90 3
26/05/2023	21 5	34 6	55.0	91.0
27/05/2023	21 6	33 5	51 6	89 0
28/05/2023	21 3	35 2	51 0	90.4
29/05/2023	21 5	35 6	50.1	87.5
30/05/2023	22.6	35.1	56.1	88.0
31/05/2023	22.3	35.6	56.3	91.3

Govt. Analyst / Authorised Signatory

948, 2nd Cross, St. Thomas Town Post, Kammanahalli, Bangalore - 560 084.
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TEST REPORT

Table No. 1

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A1 Core zone Within Mineral Block
Duration : 24 Hrs
Issue Date : 10.06.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
03.03.2023	ED/23/03/2-0132	10	12	36	22	<20	<1
07.03.2023	ED/23/03/2-0203	8	11	40	25	<20	<1
10.03.2023	ED/23/03/3-0057	13	18	30	18	<20	<1
14.03.2023	ED/23/03/3-0118	12	15	44	23	<20	<1
17.03.2023	ED/23/03/4-0011	9	11	30	19	<20	<1
21.03.2023	ED/23/03/4-0078	9	10	36	28	<20	<1
24.03.2023	ED/23/03/5-0009	6	9	32	22	<20	<1
28.03.2023	ED/23/03/5-0080	10	12	35	19	<20	<1
31.03.2023	ED/23/04/2-0087	11	14	38	25	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
03.03.2023	ED/23/03/2-0132	0.08	<0.5	<0.5	<0.5	0.11	20
07.03.2023	ED/23/03/2-0203	0.19	<0.5	<0.5	<0.5	0.10	24
10.03.2023	ED/23/03/3-0057	0.16	<0.5	<0.5	<0.5	0.21	20
14.03.2023	ED/23/03/3-0118	0.15	<0.5	<0.5	<0.5	0.12	22
17.03.2023	ED/23/03/4-0011	0.05	<0.5	<0.5	<0.5	0.11	25
21.03.2023	ED/23/03/4-0078	0.22	<0.5	<0.5	<0.5	0.23	22
24.03.2023	ED/23/03/5-0009	0.15	<0.5	<0.5	<0.5	0.21	29
28.03.2023	ED/23/03/5-0080	0.12	<0.5	<0.5	<0.5	0.11	20
31.03.2023	ED/23/04/2-0087	0.06	<0.5	<0.5	<0.5	0.24	26
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

Govt. Analyst / Authorised Signatory

948, 2nd Cross, St. Thomas Town Post, Kammanahalli, Bangalore - 560 084.
Phone : 080-25432969 Tel/fax : 25432968. E-mail : mesbng@gmail.com, www.envtest.in

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Recognised by MoEFCC(CPCB) under E(P) Act 1986 & recognition is valid upto 23.05.2025

TEST REPORT

Table No. 2

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages. Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A2 Sirigao village
Duration : 24 Hrs
Issue Date : 10.06.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10}, (µg/m³)	$PM_{2.5}$, (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
03.03.2023	ED/23/03/2-0130	6	9	48	21	<20	<1
07.03.2023	ED/23/03/2-0201	9	11	35	15	<20	<1
10.03.2023	ED/23/03/3-0055	10	12	48	25	<20	<1
14.03.2023	ED/23/03/3-0114	9	11	40	23	<20	<1
17.03.2023	ED/23/03/4-0009	6	9	33	16	<20	<1
21.03.2023	ED/23/03/4-0076	10	11	41	27	<20	<1
24.03.2023	ED/23/03/5-0007	9	12	42	23	<20	<1
28.03.2023	ED/23/03/5-0078	7	11	49	28	<20	<1
31.03.2023	ED/23/04/2-0085	6	9	43	16	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
03.03.2023	ED/23/03/2-0130	0.08	<0.5	<0.5	<0.5	0.11	29
07.03.2023	ED/23/03/2-0201	0.05	<0.5	<0.5	<0.5	0.21	20
10.03.2023	ED/23/03/3-0055	0.13	<0.5	<0.5	<0.5	0.25	26
14.03.2023	ED/23/03/3-0114	0.05	<0.5	<0.5	<0.5	0.13	24
17.03.2023	ED/23/03/4-0009	0.08	<0.5	<0.5	<0.5	0.16	20
21.03.2023	ED/23/03/4-0076	0.12	<0.5	<0.5	<0.5	0.11	22
24.03.2023	ED/23/03/5-0007	0.07	<0.5	<0.5	<0.5	0.16	25
28.03.2023	ED/23/03/5-0078	0.15	<0.5	<0.5	<0.5	0.33	28
31.03.2023	ED/23/04/2-0085	0.11	<0.5	<0.5	<0.5	0.16	23
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

Govt. Analyst / Authorised Signatory

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ENVIRONMENTAL LABORATORY

(UNIT OF MINERAL ENGINEERING SERVICES)

ISO 45001:2018

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TEST REPORT

Table No. 3

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A3, Mulgao village
Duration : 24 Hrs
Issue Date : 10.06.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
03.03.2023	ED/23/03/2-0126	11	14	46	23	<20	<1
07.03.2023	ED/23/03/2-0196	12	13	41	28	<20	<1
10.03.2023	ED/23/03/3-0050	8	12	43	25	<20	<1
14.03.2023	ED/23/03/3-0109	9	13	39	24	<20	<1
17.03.2023	ED/23/03/4-0004	11	15	50	27	<20	<1
21.03.2023	ED/23/03/4-0071	10	11	47	26	<20	<1
24.03.2023	ED/23/03/5-0002	13	18	54	27	<20	<1
28.03.2023	ED/23/03/5-0073	10	11	43	26	<20	<1
31.03.2023	ED/23/04/2-0080	8	16	37	19	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
03.03.2023	ED/23/03/2-0125	0.06	<0.5	<0.5	<0.5	0.30	20
07.03.2023	ED/23/03/2-0195	0.11	<0.5	<0.5	<0.5	0.19	21
10.03.2023	ED/23/03/3-0060	0.10	<0.5	<0.5	<0.5	0.12	20
14.03.2023	ED/23/03/3-0109	0.11	<0.5	<0.5	<0.5	0.21	26
17.03.2023	ED/23/03/4-0004	0.15	<0.5	<0.5	<0.5	0.12	20
21.03.2023	ED/23/03/4-0071	0.16	<0.5	<0.5	<0.5	0.07	21
24.03.2023	ED/23/03/5-0002	0.08	<0.5	<0.5	<0.5	0.12	20
28.03.2023	ED/23/03/5-0073	0.07	<0.5	<0.5	<0.5	0.19	21
31.03.2023	ED/23/04/2-0080	0.12	<0.5	<0.5	<0.5	0.30	22
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

Govt Analyst / Authorised Signatory

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ISO 45001:2018

TEST REPORT

Table No. 4

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A4, Sircaim village
Duration : 24 Hrs
Issue Date : 10.06.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10}, (µg/m³)	$PM_{2.5}$, (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
03.03.2023	ED/23/03/2-0128	10	16	61	31	<20	<1
07.03.2023	ED/23/03/2-0198	9	12	59	21	<20	<1
10.03.2023	ED/23/03/3-0063	11	14	49	22	<20	<1
14.03.2023	ED/23/03/3-0112	9	11	46	26	<20	<1
17.03.2023	ED/23/03/4-0007	10	12	53	23	<20	<1
21.03.2023	ED/23/03/4-0074	11	14	40	21	<20	<1
24.03.2023	ED/23/03/5-0006	9	12	50	26	<20	<1
28.03.2023	ED/23/03/5-0076	7	9	46	24	<20	<1
31.03.2023	ED/23/04/2-0083	10	11	40	22	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
03.03.2023	ED/23/03/2-0128	0.07	<0.5	<0.5	<0.5	0.16	23
07.03.2023	ED/23/03/2-0198	0.12	<0.5	<0.5	<0.5	0.11	21
10.03.2023	ED/23/03/3-0063	0.05	<0.5	<0.5	<0.5	0.21	22
14.03.2023	ED/23/03/3-0112	0.12	<0.5	<0.5	<0.5	0.32	25
17.03.2023	ED/23/03/4-0007	0.07	<0.5	<0.5	<0.5	0.28	28
21.03.2023	ED/23/03/4-0074	0.05	<0.5	<0.5	<0.5	0.09	20
24.03.2023	ED/23/03/5-0006	0.15	<0.5	<0.5	<0.5	0.33	21
28.03.2023	ED/23/03/5-0076	0.08	<0.5	<0.5	<0.5	0.13	22
31.03.2023	ED/23/04/2-0083	0.06	<0.5	<0.5	<0.5	0.21	25
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

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TEST REPORT

Table No. 5

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block – II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A5, Calvim village
Duration : 24 Hrs
Issue Date : 10.06.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10}, (µg/m³)	$PM_{2.5}$, (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
02.03.2023	ED/23/03/1-0022	7	11	30	20	<20	<1
06.03.2023	ED/23/03/2-0176	11	12	35	22	<20	<1
09.03.2023	ED/23/03/2-0247	8	11	36	18	<20	<1
13.03.2023	ED/23/03/3-0093	6	<9	32	15	<20	<1
16.03.2023	ED/23/03/3-0156	8	<9	29	16	<20	<1
20.03.2023	ED/23/03/4-0055	10	12	37	20	<20	<1
23.03.2023	ED/23/03/4-0118	11	11	29	15	<20	<1
27.03.2023	ED/23/03/5-0053	12	13	38	20	<20	<1
30.03.2023	ED/23/04/1-0006	6	9	30	15	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), ng/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
02.03.2023	ED/23/03/1-0022	0.22	<0.5	<0.5	<0.5	0.20	20
06.03.2023	ED/23/03/2-0176	0.12	<0.5	<0.5	<0.5	0.16	22
09.03.2023	ED/23/03/2-0247	0.11	<0.5	<0.5	<0.5	0.23	27
13.03.2023	ED/23/03/3-0093	0.12	<0.5	<0.5	<0.5	0.12	21
16.03.2023	ED/23/03/3-0156	0.11	<0.5	<0.5	<0.5	0.23	29
20.03.2023	ED/23/03/4-0055	0.09	<0.5	<0.5	<0.5	0.11	22
23.03.2023	ED/23/03/4-0118	0.10	<0.5	<0.5	<0.5	0.22	26
27.03.2023	ED/23/03/5-0053	0.08	<0.5	<0.5	<0.5	0.13	26
30.03.2023	ED/23/04/1-0006	0.14	<0.5	<0.5	<0.5	0.32	22
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

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TEST REPORT

Table No. 6

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa. Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A6, Sinquirem wada
Duration : 24 Hrs
Issue Date : 10.06.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
03.03.2023	ED/23/03/2-0134	9	11	38	22	<20	<1
07.03.2023	ED/23/03/2-0205	7	12	40	23	<20	<1
11.03.2023	ED/23/03/3-0073	9	11	46	25	<20	<1
14.03.2023	ED/23/03/3-0118	10	12	40	22	<20	<1
17.03.2023	ED/23/03/4-0013	11	13	50	24	<20	<1
21.03.2023	ED/23/03/4-0060	12	14	53	26	<20	<1
24.03.2023	ED/23/03/5-0011	9	11	46	24	<20	<1
28.03.2023	ED/23/03/5-0062	12	15	50	27	<20	<1
31.03.2023	ED/23/04/2-0089	10	11	38	22	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
03.03.2023	ED/23/03/2-0134	0.05	<0.5	<0.5	<0.5	0.18	24
07.03.2023	ED/23/03/2-0205	0.09	<0.5	<0.5	<0.5	0.11	20
11.03.2023	ED/23/03/3-0073	0.18	<0.5	<0.5	<0.5	0.31	22
14.03.2023	ED/23/03/3-0118	0.08	<0.5	<0.5	<0.5	0.13	28
17.03.2023	ED/23/03/4-0013	0.13	<0.5	<0.5	<0.5	0.19	25
21.03.2023	ED/23/03/4-0060	0.06	<0.5	<0.5	<0.5	0.22	23
24.03.2023	ED/23/03/5-0011	0.15	<0.5	<0.5	<0.5	0.31	28
28.03.2023	ED/23/03/5-0062	0.17	<0.5	<0.5	<0.5	0.35	26
31.03.2023	ED/23/04/2-0089	0.05	<0.5	<0.5	<0.5	0.15	20
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

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TEST REPORT

Table No. 7

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : AT, Advalpale Village
Duration : 24 Hrs
Issue Date : 10.06.2023
Reference : IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10}, (µg/m³)	$PM_{2.5}$, (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
04.03.2023	EDI/23/03/2-0151	6	9	38	18	<20	<1
08.03.2023	EDI/23/03/2-0222	6	9	42	24	<20	<1
11.03.2023	EDI/23/03/3-0070	5	13	40	21	<20	<1
15.03.2023	EDI/23/03/3-0131	7	9	34	19	<20	<1
18.03.2023	EDI/23/03/4-0030	4	9	37	23	<20	<1
22.03.2023	EDI/23/03/4-0093	9	11	39	16	<20	<1
25.03.2023	EDI/23/03/5-0028	6	9	41	23	<20	<1
29.03.2023	EDI/23/03/5-0099	7	9	49	25	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
04.03.2023	EDI/23/03/2-0151	0.08	<0.5	<0.5	<0.5	0.21	21
08.03.2023	EDI/23/03/2-0222	0.05	<0.5	<0.5	<0.5	0.08	23
11.03.2023	EDI/23/03/3-0070	0.11	<0.5	<0.5	<0.5	0.31	26
15.03.2023	EDI/23/03/3-0131	0.07	<0.5	<0.5	<0.5	0.09	22
18.03.2023	EDI/23/03/4-0030	0.09	<0.5	<0.5	<0.5	0.11	20
22.03.2023	EDI/23/03/4-0093	0.05	<0.5	<0.5	<0.5	0.10	23
25.03.2023	EDI/23/03/5-0028	0.11	<0.5	<0.5	<0.5	0.08	21
29.03.2023	EDI/23/03/5-0099	0.08	<0.5	<0.5	<0.5	0.13	23
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

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TEST REPORT

Table No. 8

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A8, Lamgao Village
Duration : 24 Hrs
Issue Date : 10.06.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10}, (µg/m³)	$PM_{2.5}$, (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
02.03.2023	ED/23/03/1-0019	11	13	32	20	<20	<1
06.03.2023	ED/23/03/2-0173	9	14	36	20	<20	<1
09.03.2023	ED/23/03/2-0244	10	17	40	20	<20	<1
13.03.2023	ED/23/03/3-0090	10	12	41	24	<20	<1
16.03.2023	ED/23/03/3-0153	5	9	39	26	<20	<1
20.03.2023	ED/23/03/4-0052	8	9	37	17	<20	<1
23.03.2023	ED/23/03/4-0115	8	12	33	18	<20	<1
27.03.2023	ED/23/03/5-0050	9	11	42	21	<20	<1
30.03.2023	ED/23/04/1-0003	10	11	43	25	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
02.03.2023	ED/23/03/1-0019	0.18	<0.5	<0.5	<0.5	0.32	25
06.03.2023	ED/23/03/2-0173	0.13	<0.6	<0.5	<0.6	0.16	27
09.03.2023	ED/23/03/2-0244	0.08	<0.6	<0.5	<0.5	0.05	20
13.03.2023	ED/23/03/3-0090	0.13	<0.5	<0.5	<0.6	0.15	23
16.03.2023	ED/23/03/3-0153	0.06	<0.5	<0.5	<0.5	0.22	20
20.03.2023	ED/23/03/4-0052	0.12	<0.5	<0.5	<0.5	0.14	24
23.03.2023	ED/23/03/4-0115	0.08	<0.5	<0.5	<0.5	0.24	24
27.03.2023	ED/23/03/5-0050	0.09	<0.5	<0.5	<0.5	0.12	20
30.03.2023	ED/23/04/1-0003	0.11	<0.5	<0.5	<0.5	0.16	21
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

ASSISTANT MANAGER
For Unit Operations
Govt. Analyst / Authorised Signatory

948, 2nd Cross, St. Thomas Town Post, Kammanahalli, Bangalore - 560 084.
Phone : 080-25432969 Tel/fax : 25432968. E-mail : mesblr@gmail.com, www.envtest.in

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ENVIRONMENTAL LABORATORY

(UNIT OF MINERAL ENGINEERING SERVICES)

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TEST REPORT

Table No. 9

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A1 Core zone Within Mineral Block
Duration : 24 Hrs
Issue Date : 10.05.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10}, (µg/m³)	$PM_{2.5}$, (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
04.04.2023	ED/23/04/2-0146	9	11	35	18	<20	<1
07.04.2023	ED/23/04/3-0077	11	13	42	23	<20	<1
11.04.2023	ED/23/04/3-0148	6	9	30	16	<20	<1
14.04.2023	ED/23/04/4-0041	9	11	43	23	<20	<1
18.04.2023	ED/23/04/4-0100	11	13	53	24	<20	<1
21.04.2023	ED/23/04/5-0025	6	9	44	21	<20	<1
25.04.2023	ED/23/04/5-0092	11	12	50	24	<20	<1
28.04.2023	ED/23/05/1-0022	7	9	47	23	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
04.04.2023	ED/23/04/2-0146	0.05	<0.5	<0.5	<0.5	0.21	23
07.04.2023	ED/23/04/3-0077	0.07	<0.5	<0.5	<0.5	0.13	20
11.04.2023	ED/23/04/3-0148	0.05	<0.5	<0.5	<0.5	0.08	23
14.04.2023	ED/23/04/4-0041	0.07	<0.5	<0.5	<0.5	0.07	20
18.04.2023	ED/23/04/4-0100	0.13	<0.5	<0.5	<0.5	0.21	25
21.04.2023	ED/23/04/5-0025	0.06	<0.5	<0.5	<0.5	0.09	21
25.04.2023	ED/23/04/5-0092	0.05	<0.5	<0.5	<0.5	0.32	23
28.04.2023	ED/23/05/1-0022	0.11	<0.5	<0.5	<0.5	0.15	22
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

Govt. Analyst / Authorised Signatory

948, 2nd Cross, St. Thomas Town Post, Kammanahalli, Bangalore - 560 084
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(UNIT OF MINERAL ENGINEERING SERVICES)

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TEST REPORT

Table No. 10

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A2 Sirigao Village
Duration : 24 Hrs
Issue Date : 10.05.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10}, (µg/m³)	$PM_{2.5}$, (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
04.04.2023	ED/23/04/2-0144	11	12	46	21	<20	<1
07.04.2023	ED/23/04/3-0075	9	11	39	25	<20	<1
11.04.2023	ED/23/04/3-0146	7	9	38	18	<20	<1
14.04.2023	ED/23/04/4-0039	9	10	46	22	<20	<1
18.04.2023	ED/23/04/4-0098	10	12	50	27	<20	<1
21.04.2023	ED/23/04/5-0023	7	9	38	19	<20	<1
25.04.2023	ED/23/04/5-0090	11	14	46	24	<20	<1
28.04.2023	ED/23/05/1-0020	6	9	40	22	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
04.04.2023	ED/23/04/2-0144	0.08	<0.5	<0.5	<0.5	0.21	25
07.04.2023	ED/23/04/3-0075	0.06	<0.5	<0.5	<0.5	0.11	22
11.04.2023	ED/23/04/3-0146	0.13	<0.5	<0.5	<0.5	0.08	21
14.04.2023	ED/23/04/4-0039	0.07	<0.5	<0.5	<0.5	0.12	20
18.04.2023	ED/23/04/4-0098	0.09	<0.5	<0.5	<0.5	0.16	22
21.04.2023	ED/23/04/5-0023	0.15	<0.5	<0.5	<0.5	0.31	20
25.04.2023	ED/23/04/5-0090	0.08	<0.5	<0.5	<0.5	0.13	22
28.04.2023	ED/23/05/1-0020	0.05	<0.5	<0.5	<0.5	0.08	24
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

Govt. Analyst / Authorised Signatory

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ENVIRONMENTAL LABORATORY

NABL ISO 45001:2018

(UNIT OF MINERAL ENGINEERING SERVICES)

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TEST REPORT

Table No. 11

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A3, Mulgao village
Duration : 24 Hrs
Issue Date : 10.06.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10}, (µg/m³)	$PM_{2.5}$, (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
04.04.2023	ED/23/04/2-0139	12	14	53	28	<20	<1
07.04.2023	ED/23/04/3-0070	10	12	40	22	<20	<1
11.04.2023	ED/23/04/3-0141	11	13	35	20	<20	<1
14.04.2023	ED/23/04/4-0034	9	11	46	24	<20	<1
18.04.2023	ED/23/04/4-0093	11	12	38	21	<20	<1
21.04.2023	ED/23/04/5-0014	9	11	53	25	<20	<1
25.04.2023	ED/23/04/5-0085	7	9	46	26	<20	<1
28.04.2023	ED/23/05/1-0015	9	11	54	28	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
04.04.2023	ED/23/04/2-0139	0.13	<0.5	<0.5	<0.5	0.25	28
07.04.2023	ED/23/04/3-0070	0.08	<0.5	<0.5	<0.5	0.13	25
11.04.2023	ED/23/04/3-0141	0.05	<0.5	<0.5	<0.5	0.21	27
14.04.2023	ED/23/04/4-0034	0.11	<0.5	<0.5	<0.5	0.31	25
18.04.2023	ED/23/04/4-0093	0.08	<0.5	<0.5	<0.5	0.13	29
21.04.2023	ED/23/04/5-0014	0.13	<0.5	<0.5	<0.5	0.22	20
25.04.2023	ED/23/04/5-0085	0.06	<0.5	<0.5	<0.5	0.16	25
28.04.2023	ED/23/05/1-0015	0.11	<0.5	<0.5	<0.5	0.31	21
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

Govt. Analyst / Authorised Signatory

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TEST REPORT

Table No. 12

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A4, Sircaim village
Duration : 24 Hrs
Issue Date : 10.06.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	PM_{10}, ($\mu g/m^3$)	$PM_{2.5}$, ($\mu g/m^3$)	Ammonia (NH_3), $\mu g/m^3$	Benzene (C_6H_6), $\mu g/m^3$
04.04.2023	ED/23/04/2-0142	8	10	48	25	<20	<1
07.04.2023	ED/23/04/3-0073	11	13	53	26	<20	<1
11.04.2023	ED/23/04/3-0144	6	9	45	26	<20	<1
14.04.2023	ED/23/04/4-0037	9	11	35	19	<20	<1
18.04.2023	ED/23/04/4-0096	10	12	40	24	<20	<1
21.04.2023	ED/23/04/5-0017	9	11	33	16	<20	<1
25.04.2023	ED/23/04/5-0068	9	10	41	22	<20	<1
28.04.2023	ED/23/05/1-0018	7	9	30	18	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), $\mu g/m^3$	Nickel (Ni), ng/m^3	Arsenic (As), ng/m^3	Benzo(a) Pyrene (BaP), ng/m^3	Carbon Monoxide* (CO), mg/m^3	Ozone* (O_3), $\mu g/m^3$
04.04.2023	ED/23/04/2-0142	0.30	<0.5	<0.5	<0.5	0.12	22
07.04.2023	ED/23/04/3-0073	0.24	<0.5	<0.5	<0.5	0.11	24
11.04.2023	ED/23/04/3-0144	0.15	<0.5	<0.5	<0.5	0.12	20
14.04.2023	ED/23/04/4-0037	0.11	<0.5	<0.5	<0.5	0.08	21
18.04.2023	ED/23/04/4-0096	0.08	<0.5	<0.5	<0.5	0.05	20
21.04.2023	ED/23/04/5-0017	0.05	<0.5	<0.5	<0.5	0.11	20
25.04.2023	ED/23/04/5-0068	0.05	<0.5	<0.5	<0.5	0.09	23
28.04.2023	ED/23/05/1-0018	0.20	<0.5	<0.5	<0.5	0.12	26
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

Govt. Analyst / Authorised Signatory

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TEST REPORT

Table No. 13

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Singao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A5, Calvim village
Duration : 24 Hrs
Issue Date : 10.06.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10}, (µg/m³)	$PM_{2.5}$, (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
03.04.2023	ED/23/04/2-0123	7	11	46	29	<20	<1
06.04.2023	ED/23/04/2-0186	11	16	40	19	<20	<1
10.04.2023	ED/23/04/3-0121	9	12	39	17	<20	<1
13.04.2023	ED/23/04/3-0192	7	10	36	18	<20	<1
17.04.2023	ED/23/04/4-0077	8	10	40	26	<20	<1
20.04.2023	ED/23/04/4-0139	10	11	44	25	<20	<1
24.04.2023	ED/23/04/5-0085	7	12	35	25	<20	<1
27.04.2023	ED/23/04/5-0136	12	15	31	17	<20	<1
Limits for Industrial, Residential, Rural and other Areas		50 24 Hrs	50 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
03.04.2023	ED/23/04/2-0123	0.12	<0.5	<0.5	<0.5	0.11	20
06.04.2023	ED/23/04/2-0186	0.06	<0.5	<0.5	<0.5	0.13	23
10.04.2023	ED/23/04/3-0121	0.08	<0.5	<0.5	<0.5	0.14	21
13.04.2023	ED/23/04/3-0192	0.08	<0.5	<0.5	<0.5	0.24	24
17.04.2023	ED/23/04/4-0077	0.11	<0.5	<0.5	<0.5	0.11	25
20.04.2023	ED/23/04/4-0139	0.05	<0.5	<0.5	<0.5	0.19	22
24.04.2023	ED/23/04/5-0085	0.08	<0.5	<0.5	<0.5	0.11	22
27.04.2023	ED/23/04/5-0136	0.09	<0.5	<0.5	<0.5	0.24	23
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

Govt. Analyst / Authorised Signatory

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ISO 45001:2018

TEST REPORT

Table No. 14

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A6, Sinquirem wada
Duration : 24 Hrs
Issue Date : 10.05.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
04.04.2023	ED/23/04/2-0149	12	14	48	35	<20	<1
07.04.2023	ED/23/04/3-0079	9	11	41	21	<20	<1
11.04.2023	ED/23/04/3-0150	6	9	43	18	<20	<1
14.04.2023	ED/23/04/4-0043	9	11	44	23	<20	<1
18.04.2023	ED/23/04/4-0102	10	12	33	15	<20	<1
21.04.2023	ED/23/04/5-0027	9	12	30	16	<20	<1
25.04.2023	ED/23/04/5-0094	7	11	42	23	<20	<1
28.04.2023	ED/23/05/1-0024	11	13	40	19	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
04.04.2023	ED/23/04/2-0149	0.06	<0.5	<0.6	<0.5	0.13	22
07.04.2023	ED/23/04/3-0079	0.05	<0.5	<0.5	<0.5	0.11	20
11.04.2023	ED/23/04/3-0150	0.11	<0.5	<0.5	<0.5	0.05	22
14.04.2023	ED/23/04/4-0043	0.08	<0.5	<0.5	<0.5	0.13	23
18.04.2023	ED/23/04/4-0102	0.07	<0.5	<0.5	<0.5	0.06	21
21.04.2023	ED/23/04/5-0027	0.05	<0.5	<0.5	<0.5	0.13	20
25.04.2023	ED/23/04/5-0094	0.08	<0.5	<0.6	<0.5	0.11	23
28.04.2023	ED/23/05/1-0024	0.13	<0.5	<0.5	<0.5	0.22	24
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

Govt. Analyst / Authorised Signatory

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ISO 45001:2018

TEST REPORT

Table No. 15

AMBIENT AIR QUALITY

Client : Selgeocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A7, Advalpale Village
Duration : 24 Hrs
Issue Date : 10.06.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10}, (µg/m³)	$PM_{2.5}$, (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
01.04.2023	ED/23/04/2-0102	7	10	40	24	<20	<1
05.04.2023	ED/23/04/2-0161	9	12	42	22	<20	<1
08.04.2023	ED/23/04/3-0095	6	9	40	26	<20	<1
12.04.2023	ED/23/04/3-0167	8	10	38	19	<20	<1
15.04.2023	ED/23/04/4-0056	9	11	36	18	<20	<1
19.04.2023	ED/23/04/4-0115	7	9	41	25	<20	<1
21.04.2023	ED/23/04/5-0020	9	10	33	18	<20	<1
26.04.2023	ED/23/04/5-0111	6	12	39	19	<20	<1
29.04.2023	ED/23/05/1-0037	<4	11	42	23	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
01.04.2023	ED/23/04/2-0102	0.05	<0.5	<0.5	<0.5	0.21	22
05.04.2023	ED/23/04/2-0161	0.11	<0.5	<0.5	<0.5	0.13	27
08.04.2023	ED/23/04/3-0096	0.06	<0.5	<0.5	<0.5	0.22	20
12.04.2023	ED/23/04/3-0167	0.15	<0.5	<0.5	<0.5	0.11	21
15.04.2023	ED/23/04/4-0056	0.07	<0.5	<0.5	<0.5	0.05	21
19.04.2023	ED/23/04/4-0115	0.09	<0.5	<0.5	<0.5	0.12	22
21.04.2023	ED/23/04/5-0020	0.05	<0.5	<0.5	<0.5	0.11	23
26.04.2023	ED/23/04/5-0111	0.07	<0.5	<0.5	<0.5	0.26	24
29.04.2023	ED/23/05/1-0037	0.05	<0.5	<0.5	<0.5	0.24	20
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

Govt. Analyst / Authorised Signatory

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(UNIT OF MINERAL ENGINEERING SERVICES)

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ISO 45001:2018

TEST REPORT

Table No. 16

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Singao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A8, Lamgao Village
Duration : 24 Hrs
Issue Date : 10.05.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
03.04.2023	EDV23/04/2-0120	7	13	43	20	<20	<1
06.04.2023	EDV23/04/2-0183	8	10	38	20	<20	<1
10.04.2023	EDV23/04/3-0118	11	12	40	21	<20	<1
13.04.2023	EDV23/04/3-0189	10	11	42	20	<20	<1
17.04.2023	EDV23/04/4-0074	7	9	39	15	<20	<1
20.04.2023	EDV23/04/4-0136	11	13	31	20	<20	<1
24.04.2023	EDV23/04/5-0082	9	10	40	25	<20	<1
27.04.2023	EDV23/04/5-0133	10	11	39	20	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
03.04.2023	EDV23/04/2-0120	0.06	<0.5	<0.5	<0.5	0.16	26
06.04.2023	EDV23/04/2-0183	0.15	<0.5	<0.5	<0.5	0.24	20
10.04.2023	EDV23/04/3-0118	0.05	<0.5	<0.5	<0.5	0.16	21
13.04.2023	EDV23/04/3-0189	0.05	<0.5	<0.5	<0.5	0.27	24
17.04.2023	EDV23/04/4-0074	0.07	<0.5	<0.5	<0.5	0.11	21
20.04.2023	EDV23/04/4-0136	0.08	<0.5	<0.5	<0.5	0.16	22
24.04.2023	EDV23/04/5-0082	0.08	<0.5	<0.5	<0.5	0.18	21
27.04.2023	EDV23/04/5-0133	0.09	<0.5	<0.5	<0.5	0.19	24
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

Govt. Analyst / Authorised Signatory

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TEST REPORT

Table No. 17

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A1 Core zone Within Mineral Block
Duration : 24 Hrs
Issue Date : 10.05.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	Ammonia (NH_3), $\mu g/m^3$	Benzene (C_6H_6), $\mu g/m^3$
02.05.2023	EDI/23/05/1-0081	8	11	38	24	<20	<1
05.05.2023	EDI/23/05/2-0293	7	12	49	22	<20	<1
09.05.2023	EDI/23/05/2-0364	9	11	35	20	<20	<1
12.05.2023	EDI/23/05/3-0273	10	12	46	33	<20	<1
16.05.2023	EDI/23/05/3-0344	8	14	35	16	<20	<1
19.05.2023	EDI/23/05/4-0336	7	13	40	24	<20	<1
23.05.2023	EDI/23/05/4-0395	9	10	37	17	<20	<1
26.05.2023	EDI/23/05/5-0113	10	16	39	22	<20	<1
30.05.2023	EDI/23/06/1-0120	7	13	35	19	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), $\mu g/m^3$	Nickel (Ni), ng/m^3	Arsenic (As), ng/m^3	Benzo(a) Pyrene (BaP), ng/m^3	Carbon Monoxide* (CO), mg/m^3	Ozone* (O_3), $\mu g/m^3$
02.05.2023	EDI/23/05/1-0081	0.12	<0.5	<0.5	<0.5	0.25	24
05.05.2023	EDI/23/05/2-0293	0.07	<0.5	<0.5	<0.5	0.45	20
09.05.2023	EDI/23/05/2-0364	0.11	<0.5	<0.5	<0.5	0.35	21
12.05.2023	EDI/23/05/3-0273	0.06	<0.5	<0.5	<0.5	0.24	20
16.05.2023	EDI/23/05/3-0344	0.12	<0.5	<0.5	<0.5	0.22	21
19.05.2023	EDI/23/05/4-0336	0.05	<0.5	<0.5	<0.5	0.06	25
23.05.2023	EDI/23/05/4-0395	0.07	<0.5	<0.5	<0.5	0.11	22
26.05.2023	EDI/23/05/5-0113	0.15	<0.5	<0.5	<0.5	0.29	24
30.05.2023	EDI/23/06/1-0120	0.16	<0.5	<0.5	<0.5	0.33	20
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

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ISO 45001:2018

TEST REPORT

Table No. 18

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A2 Sirigao Village
Duration : 24 Hrs
Issue Date : 10.06.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10}, (µg/m³)	$PM_{2.5}$, (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
02.05.2023	EDI/23/05/1-0079	9	12	48	24	<20	<1
05.05.2023	EDI/23/05/2-0291	12	13	46	20	<20	<1
09.05.2023	EDI/23/05/2-0362	8	15	47	23	<20	<1
12.05.2023	EDI/23/05/3-0271	9	14	40	26	<20	<1
16.05.2023	EDI/23/05/3-0342	10	13	45	27	<20	<1
19.05.2023	EDI/23/05/4-0334	12	16	43	25	<20	<1
23.05.2023	EDI/23/05/4-0393	8	13	48	21	<20	<1
26.05.2023	EDI/23/05/5-0111	10	15	45	20	<20	<1
30.05.2023	EDI/23/06/1-0118	6	12	42	26	<20	<1
Limits for Industrial, Residential, Rural and other Areas		**80** 24 Hrs	**80** 24 Hrs	**100** 24 Hrs	**60** 24 Hrs	**400** 24 Hrs	**5** Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
02.05.2023	EDI/23/05/1-0079	0.05	<0.5	<0.5	<0.5	0.24	23
05.05.2023	EDI/23/05/2-0291	0.17	<0.5	<0.5	<0.5	0.26	24
09.05.2023	EDI/23/05/2-0362	0.11	<0.5	<0.5	<0.5	0.34	28
12.05.2023	EDI/23/05/3-0271	0.05	<0.5	<0.5	<0.5	0.18	20
16.05.2023	EDI/23/05/3-0342	0.16	<0.5	<0.5	<0.5	0.06	21
19.05.2023	EDI/23/05/4-0334	0.11	<0.5	<0.5	<0.5	0.18	20
23.05.2023	EDI/23/05/4-0393	0.08	<0.5	<0.5	<0.5	0.05	26
26.05.2023	EDI/23/05/5-0111	0.12	<0.5	<0.5	<0.5	0.11	23
30.05.2023	EDI/23/06/1-0118	0.05	<0.5	<0.5	<0.5	0.09	21
Limits for Industrial, Residential, Rural and other Areas		**1.0** 24 Hrs	**20** Annual	**6** Annual	**1** Annual	**4** 1 Hr	**180** 1 Hr

Note : * Parameters monitored for period of 1 hr

Govt Analyst / Authorised Signatory

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ISO 45001:2018

TEST REPORT

Table No. 19

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station al & Code : A3, Mulgao village
Duration : 24 Hrs
Issue Date : 10.06.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
02.05.2023	EDV23/05/1-0074	11	13	56	29	<20	<1
05.05.2023	EDV23/05/2-0286	8	11	53	27	<20	<1
09.05.2023	EDV23/05/2-0357	10	14	47	31	<20	<1
12.05.2023	EDV23/05/3-0266	12	13	37	19	<20	<1
16.05.2023	EDV23/05/3-0337	10	14	53	28	<20	<1
19.05.2023	EDV23/05/4-0329	9	13	48	25	<20	<1
23.05.2023	EDV23/05/4-0388	11	11	40	26	<20	<1
26.05.2023	EDV23/05/5-0106	7	11	43	34	<20	<1
30.05.2023	EDV23/06/1-0113	10	12	42	18	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
02.05.2023	EDV23/05/1-0074	0.18	<0.5	<0.5	<0.5	0.33	22
05.05.2023	EDV23/05/2-0286	0.13	<0.5	<0.5	<0.5	0.28	26
09.05.2023	EDV23/05/2-0357	0.22	<0.5	<0.5	<0.5	0.44	27
12.05.2023	EDV23/05/3-0266	0.22	<0.5	<0.5	<0.5	0.35	28
16.05.2023	EDV23/05/3-0337	0.16	<0.5	<0.5	<0.5	0.19	26
19.05.2023	EDV23/05/4-0329	0.15	<0.5	<0.5	<0.5	0.25	24
23.05.2023	EDV23/05/4-0388	0.22	<0.5	<0.5	<0.5	0.16	21
26.05.2023	EDV23/05/5-0106	0.16	<0.5	<0.5	<0.5	0.17	22
30.05.2023	EDV23/06/1-0113	0.11	<0.5	<0.5	<0.5	0.16	26
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

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TEST REPORT

Table No. 20

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A4, Sircaim village
Duration : 24 Hrs
Issue Date : 10.06.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10}, (µg/m³)	$PM_{2.5}$, (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
02.05.2023	EDI/23/05/1-0077	8	13	48	25	<20	<1
05.05.2023	EDI/23/05/2-0288	11	14	38	15	<20	<1
09.05.2023	EDI/23/05/2-0360	6	12	45	29	<20	<1
12.05.2023	EDI/23/05/3-0289	12	13	46	30	<20	<1
16.05.2023	EDI/23/05/3-0340	8	12	30	19	<20	<1
19.05.2023	EDI/23/05/4-0332	6	9	49	20	<20	<1
23.05.2023	EDI/23/05/4-0391	8	12	36	27	<20	<1
26.05.2023	EDI/23/05/5-0109	11	13	48	29	<20	<1
30.05.2023	EDI/23/05/1-0116	7	10	50	30	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
02.05.2023	EDI/23/05/1-0077	0.09	<0.5	<0.5	<0.5	0.07	23
05.05.2023	EDI/23/05/2-0288	0.05	<0.5	<0.5	<0.5	0.24	23
09.05.2023	EDI/23/05/2-0360	0.11	<0.5	<0.5	<0.5	0.12	23
12.05.2023	EDI/23/05/3-0289	0.09	<0.5	<0.5	<0.5	0.14	20
16.05.2023	EDI/23/05/3-0340	0.13	<0.5	<0.5	<0.5	0.21	20
19.05.2023	EDI/23/05/4-0332	0.09	<0.5	<0.5	<0.5	0.11	21
23.05.2023	EDI/23/05/4-0391	0.15	<0.5	<0.5	<0.5	0.16	22
26.05.2023	EDI/23/05/5-0109	0.11	<0.5	<0.5	<0.5	0.22	26
30.05.2023	EDI/23/05/1-0116	0.06	<0.5	<0.5	<0.5	0.30	20
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

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TEST REPORT

Table No. 21

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A5, Calwim village
Duration : 24 Hrs
Issue Date : 10.06.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10}, (µg/m³)	$PM_{2.5}$, µg/m³	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
01.05.2023	ED/23/05/1-0058	8	13	39	16	<20	<1
04.05.2023	ED/23/05/1-0121	11	10	38	27	<20	<1
08.05.2023	ED/23/05/2-0337	10	11	44	25	<20	<1
11.05.2023	ED/23/05/2-0404	11	17	42	22	<20	<1
15.05.2023	ED/23/05/3-0317	8	15	48	24	<20	<1
18.05.2023	ED/23/05/3-0388	10	13	38	17	<20	<1
22.05.2023	ED/23/05/4-0372	8	12	43	25	<20	<1
25.05.2023	ED/23/05/4-0435	11	12	41	28	<20	<1
29.05.2023	ED/23/05/5-0157	7	10	39	21	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
01.05.2023	ED/23/05/1-0058	0.14	<0.5	<0.5	<0.5	0.34	26
04.05.2023	ED/23/05/1-0121	0.13	<0.5	<0.5	<0.5	0.29	27
08.05.2023	ED/23/05/2-0337	0.22	<0.5	<0.5	<0.5	0.44	26
11.05.2023	ED/23/05/2-0404	0.16	<0.5	<0.5	<0.5	0.29	24
15.05.2023	ED/23/05/3-0317	0.17	<0.5	<0.5	<0.5	0.36	22
18.05.2023	ED/23/05/3-0388	0.15	<0.5	<0.5	<0.5	0.44	29
22.05.2023	ED/23/05/4-0372	0.13	<0.5	<0.5	<0.5	0.25	23
25.05.2023	ED/23/05/4-0435	0.22	<0.6	<0.6	<0.6	0.18	24
29.05.2023	ED/23/05/5-0157	0.18	<0.5	<0.5	<0.5	0.22	22
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

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ENVIRONMENTAL LABORATORY

(UNIT OF MINERAL ENGINEERING SERVICES)

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TEST REPORT

Table No. 22

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A5, Sinquirem wada
Duration : 24 Hrs
Issue Date : 10.06.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
02.05.2023	ED/23/05/1-0053	10	14	40	27	<20	<1
05.05.2023	ED/23/05/2-0295	10	15	38	22	<20	<1
09.05.2023	ED/23/05/2-0386	12	21	43	27	<20	<1
12.05.2023	ED/23/05/3-0275	8	17	40	26	<20	<1
16.05.2023	ED/23/05/3-0346	10	13	45	35	<20	<1
19.05.2023	ED/23/05/4-0338	9	15	45	27	<20	<1
23.05.2023	ED/23/05/4-0397	10	19	42	20	<20	<1
26.05.2023	ED/23/05/5-0115	7	11	46	25	<20	<1
30.05.2023	ED/23/05/1-0122	6	14	40	23	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
02.05.2023	ED/23/05/1-0053	0.05	<0.5	<0.5	<0.5	0.24	25
05.05.2023	ED/23/05/2-0295	0.15	<0.5	<0.5	<0.5	0.16	23
09.05.2023	ED/23/05/2-0386	0.06	<0.5	<0.5	<0.5	0.05	24
12.05.2023	ED/23/05/3-0275	0.11	<0.5	<0.5	<0.5	0.16	26
16.05.2023	ED/23/05/3-0346	0.05	<0.5	<0.5	<0.5	0.12	28
19.05.2023	ED/23/05/4-0338	0.11	<0.5	<0.5	<0.5	0.25	21
23.05.2023	ED/23/05/4-0397	0.12	<0.5	<0.5	<0.5	0.34	20
26.05.2023	ED/23/05/5-0115	0.06	<0.5	<0.5	<0.5	0.22	23
30.05.2023	ED/23/05/1-0122	0.05	<0.5	<0.5	<0.5	0.33	26
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

Govt. Analyst / Authorised Signatory

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TEST REPORT

Table No. 23

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A7, Advalpale Village
Duration : 24 Hrs
Issue Date : 10.06.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10}, (µg/m³)	$PM_{2.5}$, (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
03.05.2023	ED/23/05/1-0096	6	11	39	19	<20	<1
06.05.2023	ED/23/05/2-0312	8	13	48	26	<20	<1
10.05.2023	ED/23/05/2-0383	6	12	45	25	<20	<1
13.05.2023	ED/23/05/3-0292	7	9	47	29	<20	<1
17.05.2023	ED/23/05/3-0363	8	14	40	22	<20	<1
20.05.2023	ED/23/05/4-0351	6	9	44	22	<20	<1
24.05.2023	ED/23/05/4-0410	7	13	39	26	<20	<1
27.05.2023	ED/23/05/5-0132	8	11	54	27	<20	<1
31.05.2023	ED/23/06/1-0139	6	12	36	20	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
03.05.2023	ED/23/05/1-0096	0.06	<0.5	<0.5	<0.5	0.15	21
06.05.2023	ED/23/05/2-0312	0.16	<0.5	<0.5	<0.5	0.08	20
10.05.2023	ED/23/05/2-0383	0.12	<0.5	<0.5	<0.5	0.14	22
13.05.2023	ED/23/05/3-0292	0.12	<0.5	<0.5	<0.5	0.23	22
17.05.2023	ED/23/05/3-0363	0.25	<0.5	<0.5	<0.5	0.32	24
20.05.2023	ED/23/05/4-0351	0.16	<0.5	<0.5	<0.5	0.11	24
24.05.2023	ED/23/05/4-0410	0.17	<0.5	<0.5	<0.5	0.21	<20
27.05.2023	ED/23/05/5-0132	0.09	<0.5	<0.5	<0.5	0.30	21
31.05.2023	ED/23/06/1-0139	0.05	<0.5	<0.5	<0.5	0.15	<20
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

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TEST REPORT

Table No. 24

AMBIENT AIR QUALITY

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Station at & Code : A3, Lamgao Village
Duration : 24 Hrs
Issue Date : 10.06.2023
Reference IS 5182

Date of Sampling	Lab Code	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10}, (µg/m³)	$PM_{2.5}$, (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
01.05.2023	ED/23/05/1-0055	11	12	41	23	<20	<1
04.05.2023	ED/23/05/1-0118	8	11	43	27	<20	<1
08.05.2023	ED/23/05/2-0334	10	13	36	22	<20	<1
11.05.2023	ED/23/05/2-0401	7	9	39	20	<20	<1
15.05.2023	ED/23/05/3-0314	10	11	42	21	<20	<1
18.05.2023	ED/23/05/3-0385	8	10	38	25	<20	<1
22.05.2023	ED/23/05/4-0389	7	12	30	16	<20	<1
25.05.2023	ED/23/05/4-0432	10	10	36	20	<20	<1
29.05.2023	ED/23/05/5-0154	9	14	39	20	<20	<1
Limits for Industrial, Residential, Rural and other Areas		80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Lab Code	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a) Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
01.05.2023	ED/23/05/1-0055	0.22	<0.5	<0.5	<0.5	0.16	26
04.05.2023	ED/23/05/1-0118	0.23	<0.5	<0.5	<0.5	0.22	22
08.05.2023	ED/23/05/2-0334	0.18	<0.5	<0.5	<0.5	0.17	28
11.05.2023	ED/23/05/2-0401	0.24	<0.5	<0.5	<0.5	0.22	26
15.05.2023	ED/23/05/3-0314	0.23	<0.5	<0.5	<0.5	0.32	22
18.05.2023	ED/23/05/3-0385	0.16	<0.5	<0.5	<0.5	0.19	24
22.05.2023	ED/23/05/4-0389	0.24	<0.5	<0.5	<0.5	0.24	28
25.05.2023	ED/23/05/4-0432	0.22	<0.5	<0.5	<0.5	0.31	26
29.05.2023	ED/23/05/5-0154	0.16	<0.5	<0.5	<0.5	0.27	27
Limits for Industrial, Residential, Rural and other Areas		1.0 24 Hrs	20 Annual	5 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for period of 1 hr

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ISO 45001:2018

TEST REPORT

Table No. 25

STATISTICAL AMBIENT AIR QUALITY DATA

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Season : Summer Season, 2023 (March to May, 2023)

Station Code : A1 Core zone Within Mineral Block					A2 Sirigao Village				A3, Mulgao village			
	SO_2	NO_2	PM_{10}	$PM_{2.5}$	SO_2	NO_2	PM_{10}	$PM_{2.5}$	SO_2	NO_2	PM_{10}	$PM_{2.5}$
Min.	6	9	30	16	6	9	33	16	7	9	35	18
10%	7	9	31	18	6	9	36	17	8	11	38	20
25%	7	11	35	19	7	10	40	20	9	11	40	23
50%	9	12	38	22	9	12	44	23	10	13	46	26
75%	10	13	44	24	10	13	48	25	11	14	52	28
98%	13	17	52	31	12	16	50	27	13	17	55	33
Max.	13	18	53	33	12	16	50	27	13	18	56	34
Avg.	9	12	39	22	9	12	43	22	10	13	46	25
SD	2	2	6	4	2	2	5	4	2	2	6	4
No. of obs	26				26				26			

Station Code : A4, Siregaire village					A5, Colvim village				A6, Siregaireem wada			
	SO_2	NO_2	PM_{10}	$PM_{2.5}$	SO_2	NO_2	PM_{10}	$PM_{2.5}$	SO_2	NO_2	PM_{10}	$PM_{2.5}$
Min.	6	9	30	15	6	<9	29	15	6	9	30	15
10%	7	9	34	19	7	10	30	16	7	11	38	19
25%	8	10	40	21	7	11	35	17	9	11	40	22
50%	9	12	46	24	9	12	38	20	10	13	42	23
75%	10	13	49	26	11	13	41	25	10	14	46	26
98%	12	15	53	31	12	17	47	29	12	20	52	35
Max.	12	16	53	31	12	17	48	29	12	21	53	35
Avg.	9	12	44	24	9	12	38	21	9	13	42	24
SD	2	2	7	4	2	2	5	4	2	3	5	5
No. of obs	26				26				26			

Station Code : A7, Advalpale Village					A8, Lamgao Village			
	SO_2	NO_2	PM_{10}	$PM_{2.5}$	SO_2	NO_2	PM_{10}	$PM_{2.5}$
Min.	<4	9	33	16	6	9	30	15
10%	6	9	36	18	7	9	33	18
25%	6	9	38	19	8	10	36	20
50%	7	11	40	23	9	11	38	20
75%	8	12	43	25	10	13	41	23
98%	9	14	52	28	11	16	43	27
Max.	9	14	54	29	11	17	43	27
Avg.	7	11	41	22	9	12	38	21
SD	1	2	5	3	2	2	4	3
No. of obs	26				26			

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TEST REPORT

Table No. 26

Analysis Report of Free Silica (Quartz)

Client : Salgaocar Shipping Company Private Limited

Projec : Block - II, Sirigao - Mayem Mineral Block , Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa

Sample Collected by : Environmental Laboratory Representative

Issue Date : 10.06.2023

Test Method Reference : NIOSH 7601

Sl No.	Location	Date of Sampling	Free Silica Content (%)	Free Silica Limits (%)
2	Core zone Within Mineral Block	02.05.2023	ND	5
1	Sirigao Village	02.05.2023	ND	5
3	Calvim village	04.05.2023	ND	5
4	Mulgao village	09.05.2023	ND	5
5	Sircaim village	09.05.2023	ND	5
6	Advalpale Village	10.05.2023	ND	5
7	Lamgao Village	11.05.2023	ND	5
8	Sinquirem wada	12.05.2023	ND	5

Note: ND-Not Detected, Detection Level : 0.0005%

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M.Sc. Chemist
Govt. Analyst / Authorised Signatory

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TEST REPORT

Table No 27

NOISE LEVEL DATA

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative
Season : Summer, 2023
Issue Date : 06.06.2023

Code No.	Date of Monitoring	Monitoring stations	Area	Day			Night		
				L_{min}	L_{eq}	L_{max}	L_{min}	L_{eq}	L_{max}
N1	04.04.2023	Core zone Within Mineral Block	Industrial areas	36.5	46.0	49.8	34.8	38.7	42.8
N2	04.04.2023	Sirigao Village	Industrial areas	37.6	46.3	54.0	34.9	44.9	53.6
N3	06.04.2023	Lamgao Village	Residential area	38.9	48.3	55.6	34.0	35.9	38.0
N4	10.04.2023	Mulgao village	Commercial area	50.5	61.2	67.5	34.8	39.6	43.5
N5	11.04.2023	Corjuem village	Residential area	36.0	44.5	49.5	34.8	38.0	40.6
N6	13.04.2023	Sircaim village	Residential area	41.6	50.4	53.6	34.8	40.0	44.5
N7	17.04.2023	Calvim village	Residential area	37.0	46.0	52.8	34.8	39.0	42.0
N8	25.04.2023	Sinquirem wada	Residential area	37.0	45.4	52.6	34.8	39.0	42.5
N9	28.04.2023	Assonara Village	Commercial area	39.5	49.8	56.0	34.8	41.5	47.5

Permissible Limits of Ambient Noise Levels as per CPCB Guidelines

	Leq. Limit dB(A)	
	Day	Night
Industrial areas	75	70
commercial area	65	55
Residential area	55	45
Silence area	50	40

ASSOCIATE DIRECTOR
Dy. Chief Chemist
Govt. Analyst / Authorised Signatory

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TEST REPORT

Table No. 29

Name of the Client	:	Salgaocar Shipping Company Private Limited
Name of the Project	:	Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by	:	Environmental Laboratory Representative
Date of sampling	:	29.05.2023
Issue Date	:	12.06.2023
Ref:IS : 2296, 1982 Class C Norms (Stream Water Standards)		

Sl.No.	Lab Code / Parameters	EDV2305/1-018 SW1	EDV2306/1-022 SW2	EDV2306/1-0019 SW3	Limits For Stream Water Standards	Method of Testing
1	Colour (Hazen Units) Max	10	20	<5	300	IS:3025(Part-4)2021
2	pH	7.15	8.07	6.77	6.5 to 8.5	IS:3025(Part-11)2022
3	Dissolved Oxygen (as O_2), mg/l, Min	5.6	5.8	5.6	4	IS:3025(Part-38)1989 RA 2019
4	Oil and grease, mg/l, Max	<0.1	<0.1	<0.1	0.1	IS:3025(Part-39) 2021
5	Total Dissolved Solids (mg/l), Max	35650	52	210	1500	IS:3025(Part-16)2023
6	Nitrates (as NO_3),mg/l, Max	0.7	0.1	0.1	50	IS:3025(Part-34)1988 RA 2019
7	Anionic detergents (as MBAS),mg/l, Max	<0.1	<0.1	<0.1	1.0	IS:3025(Part-65)
8	Copper (as Cu),mg/l, Max	<0.005	<0.005	0.007	1.5	IS:3025(Part-42) 2019
9	Chloride (as Cl),mg/l, Max	1805.7	10.09	152.8	600	IS:3025(Part 32) :1988RA2019
10	Fluoride (as F),mg/l, Max	0.30	<0.1	<0.1	1.5	APHA 23rd Edition 4500F
11	Iron (as Fe),mg/l, Max	0.05	0.06	<0.005	50	IS:3025(P-2) 2019
12	Phenolic compounds (as C_6H_5OH),mg/l, Max	<0.001	<0.001	<0.001	0.005	IS:3025(P-43)Sec 1 2022
13	Selenium (as Se), mg/l, Max	<0.005	<0.005	<0.005	0.05	IS.3025(P-2) 2019
14	Sulphates as SO_4 (mg/l), Max	1980.0	<1	12.8	400	IS:3025(P-24)Sec 1 2022
15	Zinc (as Zn),mg/l, Max	0.010	<0.005	<0.005	15	IS.3025(P-2) 2019
16	Cadmium (as Cd), mg/l, Max	<0.001	<0.001	<0.001	0.001	IS:3025(P-2) 2019
17	Cyanides (as CN), mg/l, Max	<0.01	<0.01	<0.01	0.05	IS.3025(P-27) Sec 1 2021
18	Lead (as Pb) mg/l, max	<0.005	<0.005	<0.005	0.1	IS.3025(P-2) 2019
19	Total Arsenic as As (mg/l), Max	<0.002	<0.002	<0.002	0.2	IS.3025(P-2) 2019
20	Chromium (as Cr^{+6}), mg/l, max	<0.03	<0.03	<0.03	0.05	IS:3025(P-52) 2014
21	Biochemical Oxygen Demand (as O_2), mg/l	<3	<3	<3	3	IS.3025(P-44) 2014
22	Total Coliform (mpn/100ml)	2	2	7	5000	IS:1622:2009
23	Total Suspended Solids (mg/l)	12	14	16	-	IS:3025(P-17) 2023
24	Total Hardness (as $CaCO_3$),mg/l	600	36	140	-	IS:3025(P-21) 2014
25	Chemical Oxygen Demand (COD) mg/l	48	16	27	-	IS.3025(P-58) 2017

SAMPLE CODE :

SW1 - Culvert Near Chimulwada, Mayem village

SW2 - Mayem Lake

SW3 -Thivim nallah water

Govt. Analyst / Authorised Signatory

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TEST REPORT

Table No. 29

Name of the Client	:	Salgaocar Shipping Company Private Limited
Name of the Project	:	Block -II, Sirigao - Mayem Mineral Block. Sirigao & Mayem Villages, Bicholim Taluka, North Goa, Goa
Sample Collected by	:	Environmental Laboratory Representative
Date of sampling	:	29.05.2023
Issue Date	:	12.06.2023

Ref:IS : 2296, 1982 Class C Norms (Stream Water Standards)

Sl.No.	Parameters	Lab Code: EL/23/06/1-020 — SW4	Lab Code: EL/23/06/1-021 — SW5	Limits For Stream Water Standards	Method of Testing
1	Colour (Hazen Units) Max	<5	<5	300	IS:3025(Part-4)2021
2	pH	7.02	6.99	6.5 to 8.5	IS 3025(Part-11)2022
3	Dissolved Oxygen (as O_2), mg/l, Min	6.2	6.3	4	IS:3025(Part-38)1989 RA 2019
4	Oil and grease, mg/l, Max	<0.1	<0.1	0.1	IS:3025(Part-39) 2021
5	Total Dissolved Solids (mg/l), Max	9550	10950	1500	IS:3025(Part-16)2023
6	Nitrate (as NO_3),mg/l, Max	<0.1	0.2	50	IS:3025(Part-34)1988 RA 2019
7	Anionic detergents (as MBAS),mg/l, Max	<0.1	<0.1	1.0	IS:3025(Part-65)
8	Copper (as Cu),mg/l, Max	<0.005	<0.005	1.5	IS:3025(Part-42) 2019
9	Chloride (as Cl),mg/l, Max	1657.7	3660.0	600	IS:3025(Part-32) 1988RA2019
10	Fluoride (as F),mg/l, Max	0.30	0.40	1.5	APHA 23rd Edition 4500F
11	Iron (as Fe),mg/l, Max	0.064	0.06	50	IS:3025(P-2) 2019
12	Phenolic compounds (as C_6H_5OH),mg/l, Max	<0.001	<0.001	0.005	IS:3025(P-43)Sec 1 2022
13	Selenium (as Se), mg/l, Max	<0.005	<0.005	0.05	IS 3025(P-2) 2019
14	Sulphates as SO_4,(mg/l), Max	360.0	530.0	400	IS:3025(P-24)Sec 1 2022
15	Zinc (as Zn),mg/l, Max	<0.005	<0.005	15	IS:3025(P-2) 2019
16	Cadmium (as Cd), mg/l, Max	<0.001	<0.001	0.001	IS 3025(P-2) 2019
17	Cyanides (as CN), mg/l, Max	<0.01	<0.01	0.05	IS:3025(P-27) Sec 12021
18	Lead (as Pb) mg/l, max	<0.005	<0.005	0.1	IS:3025(P-2) 2019
19	Total Arsenic as As (mg/l), Max	<0.002	<0.002	0.2	IS:3025(P-2) 2019
20	Chromium (as Cr^{+6}), mg/l, max	<0.03	<0.09	0.05	IS:3025(P-52) 2014
21	Biochemical Oxygen Demand (as O_2), mg/l	<3	<3	3	IS:3025(P-44) 2014
22	Total Coliform (mpn/100ml)	5	8	5000	IS 1622:2008
23	Total Suspended Solids (mg/l)	12	16	-	IS:3025(P-17) 2023
24	Total Hardness (as $CaCO_3$),mg/l	3630	3300	-	IS:3025(P-21) 2014
25	Chemical Oxygen Demand (COD) mg/l	32	36	-	IS:3025(P-58) 2017

SAMPLE CODE :

SW4 – Assonora River up stream water

SW5 – Assonora River Down stream water

ARSHTA KOUSAR
Dy. Chief Chemist

Govt. Analyst / Authorised Signatory

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Note : This report is subject to the terms and conditions mentioned overleaf

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ENVIRONMENTAL LABORATORY

(UNIT OF MINERAL ENGINEERING SERVICES)

ISO 45001:2018

Recognised by BIS, FSSAI, ISO:45001:2018 Certified Laboratory
Recognised by MoEFCC(CPCB) under E(P) Act 1986 & recognition is valid upto 23.05.2025

TEST REPORT

Table No. 30

Name of the Client : Salgaocar Shipping Company Private Limited
Name of the Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa,Goa
Sample Collected by : Environmental Laboratory Representative
Date of sample collection : 29.06.2023
Issue Date : 10.06.2023
Ref : IS:10500-2012 Norms Amendment - 4 (Drinking Water Standards)

Sl No.	Lab Code / Parameters	EW/23/06/1-0010	EW/23/06/1-0005	EW/23/06/1-011	Desirable Limits	Permissible Limits	Method of Testing
		Result					
		GW1	GW2	GW3			
1	Colour (Hazen Units), Max	<5	<5	<5	5	15	IS:3025 (P-4):2021
2	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5):2018
3	pH	6.77	6.06	6.85	6.5 to 8.5	6.5 - 8.5	IS:3025 (P-11):2022
4	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P- 8) 1984 RA 2017
5	Turbidity,NTU, Max	0.9	5.0	<0.1	1	5	IS:3025 (P-10) 1984 RA 2017
6	Electrical Conductivity (µmhos/cm)	1240	105.0	82.0	-	-	IS 3025 (P-14)
7	Total Dissolved Solids,mg/l, Max	75	35	48.0	500	2000	IS:3025 (Part-16):1984 RA2017
8	Temperature °C	25	25	25.0	-	-	IS 3025 (P-9)
9	Aluminium (as Al), Max	<0.01	<0.01	<0.01	0.03	0.2	IS 3025 (P-55):1998 RA 2019
10	Ammonia (as total Ammonia -N) mg/l, Max	<0.1	<0.1	<0.1	0.5	0.5	IS:3025 (P-34):1988 RA 2019
11	Anionic Detergents (as MBAS),mg/l, Max	<0.1	<0.1	<0.1	0.2	1.0	Annex K of IS 13428 Am(M11 2022
12	Barium (as Ba), mg/L, Max	<0.005	0.022	<0.005	0.7	0.7	IS:3025(P-2) 2019
13	Boron (as B), mg/L Max	<0.1	<0.1	<0.1	0.5	2.4	IS 3025 (P-57)2021
14	Calcium (as Ca),mg/l, Max	6.5	6	4.90	75	200	IS:3025 (P-40)1991 RA2019
15	Copper (as Cu),mg/l, Max	<0.005	<0.005	<0.005	0.05	1.5	IS:3025(P-2) 2019
16	Chloride as Cl (mg/l),mg/l, Max	20	50	13.50	250	1000	IS:3025(Part-32) :1988RA2019
17	Fluoride (as F),mg/l, Max	<0.1	<0.1	<0.1	1	1.5	IS 3025 (P-60)2008 RA2019
18	Residual, Free Chlorine,mg/l, Max	<0.1	<0.1	<0.1	0.2	1	IS 3025 (P-26)2021
19	Chloramines (as Cl_2), mg/l, Max	<0.1	<0.1	<0.1	4.0	4.0	IS 3025 (P-26)2021
20	Iron (as Fe),mg/l, Max	<0.05	0.08	<0.005	1.0	1.0	IS:3025(P-2) 2019
21	Magnesium (as Mg)mg/l, Max	1.6	4.0	<1	30	100	IS 3025 (P-46)1994 RA2019
22	Manganese (as Mn),mg/l, Max	<0.001	0.019	<0.005	0.1	0.3	IS:3025(P-2) 2019
23	Mineral Oil,mg/l, Max	<0.5	<0.5	<0.5	1.0	1.0	Clause 6 of IS 3025 (p-39)2021
24	Nitrate (NH_4NO_3), mg/l, Max	0.21	2	1.2	45	45	IS:3025(Part-34)1988 RA 2019
25	Phenolics (as C_6H_5OH),mg/l, Max	<0.001	<0.001	<0.001	0.001	0.002	IS 3025(P-2)Sec 1 2022
26	Selenium (as Se),mg/l, Max	<0.005	<0.005	<0.005	0.01	0.01	IS 3025(P-2) 2019
27	Silver (as Ag), mg/l, Max	<0.005	<0.005	<0.005	0.1	0.1	IS 3025(P-2) 2019
28	Molybdenum (as Mo), mg/l	<0.001	<0.001	<0.001	0.07	0.07	IS 3025 (P-2) 2019
29	Sulphates (as SO_4),mg/l, Max	9.85	7	2.5	200	400	IS:3025(P-24)Sec 1 2022
30	Sulphide (as H_2S), mg/l, Max	<0.01	<0.01	<0.01	0.05	0.05	IS 3025 (P 21):2009 RA2019
31	Alkalinity (as $CaCO_3$) mg/L Max	25	25	15	200	600	IS:3025 (P-21):2009 RA2019
32	Total Hardness (as $CaCO_3$),mg/l, Max	22.44	97	18.82	200	600	IS:3025 (P-21):2009 RA2019
33	Zinc (as Zn),mg/l, Max	<0.005	0.029	<0.005	5	15	IS:3025(P-2) 2019
34	Cadmium (as Cd),mg/l, Max	<0.001	<0.001	<0.001	0.003	0.003	IS.3025(P-2) 2019
35	Cyanide (as CN),mg/l, Max	<0.01	<0.01	<0.01	0.05	0.05	IS:3025(P-27) Sec I2021
36	Lead (as Pb),mg/l, Max	<0.005	<0.005	<0.005	0.01	0.01	IS:3025(P-2) 2019
37	Mercury (as Hg) mg/l Max	<0.0005	<0.0005	<0.0005	0.001	0.001	USEPA 200.7 Rev 4.4
38	Nickel (as Ni),mg/l, Max	<0.001	<0.001	<0.001	0.02	0.02	IS.3025(P-2) 2019
39	Arsenic (as As),mg/l, Max	<0.002	<0.002	<0.002	0.01	0.01	IS 3025(P-2) 2019
40	Sodium, mg/l, Max	7.5	8	8.2	--	--	IS 3025 (P-45):1993 RA 2019
41	Potassium, mg/l, Max	<1	<1	2	--	--	IS 3025 (P--45)
42	Chromium (as Cr^{+6}),mg/l, Max	<0.03	<0.03	<0.03	--	--	IS:3025 (P-52)2014
43	Escherichia Coli/100ml	Absent	Absent	Absent			IS 1622 1981
44	Total Coliform (mpn/100ml)	<1	<1	<1	--	--	IS 1622 1981

SAMPLE TYPE : GW1 - Sirigao village Open Well water, GW2 - Assonora Open Well water, GW3 - Advalpale village Open Well water

-END OF REPORT-

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TEST REPORT

Table No. 31

Name of the Client : Salgaocar Shipping Company Private Limited
Name of the Project : Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa,Goa
Sample Collected by : Environmental Laboratory Representative
Date of sample collection : 29.05.2023
Issue Date : 10.06.2023
Ref : IS 10500-2012 Norms Amendment - 4 (Drinking Water Standards)

Sl No.	Lab Code	EDI23/06/1-0003	EDI23/06/1-0004	EDI23/06/1-0012	Desirable Limits	Permissible Limits	Method of Testing
	Parameters	Result					
		GW4	GW5	GW6			
1	Colour (Hazen Units), Max	<5	<5	<5	5	15	IS:3025 (P-4) 2021
2	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	IS 3025 (P-5) 2018
3	pH	5.93	5.90	5.99	6.5 to 8.5	6.5 - 8.5	IS:3025 (P-11) 2022
4	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	IS 3025 (P-8) 1984 RA 2017
5	Turbidity,NTU, Max	0.5	0.7	0.4	1	5	IS:3025 (P-10) 1984 RA 2017
6	Electrical Conductivity (Jamhosurm)	80.0	91.0	113	-	-	IS:3025 (P-14)
7	Total Dissolved Solids,mg/l, Max	28	29	69.0	500	2000	IS:3025 (Part-16):1984 RA2017
8	Temperature ° C	25	25	25.0	-		IS 3025 (P-9)
9	Aluminium (as Al), Max	<0.01	<0.01	<0.01	0.03	0.2	IS:3025 (P-55)1998 RA 2019
10	Ammonia (as total Ammonia -N),mg/l, Max	<0.1	<0.1	<0.1	0.5	0.5	IS 3025 (P-34)1988 RA 2019
11	Anionic Detergents (as MBAS),mg/l , Max	<0.1	<0.1	<0.1	0.2	1.0	Annex K of IS:13428 Addl1 2022
12	Barium (as Ba), mg/l, Max	<0.005	0.077	<0.005	0.7	0.7	IS 3025(P-2) 2019
13	Boron (As B), mg/l, Max	<0.1	<0.1	<0.1	0.5	2.4	IS:3025 (P-57)2021
14	Calcium (as Ca),mg/l, Max	7	7	7.35	75	200	IS 3025 (P-40)1991 RA2019
15	Copper (as Cu),mg/l, Max	<0.005	0.009	<0.005	0.05	1.5	IS 3025(P-2) 2019
16	Chloride as Cl (mg/l),mg/l, Max	15	12	8.06	250	1000	IS 3025(Part-32) :1988RA2019
17	Fluoride (as F),mg/l, Max	<0.1	<0.1	<0.1	1	1.5	IS:3025 (P-60)2008 RA2019
18	Residual, Free Chlorine,mg/l, Max	<0.1	<0.1	<0.1	0.2	1	IS:3025 (P-26)2021
19	Chloramines (as Cl_2), mg/l Max	<0.1	<0.1	<0.1	4.0	4.0	IS 3025 (P-26)2021
20	Iron (as Fe),mg/l, Max	<0.05	0.18	<0.005	1.0	1.0	IS 3025(P-2) 2019
21	Magnesium (as Mg),mg/L Max	1.0	2.0	2.47	30	100	IS:3025 (P-46)1994 RA2019
22	Manganese (as Mn),mg/l, Max	0.013	0.009	<0.005	0.1	0.3	IS:3025(P-2) 2019
23	Mineral Oil,mg/l, Max	<0.5	<0.5	<0.5	1.0	1.0	Clause 6 of IS 3025 (p 39)2021
24	Nitrate (as NO_3),mg/l, Max	4	1.6	0.4	45	45	IS:3025(Part-34)1988 RA 2019
25	Phenolics (as C_6H_5OH),mg/l, Max	<0.001	<0.001	<0.001	0.001	0.002	IS:3025(P-24)Sec 1 2022
26	Selenium (as Se),mg/l, Max	<0.005	<0.005	<0.005	0.01	0.01	IS 3025(P-2) 2019
27	Silver (as Ag), mg/l, Max	<0.005	<0.005	<0.005	0.1	0.1	IS:3025(P-2) 2019
28	Molybdenum (as Mo), mg/l	<0.001	<0.001	<0.001	0.07	0.07	IS 3025 (P-2) 2019
29	Sulphates (as SO_4),mg/l, Max	8	8.40	14.42	200	400	IS 3025(P-24)Sec 1 2022
30	Sulphide (as H_2S) , mg/L Max	<0.01	<0.01	<0.01	0.05	0.05	IS:3025 (P-21) 2009 RA2019
31	Alkalinity (as $CaCO_3$) mg/l, Max	10	25.0	50.0	200	600	IS 3025 (P-21) 2009 RA2019
32	Total Hardness (as $CaCO_3$),mg/l, Max	29	24.0	20.0	200	600	IS 3025 (P-21) 2009 RA2019
33	Zinc (as Zn),mg/l, Max	0.015	0.036	<0.005	5	15	IS 3025(P-2) 2019
34	Cadmium (as Cd),mg/l, Max	<0.001	<0.001	<0.001	0.003	0.003	IS:3025(P-2) 2019
35	Cyanide (as CN), mg/l, Max	<0.01	<0.01	<0.01	0.05	0.05	IS 3025(P-27) Sec 1 2021
36	Lead (as Pb),mg/l, Max	<0.005	<0.005	<0.005	0.01	0.01	IS 3025(P-2) 2019
37	Mercury (as Hg),mg/l, Max	<0.0005	<0.0005	<0.0005	0.001	0.001	USEPA 200.7 Rev4.4
38	Nickel (as Ni),mg/l Max	<0.001	<0.001	<0.001	0.02	0.02	IS:3025(P-2) 2019
39	Arsenic (as As),mg/l, Max	<0.002	<0.002	<0.002	0.01	0.01	IS 3025(P-2) 2019
40	Sodium, mg/l, Max	5.5	10	7.65	--	--	IS 3025 (P-45) 1993 RA 2018
41	Potassium, mg/l Max	<1	<1	3	--	--	IS:3025 (P-45)
42	Chromium (as Cr^{+6}),mg/l, Max	<0.03	<0.03	<0.03	--	--	IS 3025 (P-52)2014
43	Escherichia Coli/100ml	Absent	Absent	Absent			IS 1622:1981
44	Total Coliform (mpn/100ml)	<1	<1	<1	--	--	IS 1622:1981

SAMPLE TYPE : GW4 - Mulgao village Open Well water, GW5 - Sirigao village Open Well water, GW6 - Calvim village Open Well water

"END OF REPORT"

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ISO 45001 : 2018

TEST REPORT

Table No. 32

Name of the Client : Salgaocar Shipping Company Private Limited
Name of the Project : Block - 9, Sirigao - Mayem Mineral Block, Sirigao & Mayem villages, Bicholim Taluka, North Goa,Goa
Sample Collected by : Environmental Laboratory Representative
Date of sample collection : 29.05.2023
Issue Date : 10.06.2023
Ref : IS:10500-2012 Norms Amendment - 4 (Drinking Water Standards)

Sl. No.	Parameters	Lab Code: EDI/23/06/1-0013 (GW7)	Lab Code: EDI/23/06/1-007 (GW8)	Desirable Limits	Permissible Limits	Method of Testing
		Result				
1	Colour (Hazen Units), Max	<5	<1	5	15	IS:3025 (P-4) 2021
2	Odour	Agreeable	Agreeable	Agreeable	Agreeable	IS 3025 (P-5) 2018
3	pH	6.69	6.28	6.5 to 8.5	6.5 - 8.5	IS 3025 (P-11) 2022
4	Taste	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-8) 1984 RA 2017
5	Turbidity,NTU, Max	0.6	0.9	1	5	IS:3025 (P-10) 1984 RA 2017
6	Electrical Conductivity (µmhos/cm)	86.0	81	-	-	IS:3025 (P-14)
7	Total Dissolved Solids,mg/l, Max	49	25.0	500	2000	IS 3025 (Part-16)1984 RA2017
8	Temperature ° C	25	20.0	-	-	IS 3025 (P-9)
9	Aluminium (as Al), Max	<0.01	<0.01	0.03	0.2	IS 3025 (P-55)1998 RA 2019
10	Ammonia (as total Ammonia -N),mg/l, Max	<0.1	<0.1	0.5	0.5	IS 3025 (P-34)1988 RA 2019
11	Anionic Detergents (as MBAS),mg/l , Max	<0.1	<0.1	0.2	1.0	Alpha, K.of IS 13428 Addn.1 2022
12	Barium (as Ba), mg/l, Max	<0.005	0.01	0.7	0.7	IS:3025(P-2) 2019
13	Boron (as B), mg/l, Max	<0.1	<0.1	0.5	2.4	IS:3025 (P-57)2021
14	Calcium (as Ca),mg/l, Max	6.34	4.80	75	200	IS 3025 (P-40)1991 RA2019
15	Copper (as Cu),mg/l, Max	<0.005	<0.005	0.05	1.5	IS 3025(P-2) 2019
16	Chloride as Cl (mg/l),mg/l, Max	12.6	14.09	250	1000	IS 3025(Part-32)_1988RA2019
17	Fluoride (as F),mg/l, Max	<0.1	<0.1	1	1.5	IS 3025 (P-60)2008 RA2019
18	Residual, Free Chlorine,mg/l, Max	<0.1	<0.1	0.2	1	IS 3025 (P-26)2021
19	Chloramines (as Cl_2), mg/l, Max	<0.1	<0.1	4.0	4.0	IS 3025 (P-26)2021
20	Iron (as Fe),mg/l, Max	<0.005	0.1	1.0	1.0	IS 3025(P-2) 2019
21	Magnesium (as Mg),mg/l, Max	1.5	1.88	30	100	IS 3025 (P-46)1994 RA2019
22	Manganese (as Mn),mg/l, Max	<0.005	<0.001	0.1	0.3	IS 3025(P-2) 2019
23	Mineral Oil,mg/l, Max	<0.5	<0.5	1.0	1.0	Please refer page no. - report
24	Nitrates (as NO_3),mg/l, Max	0.15	0.8	45	45	IS 3025(Part-34)1988 RA 2019
25	Phenolics (as C_6H_5OH),mg/l, Max	<0.001	<0.001	0.001	0.002	IS 3025(P-24)Sec 1 2022
26	Selenium (as Se),mg/l, Max	<0.005	<0.005	0.01	0.01	IS 3025(P-2) 2019
27	Silver (as Ag), mg/l, Max	<0.005	<0.005	0.1	0.1	IS 3025(P-2) 2019
28	Molybdenum (as Mo), mg/l	<0.001	<0.001	0.07	0.07	IS:3025 (P-2) 2019
29	Sulphates (as SO_4),mg/l Max	<1	7.4	200	400	IS:3025(P-24)Sec 1 2022
30	Sulphide (as H_2S) , mg/l, Max	<0.01	<0.01	0.05	0.05	IS:3025 (P-29)2009 RA2019
31	Alkalinity (as $CaCO_3$) mg/l, Max	30	20	200	600	IS 3025 (P-23)2009 RA2019
32	Total Hardness (as $CaCO_3$),mg/l, Max	22.44	20.4	200	600	IS 3025 (P-21)2009 RA2019
33	Zinc (as Zn),mg/l, Max	<0.005	0.009	5	15	IS 3025(P-2) 2019
34	Cadmium (as Cd),mg/l, Max	<0.001	<0.001	0.003	0.003	IS 3025(P-2) 2019
35	Cyanide (as CN),mg/l, Max	<0.01	<0.01	0.05	0.05	IS:3025(P-27) Sec 1 2021
36	Lead (as Pb),mg/l, Max	<0.005	<0.005	0.01	0.01	IS 3025(P-2) 2019
37	Mercury (as Hg),mg/l, Max	<0.0005	<0.0005	0.001	0.001	USEPA 200.7 Rev 4.4
38	Nickel (as Ni),mg/l, Max	<0.001	<0.001	0.02	0.02	IS 3025(P-2) 2019
39	Arsenic (as As),mg/l, Max	<0.002	<0.002	0.01	0.01	IS 3025(P-2) 2019
40	Sodium, mg/l, Max	8.6	12	–	–	IS:3025 (P-45)1993 RA 2019
41	Potassium, mg/l, Max	<1	<1	–	–	IS:3025 (P-45)
42	Chromium (as Cr^{+6}),mg/l, Max	<0.03	<0.03	–	–	IS:3025 (P-52)2014
43	Escherichia Coli/100ml	Absent	Absent			IS 1622:1981
44	Total Coliforms (mpn/100ml)	<1	<1	–	–	IS 1622:1981

SAMPLE TYPE : GW7 - Singuirem wada Open Well water, GW8 - Mayem village Open Well water

"END OF REPORT"

Govt. Analyst / Authorised Signatory

948, 2nd Cross, St. Thomas Town Post, Kammanahalli, Bangalore - 560 084.
Phone : 080-25432969 Tel/fax : 25432968. E-mail : mesbng@gmail.com, www.envtest.in

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TEST REPORT

Table No. 33

GROUND WATER LEVEL

Client : Salgaocar Shipping Company Private Limited
Project : Block - II, Sirigao - Mayem Mineral Block , Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa
Sample Collected by : Environmental Laboratory Representative

Code No.	Monitoring stations	Date of Samples	Depth (M)
GW1	Sirigao village Open well water	29.05.2023	2.75
GW2	Assonara Village Open well water	29.05.2023	2.55
GW3	Advalpale village Open well water	29.05.2023	2.73
GW4	Mulgao village Open well water	29.05.2023	1.27
GW5	Sircaim village Open well water	29.05 2023	5 53
GW6	Calvim village Open well water	29.05 2023	4 30
GW7	Sinquirem wada Open well water	29.05.2023	6 30
GW8	Mayem village Open well water	29.05 2023	5.84

Govt. Analyst / Authorised Signatory

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Format No. : 10/Rev 06

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TEST REPORT

Table No. 34

Client : Salgaocar Shipping Company Private Limited

Project : Block - II, Sirigao - Mayem Mineral Block , Sirigao & Mayem villages, Bicholim Taluka, North Goa, Goa

Date of Report : 08.05.2023

Report No. : 08.06.2023

Sl. No.	PARAMETERS	Unit	S1	S2	S3	S4	S5	Normal	High
	Lab Code		ED/23/05/2-0431	ED/23/05/2-0432	ED/23/05/2-0433	ED/23/05/2-0434	ED/23/05/2-0435		
PHYSICAL PROPERTIES									
1	Colour	--	Red soil	Red soil	Red soil	Red soil	Red soil	--	--
2	Textural class	--	SANDY CLAY	CLAY LOAM	CLAY LOAM	CLAY LOAM	CLAY LOAM	--	--
3	**Size Distribution**								
	Sand	%	47.62	39.63	36.55	44.62	39.5	--	--
	Clay	%	42.22	37.6	34.62	38.62	33.25	--	--
	Silt	%	10.16	22.77	28.83	16.76	27.25	--	--
4	Moisture Content	%	7.63	8.96	9.48	9.35	8.82	--	--
5	Bulk Density	gm/cc	1.37	1.39	1.41	1.36	1.41	--	--
6	Porosity	%	48.50	51.13	46.99	48.87	46.99	--	--
7	Water holding capacity	%	31.63	37.25	31.05	33.72	30.00		-
8	pH	--	5.69	5.48	5.65	6.05	6.11	6.3	>8.3
9	EC	m.mohs/cm	0.355	0.275	0.318	0.299	0.316	1.0 to 2.0	>2
Chemical Properties									
10	Organic Carbon	%	1.15	1.09	1.18	0.72	0.69	0.5 to 0.75	>0.75
11	Nitrogen as N	Kg/Ha	207	200	276	233	207	280-560	>560
12	Phosphorous as P	Kg/Ha	17.6	18.5	14.6	20.0	22.3	9 to 22	>22
13	Potassium as K_2O	Kg/Ha	230	275	246	260	270	50 to 120	>120
14	Calcium as Ca^{++}	mg/kg	760.00	890.00	768.00	740.00	680.00		
15	Magnesium as Mg^{++}	mg/kg	138	260	230	218	193	--	--
16	Sodium as Na_2O	mg/Kg	158.00	162.00	156.00	162.00	142.00	--	--
17	Chloride as Cl	mg/Kg	188.00	192.00	176.00	190.00	163.00	--	--
18	sodium absorption ratio	%	1.08	0.92	0.95	1.00	0.92	--	--
19	Salinity	ppt	0.24	0.33	0.32	0.34	0.29	--	--
20	Sulphate as SO_4	%	130	130	114	96	132	-	-
Micro- nutrients									
21	Boron (as B)	mg/Kg	0.41	0.36	0.38	0.29	0.33	--	--
22	Zinc (as Zn)	mg/Kg	0.29	0.33	0.30	0.28	0.36	--	--
23	Copper (as Cu)	mg/Kg	0.19	0.24	0.27	0.33	0.28		
24	Iron (as Fe)	%	3.62	4.75	3.65	4.78	3.55	--	--

Sample Code :

S1 - Dump Soil Within Mineral Block
S2 - Mayem village fairly dense forest Cashew Plantation
S3 - Salgao village Agricultural Land
S4 - Vainginim village Agricultural Land
S5 - Corjuem village Agricultural Land

Govt. Analyst / Authorised Signatory

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Annexure-8

GOVERNMENT OF GOA
Office of the Deputy Conservator of Forests,
North Goa Division,
Ponda – Goa, 403 401
Ph No: 0832-2312856 Fax No: 2312095 email:- dcfnorth-forest.goa@nic.in
No.5/FCA/GEN/T & F/DCFN/TECH/2023-24/1081 Dated:- 25/09/2023

To,
Salgaonkar Shipping Co.Pvt Ltd.
Salgaonkar Bhavan,
Alinho, Panaji- Goa

Sub:- :- Authenticated list of Flora and Fauna - reg.

Sir,

With reference to your letter dated 31/08/2023, please find enclosed herewith the list of Flora & Fauna / species present in core and buffer zone of the Iron Ore Mine lease w.r. to Salgaonkar Shipping Co Op. Ltd Mayem, Bicholim Taluka , North Goa District, prepared by the authorized agency and authenticated by Forest Personel for further necessary action.

Yours faithfully,

Dy Conservator of Forests,
North Goa Division,
Ponda- Goa

Encl:- As above.

LIST OF FLORA AND FAUNA IN THE CORE AND BUFFER ZONE OF BLOCK-II SIRIGAO MAYEM MINERAL BLOCK OF SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

FLORAL DIVERSITY IN THE CORE AREA

A. List of plants (trees, shrubs and herbs) reported from Core area

Sl. No	Species name	Family	Common Name
		TREE	
1	*Anacardium occidentale*	Anacardiaceae	Cashew
2	*Acacia auriculiformis* *	Fabaceae	Acacia
3	*Eucalyptus sps*	Myrtaceae	Nilgiri
4	*Casuaringa equisetifolia*	Casuarinaceae	Suru
5	*Alstonia scholaris*	Apocynaceae	Saten
6	*Samanea saman*	Fabaceae	Rain tree
7	*Bauhinia racemose*	Fabaceae	Apto
8	*Artocarpus heterophyllus*	Moraceae	Phanas
9	*Bombax ceiba*	Bombacaceae	Sanwar
10	*Delonix regia*	Fabaceae	Gulmohar
11	*Emblica officinalis*	Phyllanthaceae	Aonla
12	*Garcinia indica*	Clusiaceae	Kokum
13	*Gmelina arboren*	Lamiaceae	Shivan
14	*Leucnena leucocephala*	Fabaceae	Subabul
15	*Mangifera indica*	Anacardiaceae	Mango
16	*Syzygium cumini*	Myrtaceae	Jamun
17	*Trema orientalis*	Cannabaceae	Charcoal tree
18	*Acacia catechu*	Fabaceae	Khair
19	*Canthium dicoccum*	Rubiaceae	Ceylon boxwood
20	*Ziziphus mauritiana*	Rhamnaceae	Indian jujube
21	*Macaranga peltata*	Euphorbiaceae	Chandada
		SHRUBS	
1	*Acacia paniculate*	Mimosaceae	sickle wattle
2	*Calotropis gigantean*	Asclepidiaceae	crown flower
3	*Carissa congesta*	Apocynaceae	Karamda
4	*Crotolaria virosa.*	Fabaceae	Rattlepod
5	*Helicteris isora*	Malvaceae	Marodphali
6	*Lantana camara**	Verbenaceae	Lantana
7	*Zizyphus oenoplea*	Rhamnaceae	Jackal jujube
		HERBS AND CLIMBERS	
1	*Asparagus racemosa*	Asparagaceae	Satavar
2	*Bidens biternata*	Asteraceae	Churchitta
3	*Ipomea cmuricata*	Convolvulaceae	Bhingari
4	*Ocimum sanctum*	Lamiaceae	Tumole
5	*Parthenium hysterophorus*	Asteraceae	Santa-Maria
6	*Smilax zeylanica*	Smilacaceae	Kumarika

NOTE: * Invasive species

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GOA

Mineral Engineering Services
(M.S. Raju)
NABET Consultant

LIST OF FLORA AND FAUNA IN THE CORE AND BUFFER ZONE OF BLOCK-II SIRIGAO MAYEM MINERAL BLOCK OF SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

FAUNA RECORDED WITH CORE AREA:

B. List of faunal species – Birds, Mammals and Reptiles in the core area

Sl. No.	Common name	Scientific name	Family	IUCN / WPA status
	BIRDS			
1	Common Iora	*Aegithina tiphia*	Irenidae	R/IV
2	Common Myna	*Acridotheres tristis*	Sturnidae	R/IV
3	Crow Pheasant	*Centropus sinensis*	Cuculidae	R/IV
4	Green Bee Eater	*Merops orientalis*	Meropidae	MR/IV
5	House Crow	*Corvus splendens*	Corvidae	R/IV
6	House Sparrow	*Passer domesticus*	Passeridae	R/IV
7	House Swift	*Apus affinis*	Apodidae	R/IV
8	Indian Robin	*Saxicoloides fulicata*	Turdinae	R/IV
9	Jungle Crow	*Corvus macrorhynchos*	Corvidae	R/IV
10	Jungle Myna	*Acridotheres fuscus*	Sturnidae	R/IV
11	Red-wattled Lapwing	*Vanellus indicus*	Charadriidae	R/IV
12	Red-whiskered Bulbul	*Pycnonotus jocosus*	Pycnonotidae	R/IV
	MAMMALS			
13	Indian Hare	*Lepus nigricollis*	Leporidae	Lower risk/ IV
14	Rat	*Rattus rattus*	Muridae	Sch-V
15	Common grey mongoose	*Herpestes edwardsii*	Herpestidae	Least Concern / IV
	REPTILES			
16	Green Forest lizard	*Calotes calotes*	Agamidae	Common
17	Roux's Forest lizard	*Calotes rouxii*	Agamidae	Common
18	Garden lizard	*Calotes elloti*	Agamidae	Common
19	Russell's Viper	Daboia russelli	Viperidae	Sch-II

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LIST OF FLORA AND FAUNA IN THE CORE AND BUFFER ZONE OF BLOCK-II SIRIGAO MAYEM MINERAL BLOCK OF SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

FLORAL DIVERSITY OF BUFFER AREA

C. List of Trees growing at buffer area of 10-km radius of Block-II Sirigao-Mayem Block

Sl.No.	Species name	Family
1	*Acacia catechu (L.f.) Willd. var.*	Fabaceae
2	*Adina cordifolia Hook. f. ex Brandis*	Dipterocarpaceae
3	*Alstonia scholaris (L.) R Br.*	Apocynaceae
4	*Annona squamosa L.*	Annonaceae
5	*Artocarpus lakoocha Wall. ex Roxb*	Moraceae
6	*Artocarpus heterophyllus Lam.*	Moraceae
7	*Artocarpus integrifolius Auct.*	Moraceae
8	*Bischofia javanica Bl.*	Phyllanthaceae
9	*Bombax malabaricum DC.*	Bombacaceae
10	*Buchanania latifolia Roxb.*	Anacardiaceae
11	*Butea monosperma (Lam.) Taub.*	Fabaceae
12	*Caesalpinia bonducella (L.) Fleming*	Caesalpinaceae
13	*Canthium dicoccum (Gaert.) T. & B.*	Rubiaceae
14	*Careya arborea Roxb.*	Lecythidaceae
15	*Caryota urens L. (Kithul) sap.*	Arecaceae
16	*Cassia fistula L.*	Fabaceae
17	*Casearia ovoidea Sleumer*	Salicaceae
18	*Cassia siamea Lam.*	Fabaceae
19	*Celtis cinnamomea Lindl. ex Planch.*	Ulmaceae
20	*Clerodendron sp.,*	Lamiaceae
21	*Cordia wallichii L.*	Boraginaceae
22	*Dalbergia latifolia Roxb.*	Fabaceae
23	*Delonix regia (Hk.) Raf.*	Fabaceae
24	*Diospyros montana Roxb.*	Ebenaceae
25	*Erythrina indica L.*	Fabaceae
26	*Ficus arnottiana (Miq.) Miq.*	Moraceae
27	*Ficus glomerata Roxb.*	Moraceae
28	*Ficus microcarpa L.f.*	Moraceae
29	*Flueggea leucopyrus Willd.*	Phyllanthaceae
30	*Gliricidia sepium (Jacq.) Kunth*	Fabaceae
31	*Glochidion velutinum L.*	Euphorbiaceae
32	*Grewia robusta L.*	Tiliaceae
33	*Grewia tiliifolia Vahl.*	Tiliaceae
34	*Holoptelea integrifolia (Roxb.) Planch*	Ulmaceae
35	*Holarrhena pubescens (Buch.-Ham.)*	Apocynaceae
36	*Hopia periflora Bedd.*	Lythraceae
37	*Hydnocarpus wightiana Bl.*	Achariaceae

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38	*Lannea grandis (Dennst.) Engl.*	Anacardiaceae
39	*Macaranga peltata (Roxb.) Muell.*	Euphorbiaceae
40	*Mallotus philippensis (Lam.) Muell.*	Euphorbiaceae
41	*Mangifera indica L.*	Anacardiaceae
42	*Memecylon umbellatum Burm.*	Melastomataceae
43	*Mitragyna parviflora (Roxb.) Korth.*	Rubiaceae
44	*Olea dioica L.*	Oleaceae
45	*Peltophorum pterocarpum (DC.)*	Fabaceae
46	*Polyalthia longifolia Sonn.*	Annonaceae
47	*Pterocarpus marsupium Roxb.*	Fabaceae
48	*Radermachera xylocarpa (Roxb.) Schm.*	bignoniaceae
49	*Randia dumetorum L.*	Rubiaceae
50	*Sapindus emarginatus L.*	Sapindaceae
51	*Schleichera oleosa (Lour.) Oken*	Euphorbiaceae
52	*Semecarpus anacardium L. f.*	Anacardiaceae
53	*Spondias mangifera Willd.*	Anacardiaceae
54	*Syzygium caryophyllatum (L.) Alston*	Myrtaceae
55	*Syzygium cumini (L.) Skeels*	Myrtaceae
56	*Terminalia paniculata Roth*	Combretaceae
57	*Thespesia populnea (L.) Correa*	Malvaceae
58	*Trema orientalis (L.) Bl*	Cannabinaceae
59	*Vitex altissima L. f.*	Verbenaceae
60	*Wrightia tinctoria*	Apocynaceae
61	*Xylia xylocarpa (Roxb.) Taub.*	Mimosaceae
62	*Ziziphus mauritiana Lam.*	Rhamnaceae

D. List of Shrubs growing at buffer area of 10-km radius of Block-II Sirigao-Mayem Block

Sl.No.	Species name	Family
1	*Acacia paniculata Willd.*	Mimosaceae
2	*Amaranthus spinosus L.*	Amaranthaceae
3	*Annona muricata L.*	Annonaceae
4	*Calotropis gigantean L.*	Asclepidiaceae
5	*Canthium parviflorum Lam.*	Rubiaceae
6	*Carissa congesta L.*	Apocynaceae
7	*Chromolaena odorata (L.) K.R.*	Asteraceae
8	*Crotolaria virosa (Roxb.) Baker.*	Fabaceae
9	*Dendrocalamus strictus*	Poaceae
10	*Helictris isora*	Malvaceae
11	*Ixora brachiata Roxb ex DC*	Rubiaceae

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12	*Jatropha gossypiifolia*	Euphorbiaceae
13	*Lantana camara L.*	Verbenaceae
14	*Rosa chinensis Jacq.*	Rosaceae
15	*Vitex negundo*	Verbenaceae
16	*Ziziphus oenoplea Miller.*	Rhamnaceae

E. List of Shrubs growing at buffer area of 10-km radius of Block-II Sirigao-Mayem Block

Sl. No	*Species name*	Family
1	*Acrostichum aureum*	Pteridaceae
2	*Ageratum conyzoides*	Astraceae
3	*Asparagus racemose*	Asparagaceae
4	*Atlantia species*	Rutaceae
5	*Bidens biternata*	Asteraceae
6	*Borreria articulata*	Rubiaceae
7	*Cassia tora*	Caesalpinaceae
8	*Cymbopogon citratus*	Poaceae
9	*Cyperus difformis*	Cyperaceae
10	*Ipomea cairicata*	Convolvulaceae
11	*Ocimum sanctum*	Lamiaceae
12	*Parthenium spp*	Asteraceae
13	*Premna corimbosa*	Verbenaceae
14	*Sida cordifolia*	Malvaceae
15	*Solanum indicum*	Solanaceae

F. List of Mangrove species recorded from the 10 km radius from block boundary of Block II Sirigao- Mayem Block

Sl. No.	Species Name	Family
1	*Rhizophora mucronata*	Rhizophoraceae
2	*Rhizophora apiculata*	Rhizophoraceae
3	*Avicennia marina*	Acanthaceae
4	*Avicennia officinalis*	Acanthaceae
5	*Sonneratia alba*	Lythraceae
6	*Sonneratia caseolaris*	Lythraceae
7	*Ceriops tagal*	Rhizophoraceae
8	*Bruguiera gymnorhiza*	Rhizophoraceae
9	*Bruguiera cylindrica*	Rhizophoraceae

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10	*Kandelia candel*	Rhizophoraceae
11	*Lumnitzera racemosa*	Combretaceae
12	*Aegiceras corniculatum*	Primulaceae
13	*Dolichandron spathiecae*	Bignoniaceae
14	*Excoecaria agallocha*	Euphorbiaceae
15	*Acanthus ilicifolius*	Acanthaceae
16	*Acrostichum aureum*	Pteridaceae

G. List of species recorded from avenue forest and nearby human settlement within 10 km radius.

Sl. No	Species name	common name	Family	habit
1	*Tamarindus indica*	Tamrind/imli	Cesalpinaceae	Tree
2	*Annona reticulata*	Ramphal	Annonaceae	Tree
3	*Bambusa sp*	Bamboo	Bambocaceae	Tree
4	*Bougainvillea spectabilis*	Bouganvilla	Nyctaginaceae	Tree
5	*Cassia fistula*	Amaltas	Fabaceae	Tree
6	*Dalbergia latifolia*	Shisam/ Shisoo	Fabaceae	Tree
7	*Delonix regia*	Gulmohar	Fabaceae	Tree
8	*Phyllanthus emblica*	Awala/.Avala	Phyllanthaceae	Tree
9	*Psidium guajava*	Peru/Gauva	Myrtaceae	Tree
10	*Samanea saman*	Rain tree	Fabaceae	Tree
11	*Sapindus laukorossi*	Ritha/Reetha	Sapindaceae	Tree
12	*Swetenia mahagoni*	Mohagony	Meliaceae	Tree
13	*Syzygium cumini*	Jamun	Myrtaceae	Tree
14	*Terminalia bellerica*	Ghoting/bchado	Combretaceae	Tree
15	*Acacia auriculiformis*	Babul	Mimosaceae	Tree
16	*Garcinia indica*	kokum	Clusiaceae	Tree
17	*Pongamia pinnata*	Karuaini	Fabaceae	Tree
18	*Ficus benghalensis*	Banyan tree	Moraceae	Tree
19	*Ficus religiosa*	Peepal Tree	Moraceae	Tree
20	*Vitex negundo*	Nirgundi	Lamiaceae	Shrub
21	*Mucuna pruriens*	Kavachkuiri	Fabaceae	Climber
22	*Dioscorea bulbifera*	Aerial yam	Dioscoreaceae	Climber
23	*Zornia diphylla*	Two-Leaf Zornia	Fabaceae	Herb
24	*Justicia simplex*	Simple Justicia	Acanthaceae	Herb
25	*Cynodon dactylo*	Lawn Grass	Poaceae	Grass

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H. List of Endemic, Keystone and Threatened species recorded in 10-km radius area

Sl. No.	Species	Family	Core/buffer region	Habitat	Status
1	*Artocarpus heterophyllus* Lam.	Moraceae	Buffer	Open / Reserve Forest	Endemic
2	*Ficus arnottiana* (Miq.) Miq.	Moraceae	Buffer	Open	Keystone
3	*Ficus benghalensis* L.	Moraceae	Buffer	Open	Keystone
4	*Ficus glomerata* Roxb.	Moraceae	Buffer	Open	Keystone
5	*Ficus racemosa* L.	Moraceae	Buffer	Open	Keystone
6	*Ficus religiosa* L.	Moraceae	Buffer	Open/ Rivulets	Keystone

FAUNA OF BUFFER AREA

1. List of the mammal species reported from 10-km radius of Block-II Sirigao-Mayem Block

Sl. No	Local Name	Scientific name	Family	IUCN Status/ WPA Schedule
1	Bonnet macaque	*Macaca radiata*	Cercopithecidae	Least Concern /II
2	Rat	*Rattus rattus*	Muridae	Sch-V
3	Common grey mongoose	*Herpestes edwardsii*	Herpestidae	Least Concern / IV
4	Indian Hare	*Lepus nigricollis*	Leporidae	Least Concern / IV
5	Flying fox bat	*Pteropus gigenteus*	Pteropodidae	Sch-V
6	Indian porcupine	*Hystrix indica*	Hystricidae	Least Concern /IV
7	Wild boar	*Sus scrofa*	Suidae	Least Concern /III
8	Striped squirrel	*Funambulus palmarum*	Sciuridae	Sch-IV
9	Common leopard	*Panthera pardus*	Felidae	Least Concern /I
10	Small Indian civet	*Viverricula indica*	Viverridae	Least Concern /II
11	Crocodile	*Crocodylus palustris*	Crocodylidae	VU/ I
12	Small-clawed otters	*Aonyx cinereus*		VU/II

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J. List of Reptile's reported from the 10-km radius of Block-II Sirigao-Mayem Block

Sl. No.	Common name	Scientific name	Family	IUCN status / WPA schedule
1	Cobra	*Naja naja*	Elapidae	Rare/II
2	Russell's Viper	*Daboia russelii*	Viperidae	Sch-II
3	Green Forest lizard	*Calotes calotes*	Agamidae	Common
4	Indian rat Snake	*Ptyas mucosa*	Colubridae	Sch-II
5	Common Sand Boa	*Gongylophis conicus*	*Boidae*	Common
6	Montane trunket snake	*Coelognathus helena monticollaris*	*Colubridae*	Common
7	Common Kukri Snake	*Oligodon arnensis*	*Colubridae*	Common
8	Western Kukri Snake	*Oligodon affinis*	*Colubridae*	Uncommon
9	Checkered Keelback	*Xenochrophis piscator*	*Colubridae*	Sch-II
10	Striped Keelback	*Amphiesma stolatum*	*Colubridae*	Common
11	Hill keelback	*Amphiesma monticola*	*Colubridae*	Endemic to WGs
12	Saw scaled Viper	*Echis carinatus*	*Viperidae*	Sch-IV
13	Roux's Forest lizard	*Calotes rouxii*	*Agamidae*	Common
14	Indian Garden lizard	*Calotes versicolor*	*Agamidae*	Common
15	Bark/Marbled Tree gecko	*Hemidactylus leschenaultia*	*Gekkonidae*	Common
16	Common Indian monitor lizard	*Varanus bengalensis*	*Varanidae*	Least concern/II

K. List of toads and amphibians reported from 10-km radius of Block-II Sirigao-Mayem Block

Sl. No.	Common name	Scientific name	Family	IUCN status / WPA schedule
1	Common Indian toad	*Bufo melanostictus*	Bufonidae	LC
2	Jerdon's narrow mouthed frog	*Ramanella Montana*	Microhylidae	NT
3	Konkan bush frog	*Philautus bombayensis*	Rhacophoridae	VU
4	Marren's bush frog	*Philautus leucorhinus*	Rhacophoridae	LC
5	Bamboo tree frog	*Polypedates leucomystax*	Rhacophoridae	LC
6	Common tree frog	*Polypedates maculatus*	Rhacophoridae	LC
7	Malabar gliding frog	*Rhacophorus malabaricus*	Rhacophorida	LC

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			e	
8	Skipper frog	*Euphlyctis cyanophlyctis*	Ranidae	LC/IV
9	Jerdon's bull frog	*Hoplobatrachus crassus*	Ranidae	LC/IV
10	Indian bull frog	*Hoplobatrachus tigerinus*	Ranidae	LC/IV
11	Brown leaping frog	*Indirana semipalmata*	Ranidae	LC/IV
12	Paddyfield frog	*Limnonectes limnocharis*	Ranidae	LC/IV
13	Hill cricket frog	*Limnonectes syhadrensis*	Ranidae	LC/IV
14	Fungoid frog	*Rana malabaricus*	Ranidae	LC/IV
15	Bronzed frog	*Rana temporalis*	Ranidae	NT/IV
16	Indian burrowing frog	*Tomopterna breviceps*	Ranidae	LC/IV
17	Dobson's burrowing frog	*Tomopterna dobsoni*	Dicroglossidae	LC

L. List of birds reported from 10-km radius of Block-II Sirigao-Mayem Block

Sl. No.	Common Name	Scientific name	Family	IUCN Status/ WPA Schedule
1	Indian Peafowl	*Pavo cristatus*	Phasianidae	R/I
2	Red-vented Bulbul	*Pycnonotus cafer*	Pycnonotidae	R/IV
3	Little Egret	*Egretta garzetta*	Ardeidae	R/IV
4	Cattle Egret	*Bubulcus ibis*	Ardeidae	R/IV
5	Spotted Dove	*Streptopelia chinensis*	Columbidae	R/IV
6	Indian Plaintve Cuckoo	*Cacomantis passerinus*	Cuculidae	R/IV
7	Stork-billed Kingfisher	*Halcion capensis*	Alcedinidae	R/IV
8	Purple-rumped Sunbird	*Nectarinia zeylonica*	Nectariniidae	R/IV
9	Red-whiskered Bulbul	*Pycnonotus jocosus*	Pycnonotidae	R/IV
10	Malabar Whistling Thrush	*Myophonus horsfieldii*	Turdinae	R/IV
11	Common Cuckoo	*Cuculus micropterus*	Cuculidae	M/IV
12	Yellow-thraoted Sparrow	*Petronia xanthocollis*	Passeridae	R/IV
13	Small Minivet	*Pericrocotus cinnamomeus*	Campephagidae	R/IV
14	Median Egret	*Mesophoyx intermedia*	Ardeidae	M/IV
15	Common Myna	*Acridotheres tristis*	Sturnidae	R/IV
16	Cotton Teal	*Nettapus coromandelianus*	Anatidae	MR/IV
17	Indian Treepie	*Dendrocitta vagabunda*	Corvidae	R/IV
18	House Crow	*Corvus splendens*	Corvidae	R/IV
19	Common Iora	*Aegithina tiphia*	Irenidae	R/IV
20	Common Tailorbird	*Orthotomus sutorius*	Sylviinae	R/IV
21	Yellow Wagtail	*Motacilla flava*	Motacillidae	M/IV
22	White-breasted Kingfisher	*Halcyon smyrnensis*	Alcedinidae	R/IV
23	Indian Cuckoo	*Cuculus micropterus*	Cuculidae	U/IV
24	Black Drongo	*Dicrurus macrocercus*	Dicruridae	R/IV
25	Spotted Babbler	*Pellorneum ruficeps*	Timaliinae	R/IV

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LIST OF FLORA AND FAUNA IN THE CORE AND BUFFER ZONE OF BLOCK-II SIRIGAO MAYEM MINERAL BLOCK OF SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

26	Plum-headed Parakeet	*Psittacula cyanocephala*	Psittacidae	R/IV
27	Indian Edible-nest Swiftlet	*Collocalia unicolor*	Apodidae	RM/IV
28	Malayan Night Heron	*Gorsachius melanocephalus*	Ardeidae	M/IV
29	Blue-tailed Bee-eater	*Merops philippinus*	Meropidae	M/IV
30	Green Imperial Pigeon	*Ducula aenea*	Columbidae	R/IV
31	Blue-eared Kingfisher	*Alcedo meningting*	Alcedinidae	R/IV
32	Indian Robin	*Saxicoloides fulicata*	Turdinae	R/IV
33	Black Kite	*Milous migrans*	Accipitridae	R/IV
34	White-rumped Shama	*Copsychus malabaricus*	Turdinae	R/IV
35	Purple Moorhen	*Porphyrio porphyrio*	Rallidae	RM/IV
36	Brainfever Bird	*Hierococcyx varius*	Cuculidae	R/IV
37	Wire-tailed Swallow	*Hirundo smithii*	Hirudinidae	R/IV
38	Eurasian Marsh Harrier	*Circus aeruginosus*	Accipitridae	R/IV
39	Shikra	*Accipiter badius*	Accipitridae	R/I
40	Little Green Heron	*Butorides striatus*	Ardeidae	R/IV
41	Lesser Coucal	*Centropus bengalensis*	Cuculidae	U/IV
42	Asian Fairy-Bluebird	*Irena puella*	Irenidae	R/IV
43	Brown-headed Barbet	*Megalaima zeylanica*	Capitonidae	R/IV
44	Ceryle rudis	*Lesser Pied Kingfisher*	Alcedinidae	R/IV
45	Indian Jungle Nightjar	*Caprimulgus indicus*	Caprimulgidae	RM/IV
46	Indian Shag	*Phalacrocorax fuscicollis*	Phalacrocoracidae	R/IV
47	Red Spurfowl	*Galloperdix spadicea*	Phasianidae	R/IV
48	Black-headed Babbler	*Rhopocichla atriceps*	Timaliinae	R/IV
49	Ketupa zeylonensis	*Brown Fish-Owl*	Strigidae	R/IV
50	Small Bee-eater	*Merops orientalis*	Meropidae	R/IV
51	White-breasted Waterhen	*Amaurornis phoenicurus*	Rallidae	R/IV
52	Chestnut Bittern	*Ixobrychus cinnamomeus*	Ardeidae	M/IV
53	House Swift	*Apus affinis*	Apodidae	R/IV
54	Darter	*Anhinga melanogaster*	Phalacrocoracidae	RV/IV
55	Indian Scimitar Babbler	*Pomatorhinus horsfieldii*	Timaliinae	R/IV
56	Jerdon's Chloropsis	*Chloropsis cochinchinensis*	Irenidae	R/IV
57	Quaker Tit-Babbler	*Alcippe poioicephalA*	Timaliinae	R/IV
58	Yellow-fronted Pied woodpecker	*Dendrocopos mahrattensis*	Picidae	R/IV
59	Bronze-winged Jacana	*Metopidius indicus*	Jacanidae	R/IV
60	Brown-backed Needletail-Swift	*Hirundapus giganteus*	Apodidae	M/IV
61	Oriental Honey-buzzard	*Pernis ptilorhynchus*	Accipitridae	T/IV
62	Crested Tree-swift	*Hemiprocne coronata*	Hemiprocnidae	R/IV
63	Streaked Fantail-Warbler	*Cisticola juncidis*	Sylviinae	R/IV
64	Red-rumped Swallow	*Hirundo daurica*	Hirudinidae	R/IV

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65	White-browed Bulbul	*Pycnonotus luteolus*	Pycnonotidae	R/IV
66	Little Cormorant	*Phalacrocorax niger*	Phalacrocoracidae	R/IV
67	Banded Bay Cuckoo	*Cacomantis sonneratii*	Cuculidae	RM/IV
68	Oriental Dwarf Kingfisher	*Ceyx erithacus*	Alcedinidae	R/IV
69	Oriental Magpie-Robin	*Copsychus saularis*	Turdinae	R/IV
70	Large Egret	*Casmerodius albus*	Ardeidae	R/IV
71	Asian Koel	*Eudynamys scolopacea*	Cuculidae	R/IV
72	White-bellied Tree Pie	*Dendrocitta leucogaster*	Corvidae	U/IV
73	Great Cormorant	*Phalacrocorax carbo*	Phalacrocoracidae	M/IV
74	Black-capped Kingfisher	*Halcyon pileata*	Alcedinidae	R/IV
75	Greater Coucal	*Centropus sinensis*	Cuculidae	R/IV
76	Pied Bushchat	*Saxicola caprata*	Turdinae	R/IV
77	Pheasant-tailed	*Hydrophasianus chirurgus*	Jacanidae	R/IV
78	Plain Flowerpecker	*Dicaeum concolor*	Dicaeidae	R/IV
79	Eurasian Woodcock	*Scolopax rusticola*	Scolopacidae	R/IV
80	Small Green-billed Malkoha	*Phaenicophaeus viridirostris*	Cuculidae	R/IV
81	Yellow-wattled Lapwing	*Vanellus malabaricus*	Charadriidae	M/IV
82	Common Buttonquail	*Turnix suscitator*	Turnicidae	R/IV
83	Jungle Bush Quail	*Perdicula asiatica*	Phasianidae	R/IV
84	Little Ringed Plover	*Charadrius dubius*	Charadriidae	M/IV
85	Drongo Cuckoo	*Surniculus lugubris*	Cuculidae	R/IV
86	Kentish Plover	*Charadrius alexandrinus*	Charadriidae	M/IV
87	White-rumped Needletail-Swift	*Zoonavena sylvatica*	Apodidae	M/IV
88	Emerald Dove	*Chalcophaps indica*	Columbidae	R/IV
89	Yellow-browed Bulbul	*Iole indica*	Pycnonotidae	R/IV
90	Oriental Scops-Owl	*Otus sunia*	Strigidae	R/IV
91	Mountain Imperial-Pigeon	*Ducula badia*	Columbidae	R/IV
92	Plain Prinia	*Prinia inornata*	Sylviinae	R/IV
93	Jungle Crow	*Corvus macrorhynchos*	Corvidae	R/IV
94	Coppersmith Barbet	*Megalaima haemacephala*	Capitonidae	R/IV
95	Pacific Swift	*Apus pacificus*	Apodidae	U/IV
96	Brahminy Kite	*Haliastur indus*	Accipitridae	R/IV
97	Grey Heron	*Ardea cinerea*	Ardeidae	RM/IV
98	Asian Palm Swift	*Cypsiurus balasiensis*	Apodidae	R/IV
99	Rose-ringed Parakeet	*Psittacula krameri*	Psittacidae	R/IV
100	Crimson-throated Barbet	*Megalaima rubricapilla*	Capitonidae	R/IV
101	Orange-headed Thrush	*Zoothera citrinocapnotus*	Turdinae	R/IV
102	Indian Hanging-Parrot	*Parrot Loriculus vernalis*	Psittacidae	R/IV
103	Blue-breasted Rail	*Gallirallus striatus*	Rallidae	R/IV
104	Common Ringed Plover	*Charadrius hiaticula*	Charadriidae	M/IV

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105	Jungle Babbler	*Turdoides striatus*	Timaliinae	R/IV
106	Greater Racket-tailed Drongo	*Dicrurus paradiseus*	Dicruridae	R/IV
107	Crested Goshawk	*Accipiter trivirgatus*	Accipitridae	MR/IV
108	Blue-bearded Bee-eater	*Nyctyornis athertoni*	Meropidae	R/IV
109	Black-headed Munia	*Lonchura malacca*	Estrildidae	MR/IV
110	Purple Heron	*Ardea purpurea*	Ardeidae	R/IV
111	Grey Junglefowl	*Gallus sonneratii*	Phasianidae	R/IV
112	House Sparrow	*Passer domesticus*	Passeridae	R/IV
113	Large Cuckoo-shrike	*Coracina macei*	Campephagidae	R/IV
114	Nilgiri Wood Pigeon	*Columba elphinstonii*	Columbidae	RV/ IV
115	Jungle Myna	*Acridotheres fuscus*	Sturnidae	R/IV
116	Chestnut-headed Bee-eater	*Merops leschenaulti*	Meropidae	R/IV
117	Glaucidium radiatum	*Jungle Owlet*	Strigidae	R/IV
118	Malabar Trogon	*Harpactes fasciatus*	Trogonidae	R/IV
119	Rufous-bellied Babbler	*Dumetia hyperythra*	Timaliinae	R/IV
120	Brown-capped Pygmy woodpecker	*Dendrocopos nanus*	Picidae	R/IV
121	Paddyfield Pipit	*Anthus rufulus*	Motacillidae	R/IV
122	Ashy Drongo	*Dicrurus leucophaeus*	Dicruridae	M/IV
123	Painted Stork	*Mycteria leucocephala*	Ciconiidae	M/IV
124	Common Hill-Myna	*Gracula religiosa*	Sturnidae	R/IV
125	Lesser Whistling-Duck	*Dendrocygna javanica*	Anatidae	MR/IV
126	Blue-winged Parakeet	*Psittacula columboides*	Psittacidae	RE/IV
127	Red-wattled Lapwing	*Vanellus indicus*	Charadriidae	R/IV
128	Rufous Babbler	*Turdoides subrufus*	Timaliinae	RE/IV
129	Brown Wood Owl	*Strix leptogrammica*	Strigidae	R/IV
130	Spot-billed Duck	*Anas poecilorhyncha*	Anatidae	M/IV
131	Long-billed Vulture	*Gyps indicus*	Accipitridae	CE/IV
132	Spotted Owlet	*Athene brama*	Strigidae	R/IV
133	Indian Pond-Heron	*Ardeola grayii*	Ardeidae	R/IV
134	Tickell's Blue-Flycatcher	*Cyornis tickelliae*	Muscicapinae	R/IV
135	Bronzed Drongo	*Dicrurus aeneus*	Dicruridae	R/IV
136	Western Reef Egret	*Egretta gularis*	Ardeidae	RM/IV
137	Besra Sparrowhawk	*Accipiter virgatus*	Accipitridae	R/IV
138	Alpine Swift	*Tachymarptis melba*	Apodidae	U/IV
139	Scarlet Minivet	*Pericrocotus flammeus*	Campephagidae	R/IV
140	Little Grebe	*Tachybaptus ruficollis*	Podicipedidae	R/IV
141	Black Bittern	*Dupetor flavicollis*	Ardeidae	M/IV
142	White-bellied Sea-Eagle	*Haliaeetus leucogaster*	Accipitridae	R/I
143	Small Blue Kingfisher	*Alcedo atthis*	Alcedinidae	R/IV

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144	Tickell's Flowerpecker	*Dicaeum erythrorynchos*	Dicaeidae	R/IV
145	Crested Serpent Eagle	*Spilornis cheela*	Accipitridae	R/IV
146	Collared Kingfisher	*Todiramphus chloris*	Alcedinidae	R/IV
147	Black-crowned Night Heron	*Nycticorax nycticorax*	Ardeidae	RM/IV
148	Large Pied Wagtail	*Motacilla maderaspatensis*	Motacillidae	R/IV
149	Franklin's Prinia	*Prinia hodgsonii*	Sylviinae	R/IV
150	Yellow-eyed Babbler	*Chrysomma sinense*	Timaliinae	R/IV
151	Forest Eagle-Owl	*Bubo nipalensis*	Strigidae	U/IV
152	Black Eagle	*Ictinaetus malayensis*	Accipitridae	R/IV
153	Ashy Prinia	*Prinia socialis*	Sylviinae	R/IV

M. List of butterfly species reported within 10-km radius of Block-II Sirigao-Mayem Block

Sl.No.	Common Name	Scientific name	Family	IUCN status/ WPA schedule
1	Spot swordtail	*Graphium nomius* Esper	Papilionidae	Common
2	Crimson rose	*Pachliopta hector* Linnaeus	Papilionidae	Schedule I
3	Common rose	*Pachliopta aristolachiae* Fabricius	Papilionidae	Common
4	Common castor	*Ariadne merione assama* Evans	Nymphalinae	Common
5	Lemon pansy	*Precis lemonias lemonias* L	Nymphalinae	Common
6	Commander	*Moduza procis procis* Cramer	Nymphalinae	Common
7	Tree Nymph	*Idea malabarica* Moore	Danainae	Common
8	Common Indian Crow	*Euploea core* Cramer	Danainae	Common
9	Plain Tiger	*Danaus (Anosia) chrysippus* L	Danainae	Common
10	Grass demon	*Udaspes folus* Cramer	Hesperiidae	Common
11	Common dart	*Potanthus spp* Fabricius	Hesperiidae	Common
12	Red helan	*Pachliopta helenus helenus* Hampson	Papilionidae	Common
13	Malabar banded peacock	*Papilio buddh* Westwood	Papilionidae	Schedule II
14	Lime butterfly	*Papilio demoleus* Linnaeus	Papilionidae	Common
15	Chocolate albatross	*Appias lyncida* Cramer	Pierinae	Schedule II
16	Common Jezebel	*Delias eucharis* Drury	Pierinae	Common
17	Common emigrant	*Catopsilia pomona* Fabricius	Colindinae	Common

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18	Common grass Yellow	*Eurema hecabe contubernalis* Moore	Coliadinae	Common
19	Angled Sunbeam	*Curetis dentata* Moore	Curetinae	Common
20	Common Silverline	*Spindasis vulcanus fusca* Moore	Theclinae	Common
21	Angled pierrot	*Caleta caleta decidia* Cromer	Polyommatinae	Common
22	Pea Blue	*Lampides boeticus* Linneaus	Polyommatinae	Schedule II
23	Common pierrot	*Castalius rosimon rosimon*	Polyommatinae	Schedule II
24	Dark pierrot	*Tarucus ananda*	Polyommatinae	Schedule IV
25	Common four ring	*Ypthima huebneri huebneri* Fabricius	Polyommatinae	Common
26	Common nawab	*Polyura athamas athamas* Drury	Charaxinae	Common
27	Angled Castor	*Ariadne ariadne pallidior* Frusthorfer	Nymphalinae	Common

N. List of fishes and crab species reported from 10-km radius of Block-II Sirigao-Mayem Block

Sl.No.	Common name	Scientific name	Family	IUCN status/ WPA Schedule
1	Spangled emperor	*Lethrinus nebulosus*	Lethrinidae	Not evaluated
2	Mangrove red snapper	*Lutjanus argentimaculatus*	Lutjanidae	Not evaluated
3	Malabar blood snapper	*Lutjanus malabaricus*	Lutjanidae	Not evaluated
4	John's snapper	*Lutjanus johni*	Lutjanidae	Not evaluated
5	Yellowfin tuna	*Thunnus albacares*	Lutjanidae	Near Threatened
6	Bigeye tuna	*Thunnus obesus*	Lutjanidae	Vulnerable
7	Indian mackerel	*Rastrelliger kanagurta*	Lutjanidae	Data Deficient
8	Black marlin	*Makaira indica*	Lutjanidae	Data Deficient
9	Goatee croaker	*Dendrophysa russelli*	Sciaendae	Not evaluated
10	Blotched croaker	*Nibea maculate*	Sciaendae	Not evaluated
11	Indian oil-Sardinella	*Sardinella longiceps*	Sciaendae	Least Concern
12	Indian spiny turbot	*Psettodes erumei*	Psettodidae	Not evaluated
13	Malabar tonguesole	*Cynoglossus macrostomus*	Cynoglossidea	Not evaluated
14	Dorab wolf-herrings	*Chirocentrus dorab*	Chirocentridae	Not evaluated
15	Chacunda gizzard-shad	*Anodontostoma Chacunda*	Clupeidae	Not evaluated
16	Engraved catfish	*Arius caelatus*	Ariidae	Not evaluated
17	Christian crabs	*Charybdis cruciate*	Portunidae	Not evaluated

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NABET Consultant

LIST OF FLORA AND FAUNA IN THE CORE AND BUFFER ZONE OF BLOCK-II SIRIGAO MAYEM MINERAL BLOCK OF SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

18	Blue swimming crab	*Portunus Pelagicus*	Portunidae	Not evaluated

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Annexure-9

GOA STATE POLLUTION CONTROL BOARD

गोंय राज्य प्रदूषण नियंत्रण मंडळ

(An ISO 9001-2015, ISO 14001:2015, ISO 45001:2018 Certified Board)

Phone Nos : 0832- 2407700,
2407701, 2407703

Email Ids:
Chairman, GSPCB: chairman-gspcb.goa@nic.in
Member Secretary, GSPCB: ms-gspcb.goa@nic.in
Office: mail.gspcb@gov.in

BY SPEED POST
MOST URGENT

No 11/15/2023-PCB/Leg/7588 Date:-03/07/2024

To,
The Director (Envt & CC) & Member Secretary,
Goa-SEIAA, Goa State Environment Impact Assessment Authority,
Constituted by the Ministry of Environment, Forest and Climate Change,
Govt Of India, C/o. Dept. Of Environment and Climate Change,
4th Floor, Dempo Towers, Patto, Panaji Goa

Sub:- Environmental Public Hearing

Sir,

As per the Environment Impact Assessment Notification (EIA) dated 14/09/2006, issued by the Ministry of Environment, Forests and Climate Change, Government of India, the Goa State Pollution Control Board has conducted Environmental Public Hearing as per the said notification with respect to Block II Sirigao Mayem Mineral Block with area of 171.2472 Ha. located in Sirigao and Mayem Village of Bicholim Taluka of North Goa District of Goa State for production of 1.0 MTPA of Iron Ore by M/s. Salgaocar Shipping Co.Pvt. Ltd.

In this regard, I am to enclose herewith the following documents for your perusal and necessary action.

1. The copy of the dully approved proceedings of the Environmental Public Hearing held on 19/6/2024 reflecting the views and concerns expressed by the public present for the hearing recorded and read out to the public out on the same day, alongwith translation of the same in the official State Language i.e Konkani – **Annexure "A"**
2. Attendance Sheet – **Annexure "B"**
3. Attendance of Speakers – **Annexure "C"**
4. The recordings of the proceedings (Pendrive 1 no.)– **Annexure "D"**
5. The copy of representation/ suggestions/ objections received by the Board– **Annexure "E"**

6. The copy of the supporting received by the Board– **Annexure "F"**

7. Reply to the queries submitted by project proponent raised during the Environmental public hearing in English - **Annexure "G"**

8. The copies of the notices issued in the various newspapers/T.V Channels - **Annexure "H"**

Kindly acknowledge the receipt of the same.

Yours faithfully,

(Dr.Shamila Monteiro)
Member Secretary
Goa State Pollution Control Board

Encl: As above.

Copy to:-

1	**M/s. Salgaocar Shipping Company Private Limited, Salgaocar Bhavan, Alhnho, Panaji - Goa. Email:- info@smiindia.com .....for information**
2	Office copy
3	Guard file

ANNEXURE B

NAME :
DATE : / /

ATTENDANCE REGISTER

Environmental Public Hearing as per Environmental Impact Assessment 2006 w.r.t. Block II Sirigao Mayem Mineral Block with area of 171.2472 Ha. located in Sirigao and Mayem Village of Bicholim Taluka of North Goa District of Goa State for production of 1.0 MTPA of Iron Ore by M/s. Salgaocar Shipping Co.Pvt. Ltd.

Date:- 19/6/2024

Time:- 10.30 am onwards

Venue:-Narayan Zantye Multipurpose Sports Complex, Sarvan, Bicholim Goa

NAME:
DATE: / /

Sr. No	Name and Address	Mobile No.	Sign
1	Yeshwant Vamandas Deridas	9833070 5393	
2	Bappa Jatto	9819371016	
3	Vinod G. Shirgaonkar	9923271879	
4)	Anant S. Chari	9011445850	
5)	Naresh V. Naik (Canacona)	7030151627	
6)	Anju Jayachandran.	9922289333	
7	Sandeep Naik	9423320259	
8	Mahesh Pai Vernekar	9822124148	
9	Dr. Viraj B. Kale	7030784272	
10	Raju Chavan	9356217304	
11	Subrat Panigrahi	9823767932	
12	Nitin Sood	9822037251	
13	Vijay A Palle	8605414335	
14	S. K. Jawadar -	9422440606	
15	Mangesh S. Gaonkar	9823176459	
16	Yeshwant Gad.	9011232418	
17	Vivek V. Kudalkar	9823559600	
18	Gajanan Suresh Korbolkar	9579245376	
19	Gaurish S. Sawant	9850417982	
20	Ravi Gaude	7769011818	
21	Ganesh Gopal Gaonkar	9823172721	
22	Ishan Borkar	9923668786	
23	Vishnu Halarnkar	84090 3940	
24	Vinayak Naik	7218532820	
25	Rajaram Dhavalikar	7588420334	
26	Santosh V. Naik	9823740116	
27	Mahesh V. Shirgaokar	9764893727	
28	Satish Pethkar	7798865151	
29	Dilip Virodkar	8999321977	
30	Shamba Kavlekar	7798106553	
31	Sandeep [illegible]	9420288528	
32	Sanyakant R. Palni	9767266810	
33	Pravin G. Gaonkar	9823890	
34	Sujay C. Parrikar	7768984300	
35	Sadhram Anant Padnekar	9767050508	
36	ATUL BHANDARI	8888990770	

NAME:
DATE: / /

Sr No.	Name and Address	Mobile No.
37	Vijay L. Gaonkar	7998438835
38	Umesh Naik	9158850049
39	Dinanath C Gaonkar	7721920 Cell
40	Suresh G. Gaonkar	9423057804
41	Surendra V Chodankar	8329251673
42	Sameer P. Gaonkar	9423486232
43	Sanjay Salgaonkar	9421242731
44	Sadanand A. Hoble	8308393241
45	Sushant P. Meerikar	9763685042
46	Vasudev K Tari	9075224046
47	Ramanna. K. Kavadimatti	9420297405
48	Devanand A. Mandrekar	9823741608
49	Vasu S. Shari	9823439220
50	Vikas V. Bhairavdi	8805314079
51	Babu M. Parlekar	9923878733
52	Naresh Parab	9011995237
53	Dinesh Gaonkar	9823246466
54	[illegible]	—
55	Eknath Amonkar	9403879961
56	Santosh Bugde	9765795479
57	Fany [illegible]	[illegible]
58	A.R.V. Prasad	8129741865
59	Chandrakant Naik	9637830850
60	Rama L. Kamat	9607263197
61	KOTAPKAR SANTOSH G	9226578944
62	Abhijeet Naik	7798532258
63	Viranjak Panjikar	9011842117
64	Ashvek Chodvad	9823994736
65	Kunal Shetgaonkar	7350477907
66	Pradeep S Bhonsle	9822191515
67	Naresh R. Tari	—
68	Bhagwant B. Gaonkar	9923826379
69	Dilip G. Gaonkar	9049600004
70	Dinanath R Gaonkar	—
71	Pradip Bhaskar Gaonkar	9822181573
72	Ramesh D. Kare	8975129620

NAME:
DATE: / /

Sr. No.	Name and Address	Mobile No.	Sign.
73	Seema S. Arondekar.	8080625938	
74.	Krishna M. Chavan	9890688338	
75	Santosh J. Bhosle	9607194995	
76	Prakash K. Naik	8104804817	
77	Dipak Dattu Naik	9822585857	
78	Leelkaly V. Desai.	9511279949	
79	Ramesh S. Cosme		
80	Laxman Y. Gaonkar	9158991686	
81	Vishwanath Gopal Gaonkar	7798355481	
82	Shri Babuso Bhalchandra Gaonkar	9923794623	
83	Subhash Kudalkar	9764246484	
84	S. V. Gadre.	9822178	
85	Chandrakant D. Sarf.	9322892533	
86	Srinath R. Aavankar.	9763664117	
87	Chandrashekhar S. Shirodkar	9423834533	
88	Jayant V. Gaude	9764232207	
89	Praveen R. Gaonkar	9158423218	
90	Pradeep Hari Gaonkar	8805114975	
91	Ashutosh Kumar	7020471582	
92	Smith Sandeep Ghatwal	9922070847	
93	Jeet Suraj Ghatwal	9923070247	
94	Vasant G. Gadekar	8459940851	
95	Kamlakar Berde		
96	Sandeep K Devidas	9765599670	
97	Shailesh Vaziikar	8698128642	
98	Mayur Parab	—	
99	Tushar Shirvi	—	
100	Devi P. Ghatwal	9923487337	
101	Mukund S. Ghatwal	—	
102	Vasudev P. Gaonkar	9657833891	
103	Kundan Singh	9890637345	
104	Tulsidas Chodankar	9370295086	

Sr. No.

ATTENDANCE REGISTER

Environmental Public Hearing as per Environmental Impact Assessment 2006 w.r.t. Block II Sirigao Mayem Mineral Block with area of 171.2472 Ha. located in Sirigao and Mayem Village of Bicholim Taluka of North Goa District of Goa State for production of 1.0 MTPA of Iron Ore by M/s. Salgaocar Shipping Co.Pvt. Ltd.

Date:- 19/06/2024
Time:- 10.30 am onwards
Venue:-Narayan Zantye Multipurpose Sports Complex, Sarvan, Bicholim Goa

Presenters at Environmental Public hea

No.	Name	Place of Residence	Sign.	Mobile No.
1)	Ajay Ashok Gc[illegible]	Sin[illegible]		9765032[illegible]
2)	Devanand. S. Kasbekar	Poira		9403274618
3)	Siddesh. V. Sukhtar	Porra		9011673548
4)	[illegible] Bhuvalka	[illegible]		9881284781
5)	Jaydeep S Ghatwal	Poira		98239982[illegible]
6)	Anand S. Naik	Porra		9822157457

Annexure C

NAME :
DATE : / /

Sr.

SPEAKERS REGISTER

Environmental Public Hearing as per Environmental Impact Assessment 2006 w.r.t. Block II Sirigao Mayem Mineral Block with area of 171.2472 Ha. located in Sirigao and Mayem Village of Bicholim Taluka of North Goa District of Goa State for production of 1.0 MTPA of Iron Ore by M/s. Salgaocar Shipping Co.Pvt. Ltd.

Date:- 29/6/2024
Time:- 10.30 am onwards
Venue:-Narayan Zantye Multipurpose Sports Complex, Sarvan, Bicholim Goa

NAME:
DATE: / /

Sr.No.	Name of Speaker & Address	mobile No.	Sign
1	Ajay Anant Gaonkar Mamarde (Siriguo)	9765031720	
2	Anant S. Chari, Siriguo	9011445850	
3	Ramesh H. Naikar (Siriguo)	8806853935	
4	Vinod G. Shirgaonkar (Shiriguo)	9423221879	
5	Nayeed U. Nadaf (Mapusa)	7030156722	
6	Karishma G. Gaonkar (Shiriguo)	8329017018	
7	Devanand. Kankonkar (Poira)	9403274818	
8	Vinayak V. Kudalkar (Mayem)	9823559600	
9	Subhash Kinalekar, Mayem	9373847769	
10	Amit A. Gaonkar (Siriguo)	9689567224	
11.	Siddesh V. Sulikar (Poira)	9011673548	
12	Jaydeep Ghatwal (Poira)	9823998263	
13	Satyawan Naik Parab	9881289788	
14	Sachin Surlikar (Poira)	9423400555	
15	Anand S. Naik (Poira)	9822137437	
16	Vijay A. Palle (Poira)	8605434135	
17	Subhash D. Salgaonkar (Poira)	8975 2729	
18	Ravi Gaonkar (Siriguo)	7769011358	
19	Ganesh Gopal Gaonkar (Shiriguo)	9823172721	
20	Seema Anandekar	8080625938	
21	Dilip Shirodkar (Poira)	8007092886	
22	Yash V. Chatterjee (Poira)	9145713785 3	
23	Vishant Pednekar, Mayem	9850410841	
24	Krishna Chodankar, Mayem	9823688358	
25	Santosh Bhosle, Shiroorm	9823749736	
26	Ashvek Ghatwal Poira	9823994873	
27	Narayan Narvekar, Poira	9423066	
28	Sanyakant R. Palkar (Shiroda)	9767266820	
29.	Sharlesh G. Shirodkar	8550925816	
30	Sujay C. Parreikar Mapusa	7768984500	
31	Atchyut Ramchandra Gaonkar (Shiroda)	9226198980	
32	Sitaram Sirlaikar, Ghatwal	9763696020	
33	Sakharam Anant Padyekar (mayem)	9767050503	

Sl. No.	Name of Applicant & Address	Mobile No.	Sign
34	Vinay P. Kowalczyk (School)	7498038835	dP
35	[illegible]	4239 [illegible]	[illegible]
36	[illegible]	0192387197873	[illegible]
37	Sourish [illegible]	9238535944	[illegible]
38	~~Ashwek Chadhuri~~	~~7853991756~~	~~[illegible]~~
39	Bhagyashree Bhaskar Chaudhari	9938862839	[illegible]
~~40~~	~~Sanjeev Shirole~~	~~[illegible]~~	~~[illegible]~~
40	Laxman V. Chandekar (Bhai Tyre)	9158 99168786	[illegible]
41	Vishwambhar Gopal Chaudhari Bhangre	7498 35651	[illegible]
42	Dinesh Sonkar	7893994446	[illegible]
43	Tushar J. Chandak (Shinde)	9346425230	[illegible]
44	Vandana [illegible] Kulkarni (Mrs)	[illegible]	[illegible]
45	Smith Sandeep Dhatwalia (Rohit)	9992078	[illegible]

NAME:

DATE: / /

Annexure E Lo
Neebh. Assist
attch...

Ramesh S. Gauns
Hose No.:1724
Pajwada -Bicholim
Date:20th June 2024.

To
The Member Secretary
Goa State Pollution Control Board
Saligao –Bardes
Goa.

Subject: Submission on EIA on Block-II Sirigao-Mayem Mineral Block.

Madam

I was present for the Public Hearing from the beginning ,but sad to say that since I failed to register my name in speakers register ,the Chair did not allow me to speak and abruptly told to disconnect mike as well as shut the video off and got up from the chair and went away. There fore following are my submission submitting in writing .

1.The village Poira which is in the core zone of Block-II is missing. No sudy is done on the said village. Even the name is not mentioned in EIA. Therefore the EIA becomes Incomplete and in adequate. Yet the Public Hearing was conducted Such Public Hearing does not attain legal status .Hence No processing be done to grant EC.

2.Block –I of Vedanta is adjacent to Block-II. There are in all 3 Mines and hence a cumulative Impact assessment is necessary and, which is not done and made a part of the EIA. Hence the Public Hearing by itself becomes in valid. Based on invalid Public Hearing processing and considering the project for EC also become unlawful. So the PH report should be rejected for want of the mandatory thins which are not complied.

3.It is also see that the lake by name GOIGANE lake in Maye bearing survey number 79 and having an area of 218250sq m.(Two lakhs eighteen thousand and two hundred fifty). This information is concealed. There are also two more perennial water bodies in Mayem at Tirthbag these water bodies are also missing in EIA .

This possible only if the physical study is not done in person by the consultant.

4.On page 6 of the Executive Summery it is stated " As the area is located on the foot hills of western Ghats....." Infact the Western Ghats are nearly 40km away from Block-II. This also proves that the ground level study is not carried out by the consultant. They are also ignorant about the Bicholim taluka in which Block-II is located.

It is also interesting to see the above statement in the Executive Summary of Vedanta Block –I. page no. 7, " The area is located on the foot hills of Western Ghats belt....." It seems that the Mineral Engineering Services have done the business is cut and paste/.copy paste.

So based on omission of one village from core zone, concealment of facts and copy paste business EAC should not entertain the pracess of granting EC but ask to incorporate the facts and conduct fresh Public Hearing or no EC should be granted to the project proponent.

Thanking you

Yours truly

(Ramesh S. Gauns)

Mob: 9270085105.

LO

Received
18/6/24

From:
Anand Sadashiv Naik & Ors..
C/o Poira Block-II Mining
Affected Forum,
Village Panchayat Mayem.
H. No. 1133, Poira-Mayem.
Bicholim-Goa. 403503.

Date : 16.06.2024

To,
1) The Members Secretary,
Goa State Pollution Control Board,
Government of Goa,
Panaji-Goa.

2) The Director,
The Directorate of Mines,
Government of Goa,
Panaji-Goa.

3) The Director,
The Directorate of Environment,
Government of Goa,
Panaji-Goa.

Subject : Memorandum for Inclusion of Poira Village along with its specific mention in the Executive Summary of EIA & EMP - II Sirigao - Maem Mineral Block as well as Exclusion of said village beyond buffer zone of mining mineral block, Reg...

Sir,

We the Villagers of Ward No. 9 of Poira Part of Mayem V.P. falling under Sirigao-Mayem Mineral Block-II who are directly affected due to all Mining Operators related activities in our part of Poira would like most humbly state, submit and pray as under:-

The area mentioned is the subject above having being land locked as well as sandwiched between effective mining operations on the one side and Konkan Railway Track on the other side within 50 metres, the ill effects of mining such as soil erosion,

silting of mines rejected mud, heavy dust pollution, noise, air and water pollution besides soil pollution, ponds and water locking, water stagnation, blockades of gutters and natural irrigation system detrimental and hazardous to human health and safety causing industrial occupational hazard to life are daily affairs to the local resident of this part of Poira Village.

It has caused enhanced quantum of loss to people, their assets including the live stock as a result we the local residents are the first and worst affected people since most of the mining operations as mentioned at para two above are taking place in our landed prosperities with survey Nos. from 47, 56, 57, 58 & 59.

Unfortunately however it is most pertinent to note that, even having being this area is the most mining affected pollution hot spot, there is no required and necessary mention of our area in the Executive Summary of EIA & EMP Sirigao-Mayem Mineral Block-II of Bicholim Taluka in North Goa District of Goa State. On account of this there is general feeling of discrimination which the Government having meted step motherly treatment to the residents of Poira.

On the other hand some of the far distance village areas and public places are included in the mining Block-II.

In view of the above facts and circumstances you are hereby most humbly requested to include part of Poira Village in Block-II in the Executive Summary of EIA & EMP.

Further it is requested to arrange for the protective and compensatory measures in this area in order to safeguard the life and property including live-stock of the local residents besides ensuring the grant of facilities such as pollution compensation, damages towards agricultural land loss, silting clearance of farming fields, cleaning of drains, medical facilities, disilting of water bodies including drinking water wells, provision of

medical facilities etc. etc. which the concern authorities as in law are required to undertake.

Under the above facts and circumstances you are hereby most humbly requested to ensure that direct specific mention of the Poira Village in Executive Summary of EIA & EMP, besides its exclusion from the Mining buffer zones be done in the larger interest of the residents of Poira as well as the protection and promotion of their basic and fundamental Human Rights to clean Environment.

Hope that your goodself will pursue into the content of this application and personally look into the matter on a most humanitarian grounds to ensure justice is done to these mining affected local residents.

Thanking you.

Yours faithfully,

(Siddhesh S. Ghatwal)
Secretary

(Siddhesh V. Surlikar)
Vice President

(Anand Naik)
President
Ex. Sarpanch V.P. Mayem
9822154721

CC to :
1. The Director,
M/s Salgaocar Shipping Co. Pvt. Ltd.,
Salgaocar Bhavan, Altinho, Panaji-Goa.

Received on 26/06/24

LO

Navbharat

26/6/24

From:

President

All India Kisan Sabha, Mayem unit

Krishna K Gadekar

Mayem, Goankarwada

Bicholim, Goa

Date 26/06/2024

To

The Chairman

Goa State Pollution Control Board

Sub: Views/Suggestions/objections of Stakeholder in response to Public Notice on news paper in respect of Environmental Public Hearing to be conducted by the Goa State Pollution Control Board on 19/06/2024 at Bicholim, Goa w.r.t Poira Sirgao Mineral Block

Sir,

The undersigned wishes to draw your kind attention to the office memorandum dated 29th October 2014 of the Ministry of Environmental and Climate Change (Impact assessment Division) which states that" In the Mining area adequate number of check dams, retaining walls/structures, garlands drains and settling ponds should be provided to arrest the wash – off with rain water in catchment area" The absence of such steps has led to damage of the fields in the past and there is no ground to presume that similar adverse impact will not occur in future

Futher, the memorandum states that " The natural water bodies and/ or streams which are flowing in and around the village should not be disturbed. The water table should nurtured so as not to go down below the pre-mining period... A provision for regular monitoring of water table in open dug well located in village should be incorporated to ascertain the Impact of mining over ground water table". The undersigned asserts that the water table has already dropped much lower as compared to the pre – mining period in this area. This has had a severe impact on the overall

agricultural production in the area thereby jeopardizing the means of livelihood of the residents. Considering the fact that the lease for mining has been granted for a period of fifty years and the scale of mining enabled by the improved technology, the disastrous effects which the local people will have to face cannot be overestimated.

The memorandum also states that "The project authority shall ensure that the productivity of agricultural crops is not affected due to mining operations." The undersigned emphasizes the fact that the mining operations in the past have adversely affected the crop productivity on regular basis and the peasants have had to struggle even to receive compensation for such losses. There is hardly any ground to presume that the consequences will be different this time considering the fact that no steps have been taken to evaluate the possible damage resulting from the mining activities. It is further stated that " ...Socio-economic Development of the neighborhood Habitats could also be planned and executed by the PPs more systematically based on the 'Need based door to door survey by established Social Institutes/ Workers on the lines as required under TOR. R&R plan/compensation details for the project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view." In the absence of any concrete Rehabilitation plan a mining lease of fifty years will have disastrous consequences on the ecology, which has already been damaged by the mining in the past, and the lives and means of livelihoods of the inhabitants.

The memorandum also states that "Transportation of the minerals by road passing through the village shall not be allowed. As bypass road should be constructed (say, leaving a gap of at least 200 meters) for the purpose of transportation of the minerals so that the impact of sound, dust and accidents could be mitigated... No road movement should be allowed on existing village road network without appropriately increasing the carrying capacity of such roads." Such measures have not been taken as of now.

The zonal agricultural officer's reports dated bear testimony to how mining in the past has adversely affected the local farmers. One such reports admit

Thus as the field situated at lower elevation water flow along with silt into the field during the rainy season. Several hundred farmers'peasants. fields have been affected due to silt. It was officially reported more than ten years ago that this situation existed" for last 15 years as informed by the farmers presents" it has also been reported that " only one paddy crop is possible during RABI Season and every year farmer use to remove the silt for taking up their Rabi Crop and facilitate irrigation for distance fields."

Mining in th past has already had a serious impact on the water bodies in the locality thereby posing serious threat to the agriculture and ecology in general.

Lease which has given to company for Salgaonkar Mines Pvt. Ltd to previous mining activities.

In View of the above documents available at your good office, the undersigned most vehemently opposes the granting of environmental clearance to the leaseholder. as long as no concrete and compressive plan for the rehabilitation of the affected people is ready. Further, the undersigned also states that the project affected people should have direct representation in the process of formulating such a rehabilitation plan

Thanking You

Mr. Krishna K Godekar

President

All India Kisan Sabha. Mayem Unit

Bicholim. Goa

Annexure P1

Phone Nos: (0832) 2402700, 2402701, 2402702

Email Ids:
Chairman, GSPCB: chairman-gspcb.goa@nic.in
Member Secretary, GSPCB: ms-gspcb.goa@nic.in
Office: mail.gspcb@gov.in

No. 11/15/2022-PCB/Legal/2966

Dt:14/2/2024

PUBLIC NOTICE FOR ENVIRONMENTAL PUBLIC HEARING

Whereas as per the Environmental Impact Assessment Notification No. S533 (E) dated 14/09/2006 as amended by the Ministry of Environment, Forest and Climate Change, Government of India, Environmental Public Hearing at the site or in its close proximity, district wise has to be carried out in the manner prescribed in Appendix IV for ascertaining concerns of the affected persons for the projects covered in Schedule I of the said notification.

In accordance with the procedure stipulated in the amended Environmental Impact Assessment Notification dated 14/09/2006 as amended, the District Collector or the Additional Collector or the Deputy Collector is required to preside over the above fixed Environmental Public Hearing.

Whereas, as directed, the Environmental Public Hearing is proposed to be conducted by the Goa State Pollution Control Board in consultation with the District Collector for the following Project on the Date, Time and Venue as mentioned below:

Sr No	Project details	Date	Time	Venue
1	Public Hearing as per the Environmental Impact Assessment 2006 Block B Shilpa Steven Mineral Block area of 181.2472 Ha. located in Sirigao and Mapusa Village of Bicholim Taluka of North Goa District of Goa State for production of 4.8 MTPA of Iron Ore by M/s. Salgaocar Shipping Co. Pvt. Ltd.	28/2/2024	10.30 am onwards	Kacropon Zantye Multipurpose Comm. Complex, Barsor, Bicholim Goa

The Environmental Public Hearing is conducted for ascertaining the concerns of the affected persons who can express their views or seek information or clarifications from the project proponent.

The participants who intends to express their views and speak shall register their names separately from 9.30 am to 12.00 pm on the day of the hearing.

The concerned persons having stake in the Environmental aspects of the project or activity can send their views, suggestions, comments and objections in writing on or before the scheduled date of Public Hearing to the Director (East & CC) & Member Secretary, Goa-SEIAA, Goa State Environment Impact Assessment Authority, Constituted by the Ministry of Environment, Forest and Climate Change, Govt. Of India, C/o. Dept. Of Environment and Climate Change, 4th Floor, Dempo Towers, Patto, Panaji Goa or the Goa State Pollution Control Board, Opp. Saligao Seminary, Mr. Pierre Mall, Bardez, Saligao, Bardez Goa.

Hard Copies of the Draft Environmental Impact Assessment Report along with Executive Summary in Konkani and English submitted by the project proponent is made available for reference at the following offices. The soft copies can be also referred on the website of Goa State Pollution Control Board i.e. www.goaspcb.gov.in.

1	The Collector & District Magistrate (North), Collectorate Bldg., Panaji Goa.
2	The Director, Directorate of Mines and Geology, Ground Floor of Institute Menezes Braganza, Panaji, Goa 403001.
3	The Director (East) & CCI & Member Secretary, Goa-SEIAA, Goa State Environment Impact Assessment Authority, Constituted by the Ministry of Environment, Forest and Climate Change, Govt. Of India, C/o. Dept. Of Environment and Climate Change, 4th Floor, Dempo Towers, Patto, Panaji Goa
4	The Chief Officer, Mapusa Municipal Council, Mapusa Goa
5	The Chief Officer, Bicholim Municipal Council, Bicholim Goa
6	The Dy. Collector & SDO, Bicholim Goa
7	The Block Development Officer, Bicholim
8	The Chief Executive Officer, North Goa Panchayat, Junta House, 3rd fl., Panaji, Ilhasem Goa
9	The Secretary/Sarpanch, Village Panchayat Alorna, Pernem
10	The Secretary/Sarpanch, Village Panchayat Calanguinim, Pernem
11	The Secretary/Sarpanch, Village Panchayat Chopdem, Pernem
12	The Secretary/Sarpanch, Village Panchayat Dargalim, Pernem
13	The Secretary/Sarpanch, Village Panchayat Tuem, Pernem
14	The Secretary/Sarpanch, Village Panchayat Porne, Bardez
15	The Secretary/Sarpanch, Village Panchayat Saligao, Bardez
16	The Secretary/Sarpanch, Village Panchayat Pilerne, Bardez
17	The Secretary/Sarpanch, Village Panchayat Assagao, Bardez
18	The Secretary/Sarpanch, Village Panchayat Anjuna, Bardez
19	The Secretary/Sarpanch, Village Panchayat Vagator, Bardez
20	The Secretary/Sarpanch, Village Panchayat Siolim, Bardez
21	The Secretary/Sarpanch, Village Panchayat Moira, Bardez
22	The Secretary/Sarpanch, Village Panchayat Nerul, Bardez
23	The Secretary/Sarpanch, Village Panchayat Candolim, Bardez
24	The Secretary/Sarpanch, Village Panchayat Porvorim (Gaudem), Bardez
25	The Secretary/Sarpanch, Village Panchayat Santacruz de Nerul, Bardez
26	The Secretary/Sarpanch, Village Panchayat Mapusa Market, Tivrem
27	The Secretary/Sarpanch, Village Panchayat Sankta Khedtir, Tivrem
28	The Secretary/Sarpanch, Village Panchayat Dan Modhas, Tivrem
29	The Secretary/Sarpanch, Village Panchayat Ze Dill Goa, Tivrem
30	The Secretary/Sarpanch, Village Panchayat St. Estevam, Tivrem
31	The Secretary/Sarpanch, Village Panchayat Mangueshi Dattvadem, Bicholim
32	The Secretary/Sarpanch, Village Panchayat Salem, Bicholim
33	The Secretary/Sarpanch, Village Panchayat Advalpale, Bicholim
34	The Secretary/Sarpanch, Village Panchayat Mulgao, Bicholim
35	The Secretary/Sarpanch, Village Panchayat Sirigao, Bicholim
36	The Secretary/Sarpanch, Village Panchayat Ond Mauxiguem-Curchirem, Bicholim
37	The Secretary/Sarpanch, Village Panchayat Korgao-Sanguem, Bicholim
38	The Secretary/Sarpanch, Village Panchayat Usgao Ganjem, Bicholim Goa
39	The Secretary/Sarpanch, Village Panchayat Pissa, Bicholim Goa
40	The Secretary/Sarpanch, Village Panchayat Pissa, Bicholim Goa
41	The Secretary/Sarpanch, Village Panchayat Chalt, Bicholim Goa
42	The Secretary/Sarpanch, Village Panchayat Parcem, Satari Goa
43	The Secretary/Sarpanch, Village Panchayat Tivrem Ganje, Pernem
44	The Secretary/Sarpanch, Village Panchayat Betaul Canacona Pargda
45	The Curator, Government Library, Mapusa Municipal Hall Fort, Bicholim - Goa.
46	Office of the Goa State Pollution Control Board, Saligao Bardez, Goa

The proceedings of the Environmental Public Hearing shall be forwarded to the Director (East & CC) & Member Secretary, Goa-SEIAA, Goa State Environment Impact Assessment Authority, Constituted by the Ministry of Environment, Forest and Climate Change, Govt. Of India, C/o. Dept. Of Environment and Climate Change, 4th Floor, Dempo Towers, Patto, Panaji Goa, for appropriate action in the matter.

Sd/-
(Dr. Sharmila Monteiro)
Member Secretary
For Goa State Pollution Control Board

Dt:14/2/2024

'Talks on with Co

PTI
Srinagar

The National Conference is a part of the INDIA grouping and will continue to be, party leader Omar Abdullah clarified on Thursday and said it is to talk with the Congress for an arrangement in three of the six Lok Sabha seats in Jammu and Kashmir and Ladakh.

Omar Abdullah's statement came shortly after NC chief Farooq Abdullah told reporters that the party would contest the forthcoming Lok Sabha elections and possible assembly polls in the Union territory on its own.

"We were a part of the INDIA alliance and we still are. Things have been taken out of context. The main idea of the grouping is to defeat the BJP because there is no point in selling to two boats" Omar Abdullah said with his father, also the party's Srinagar MP, by his side.

Farooq Abdullah, he said, was echoing the general sentiments of party workers.

"NC workers want to fight elections on all six seats but the truth is that sometimes for a bigger objective, small sacrifices have to be made.

"If the bigger objective is to win seats back from the BJP, it is necessary for the National Conference to

Haldwani riots: Curfew relaxed after 7 days

PTI
Haldwani

Authorities on Thursday relaxed curfew in Banbhoolpura area of the town for varied durations, seven days after it was imposed following the violence over the demolition of an "illegal" madrasa.

Banbhoolpura was the epicenter of the mob violence which included stone pelting and arson.

According to an order issued by Nainital district magistrate Vandana Singh, curfew will be relaxed from 9 am to 4 pm in Gadjajali, Railway Bazar and PCI godown area.

However, in the rest of Banbhoolpura, it was relaxed for two hours from 9 am to 11 am.

During the curfew relaxation shops dealing in essentials will remain open and the residents will be allowed to out to buy essentials, the order said.

Continued on P 10

Commer... office/lab use in ... area, 300 sq. mts. First ... Contact - 9423530804 (03030)

कोकण रेल्वे कार्पोरेशन लि.

पर्वरी नगरपालिका

पर्वरी - गोवा

निविदा सूचनाबाबत

(फक्त ई-निविदा पद्धतीने)

गोवा राज्य प्रदूषण नियंत्रण मंडळ

गोवा राज्य शहर उद्दयगत एजन्सी

(गोवा सरकारचे स्वतंत्र)

गोवा गृहनिर्माण मंडळ

PUBLIC NOTICE OF CANCELLATION OF RECRUITMENT PROCESS FOR POST OF DEPUTY SUPERINTENDENT OF POLICE, GOVERNMENT OF GOA

पणजीचे उपजिल्हाधिकारी कुलदीप अडकोणकर

गोवा राज्य शहर उद्दयगत एजन्सी

(फक्त ई-निविदा पद्धतीने)

गोवा गृहनिर्माण मंडळ

गोवा राज्य प्रदूषण नियंत्रण मंडळ

(एक सरकारचे स्वतंत्र मंडळ, अधिसूचना 1998/2/95, तारीख 18.01.2006 अन्वये गठित)

पत्र सं. GSPCB/HQ/TC/[illegible]
[illegible]/2023/[illegible]
दि. 11/12/2023/[illegible]/Corrigendum

दूरध्वनी: [illegible]
ई-मेल आयडी:
अध्यक्ष, पीसीबी: chairman-gspcb@gov.in
सदस्य सचिव, मंडळाचेही: ms-gspcb@gov.in
फॅक्स: 0832-2402339
वेबसाइट: www.gspcb.gov.in

पर्यावरणीय परिणाम मूल्यांकन खाणीवर जाहीर सार्वजनिक सुनावणी

गोवा राज्य पर्यावरणीय मूल्यांकन, ता.[illegible] रोजीच्या बैठकीत सुनावणी घेण्याची शिफारस केली होती. त्यानुसार, [illegible] (१) क्षेत्रीय [illegible] रोजी, सकाळी ११ वाजता [illegible] खाणीवर सुनावणी आयोजित केली आहे. [illegible] ३ रा आदेशित खाणीवर सुनावणी घेण्यात येईल.

दुसरी नियमित सुनावणी [illegible] रोजी सुरवात केलेल्या पर्यावरण परिणाम मूल्यांकन, अधिसूचनेनुसार तरतुदीनुसार करण्यात आली. मेसर्स. [illegible] या अतिरिक्त जिल्हाधिकाऱ्यांच्या या उपजिल्हाधिकाऱ्यांच्या पुनर्नियुक्ति पर्यावरण पीसीबी सुनावणीची अध्यक्षता घेण्यात आली. [illegible] या सदस्य सचिवांच्या पीसीबी सुनावणी घेण्यात सुरुवात निर्देश दिल्याने मंजूर करण्यात आले. [illegible] खाणीवर सुनावणी घेण्यात आली.

अ.क्र.	प्रकल्पाचे तपशील	तारीख	वेळ	स्थळ
१	[illegible] पर्यावरण मूल्यांकन [illegible] [illegible] खाणीवर सुनावणी [illegible]-II [illegible] [illegible] [illegible]	[illegible]	सकाळी ११.३० पासून	[illegible] [illegible] [illegible] [illegible]

[illegible] सुनावणी [illegible] [illegible] [illegible] [illegible]

गोवा राज्य प्रदूषण नियंत्रण मंडळ
गोंय राज्य प्रदूषण नियंत्रण मंडळ

(आस्थापना १९७४-२०११, आस्थापना ११००१:२०१२, आस्थापना ११००१:२०१८ प्रमाणित संस्था)

फोन क्र: ०८३२-२४०७७००, २४०७७०१, २४०७७०३

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क्र. ११/१५/२०२२ - पीसीबी/तवदेशिर/२४९८६ दिनांक: १४/०२/२०२४

पर्यावरणीय सार्वजनिक सुनावणीसाठी जाहीर सूचना

जसे की, पर्यावरण, वन आणि हवामान बदल मंत्रालय, भारत सरकार यांनी सुधारित केलेल्या दि. १४/०९/२००६ रोजीच्या पर्यावरण प्रभाव मूल्यांकन सूचना क्र. १५३३ (ई) अनुसार सदर सूचनेच्या पत्रक I मध्ये येत असलेल्या प्रकल्पांमुळे बाधित होत असलेल्या व्यक्तींच्या अडचणींची खातरजमा करण्यासाठी परिशिष्ट IV मध्ये विहित नमुन्यात दिल्याप्रमाणे जिल्हावार - प्रकल्पांच्या जवळील परिसरासाठी किंवा सदर प्रकल्पांच्या ठिकाणी पर्यावरणीय सार्वजनिक सुनावणी घेण्यात येणार आहे.

त्या अनुषंगाने, सुधारित केलेल्या दि. १४/०९/२००६ रोजीच्या पर्यावरण प्रभाव मूल्यांकन सूचनेमध्ये घालून देण्यात आलेल्या प्रक्रियेनुसार, जिल्हाधिकारी किंवा अतिरिक्त जिल्हाधिकारी किंवा उपजिल्हाधिकारी यांनी वर सांगण्यात आलेल्या पर्यावरणीय सार्वजनिक सुनावणीस अध्यक्षपदी उपस्थित असावे.

जसे की, अपेक्षित असलेप्रमाणे, पुढील प्रकल्पाकरिता खाली सांगण्यात आलेल्या तारखेस, वेळेस आणि ठिकाणी सदर पर्यावरणीय सार्वजनिक सुनावणी ही गोवा राज्य प्रदूषण नियंत्रण मंडळाने जिल्हाधिकारी यांच्यासोबत सल्लामसलतीने आयोजित करावी असे प्रस्तावित करण्यात आले आहे.

अनु. क्र.	प्रकल्पाचा तपशील	तारीख	वेळ	स्थळ
१	शिरगाव उद्योग ग्रामे ग्राम, तालुका डिचोली, जिल्हा उत्तर गोवा, गोवा राज्य मध्ये स्थित १७१.२७७२ मेसर्स क्षेत्रफळ असलेल्या प्लॉट्स I) शिरगाव मधे मिनरल ब्लॉक येथील मे. साळगावकर मिनिंग कं. प्रा. लि. यांच्याकडून १.० एमटीपीए चे खनन ओआरचे उत्पादन करण्यासंबंधी पर्यावरण प्रभाव मूल्यांकन २००६ नुसार सार्वजनिक सुनावणी.	२७/०३/२०२४	स. १०.३० वा. पासून पुढे	कार्यालय प्लॉट्स बहुउपयोगी क्रीडा संकुल, सर्वंत, डिचोली, गोवा

प्रकल्पाने बाधित होत असलेल्या व्यक्तींच्या अडचणींची खातरजमा करण्यासाठी पर्यावरणीय सार्वजनिक सुनावणी घेण्यात येणार आहे, ज्यामध्ये प्रकल्प प्रस्तावकांसमोर ते आपले मत प्रदर्शित करू शकतील किंवा माहिती किंवा स्पष्टीकरण मागतील.

आपली मते मांडण्यासाठी किंवा योगदानासाठी जे लोक सहभागी होऊ इच्छित आहेत, त्यांनी सदर सुनावणीच्या दिवशी स. ९.३० वा. ते दु. १२.०० वा. पर्यंत या केंद्रात आपली नावे स्वतंत्रपणे नोंदवायची आहे.

त्या संबंधित व्यक्तींचा या प्रकल्पाच्या बाबतीत पर्यावरणविषयक बाजूंमध्ये बाजूची सहभाग असेल त्यांनी आपली मते, सूचना, वक्तव्ये आणि हरकती ह्या सदर सार्वजनिक सुनावणीच्या ठरलेल्या तारखेअगोदर संचालक (इंडस्ट्रीज आणि सीसी) आणि सदस्य सचिव, गोवा - एसईआयए, गोवा राज्य पर्यावरण प्रभाव मूल्यांकन प्राधिकरण, पर्यावरण, वन आणि हवामान बदल मंत्रालय, भारत सरकार यांनी गठित केलेले, द्वारा पर्यावरण आणि हवामान बदल विभाग, ४ था मजला, पोर्तो टॉवर्स, पाटो, पणजी गोवा किंवा गोवा राज्य प्रदूषण नियंत्रण मंडळ, सहकार सेक्रिटरीएट समोर, सिल्वर ओक, असावलो-दवल, सालकर, वार्देस, गोवा यांना लेखी स्वरूपात पाठवावी.

प्रकल्प प्रस्तावक यांच्याकडून सदर पर्यावरण प्रभाव मूल्यांकन अहवालाचा मसुदा स्थानिक कोंकणी आणि इंग्रजी भाषेमधील कार्यकारी सारांशासह सीपीसी/ झोन कोंकणमध्ये सादर करण्यात आलेला असे आणि जो पुढील कार्यालयांमध्ये संदर्भाकरिता उपलब्ध करण्यात आलेला आहे. त्याच्या सहित सोबत गोवा राज्य प्रदूषण नियंत्रण मंडळाच्या www.goaspcb.gov.in या संकेतस्थळावरही माहितीकरिता देण्यात आलेला आहे.

१	जिल्हाधिकारी आणि न्यायदंडाधिकारी (उत्तर), जिल्हाधिकारी इमारत, पणजी, गोवा.
२	संचालक, खाणी आणि भूगर्भशास्त्र, तळ मजला, इन्स्टिट्यूट मिनेझिस ब्राग्नांझा, पणजी, गोवा ४०३००१
३	संचालक (इंडस्ट्रीज आणि सीसी) आणि सदस्य सचिव, गोवा - एसईआयए, गोवा राज्य पर्यावरण प्रभाव मूल्यांकन प्राधिकरण, पर्यावरण, वन आणि हवामान बदल मंत्रालय, भारत सरकार यांनी गठित केलेले, द्वारा पर्यावरण आणि हवामान बदल विभाग, ४ था मजला, पोर्तो टॉवर्स, पाटो, पणजी गोवा.
४	मुख्य अधिकारी, म्हापसा नगरपालिका, म्हापसा, गोवा
५	मुख्य अधिकारी, डिचोली नगरपालिका, डिचोली, गोवा
६	उपजिल्हाधिकारी आणि एसडीओ, डिचोली, गोवा
७	वन विभाग अधिकारी, डिचोली
८	मुख्य कार्यकारी अधिकारी, उत्तर जिल्हा पंचायत, जुना हाऊस, ३ रा मजला, पणजी, तिसवाडी, गोवा
९	सचिव / सरपंच, ग्रामपंचायत इब्रामपूर, पेडणे
१०	सचिव / सरपंच, ग्रामपंचायत मालपण्यारकर्ण, पेडणे
११	सचिव / सरपंच, ग्रामपंचायत मद्रापूर, पेडणे
१२	सचिव / सरपंच, ग्रामपंचायत धारबंदर, पेडणे
१३	सचिव / सरपंच, ग्रामपंचायत मांये पेडणे
१४	सचिव / सरपंच, ग्रामपंचायत पर्रा, बार्देस

१७	सचिव / सरपंच, ग्रामपंचायत असनोडा, बार्देस
१८	सचिव / सरपंच, ग्रामपंचायत शिरसई, बार्देस
१९	सचिव / सरपंच, ग्रामपंचायत शिवोली, बार्देस
२०	सचिव / सरपंच, ग्रामपंचायत आसगाव, बार्देस
२१	सचिव / सरपंच, ग्रामपंचायत उसकाई, बार्देस
२२	सचिव / सरपंच, ग्रामपंचायत नास्नोळा, बार्देस
२३	सचिव / सरपंच, ग्रामपंचायत हळदोणा, बार्देस
२४	सचिव / सरपंच, ग्रामपंचायत पोंबुर्पा ओल्डवाडी, बार्देस
२५	सचिव / सरपंच, ग्रामपंचायत सडय-कांदोळ दे मुन्सी, बार्देस
२६	सचिव / सरपंच, ग्रामपंचायत चोडण माहेल, तिसवाडी
२७	सचिव / सरपंच, ग्रामपंचायत नेरुली नावेली, तिसवाडी
२८	सचिव / सरपंच, ग्रामपंचायत सां मातियास, तिसवाडी
२९	सचिव / सरपंच, ग्रामपंचायत सां ओल्ड गोवे, तिसवाडी
३०	सचिव / सरपंच, ग्रामपंचायत सांत इस्तेव, तिसवाडी
३१	सचिव / सरपंच, ग्रामपंचायत भेंडुरे घुमास्ते, डिचोली
३२	सचिव / सरपंच, ग्रामपंचायत साळ, डिचोली
३३	सचिव / सरपंच, ग्रामपंचायत अडवलपाल, डिचोली
३४	सचिव / सरपंच, ग्रामपंचायत मुळगाव, डिचोली
३५	सचिव / सरपंच, ग्रामपंचायत तिरभाट, डिचोली
३६	सचिव / सरपंच, ग्रामपंचायत वन - मावळिंगे - कुडचिरे, डिचोली
३७	सचिव / सरपंच, ग्रामपंचायत कारापूर सर्वण, डिचोली
३८	सचिव / सरपंच, ग्रामपंचायत, मये डिचोली, गोवा
३९	सचिव / सरपंच, ग्रामपंचायत कारें, डिचोली, गोवा
४०	सचिव / सरपंच, ग्रामपंचायत पिळगाव, डिचोली, गोवा
४१	सचिव / सरपंच, ग्रामपंचायत आमोणे, डिचोली, गोवा
४२	सचिव / सरपंच, ग्रामपंचायत पर्वे, सत्तरी, गोवा
४३	सचिव / सरपंच, ग्रामपंचायत तिवरे करमल, फोंडा
४४	सचिव / सरपंच, ग्रामपंचायत केरवी खांडेपार, फोंडा
४५	संग्रहालय प्रमुख, शासकीय वाचनालय, नूतन वाचनालय, चावली पेठ, डिचोली - गोवा
४६	गोवा राज्य प्रदूषण नियंत्रण मंडळ याचे कार्यालय, साळगाव, बार्देस, गोवा

सदर पर्यावरणीय सार्वजनिक सुनावणीचे कार्यवाही ही या माहितीत पुढील योग्य कृतीसाठी संचालक (ईएनव्हीटी आणि सीसी) आणि सदस्य सचिव, गोवा - एसईआयएए, गोवा राज्य पर्यावरण परिणाम मूल्यांकन प्राधिकरण, पर्वरिम, यांना शासन हस्तांतरण बदल मंत्रालय, भारत सरकार यांनी गठित केलेले, द्वारा पर्यावरण आणि हस्तांतरण चरण विभाग, ४ था मजला, पेंगो टॉवर्स, पाटो, पणजी गोवा यांना खालीलप्रमाणे पाठवी.

सही/-

(डॉ. शमिला मोंतेरो)

सदस्य सचिव

गोवा राज्य प्रदूषण नियंत्रण मंडळ समिती

SALGAOCAR SHIPPING CO. PVT. LTD.

Salgaocar Bhavan, Altinho, Panaji, Goa – 403001
CIN: U13100GA1975PTC000223
Tel: +91-832-2460500 Email: - info@smilindia.com

July 03/2024

The Member Secretary,
Goa State Pollution Control Board,
Nr. Pilerne Industrial Estate,
Opp. Saligao Seminary- Saligao Goa.

KIND ATTN: DR. SHAMILA MONTEIRO

Respected Madam,

SUB: SUBMISSION OF CLARIFICATIONS/COMMENTS REGARDING THE ENVIRONMENTAL PUBLIC HEARING FOR BLOCK II SIRIGAO MAYEM MINERAL BLOCK held on 19/06/2024.

REF:

1. Your office email dated 20/06/2024 regarding Clarification against Environmental Public Hearing for Block II Sirigao Mayem Mineral Block held on 19/06/2024 at 10:30 am onwards.
2. Salgaocar Shipping Company Pvt. Ltd. (SSCPL) reply dated 26/04/2024.
3. Your Letter Reference No. 11/15/2022-PCB/LEG/6517 dated 24/06/2024 (received by hand delivery on 27/06/2024).

We are in receipt of your letter Reference No.3 above enclosing 5 (five) Nos. objections received by Goa State Pollution Control Board (GSPCB) with regards to Environmental Public Hearing held on 19/06/2024 from 10:30 am onwards at Narayan Zantye Multipurpose Sports Complex, Sarvan, Bicholim, Goa, for Block II Sirigao Mayem Mineral Block of Salgaocar Shipping Company Private limited.

As requested by you, we are submitting herewith clarifications/comments on the above mentioned written submissions. Enclosed as **Annexure-A**.

Please note that we have already submitted clarification/comments with respects to Views/Suggestions/Objections raised by the speakers during Environmental Public hearing held on 19/06/2024 along with photographs of notices posted and photographs of loudspeaker publicity conducted vide our letter under Reference No. 2 above.

SALGAOCAR SHIPPING COMPANY PVT. LTD.

04/07/24
Goa State Pollution Control Board
Opp. Saligao Seminary
Saligao Goa 403 511

We now kindly request your esteemed office to forward our responses to the Goa State Environmental Impact Assessment Authority (Goa-SEIAA) and to the Goa State Expert Appraisal Committee (Goa-SEAC) constituted by the Ministry of Environment, Forest and Climate Change (MOEF and CC) for further action. Please also mark a copy to us for our records and for subsequent online submission to the Goa-SEIAA.

We look forward to your prompt response and guidance on the way forward.

Thanking You,
Yours faithfully
SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

AUTHORISED SIGNATORY

SALGAOCAR SHIPPING COMPANY PVT. LTD.

ENCL:

1. Annexure – A - Point-wise clarifications/comments to the written submission made by some speakers.

COMMENTS ON LETTERS RECEIVED THROUGH GOA STATE POLLUTION CONTROL BOARD (GSPCB) REGARDING ENVIRONMENTAL PUBLIC HEARING HELD ON 19/06/2024 WITH RESPECT TO BLOCK II SIRIGAO MAYEM MINERAL BLOCK OF SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED (SSCPL)	
I	Letter by Anand Sadashiv Naik and othrs. C/O Poira Block II Mining Affected forum, Village Panchayat Mayem, H.No. 1133, Poira-Mayem, Bicholim Goa-403503. Letter dated: 16/06/2024. Letter addressed to Goa State Pollution Control Board (GSPCB), Director of Mines (DMG) and Director of Environment and Copy to Salgaocar Shipping Company Private Limited (SSCPL) Subject: Memorandum for Inclusion of Poira Village along with its specific mention in the Executive Summary of EIA & EMP-II Sirigao Maem Mineral Block as well as Exclusion of said village beyond buffer zone of mining mineral block, Reg...

Objection/Issues Raised	Clarification/Comments
We the Villagers of Ward No. 9 of Poira Part of Mayem V.P. falling under Sirigao-Mayem Mineral Block-II who are directly affected due to all Mining Operators related activities in our part of Poira would like most humbly state, submit and pray as under: - The area mentioned is the subject above having being land locked as well as sandwiched between effective mining operations on the one side and Konkan	At the time of e-auction, DMG provided all prospective bidders with various documents related to Block II-Sirigao Mayem Mineral Block such as Geological Reports (GR), Executive Block Summary and DGPS Plan approved by DMG. The EIA & EMP report were prepared on the basis of Geological Report (GR) and DGPS Approved Plan provided by Directorate of Mining & Geology to

Railway Track on the other side within 50 metres, the ill effects of mining such as soil erosion, silting of mines rejected mud, heavy dust pollution, noise, air and water pollution besides soil pollution, ponds and water locking, water stagnation, blockades of gutters and natural irrigation system detrimental and hazardous to human health and safety causing industrial occupational hazard to life are daily affairs to the local resident of this part of Poira Village.	Project Proponent (PP), as per which the Sy Nos: 47, 48, 56, 57, 58 and 59 are mentioned in Mayem village.
It has caused enhanced quantum of loss to people, their assets including the livestock as a result we the local residents are the first and worst affected people since most of the mining operations as mentioned at para two above are taking place in our landed prosperities with survey Nos. from 48,56,57,58 59.	Block II – Sirigao Mayem Mineral block is situated in Sirigao and Mayem Village. Poira is a Ward coming under as a part of Mayem Village. Block II is having 2 Mining Pits one is in Sirigao Village (Sirigao Pit) and other one is in Mayem Village (Poira Pit). Poira Pit Photographs have been shown in EIA & EMP Report. Page No 402.
Unfortunately however it is most pertinent to note that, even having being this area is the most mining affected pollution hot spot, there is no required and necessary mention of our area in the Executive Summary of EIA & EMP Sirigao-Mayem Mineral Block-II of Bicholim Taluka in North Goa District of Goa State. On account of this there is general feeling of discrimination which the Government having meted step	Mining Operations will be started after taking all the requisite statutory approvals and will be carried out in accordance with the approved Mining Plan and no Drilling and Blasting is involved. Approved Mining Plan of Block II and Draft EIA & EMP report safe guards Lairai temple and nearby habitation by maintaining safety buffer zone of 50 Meter from the periphery of nearest habitant. All compensation issues relating to the erstwhile lease holder will be dealt by them as SSCPL was not part of the same. All necessary Measures for control of environmental pollution will be carried out as mentioned in chapter 10.

motherly treatment to the residents of Poira. On the other hand some of the far distance village areas and public places are included in the mining Block-II. In view of the above facts and circumstances you are hereby most humbly requested to include part of Poira Village in Block-II in the Executive Summary of EIA & EMP. Further it is requested to arrange for the protective and compensatory measures in this area in order to safeguard the life and property including live-stock of the local residents besides ensuring the grant of facilities such as pollution compensation, damages towards agricultural land loss, silting clearance of farming fields, cleaning of drains, medical facilities, disilting of water bodies including drinking water wells, provision of medical facilities etc. etc, which the concern authorities as in law are required to undertake. Under the above facts and circumstances, you are hereby most humbly requested to ensure that direct specific mention of the Poira Village in Executive Summary of EIA & EMP, besides its exclusion from the Mining buffer zones be done in the larger	Environmental Management Plan of EIA & EMP Report.

interest of the residents of Poira as well as the protection and promotion of their basic and fundamental Human Rights to clean Environment. Hope that your good self will pursue into the content of this application and personally look into the matter on a most humanitarian grounds to ensure justice is done to these mining affected local residents.	

	Letter by Ganesh C Gaonkar, Yashwant B Gaonkar and Others Letter Dated: 19/06/2024
2	The letter addressed to The Member Secretary, Goa State Pollution Control Board, Near Pilerne Industrial Estate, Opposite Saligao Seminary, Saligao-Bardez Goa-403511 SUB: Objection for processing of Iron ore mining leases in Sirigao Mayem Mineral Block, and Environmental Clearance to Block No-II through Public Hearing scheduled on 20-03-2024 at Bicholim

Objection/Issues Raised	Clarification/Comments
We the undersigned the Villagers of Sirigao, Bicholim-Goa here by strongly oppose and file strong objection for granting of Environmental Clearance to Block No-II Sirigao Mayem Block through Public Hearing scheduled on-20-03-2024 at Bicholim pertaining to Sirigao Village, as proposed by the Government of Goa through Directorate of Mines and Geology.	Government of Goa through Director of Mines and Geology (DMG)issued Notice Inviting tender on 30/09/2022. As per the said NIT, the auction process for Block II-Sirigao Mayem Mineral Block for Iron Ore Mineral was conducted. upon successful conclusion of auction process, DMG declared Project Proponent as a preferred bidder on 22/12/2022 and issued Letter of Intent

A ISSUE OF OWNERSHIP OF SURFACE	on 13/01/2023 for fresh grant of Mining Lease.
1) The Mining concession/Lease No 5/49 were carried out in the property surveyed under Old Cadastral Survey No. 95 of Village Sirigao. The said Old Cadastral Survey No. 95 comprising of New Survey Numbers 82, 83, 84, 93, 6, 34, 33, 28, 29, 20, 13, 76, 78, and 81 part, which are owned and inheritably possessed by Communidade of Shirgao since time immemorial. The said land was commonly used for public utility such as ponds for drinking water, paddy fields for cultivation, grazing ground for cattle, common place for prayers and common place for crematorium and cultivation of forest trees.	At the time of NIT tender documents DMG provided with various documents related to Block II-Sirigao Mayem Mineral Block such as Geological Reports (GR), Executive Block Summary and DGPS Plan approved by DMG. The project proponent (PP) has obtained updated land records for the survey numbers within the Mineral Block area. These records clearly indicate that the survey numbers belong to the former leaseholder and a few local villagers. There is no mention of the Communidade of Sirigao in the survey numbers within the Mineral Block area.
2) But way back in Portuguese regime around in the year 1949 Said Mining concession/Lease No 5/41 were allotted to concessionner's M/s. Chowgule and Company Pvt. Ltd. Sirigao mines and from then onwards the above mentioned communidade along with the private property/Land illegally was used by the concessioner/Lease Holders namely M/s. Chowgule and Company Pvt. Ltd.	With regards to surface right holder Project Proponent (PP) shall comply with section 24A of MMDRA 1957 and Rule 52 of Mineral (other than Atomic and Hydrocarbon Energy Mineral) (Concession Rule 2016). The grievances/allegations against the erstwhile leaseholder should not impact the Environmental Clearance sought by the current Project Proponent.
3) Further in the year around 1972 the Department of Settlement and Land Records had erroneously recorded the name of mining leases holders in the	

occupant column of property of Communidade of Shirgao where the mining leases were allowed. Wherein the Communidade of Sirgao is the lawful owner of the land/property in active mining leases which are now again auctioned by the government. 4) The mining concession was allowed erstwhile Portuguese Government without mentioning survey numbers and demarcation of boundaries of the concession/ leases. 5) As per the Mining act the lease holder shall have to pay the royalty to the surface right holder and shall have to obtain surface right for extraction of mineral ore. but said mining lease holders had never obtained any surface right from the Communidad of Shirgao for carrying out any mining activity in mining leases No 5/49. The mining company is relying upon land records which were recorded erroneously in the year around 1972 by the Department of Settlement and Land Records of the Revenue Department of Goa State. The said mining company doesn't have title of Property/land where they have been succeeded to obtain mining concession/Lease by hook and crook method. Title of Land covered under said mining lease is under objection and therefore we are strongly against the	

auction which is proposed by the Government of Goa and said objection continues for Environmental Clearance to Block No-II through Public Hearing scheduled on 20-03-2024 at Bicholim.

6) The deed of concessioners has conditions that the prospective concession holder shall file the ownership details of the surface right holder along with the right to extract mineral ore of particular land, by paying the surface right to the actual owners. Therefore, the Government shall come out with the documentsfiled by the mining concession holders at the time of first allocation of concession and clarify who is the actual surface right holder at the time of first allocation of concession. This fact was totally neglected by the then Government.

7) In the landmark verdict in July, 2013, the Honorable Supreme Court of India in the case of Thressiamma Jacob & Others vs. Geologist, Department of Mining Geology & Others (Civil Appeal No. 4549 of 2000) has held that ownership over minerals that lie beneath the soil does not necessarily lie with the state.

8) A three member bench concluded: "there is nothing in the law which declares that all mineral wealth subsoil rights vest in the state; on the other

hand, the ownership of subsoil/mineral wealth should normally follow the ownership of the land, unless the owner of the land is deprived of the same by some valid process." The Honorable Supreme Court means that the ownership of mineral rights vests with the landowners.

9) In this connection the land falling in above mentioned leases belongs to a private institute, Communidade of Shirgao and according to established law the Government of Goa cannot auction the ore below the land owned by the private Institutions Communidade of Shirgao. The right of the ore beneath the land of institutions remains with the Institutions and hence objection continues to auction the ore beneath land of private institutions that is Communidade of Shirgao of Bicholim Taluka. And said objection continues for Environmental Clearance to Block No-II through Public Hearing scheduled on 20-02-2024 at Bicholim.

8 DISASTER OF PADDY FIELD AND AGRICULTURE WHICH IS HUGE LOSS TO THE FARMERS OF SHIRGAO.

1) Due to Excessive extraction of mining from Lease No 5/41, A huge mining pit/crater is formed in survey no 93 and 84 and which is -40 to -50 meters below

ground level. And due to said mining pit almost all water bodies were destroyed by polluting from the mining pit. There is 2 ft high polluted water in the paddy held throughout the year and therefore farmers are not able to cultivate the paddy for more than 20 years. To grow paddy the surface needs to dry in the months of April and May which is not able to dry due to percolation of water from said mining pits throughout the year. 2) The existing mining pit is adjacent and close to the vicinity of Shree Lairai temple and residential houses at Deulwada Sirigao. **C-NO DRINKING WATER** 1) Due to percolation and diverting the springs in the mining pit all springs and wells and water bodies of village Sirigao got polluted. For the last 20 years villagers have stopped drinking water from wells. Government has not made any permanent solution of drinking water for the villagers of Shirgao. Presently it is the responsibility of Government to provide potable drinking water the villagers whereas government falls to provide the same hence objection continues for Environmental Clearance to Block No-II through Public Hearing scheduled on 29- 02-2024 at Bicholim	During the monsoon season, surface runoff will be diverted and channeled through garland drains into the mining pits. The collected rain and storm water will then be pumped out and directed to a series of settling ponds, filter beds, and check dams. This treatment process ensures that the water is clean before its final discharge outside the mining lease area. The treated water will help replenish the river, contributing positively to the local water resources. Detailed Water Management Plan has been depicted in chapter 10 of EIA & EMP report and will be implemented. All necessary Mitigation Measures for control of Environmental pollution is mentioned in Chapter 10, Environmental Management Plan. The famous Lairai Temple falls within the Mineral Block area. Government Primary school is shown in the EIA reports and there are several other religious places of worships within the habitation located in mineral block, minimum buffer of 50m will be maintained. Mining Operations will be started after taking all the requisite statutory approvals.

TEMPLES, SCHOOL, HIGH SCHOOL, RESIDENTIAL HOUSES ARE NOT EXCLUDED FROM MINING LEASE Details and description of the property - Survey no. 1. Famous Larai temple, Aqarachi (Devachi) Tali & temple property 2. Government Primary School 3. Shree Sateri Temple & 13 houses 4. Shree Kulkar Bharman temple & 55 houses 5. Paddy fields bharad land 6. Shree Maringan temple, Manshechi tali, 5 houses & government water tank which is existing in the communidade land 7. Existing 35 houses 8. Survey no. 47 existing Mahadev temple, Shree Apevansh temple, chavata Shree Datta Mandir & 17 houses 9. Survey no. 48 Shree Ravalnath temple, temple property and houses, survey no. 84 communidade dongar belonging to Sirigao Communidade	Mining Operations will be carried out in accordance with the approved Mining Plan and no Drilling and Blasting is involved. Approved Mining Plan of Block II and Draft EIA & EMP report safe guards Lairai temple and nearby habitation by maintaining safety buffer zone of 50 Meter from the periphery of nearest habitant.

10. Survey No. 90 private property destroyed by the mining company was full of Kaju nut trees, fruit bearing trees and Bharad Land 11. Survey no. 91 & 92 are the same as above. 12. Survey no. 93 communidade land belonging to Sirigao communidade was full of jungle trees, fruit bearing trees, party bharad land, fire wood, medicinal plants and grazing grounds at present existing huge mining pit. 13. Survey no. 94 existing mango trees, Panchayat Ghar and houses. 14. Survey no. 95 existing 35 houses. 15. Survey no. 96 existing houses and fruit bearing trees. 16. Survey no. 97 Bharad land, fruit bearing trees belonging to villagers/private property destroyed by the mining company. 17. Survey no. 98 existing Government high school, office of village Panchayat Sirigao and 30 houses Taking into consideration all above mentioned factors the mining company	The Project Proponent is not the erstwhile lessee of Block II and not commenced any Mining Operation till date. As such, present Project Proponent is not responsible for alleged situation if any in the fields/water bodies/land dispute/or any matter. Therefore, this cannot be the reason for objecting/ canceling grant of Environmental Clearance.

operating in the village Sirigao since last 70 years have destroyed 80% of the village including water bodies, agricultural land, bharad land, coconut grooves, health of the people, total destruction of the environment and hence we object for granting of EC to MB Block No.-II Sirigao Mayem Mineral Block in view to protect the skeleton of the village Ganesh C Gaonkar Yashwant B Ganokar & Others	As already mentioned above, all necessary Measures for control of environmental pollution will be carried out as mentioned in chapter 10. Environmental Management Plan of EIA & EMP Report.

	Letter by Ashvek Ghatwal, Bharat Wada Poira, Mayem Bicholim Goa. Letter dated 19/06/2024.
3.	The letter addressed to The Member Secretary, Goa State Pollution Control Board, Panjim, Goa. Sub: Objection for Environmental Clearance to Block II in Survey No 12 & 47 at Maven Village.
Objections/Issues Raised	Clarification/Comments
I am aware that the Director of Mines & Geology have auctioned certain areas of the village for the purpose of mining and in this connection has issued letter of intent for mining blocks, particularly mining blocks II.	Government of Goa through Director of Mines and Geology (DMG) issued Notice Inviting Tender (NIT) on 30/09/2022. As per the said NIT, the auction process for Block II-Sirigao Mayem Mineral Block for Iron Ore Mineral was conducted. Upon successful conclusion

It is on record that the local Panchayat has not been consulted nor NOC taken for the purpose of granting the letter of intent and for auction of mining blocks. Village Panchayat is local body which is part of State, as defined under Article 12 of the Constitution of India and therefore its permission is required in such important matters that fall within its jurisdiction. Further No Panchayat was consulted before submission of EIA report. The present blocks will have direct major impact on all Panchayats and the same has not consulted for underrating the mining impact. This is major lapses in the EIA report. There are various flaws in the said report and prima facie it seems like to be biased favoring Mining Companies.

We being the tenant of the aforesaid area were not consulted by any authority/department/agency to understand the impact of mining activities on our fertile fields.

We are also aware that the mineral resources belong to the people of the state and not to government and the people must benefit directly from development.

In past mining activities has caused grave environmental problem to the environment of the villages. The mining

of auction process, DMG declared Project Proponent as a Preferred Bidder on 22/12/2022 and issued Letter of Intent on 13/01/2023 for fresh grant of Mining Lease for 50 years.

Mining Operations will be started after taking all the requisite statutory approvals and will be carried out in accordance with the approved Mining Plan and no Drilling and Blasting is involved.

As part of the above, PP will approach to respective Village Panchayat for getting NOC from Panchayat.

EIA Notification 2006 under Clause 13 provides for manner in which preparation and presentation of EIA Reports EMP should be carried out. In compliance with Para 13 of the EIA Notification 2006, the EIA Report is prepared by Mineral Engineering Services a NABAT accredited consultant (QCI-NABAT ORG000756) and having experience of 30 plus years. The draft EIA & EMP reports have been prepared as per the guidelines stipulated by MOEF & CC Manuals on Mining of Mineral Feb 2010 and the conditions stipulated in ToR issued by the Goa State Environmental Impact Assessment Authority (GSEIAA)

	activity has resulted in displacement of soil and sediment, filling up of our water bodies, destruction of our water resources and productive agricultural lands, and permanent destruction of the hills. Inspite of all above facts the locals were not consulted for understanding the impact of mining. I therefore have a strong objection for granting any such permission to operate mining blocks without taking local; farmers and stakeholders into confidence.	constituted by Ministry of Environment & Forest and Climate Change. As the EIA Notification 2006 guidelines Goa State Pollution and Control Board has informed to all the village Panchayat falling within of 10 Km buffer zone and also made available of Draft EIA and EMP report of Block II Sirigao & Mayem Village along with Executive Summary of EIA & EMP in English and Konkani language. The copy of the EIA & EMP was also made available at the Goa State Pollution Control board in hard as well as digital forms. As a part of consultation, consultant met with villagers, local authorities and the same is indicated in Chapter 3 of Draft EIA & EMP Reports. Even Project Proponent were on the site during Base line data collection and met several local villages and given the information about the baseline study for preparation of EIA reports. The grievances/allegations against the erstwhile leaseholder should not impact the Environmental Clearance sought by the current Project Proponent.
4.	Letter by Shree Lairai Sausthan Letter dated 19/06/2024. Letter has not been addressed to anyone.	

Sub: Submission for Public Hearing – Block II Sirigao Mayem Mineral Block

Objections/Issues Raised	Clarification/Comments
1 The primary grievance is that the village settlement including the Houses, the schools, the fields, Private Property and the temples are all included within the boundaries of the mining blocks auctioned, and that the government, when deciding on the boundaries of the mining blocks, did not apply its mind nor did it consider the unmitigated havoc caused by mining operations on the erstwhile mining lease during its earlier life or the fact that none of it had been remedied. The grant of fresh lease in relation to the same area is therefore the height of irresponsibility on the part of the department. If the mining block permitted, the entire village and its temples would become liable to wholesale destruction at some stage or the other during the next 50 years, and there would simply be no recourse at that point to any effective remedy. Hence This Shree Lairaee Saunsthan has unanimously resolved to file appropriate objections at appropriate authority against the auction/operation of Mining Block I, II and III in the village of Shirgao which is proposed by the Government of Goa before exclusion of all the Houses,	Government of Goa through Director of Mines and Geology (DMG) issued Notice Inviting Tender (NIT) on 30/09/2022. As per the said NIT, the auction process for Block II-Sirigao Mayem Mineral Block for Iron Ore Mineral was conducted. Upon successful conclusion of auction process, DMG declared Project Proponent as a Preferred Bidder on 22/12/2022 and issued Letter of Intent on 13/01/2023 for fresh grant of Mining Lease. At the time of NIT, DMG provided various documents related to Block II-Sirigao Mayem Mineral Block such as Geological Reports (GR), Executive Block Summary and DGPS plan approved by DMG Goa Based on the available documents provided by DMG, the Mining Plan for the said Mineral Block was prepared and submitted to Indian Bureau of Mine (IBM) for approval. IBM vide its letter dated 07/08/2023 approved the Mining Plan.

the schools, the fields, Private Property, the Temples and the Places of religious sentiment. Said resolution is passed in the meeting of Annual General Body of Shree Lairaee Saunsthan heald on 18 February 2024.	Mining Operations will be started after taking all the requisite statutory approvals. Mining Operation will be carried out in accordance with the approved Mining Plan and no Drilling and Blasting will be involved. Approved Mining Plan of Block II and Draft EIA & EMP report safe guards Lairai temple and nearby habitation by maintaining safety buffer zone of 50 Meter from the periphery of nearest habitant. The grievances/allegations against the erstwhile leaseholder should not impact the Environmental Clearance sought by the current Project Proponent.
5.	Letter from (1). Suresh Govind Gaonkar, resident of H. No. 2090, Housing Board Colony, Near ITI, Bordem, Bicholim, Goa- 403504, Mobile no. 9423067804 (2) Vijay Ravalnath Gaonkar, resident of H.No. 251/1, Madala Wada, Shirgao, Bicholim, Goa-403503, Mobile no. 7498438835.(3). Ganesh Chandrakant Gaonkar H.No. 1185, Collean dongor, Santemol, Salcete, South Goa, Goa-403720, Mobile no. 9822102040.(4). Dinanath Shamba Gaonkar, H. No. 269, Manaswada, Shirgao, Assonora, Goa 403503, Mobile no. 7775020411.(5). Krishna Raya Gaonkar H. No. 11, Wadachawada, Shirgao, Bicholim, Goa 403503, Mobile no. 9158472715. Letter Dated- 19/06/2024 Letter addressed to the Chairman/Collector North Goa, GOA STATE ENVIRONMENTAL ASSESSMENT AUTHORITY

Sub: SUB: MEMORANDUM FOR OBJECTION FOR GRANTING EC TO MINING BLOCK (MB) NO. II M/s SALGAONKAR SHIPPING COMPANY PVT. LTD.

Objection/Issues Raised	Clarification/Comments
Kindly acknowledge the attached copy of the Plaint filed by the complainant/petitioners in the Hon'ble High Court of Bombay at Goa. Said Plaint is from villagers of Sirigao on behalf of the village and villagers of Sirigao taluka Bicholim, in North Goa District, in respect of mining blocks recently approved by the auction in village Sirigao Mayem by the Government of Goa for the extraction of the major mineral. The present complainant/petitioners objecting the approval process of EC connected with Mining Block no. II Sirigao Mayem Mineral block on grounds of total non-application of mind and sheer injustice to the villagers of Sirigao and violation of their fundamental rights under Article 21. Therefore, the complainant/petitioners are requesting your good self to kindly look in to the matter of Plaint filed by the complainant/petitioners against successful bidder M/S SALGAONKAR SHIPPING COMPANY PVT. LTD, and restrict to grant EC to said bidder.	As it is mentioned herein that the matter is sub-judice before the Hon'ble High Court of Bombay at Goa, the PP cannot comment on the same during the pendency of the said case. However, it will not be out of place to mention herein that it is only for the concerned villagers and no one else to raise their concern. A person, Ganesh Chandrakant Gaonkar, residing at H.No. 1185, Collean dongor, Santemol, Salcete, South Goa, Goa-403720, claims to be one of the concerned party.

6.	Letter by Ramesh S. Gauuns Hose No.:1724 Pajwada-Bicholim Letter Date:20th June 2024. Letter addressed to The Member Secretary Goa State Pollution Control Board Saligao-Bardes Goa. Subject: Submission on EIA on Block-II Sirigao-Mayem Mineral Block.
Objection/issues Raised	Clarification/Comments
I was present for the Public Hearing from the beginning, but sad to say that since I failed to register my name in speakers register, the Chair did not allow me to speak and abruptly told to disconnect mike as well as shut the video off and got up from the chair and went away. Therefore following are my submission submitting in writing. 1. The village Poira which is in the core zone of Block-II is missing. No study is done on the said village. Even the name is not mentioned in EIA. Therefore the EIA becomes Incomplete and in adequate. Yet the Public Hearing was conducted Such Public Hearing does not attain legal status. Hence No processing be done to grant EC. 2.Block 1 of Vedanta is adjacent to Block-II. There are in all 3 Mines and	Government of Goa through Director of Mines and Geology (DMG) issued Notice Inviting Tender (NIT) on 30/09/2022. As per the said NIT, the auction process for Block II-Sirigao Mayem Mineral Block for Iron Ore Mineral was conducted. Upon successful conclusion of auction process, DMG declared Project Proponent as a Preferred Bsidder on 22/12/2022 and issued Letter of Intent on 13/01/2023 for fresh grant of Mining Lease for 50 years. Block II – Sirigao Mayem Mineral block is situated in Sirigao and Mayem Village. Poira is a Ward coming under as a part of Mayem Village. Block II is having 2 Mining Pits one is in Sirigao Village (Sirigao Pit) and other one is in Mayem Village (Poira Pit). Poira Pit

hence a cumulative Impact assessment is necessary and, which is not done and made a part of the EIA. Hence the Public Hearing by itself becomes in valid. Based on Invalid Public Hearing processing and considering the project for EC also become unlawful. So the PH report should be rejected for want of the mandatory thins which are not complied.	Photographs have been shown in EIA & EMP Report. Page No 402.
3.It is also see that the lake by name GOIGANE lake in Maye bearing survey number 79 and having an area of 218250sq m. (Two lakhs eighteen thousand and two hundred fifty). This information is concealed. There are also two more perennial water bodies in Mayem at Tirthbag these water bodies are also missing in EIA.	At the time of NIT, DMG provided various documents related to Block II Singao Mayem Mineral Block such as Geological Reports (GR), Executive Block Summary and DGPS plan approved by DMG Goa.
This possible only if the physical study is not done in person by the consultant.	The EIA & EMP report were prepared on the basis of Geological Report (GR) and DGPS Approved Plan provided by Directorate of Mining & Geology to PP, as per which the Sy Nos 47, 48, 56, 57, 58 and 59 are mentioned in Mayem village.
4.On page 6 of the Executive Summery it is stated" As the area is located on the foot hills of western Ghats..... Infact the Western Ghats are nearly 40km away from Block-II. This also proves that the ground level study is not carried out by the consultant. They are also Ignorant about the Bicholim taluka in which Block-II is located.	EIA Notification 2006 under Clause 13 provides for manner in which preparation and presentation of EIA Reports EMP should be carried out. In compliance with Para 13 of the EIA Notification 2006, the EIA Report is prepared by Mineral Engineering Services a NABAT accredited consultant (QCI-NABAT ORG000756) and having experience of 30 plus years. The draft EIA & EMP reports has been prepared as per the guidelines stipulated by MOEF & CC and the conditions stipulated in ToR issued by the Goa State Environmental Impact Assessment Authority constituted by

It is also interesting to see the above statement in the Executive Summary of Vedanta Block 1. page no. 7, "The area is located on the foot hills of Western Ghats belt., .." It seems that the Mineral Engineering Services have done the business is cut and paste/.copy paste. So based on omission of one village from core zone, concealment of facts and copy paste business EAC should not entertain the process of granting EC but ask to incorporate the facts and conduct fresh Public Hearing or no EC should be granted to the project proponent.	Ministry of Environment & Forest and Climate Change. The Public hearing of Block II Sirigao Mayem Mineral Block is conducted by the Goa State Pollution controlled Board as per EIA Notification 2006. Vide letter dated 15/04/2024 Director (Environment) & Member Secretary Goa -SEIAA has certified that Block II-Sirigao Mayem Mineral Block having an area of 171.2472 Ha of Project Proponent located at Sirigao & Mayem Village of Bicholim Taluka in North Goa district is not part of Eco Sensitive Area of western Ghats. EIA report is prepared by Accredited EIA Consultant having vast experience in the field for 30 Years. Since the other two blocks (Block I & Block III) fall in the sale area of Block II hence some of the data are common to all the three blocks, However the EIA & EMP report pertains to Block II Sirigao Mayem Mineral block. The grievances/allegations against the erstwhile leaseholder should not impact the Environmental Clearance sought by the current Project Proponent.

SALGAOCAR SHIPPING CO. PVT. LTD.
Salgaocar Bhavan Altinho, Panaji, Goa - 403001
CIN: U35100GA1975PTC000223
Tel: 191-832-2460500 Email: - info@salgaocar.com

June 20 / 2024

Goa State Pollution Control Board
Opp. Saligao Seminary
Saligao Goa 403 511

To,
The Member Secretary,
Goa State Pollution Control Board,
Nr. Pilerne Industrial Estate,
Opp. Saligao Seminary-Saligao Goa

KIND ATTN: DR. SHAMILA MONTEIRO

SUB: SUBMISSION OF CLARIFICATIONS/COMMENTS REGARDING THE ENVIRONMENTAL PUBLIC HEARING FOR BLOCK II SIRIGAO MAYEM MINERAL BLOCK held on 19/06/2024

Ref: Your office Email dated 20/06/2024-regarding Clarification against Environmental Public hearing for Block II Sirigao Mayem Mineral Block held on 19/06/2024 at 10:30 am onwards.

Respected Madam.

We are in receipt of your office email dated 20/06/2024 enclosing Proceedings of Environmental Public hearing held on 19/06/2024 from 10:30 am onwards at Narayan Zantye Multipurpose Sports Complex, Sarvan, Bicholim, Goa, for Block II Sirigao Mayem Mineral Block of Salgaocar Shipping Company Private limited.

As requested by you, we are submitting herewithpoint-wise clarifications/comments with respect to views/suggestion/objections of the speakers during the said Public Hearing held on 19/06/2024, enclosed as Annexure-A.

Additionally, we are also submitting photographs of the notices posted in various public places and photographs of the loudspeaker publicity conducted, enclosed as Annexures-B and Annexure-C.

We now kindly request your esteemed office to forward our responses to the Goa State Environmental Impact Assessment Authority (Goa-SEIAA) and the Goa State Expert Appraisal Committee (Goa SEAC) constituted by the Ministry of Environment, Forest and Climate Change (MOEF & CC) for further action. Please also mark a copy to us for our records and for subsequent online submission to the Goa-SEIAA.

We look forward to your prompt response and guidance on the way forward.

Thanking You,
Yours faithfully,
SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

AUTHORISED SIGNATORY

Proceedings of the Environmental Public Hearing held on 19/6/2024 at 10.30 am onwards at Narayan Zantye Multipurpose Sports Complex, Sarvan, Bicholim Goa.

In respect of:

"As per Environmental Impact Assessment 2006 Block II Sirigao Mayem Mineral Block with area of 171.2472 Ha. located in Sirigao and Mayem Village of Bicholim Taluka of North Goa District of Goa State for production of 1.0 MTPA of Iron Ore by M/s. Salgaocar Shipping Co.Pvt. Ltd."

This Environmental Public Hearing (EPH) is conducted as per the revised EIA Notification dated 14/09/2006 (as amended) issued by the Ministry of Environment, Forest and Climate Change, Government of India.

Shri. Dipak S. Dessai, Additional Collector I, North Goa and Dr. Shamila Monteiro, Member Secretary of the Goa State Pollution Control Board presided over the hearing.

The hearing commenced at 10.30 A.M. so as to enable the public present to complete formalities of registration as speakers.

At the outset, the Additional Collector I, North welcomed the public present for the Public Hearing and explained the procedure to be followed during the Environmental Public Hearing.

The public present was requested to express their views/objections/suggestions if any, after the Project Proponent gave its presentation on the proposed project.

It was informed that the views/objections/suggestions made by the public during the hearing would be recorded and forwarded to the Concerned Authority for processing and requisite action on application regarding environmental clearance for the proposed project.

With regard to the Publicity of the Environmental Public Hearing, the Presiding Officer informed that the GSPCB has issued public notices in the newspapers namely; Herald (English), Gomantak (Marathi), Bhangar Bhuim (Konkani), Mid Day, Mumbai (English) informing the general public regarding the date, time, venue, submissions of objections, suggestions, views, placement of EIA reports for reference, etc. The GSPCB has also issued advertisements on local Television/radio channels continuously for 3 days informing general public of the Public Hearing. The local Authorities such as Village Panchayats and Municipalities were requested to give vide publicity of the Public Hearing within their Jurisdiction. Banners were pasted at prominent places and Public were informed through public address system. Thus, enough publicity was given.

The Representatives of the Project Proponent have thereafter made a Power Point presentation concerning the project by explaining the contents thereof in Konkani and then as requested by the Public in English language.

The Additional Collector I, thereafter invited the public present at the Public Hearing to come forward and submit their views on the project.

The Additional Collector I, requested the speakers to try to restrict their submissions to 3 minutes each. He stated that speakers will be called upon to speak sequence wise.

Accordingly, the following individuals have submitted views/ objections/ suggestions, which are indicated as under.

1.	**Ajay Anant Gaonkar, Sirigao-** He stated that he has no objection to starting the mining operation at the earliest. He requested that local issues should be resolved and mining operation should be resumed at the earliest.
2.	**Anant S. Chari , Sirigao** He stated that he is in support of resuming of mining operation by the Project Proponent.
3.	**Ramesh H Mainkar, Sirigao-** He stated that he has no objection for issuing EC to the Project Proponent and that the villagers should be given first priority for employment. He stated that Truck owners should be given preference, by the Mining lease holder.
4.	**Mr. Vinod G. Shirgaonkar, Sirigao** He stated that he supports the operation of the mineral block -II at SirigaoMayem Mineral Block.
5.	**Mr. Nagesh V. Naik, Sirigao** He stated that he supports the operation of the mineral block -II at Sirigao Mayem Mineral Block He requested the Government to start the mining by protecting the temples, houses, flora and fauna and the villagers. He requested the Project Proponent to provide the local people with employment opportunities as the Dempo mining company, Bandodkar mining company and Bandekar mining company had always earlier provided the villagers with employment opportunities and not the outsiders. He requested that the Project Proponent shall start the mining projects as early as possible and give employment to the truck owners and youth of the village.

6.	**Mrs. Karishma G. Gaonkar** She stated that she is a resident of Sirigao and is the Sarpanch of Village Panchayat Sirigao. She stated that she supports starting of Block No. II Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co.Pvt. Ltd.". She stated that employment should be provided to local people in the project.
7.	**Mr. Devanand Karbotkar** He stated that he is a resident of Poira village. He stated that he supports mining. He stated that locals should be provided with jobs and all the surrounding area locals should get benefits from the Block No. II Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co.Pvt. Ltd.".
8.	**Mr. Vivek V. Kudaskar** He stated that the he is a resident of Mayem. He stated that he supports starting of Block No. II Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co.Pvt. Ltd."
9.	**Mr. Subhash Kinalkar** He stated that the he is a resident of Mayem. He stated that he supports the starting of Block No. II Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co. Pvt. Ltd.". He stated that Hon'ble Supreme Court had ordered to close mining activities in Goa from 2012, from that time all mines in Goa are closed. He stated that he is a truck owner. He stated that the truck owners have suffered the most loss from shutting down of mining. He stated that he had obtained loans from the Banks and could not repay them. He statesd that while he supports Block No. II Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co. Pvt. Ltd. all the temples within the lease area should be kept out from the lease. He stated that Government should think about villagers and they should get compensation. He stated that employees living in surrounding areas should be supported and employment should be provided to them first. He stated that there are 2 village Panchayats and they will get income source and villages should be developed.
10.	**Amit A Gaonkar , Sirigao-** He stated that he supports the restarting of the mining operation by the project proponent.
11.	**Mr. Siddesh V. Surlekar, Poira** He stated that Poira village and sy. No. 57 therein is not mentioned in the EIA report even though 90% of the mining is done from this village. He stated that

	there are 3 temples in the lease area which are not included in the EIA report. He states that the transportation of ore which is done from the mine is done from this village of poira but the village is not included in the EIA report. He states that he has no objection to the starting of the mining operations and he fully supports the mining operations but his village is not included in the EIA report. He states that after the start of the mining operations if there are adverse effects in his village Poira who will be responsible for the same. He states that the mining company has to set up measures to control the pollution and do regular check ups. He states that he AAQM monitoring systems are not set up . He requests the names of the Devasthan in the lease area should be included in the EIA report.
12.	**Mr. Jaideep Ghatwal** He stated that he and his family is the residents of Poira village for last 200 years. He stated that the EIA Report is partially wrong; it is just a copy paste of another EIA Report prepared by the Company earlier by changing the name of the Company. He stated that he doesn't have any objections to start mining but he suggested some rectification in Survey No. 47 & 48. He stated that there are around 25 houses in Survey No. 47 & 48 which should be excluded from the lease area. He questioned the buffer zone of 50 mtrs in the EIA Report, because the Konkan Railway Route passing through it which has a buffer zone of 300 mtrs. He stated that the tenant's names in survey no. 47 to 59 should come under consent terms. He stated that the major transportation of Ore is starting from Poira village, survey no. 47 to 59 and that the transportation route should be equipped with wind barriers (metal sheets)and APCD (Air Pollution Control Devices)
13.	**Satyawan Navelkar,** He stated that a joint survey should be conducted, inspection should be carried out of the lease area and the effect of mining on the resident should be verified.
14.	**Mr. Sachin Surlekar, Poira** He stated that he has no objections to the operation of the mining lease but he states that the village of Poira is not included in the EIA report. He states that the consultants are not the owners of the villages and the company is only a lease holder are not the owners. He stated that he has every right to voice his grievances and that the Project Proponent has to take into account each and every person of the villages that are affected due to mining operations, as mining is the backbone of Goan economy. The health of every person has to be taken into account and CSR activities have to be done in the area. He states that the about 60% mining is done in the Sy. Nos 47, 48, 56, 57, 58 and 59 of village Poira. The Consultants have to be blacklisted as they have falsely prepared the EIA report and left out the

	Poira village from the EIA report. He states that he has to fight for his village as it is not mentioned on the map. He states that there is a government high school from which four school students represented India in China and this school is not even included in the map. He requests not to play with the health of the school students. He states the houses, schools, temples located within 50 meters have to be legally removed out from the lease. He states that as when the area near the temples is excavated there will be damage to the structures of the temples. He states that the villagers go to the temples to pray and celebrate festivals and hence he requested to remove the temples out of the lease area He states that the out of CSR activities only 2% of the money is left for CSR. He states that sustainable mining has to be carried out as only 15 yrs are given for the operation of the mining company and then after 15 years then the people have no fate. He requests to protect the people and villagers.
15.	**Mr. Anand Naik** He stated that he is the resident of Poira village. He stated that he is the Ex. Sarpanch of the Village Panchayat. He stated that they had submitted letters to the various Departments and also requested the department to note whatever is spoken in this hearing. He states that he supports mining activity; however it is a shocking to know that the name of Poira Village is not recorded in the EIA Report He stated that the mining canteen, quarters, unit and the staff facilities are located in the Poira Village. He stated that he supports mining but Poira Village name should be recorded in the EIA report. He stated that all written submissions by the participants in the hearing should be recorded.
16.	**Vijay A Polle, Poira** He expressed his dissatisfaction for not including Poira village in the EIA report, He states that he supports the starting of the mining operation He expressed that the truck owners have suffered due to closing of the mines and that this has caused difficulty in providing education to children due to unemployment. He states that the 90% of the lease area includes Poira village and hence it should be included in the EIA Report. He states that thefirst priority should be given to the locals for employment and no outsiders shall be entertained as workers at mine. He stated that 20 wells are dried up due to mining activities and it has to be restored.
17.	**Mr. Subhash D. Salgaonkar - Absent**

18.	**Mr. Ravi Gaonkar – Sirigao** He stated that he has no objection to the starting of the mine but everything should be done legally.
19.	**Mr. Ganesh Gopal Gaonkar, Sirigao** He Stated that he supports the operation of the mineral block -II at SirigaoMayem Mineral Block. He states that the mine will generate employment to the villagers and youth of the village. Hence he requests to start the mining project as soon as possible.
20.	**Mrs. Seema Arondekar** She stated that the she is the Sarpanch of Village Panchayat of Mayem-Vaiguinim. She stated that she supports Block No. II Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co.Pvt. Ltd." She stated that employment should be provided to locals. She stated that since Poira is coming under her Panchayat, it should be included on the map.
21	**Mr. Dilip Shet- Absent**
22.	**Yash V Ghatwal, Poira** He states that the since his house is close to the road on which ore will be transported, he will be affected by the pollution due to the transportation of ore. He states that he is in support to the starting of the mining operation but would want to be compensated if he is affected.
23.	**Mr. Vishant Pednekar- Absent**
24.	**Mr. Krishna Chodankar, Mayem** He stated that he is the Panch member of Mayem panchayat, He stated that he supports the operation of the Mineral Block -II at SirigaoMayem Mineral Block. He stated that when mining had stopped a lot of people along with him had faced problems specially farmers and the truck owners. There was unemployment faced by the villagers he requests to start the mining project as soon as possible.
25	**Mr. Santosh Bhosle** He stated that the he is a resident of Sinquerim. He stated he is the Ex. Sarpanch of Mayem. He stated that he is happy to hear that the Block No. II Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co. Pvt. Ltd., is starting after 12 years. He stated the mining should resume by providing all basic benefits to locals specially agriculturist, schools, temples etc. He stated that it was brought to his knowledge that Poira Village is left out from the map in the EIA report and it is very surprising. He stated that the Block No. II

	Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co. Pvt. Ltd. should start by providing all the facilities to locals and by taking all environmental preventive measures.
26.	**Ashvek Ghatwal, Poira** He questioned about the action taken against the earlier complaint filed by him w.r.t transportation, auction of mine ore. He stated that no action was taken earlier and was only checked upon when High Court cracked a whip and ordered action. He requested to keep a check on the mining after issuing EC.
27.	**Mr. Narayan Narvekar- Absent**
28.	**Mr. Suryakant R. Palni, Sinquerim** He stated that he supports the operation of the Mineral Block -II at Sirigao Mayem Mineral Block but when the mines were closed in 2012 all the farmers and the youth and villagers were facing problems which were not solved by the mining companies. Hencehe now requests that the mining companies shall pay the water bills of the villagers. He requests to start the mine operations as early as possible.
29.	**Mr. Shailesh G. Shetgaonkar** He stated that the he is a resident of Sirigao. He stated that 75% people want mining to resume in this village. He stated that he supports Block No. II Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co. Pvt. Ltd. and mining should resume in this block at the earliest.
30.	**Mr. Sujay C. Porlekar** He stated that the he is a resident of Mapusa. He stated that he supports Block No. II Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co. Pvt. Ltd. and mining should resume in this block at the earliest.

31.	**Mr. Atchyut Ramachandra Gaonkar** He stated that the he is the Ex- Sarpanch of Sirigao. He stated that he is supporting the mining activity of Salgaonkar Company. He stated that all truck owners are very happy due to starting of mining and since all local businesses are dependent on mining. He stated that from 1950, Shirgao Temples, Schools are falling under the lease area. He stated that he request that residences and temples should be removed from the mining lease area and mining should start with following measures; 1. Abandoned mining pits should be restored, 2. Dust pollution should be controlled 3. Natural habitation should not be affected and should be preserved. 4. Medicinal plants should be planted by filling the abandoned mining pits. 5. Pollution Control Measures should be adopted and mining should be started.
32	**Mr. Siddhant Ghatwal- Absent**
33.	**Mr. Sakharam Anant Pednekar, Mayem** He stated that he is confused as whom to trust. He stated that survey has not be done w.r.t environmental drainage caused by the earlier mining company. He stated that schools, temples should not be included in the lease areas. He stated that de-siltation of the fields has been not mentioned in the EC. He stated that unless and until all the above fact are studied upon and degraded are restored the mines shall not to be granted permission to start. He stated that the whole procedure is handled between different departments, as such, no authority is defined and hence people lack trust as such in this case the public hearing does not hold any value. He stated that Bio diversity report has not been taken into consideration. He questioned about who prepared the EC report and the witnesses who signed the report. No mention of Khadis which are on the periphery. He stated that the mining EC can only be granted after all this issue are resolved.

34.	**Mr. Vijay R. Gaonkar, Sirigao** He stated that he opposes the operation of the Mineral Block -II at SirigaoMayem Mineral Block. He stated that the EIA Report is incomplete and misleading and he questions as to whether a comprehensive hydrogeological report has been done or not. He stated that during the earlier lease operation there was encroachment in the nearby villages which is not shown in this EIA report .He stated that the Office Memorandum of 2014 of MoEF states that the villages in the middle of the mining area have to be excluded along with the temples and the agricultural properties and the villages. He stated that the assessment of the rehabilitation has to be done. He stated that the Public hearing is illegally done and he strongly opposes the operation of the mining unit.
35.	**Mr. Dinanath Gaonkar** He stated that the he is a resident of Sirigao. He stated that 171 hectares of land of the village come under the mining lease area. He stated that 80% of the village comes under this mining block area. He states that on 31/01/2014 and in 2012 he had submitted written Memorandums requests to exclude properties falling under the mining block. He stated that lease included Survey No. 1, 2, 3 , 4, 5, 6, 7, 47, 48, 84, 90, 91, 92, 93, 94, 95, 96, 97 & 98 of Sirigao Village Which includes the following. 1. Famous Larai Temple, Agarachi (Devachi) tali & Temple Property 2. Government Primary School 3. Shree Sateri temple & 13 houses 4. Shree Kulkar Bharman Temple and 55 Houses 5 Paddy Fields barren land 6. Shree Maringan temple, Manshechi Tali, 5 houses &Government Water Tank which is existing in the communidade land. 7. Existing 35 houses 8. Survey no. 47 existing Mahadev Temple, Shree Apevanshe temple, Chavate Shree Data Mandit & 17 houses. 9. Survey No. 48 Shree Ravalnath temple, temple property and houses, Survey no. 84 communidade dongor belonging to Sirigao Communidade. **He further submitted written submission on the above points.** He stated that in 2008 he had filled petition before the Hon'ble High Court and further NEERI had done a study which states that damage to agricultural land is due to mining and same report is submitted before the Hon'ble High Court. He further stated that the Government had done nothing for the restoration of their agricultural land. He stated that the villagers also had done a joint meeting with the WRD. He stated that in 2019 order passed at agricultural land is affected. He stated that

	he is objecting the EIA report as 80% of village is destroyed. He stated that he strongly objecting the restarting of the mining activity by the Project Proponent.
36.	**Mr. Babu M. Palni- Absent**
37.	**Santosh G Kutaplkar, Bicholim** He stated that he is in support of mining operation. He stated that he is affected economically for last 12 yrs due to closing of mines, hence demands resuming of mines at the earliest.
38.	**Mr. Bhagwant B. Gaonkar** He stated thatthe he is a resident of Sirigao and that mines were closed due to illegalities. He stated that earlier mines owner have looted thousands of Crores from illegal mining and they should compensate the people.
39.	**Mr. Dilip Bhaskar Gaonkar** He stated that the he is a resident of Sirigao. He stated that he is objecting to the starting of Block No. II Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co. Pvt. Ltd.
40.	**Mr. Laxman Y. Gaonkar** He stated that the he is a resident of Sirigao. He stated that the houses and temples which are falling in the lease area are required to be excluded, from the lease area and mining company should start the mining.
41.	**Mr. Vishwambar Gopal Gaonkar, Sirigao** He stated that he supports the operation of the mineral block -II at Sirigao Mayem Mineral Block. He stated that the truck owners were given work only for 15 days and hence the remaining days they were without work. He states that to get the goodwill of the people the mining companies have to solve the problems of the people. He states the even after 70yrs the mining company has not yet compensated him for the property loss suffered by him. He states that the life span of the truck is expired and hence the same cannot be used , hence the truck owners have to be given new trucks. He requests to de-silt the river creek and to restore it. He stated that surface rights have to be given to the villagers.

42.	**Mr, Dinesh Devidas, Poira** He stated that the village of Poira is not included in the EIA report He States that he supports the operation of the mineral block -II at Sirigao Mayem Mineral Block. He states that there are many mining Engineers who are unemployed since 2012. He requests the Government to grant Environmental Clearance as soon as possible.
43.	**Mr. Jayant Y Gaonkar** He stated that he is the Deputy Sarpanch of Shirgao. He stated that since 2012, the people are facing lots of hardship due to closure of mining; He stated that his only request is to excluded the temples and houses from the lease area and mining should be started.
44.	**Mr. Umakant G. Kudnekar, Shrigao-** He states that that he supports restarting of mining operation. He stated that for the last 12 years mining operation has been stopped, people have suffered a lot. He states that Mineral fund has not been utilized in due to mine closure. He states that unemployment has risen due to closures of the mines. He requests to resume the mining at the earliest.
45.	**Mrs. Smith Sandeep Ghatwal- Absent**
46.	**Mr. Babuso Gaonkar** He stated that during the last hearing he suggested that a survey be done of the villages in the lease area, however it was not done. Mining was closed in the year 2012 because there was illegality in their operation of the mining companies. The people were facing problems hence it was closed. The names of the properties of the people in the villages are not mentioned in the EIA report. The Chowgules companies mining pits have to be filled. He questioned where the mining department has looked into the matter and whether the inspection is done. He questions how the lease agreement is done. He requests to test the well water of the villages. He stated that the temples, agricultural land and the water bodies etc have to be removed from the lease areas and the MDR road must be protected and maintained by the mining company. He states that the lease agreement has to be given only for 15yrs and not for 50yrs. He states that Vendanta has started their mines from Shirgao to Mulgao and the conditions are not complied by them and the authorities must keep a check on them. He states that he opposes the operation of the mineral block -II at Sirigao Mayem Mineral Block.

47.	**Mr. Tushidas Chodankar** He stated that he is in support of mining however betterment of the village should be taken into account and the economic development must be for the villagers. He stated that the overall betterment of the village must be given full importance.

Additional Collector I, North requested the people present that if they so desire they may file their written objection/suggestion/views within 7 days from today to the GSPCB. The same will be part of the hearing and accordingly it would be forwarded to the concerned Regulatory Authority.

The recorded minutes were accordingly read out/explained to the public in Konkani and subsequently after receiving suggestions and as agreed were signed by Shri. Dipak S. Dessai, Additional Collector I, North Goa, and Dr. Shamila Monteiro, Member Secretary of Goa State Pollution Control Board

A total of 110 numbers of persons present for the public hearing and have signed the enclosed attendance sheet.

A total of 5 written objections/suggestions have been received.

A total of 5742 written supporting have been received

The hearing ended at 3.30 p.m.

On this 19th day of June, 2024.

Shri. Dipak S. Dessai,
Additional Collector I, North Goa

Dr. Shamila Monteiro,
Member Secretary
Goa State Pollution Control Board

ANNEXURE-A

Pointwise replies for the views/ objections/ suggestions made at the Environmental Public Hearing of Block II Sirigao Mayem Mineral Block held on 19.06.2024 at Narayan Zantye Multipurpose Sports Complex, Sarvan, Bicholim, Goa

Sl. No	Public View/ Objections / Suggestions	Response of Project Proponent (PP)
1	**Ajay Anant Gaonkar, Sirigao** He stated that he has no objection to starting the mining operation at the earliest. He requested that local issues should be resolved and mining operation should be resumed at the earliest.	Support Appreciated and suggestion noted. Mining related issues will be addressed through discussions with the local villagers. Mining Operations will be started after taking all the requisite Statutory approvals
2	**Anant S. Chari , Sirigao** He stated that he is in support of resuming of mining operation by the Project Proponent.	Support appreciated.
3	**Ramesh H Mainkar, Sirigao-** He stated that he has no objection for issuing EC to the Project Proponent and that the villagers should be given first priority for employment. He stated that Truck owners should be given preference, by the Mining lease holder.	Support appreciated. Once the Mining operations start preference will be given to the qualified Local Villagers for direct and indirect employment as per level of production and profile requirement. Local Villagers trucks will be engaged in Mine as per production, capacity and requirement.
4	**Mr. Vinod G. Shirgaonkar, Sirigao** He stated that he supports the operation of the mineral block -II at	Support appreciated.

	Sirigao Mayem Mineral Block.	
5	**Mr. Nagesh V. Naik, Sirigao** He stated that he supports the operation of the mineral block -II at Sirigao Mayem Mineral Block. He requested the Government to start the mining by protecting the temples, houses, flora and fauna and the villagers. He requested the Project Proponent to provide the local people with employment opportunities as the Dempo mining company, Bandodkar mining company and Bandekar mining company had always earlier provided the villagers with employment opportunities and not the outsiders. He requested that the Project Proponent shall start the mining projects as early as possible and give employment to the truck owners and youth of the village.	Support appreciated. Mining Operations will be carried out in accordance with the approved Mining Plan. The PP shall endeavour required statutory protective measures to ensure the environmental protection of surrounding Flora & Fauna and other environmental components Mining Operations will be started after taking all the requisite statutory approvals Once the Mining operations start preference will be given to the qualified Local Villagers for direct and indirect employment as per level of production and profile requirement. Local Villagers trucks will be engaged in Mine as per production, Capacity and requirement.
6	**Mrs. Karishma G. Gaonkar** She stated that she is a resident of Sirigao and is the Sarpanch of Village Panchayat Sirigao. She stated that she supports starting of Block No. II Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co. Pvt. Ltd.". She stated that employment should be provided to local people in	Support appreciated. Once the Mining operations start preference will be given to the qualified Local Villagers for direct and indirect employment as per level of production and profile requirement.

	the project.	
7	**Mr. Devanand Karbotkar** He stated that he is a resident of Poira village. He stated that he supports mining. He stated that locals should be provided with jobs and all the surrounding area locals should get benefits from the Block No. II Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co. Pvt. Ltd.".	Support appreciated. Once the Mining operation starts preference will be given to the qualified Local Villagers for direct and indirect employment as per level of production and profile requirement
8	**Mr. Vivek V. Kudaskar** He stated that the he is a resident of Mayem. He stated that he supports starting of Block No. II Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co.Pvt. Ltd."	Support appreciated.
9	**Mr. Subhash Kinalkar** He stated that the he is a resident of Mayem. He stated that he supports the starting of Block No. II Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co. Pvt. Ltd.". He stated that Hon'ble Supreme Court had ordered to close mining activities in Goa from 2012, from that time all mines in Goa are closed. He stated that he is a truck owner. He stated that the truck owners have suffered the most loss from shutting down of mining. He stated that he had obtained loans from the Banks	Support appreciated. and Observation noted. Mining Operation will be carried out in accordance with the approved Mining Plan and no Drilling and Blasting will be involved. Approved Mining Plan of Block II and Draft EIA & EMP report safe guards Lairai temple and nearby habitation by maintaining safety buffer zone of 50 Meter from the periphery of

	and could not repay them. He states that while he supports Block No. II Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co. Pvt. Ltd. all the temples within the lease area should be kept out from the lease. He stated that Government should think about villagers and they should get compensation. He stated that employees living in surrounding areas should be supported and employment should be provided to them first. He stated that there are 2 village Panchayats and they will get income source and villages should be developed.	nearest habitant. Once the Mining operations start preference will be given to the qualified Local Villagers for direct and indirect employment as per level of production and profile requirement
10	**Amit A Gaonkar , Sirigao-** He stated that he supports the restarting of the mining operation by the project proponent.	Support appreciated.
11	**Mr. Siddesh V. Surlekar, Poira** He stated that Poira village and sy. No. 57 therein is not mentioned in the EIA report even though 90% of the mining is done from this village. He stated that there are 3 temples in the lease area which are not included in the EIA report. He states that the transportation of ore which is done from the mine is done from this village of poira but the village is not included in the EIA report. He states that he has no objection to the starting of the mining operations and	Sy. No. 57 which is in Mayem village is mentioned in EIA & EMP Report at Table.2.1 Measures to control pollution is given in EIA & EMP report. Siddivinayak Ganesh Temple is included in surface plan which is part of EIA & EMP. Block II – Sirigao Mayem Mineral block is having 2 Mining Pits. One is in Sirigao Village (Sirigao Pit) and

	he fully supports the mining operations but his village is not included in the EIA report. He states that after the start of the mining operations if there are adverse effects in his village Poira who will be responsible for the same. He states that the mining company has to set up measures to control the pollution and do regular checkups. He states that he AAQM monitoring systems are not set up . He requests the names of the Devasthan in the lease area should be included in the EIA report.	other one is in Mayem Village (Poira Pit). Poira Pit Photographs have been shown in the EIA & EMP Report. Page No (402) Mining Operations will be carried out in accordance with the approved Mining Plan and no Drilling and Blasting is involved. PP has proposed the installation of Continuous Ambient Air Quality Monitoring (CAAQM) station to monitor pollution levels, after execution of lease deed.
12	**Mr. Jaideep Ghatwal** He stated that he and his family is the residents of Poira village for last 200 years. He stated that the EIA Report is partially wrong; it is just a copy paste of another EIA Report prepared by the Company earlier by changing the name of the Company. He stated that he doesn't have any objections to start mining but he suggested some rectification in Survey No. 47 & 48. He stated that there are around 25 houses in Survey No. 47 & 48 which should be excluded from the lease area. He questioned the buffer zone of 50 mtrs in the EIA Report, because the Konkan Railway Route passing through it which has a buffer zone of 300 mtrs. He stated that the tenant's names in	Support for Mining Project appreciated EIA report is prepared by Accredited EIA Consultant having vast experience in the field for 30 Years. Since the other two blocks fall in the buffer zone of Block II and vice versa hence some of the data are common to all the three blocks, However the EIA & EMP report pertains to Block II Sirigao Mayem Mineral block. The EIA & EMP report were prepared on the basis of Geological Report (GR) and DGPS Approved Plan provided by Directorate of Mining & Geology to PP, as per which the Sy Nos: 47, 48, 56, 57, 58 and 59 are mentioned in Mayem village.

	survey no. 47 to 59 should come under consent terms. He stated that the major transportation of Ore is starting from Poira village, survey no. 47 to 59 and that the transportation route should be equipped with wind barriers (metal sheets) and APCD (Air Pollution Control Devices)	Mining Operations will be carried out in accordance with the approved Mining Plan and no Drilling and Blasting is involved. Approved Mining Plan of Block II and Draft EIA & EMP report safe guards Lairai temple and nearby habitation by maintaining safety buffer zone of 50 Meter from the periphery of nearest habitant. The PP shall endeavour required protective measures to ensure the environmental protection to minimize the air pollution. Installation of Continuous Ambient Air Quality Monitoring (CAAQM) station shall be taken up after execution of lease deed.
13	**Satyawan Navelkar,** He stated that a joint survey should be conducted, inspection should be carried out of the lease area and the effect of mining on the resident should be verified.	Mining Operations will be carried out in accordance with the approved Mining Plan and no Drilling and Blasting is involved. Mining operation will also be monitored by Statutory Authorities as per procedure.
14	**Mr. Sachin Surlekar, Poira** He stated that he has no objections to the operation of the mining lease but he states that the village of Poira is not included in the EIA report. He states that the consultants are not the owners of the villages and the company is only a lease holder are not the owners. He stated that he	Support for Mining operation appreciated and apprehension noted. Block II – Sirigao Mayem Mineral block is situated in Sirigao and Mayem Village. Poira is a Ward coming under as a part of Mayem Village. Block II is having 2 Mining

	has every right to voice his grievances and that the Project Proponent has to take into account each and every person of the villages that are affected due to mining operations, as mining is the backbone of Goan economy. The health of every person has to be taken into account and CSR activities have to be done in the area. He states that the about 60% mining is done in the Sy. Nos 47, 48, 56, 57, 58 and 59 of village Poira. The Consultants have to be blacklisted as they have falsely prepared the EIA report and left out the Poira village from the EIA report. He states that he has to fight for his village as it is not mentioned on the map. He states that there is a government high school from which four school students represented India in China and this school is not even included in the map. He requests not to play with the health of the school students. He states the houses, schools, temples located within 50 meters have to be legally removed out from the lease. He states that as when the area near the temples is excavated there will be damage to the structures of the temples. He states that the villagers go to the	Pits one is in Sirigao Village (Sirigao Pit) and other one is in Mayem Village (Poira Pit). Poira Pit Photographs have been shown in EIA & EMP Report. Page No 402 The EIA & EMP report were prepared on the basis of Geological Report (GR) and DGPS Approved Plan provided by Directorate of Mining & Geology (DMG) to PP as per which the Sy Nos: 47, 48, 56, 57, 58 and 59 are mentioned in Mayem village. The PP shall include the name of Government High School, Poira, in the Final EIA & EMP report. PP had proposed CSR budget for various activities as Rs. 93.50 lakhs for a period of five years PP proposed protective measures to ensure the control of pollution levels on nearby habitations, schools and temples. Approved Mining Plan of Block II and Draft EIA & EMP report safe guards Lairai temple and nearby habitation by maintaining safety buffer zone of 50 Meter from the periphery of nearest habitant. The life of Mine is 15 Years as per Mineable reserves provided in tender document and Geological Report (GR). However, the life of the Mine

	temples to pray and celebrate festivals and hence he requested to remove the temples out of the lease area. He states that the out of CSR activities only 2% of the money is left for CSR. He states that sustainable mining has to be carried out as only 15 yrs are given for the operation of the mining company and then after 15 years then the people have no fate. He requests to protect the people and villagers.	may increase after completion of proposed exploration by the PP.
15	**Mr. Anand Naik** He stated that he is the resident of Poira village. He stated that he is the Ex. Sarpanch of the Village Panchayat. He stated that they had submitted letters to the various Departments and also requested the department to note whatever is spoken in this hearing. He states that he supports mining activity; however, it is a shocking to know that the name of Poira Village is not recorded in the EIA Report He stated that the mining canteen, quarters, unit and the staff facilities are located in the Poira Village. He stated that he supports mining but Poira Village name should be recorded in the EIA report. He stated that all written submissions by the participants in the hearing should be recorded.	Support for the Project appreciated. Block II – Sirigao Mayem Mineral block is situated in Sirigao and Mayem Village. Poira is a Ward and comes under Mayem Village. Block II is having 2 Mining Pits one is in Sirigao Village (Sirigao Pit) and other one is in Mayem Village (Poira Pit). Poira Pit Photographs has been shown in EIA & EMP Report. Page No 402.

16	**Vijay A Polle, Poira** He expressed his dissatisfaction for not including Poira village in the EIA report, He states that he supports the starting of the mining operation. He expressed that the truck owners have suffered due to closing of the mines and that this has caused difficulty in providing education to children due to unemployment. He states that the 90% of the lease area includes Poira village and hence it should be included in the EIA Report. He states that thefirst priority should be given to the locals for employment and no outsiders shall be entertained as workers at mine.	Support for the project appreciated. The EIA & EMP report were prepared on the basis of Geological Report (GR) and DGPS Approved Plan provided by Directorate of Mining & Geology (DMG) to PP, as per which Sy Nos: 47, 48, 56, 57, 58 and 59 are mentioned in Mayem village. Block II – Sirigao Mayem Mineral block is situated in Sirigao and Mayem Village. Poira is a Ward and comes under Mayem Village. Block II is having 2 Mining Pits one is in Sirigao Village (Sirigao Pit) and other one is in Mayem Village (Poira Pit). Poira Pit Photographs have been shown in EIA & EMP Report. Page No 402. Once the Mining operation starts preference will be given to the qualified Local Villagers for direct and indirect employment as per level of production and profile requirement
17	**Mr. Subhash D. Salgaonkar – Absent**	
18	**Mr. Ravi Gaonkar – Sirigao** He stated that he has no objection to the starting of the mine but everything should be done legally.	Support appreciated and suggestion noted.

19	**Mr. Ganesh Gopal Gaonkar, Sirigao** He Stated that he supports the operation of the mineral block -II at Sirigao Mayem Mineral Block. He states that the mine will generate employment to the villagers and youth of the village. Hence he requests to start the mining project as soon as possible.	Support for Mining Operation appreciated Mining Operations will be started after taking all the requisite statutory approvals.
20	**Mrs. Seema Arondekar** She stated that the she is the Sarpanch of Village Panchayat of Mayem- Vaiguinim. She stated that she supports Block No. II Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co.Pvt. Ltd." She stated that employment should be provided to locals. She stated that since Poira is coming under her Panchayat, it should be included on the map.	Support appreciated. Once the Mining operation starts preference will be given to the qualified Local Villagers for direct and indirect employment as per level of production and profile requirement
21	**Mr. Dilip Shet- Absent**	
22	**Yash V Ghatwal, Poira** He states that the since his house is close to the road on which ore will be transported, he will be affected by the pollution due to the transportation of ore. He states that he is in support to the starting of the mining operation but would want to be compensated if he is affected.	Support for the Mining Operation appreciated. PP shall endeavour required protective measures during transportation to control of pollution levels on nearby habitations
23	**Mr. Vishant Pednekar- Absent**	

24	**Mr. Krishna Chodankar, Mayem** He stated that he is the Panch member of Mayem panchayat, He stated that he supports the operation of the Mineral Block -II at Sirigao Mayem Mineral Block. He stated that when mining had stopped a lot of people along with him had faced problems specially farmers and the truck owners. There was unemployment faced by the villagers he requests to start the mining project as soon as possible.	Support appreciated. Mining Operations will be started after taking all the requisite statutory approvals. Once the Mining operation starts preference will be given to the qualified Local Villagers for direct and indirect employment as per level of production and profile requirement
25	**Mr. Santosh Bhoske** He stated that the he is a resident of Sinquerim. He stated he is the Ex. Sarpanch of Mayem. He stated that he is happy to hear that the Block No. II Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co. Pvt. Ltd., is starting after 12 years. He stated the mining should resume by providing all basic benefits to locals specially agriculturist, schools, temples etc. He stated that it was brought to his knowledge that Poira Village is left out from the map in the EIA report and it is very surprising. He stated that the Block No. II Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co. Pvt. Ltd. should start by providing all the facilities to locals	Support appreciated. PP has proposed the CSR budget of about Rs. 93.50 lakhs for education, Health & Infrastructure development of surrounding villages over a period of five years The EIA & EMP report were prepared on the basis of Geological Report (GR) and DGPS Approved Plan provided by Directorate of Mining & Geology (DMG) to the PP, as per which Sy Nos: 47, 48, 56, 57, 58 and 59 are mentioned in Mayem village. Block II – Sirigao Mayem Mineral block is situated in Sirigao and Mayem Village. Poira is Ward and come under Mayem Village. Block II is having 2 Mining Pits one is in

	and by taking all environmental preventive measures.	Sirigao Village (Sirigao Pit) and other one is in Mayem Village (Poira Pit). Poira Pit Photographs has been shown in EIA & EMP Report. 402 Once the Mining operation starts preference will be given to the qualified Local Villagers for direct and indirect employment as per level of production and profile requirement. Required Environmental protective measures will be taken for safe mining operation.
26	**Ashvek Ghatwal, Poira** He questioned about the action taken against the earlier complaint filed by him w.r.t transportation, auction of mine ore. He stated that no action was taken earlier and was only checked upon when High Court cracked a whip and ordered action. He requested to keep a check on the mining after issuing EC.	Block II Sirigao Mayem Mineral Block has been allotted to Salgaocar Shipping Company Private Limited (SSCPL) through e-auction. Mining operations will be conducted according to the approved mining plan and in compliance with all other statutory requirements.
27	**Mr. Narayan Narvekar- Absent**	
28	**Mr. Suryakant R. Palni, Sinquerim** He stated that he supports the operation of the Mineral Block -II at Sirigao Mayem Mineral Block but when the mines were closed in 2012 all the farmers and the youth and villagers were facing problems which were not solved by the mining companies. Hence he now requests that the mining companies shall pay the water bills of the villagers. He requests to start the mine operations	Support appreciated Similar matter with respect to Sirigao Village is pending with Deputy Collector Bicholim. The matter will be addressed as per direction/decision by Deputy Collector/Government of Goa. Payment of water bills by the erstwhile leaseholder was on the basis of agreement/understanding

	as early as possible.	that the erstwhile lease holder had with the villagers. Mining Operations will be started after taking all the requisite statutory approvals.
29	**Mr. Shailesh G. Shetgaonkar** He stated that the he is a resident of Sirigao. He stated that 75% people want mining to resume in this village. He stated that he supports Block No. II Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co. Pvt. Ltd. and mining should resume in this block at the earliest.	Support Appreciated and observation noted. Mining Operations will be started after taking all the requisite permission and approvals
30	**Mr. Sujay C. Poriekar** He stated that the he is a resident of Mapusa. He stated that he supports Block No. II Sirigao Mayem Bicholim Block of M/s. Salgaocar Shipping Co. Pvt. Ltd. and mining should resume in this block at the earliest.	Support appreciated. Mining Operations will be started after taking all the requisite permission and approvals
31	**Mr. Atchyut Ramachandra Gaonkar** He stated that the he is the Ex-Sarpanch of Sirigao. He stated that he is supporting the mining activity of Salgaocar Company. He stated that all truck owners are very happy due to starting of mining and since all local businesses are dependent on mining. He stated that from 1950, Sirigao Temples, Schools are falling under the lease area. He stated that	Support appreciated and observation noted. Mining Operations will be carried out in accordance with the approved Mining Plan and no Drilling and Blasting is involved. Approved Mining Plan of Block II and Draft EIA & EMP report safe guards Lairai temple and nearby habitation

	he requests that residences and temples should be removed from the mining lease area and mining should start with following measures; 1. Abandoned mining pits should be restored, 2. Dust pollution should be controlled 3. Natural habitation should not be affected and should be preserved. 4. Medicinal plants should be planted by filling the abandoned mining pits. 5. Pollution Control Measures should be adopted and mining should be started.	by maintaining safety buffer zone of 50 Meter from the periphery of nearest habitant. PP shall endeavour necessary protective measures to control the dust pollution. During Reclamation of the mined-out pits local medicinal species shall be planted Natural habitation is not disturbed during operation of the mine
32	**Mr. Siddhant Ghatwal- Absent**	
33	**Mr. Sakharam Anant Pednekar, Mayem** He stated that he is confused as whom to trust. He stated that survey has not be done w.r.t environmental damage caused by the earlier mining company. He stated that schools, temples should not be included in the lease areas. He stated that de-siltation of the fields has been not mentioned in the EC. He stated that unless and until all the above fact are studied upon and degraded are restored the mines	Mining Operations will be carried out in accordance with the approved Mining Plan and no Drilling and Blasting is involved. Approved Mining Plan of Block II and Draft EIA & EMP report safe guards Lairai temple and nearby habitation by maintaining safety buffer zone of 50 Meter from the periphery of nearest habitant The biodiversity study is undertaken to assess the biodiversity of Mining Block Area and its buffer area of 10 Km radius. (Chapter 3.8 of EIA Report) EIA report is prepared by Accredited

	shall not to be granted permission to start. He stated that the whole procedure is handled between different departments, as such, no authority is defined and hence people lack trust as such in this case the public hearing does not hold any value. He stated that Bio diversity report has not been taken into consideration. He questioned about who prepared the EC report and the witnesses who signed the report. No mention of Khadis which are on the periphery. He stated that the mining EC can only be granted after all this issue are resolved.	EIA Consultant having vast experience in the filed for 30 Years. Corjuem Creek is mentioned in the EIA report. Mining Operations will be started after taking all the requisite statutory approvals
34	**Mr. Vijay R. Gaonkar, Sirigao** He stated that he opposes the operation of the Mineral Block -II at Sirigao Mayem Mineral Block He stated that the EIA Report is incomplete and misleading and he questions as to whether a comprehensive hydrogeological report has been done or not. He stated that during the earlier lease operation there was encroachment in the nearby villages which is not shown in this EIA report. He stated that the Office Memorandum of 2014 of MoEF	Hydrogeological and impact assessment of ground water studies were carried out by CWGA accredited consultant for the Block II Sirigao Mayem Mineral Block. The report submitted has been examined by Goa Ground water cell during its 129th meeting held on 20/12/2023 and was subsequently approved. NOC has been granted for the project. Mining Plan and EIA Report are prepared based on Geological

	states that the villages in the middle of the mining area have to be excluded along with the temples and the agricultural properties and the villages. He stated that the assessment of the rehabilitation has to be done. He stated that the Public hearing is illegally done and he strongly opposes the operation of the mining unit.	Reports and other required documents, such as approved DGPS plans provided by the Government of Goa. Sirigao Village habitation and Temple lies in Northern side of the Mineral Block area and not in the middle of Mineral block area. Approved Mining Plan of Block II and Draft EIA & EMP report safe guards Lairai temple and nearby habitation by maintaining safety buffer zone of 50 Meter from the periphery of nearest habitant The Public hearing of Block II Sirigao Mayem Mineral Block is conducted by the Goa State Pollution controlled Board as per EIA Notification 2006.
35	**Mr. Dinananth Gaonkar** He stated that he is a resident of Sirigao. He stated that 171 hectares of land of the village come under the mining lease area. He stated that 80% of the village comes under this mining block area. He states that on 31/01/2014 and in 2012he had submitted written Memorandums requests to exclude properties falling under the mining block. He stated that lease included Survey No. 1, 2, 3 , 4, 5, 6, 7, 47, 48, 84, 90, 91, 92, 93, 94, 95, 96, 97 & 98 of	As per the Geological Report (GR) and DGPS Approved Plan provided by DMG, the total area of Block II Sirigao Mayem Mineral Block is 171.2472 hectares, situated in Sirigao and Mayem villages. Of this, 52.8765 hectares are is in Sirigao, and 118.3707 hectares is in Mayem. The famous Lairai Temple falls within the Mineral Block area. Government Primary school is shown in the EIA reports and complete habitations are shown in the EIA reports. As per Land schedule and GR received from state government and

	Sirigao Village Which includes the following. 1. Famous Larai Temple, Aqarachi (Devachi) Tali & Temple Property 2. Government Primary School 3. Shree Sateri temple & 13 houses 4. Shree KulkarBharman Temple and 55 Houses 5. Paddy Fields barren land 6. Shree Maringan temple, ManshechiTali, 5 houses &Government Water Tank which is existing in the communidade land. 7. Existing 35 houses 8. Survey no. 47 existing Mahadev Temple, Shree Apevanshe temple, Chavate Shree Data Mandir & 17 houses. 9. Survey No. 48 Shree Ravalnath temple, temple property and houses, Survey no. 84 communidade dongor belonging to Sirigao Communidade. **He further submitted written submission on the above points.** He stated that in 2008 he had filled petition before the Hon'ble High Court and further NEERI had done a study which states that damage to agricultural land is due to mining and same report is submitted before the Hon'ble High Court. He further stated that the Government had	as per the latest abstract of Land Records department the survey No 84 of Sirigao Village belongs to erstwhile leaseholder.

	done nothing for the restoration of their agricultural land. He stated that the villagers also had done a joint meeting with the WRD. He stated that in 2019 order passed at agricultural land is affected. He stated that he is objecting the EIA report as 80% of village is destroyed. He stated that he strongly objecting the restarting of the mining activity by the Project Proponent.	
36	**Mr. Babu M. Palni- Absent**	
37	**Santosh G Kutapkar, Bicholim** He stated that he is in support of mining operation. He stated that he is affected economically for last 12 yrs due to closing of mines, hence demands resuming of mines at the earliest.	Support to the project appreciated. Mining Operations will be started after taking all the requisite statutory approvals
38	**Mr. Bhagwant B. Gaonkar** He stated that the he is a resident of Sirigao and that mines were closed due to illegalities. He stated that earlier mines owner have looted thousands of Crores from illegal mining and they should compensate the people.	Block II Sirigao Mayem Mineral Block has been allotted to SSCPL through e-auction. Mining operations will be conducted according to the approved mining plan and in compliance with all statutory conditions.
39	**Mr. Dilip Bhaskar Gaonkar** He stated that the he is a resident of Sirigao. He stated that he is objecting to the starting of Block No. II Sirigao	No reason expressed for objecting the Block II Sirigao Mayem Mineral Block.

	Mayem Bicholim Block of M/s. Salgaocar Shipping Co. Pvt. Ltd.	Mining operations will be conducted according to the approved mining plan and in compliance with all statutory conditions.
40	**Mr. Laxman Y. Gaonkar** He stated that the he is a resident of Sirigao. He stated that the houses and temples which are falling in the lease area are required to be excluded, from the lease area and mining company should start the mining.	Support for the project appreciated Mining Operations will be carried out in accordance with the approved Mining Plan and no Drilling and Blasting is involved. Approved Mining Plan of Block II and Draft EIA & EMP report safe guards Lairai temple and nearby habitation by maintaining safety buffer zone of 50 Meter from the periphery of nearest habitant
41	**Mr. Vishwambar Gopal Gaonkar, Sirigao** He stated that he supports the operation of the mineral block -II at Sirigao Mayem Mineral Block. He stated that the truck owners were given work only for 15 days and hence the remaining days they were without work. He states that to get the goodwill of the people the mining companies have to solve the problems of the people. He states the even after 70yrs the mining company has not yet compensated him for the property loss suffered by him. He states that the life span of the truck is expired and hence the same cannot be used, hence the truck	Support for the project appreciated. Local trucks will be engaged in the mining operations. Work will be conducted as per the approved mining plan, and the involvement of trucks will depend on the capacity, level of production & requirement. SSCPL has been granted the Lease through E-auction held by Government of Goa. Old matters pending with the erstwhile lease holder should be settled with them. Local Villagers trucks will be engaged in Mine as per capacity, production and requirement

	owners have to be given new trucks.	
42	**Mr. Dinesh Devidas, Poira** He stated that the village of Poira is not included in the EIA report. He States that he supports the operation of the mineral block -II at Sirigao Mayem Mineral Block. He states that there are many mining Engineers who are unemployed since 2012. He requests the Government to grant Environmental Clearance as soon as possible.	Support appreciated. The EIA & EMP report were prepared on the basis of Geological Report (GR) and DGPS Approved Plan provided by Directorate of Mining & Geology (DMG) to the PP, as per which Sy Nos: 47, 48, 56, 57, 58 and 59 are mentioned as in Mayem village. Poira is a ward and comes under Mayem village which is main village and included in EIA & EMP Report. Poira Pit is also included in EIA Report Page No 402
43	**Mr. Jayant Y Gaonkar** He stated that he is the Deputy Sarpanch of Sirigao. He stated that since 2012, the people are facing lots of hardship due to closure of mining; He stated that his only request is to excluded the temples and houses from the lease area and mining should be started.	Support for the project appreciated. Mining Operation will be carried out in accordance with the approved Mining Plan and No drilling and Blasting involved. Approved Mining Plan of Block II and Draft EIA & EMP report safe guards Lairai temple and nearby habitation by maintaining safety buffer zone of 50 Meter from the periphery of

		nearest habitant
44	**Mr. Umakant G. Kudnekar, Sirigao**- He states that that he supports restarting of mining operation. He stated that for the last 12 years mining operation has been stopped, people have suffered a lot. He states that Mineral fund has not been utilized in due to mine closure. He states that unemployment has risen due to closures of the mines. He requests to resume the mining at the earliest.	Support for the project appreciated and observation noted. Once the Mining operation starts preference will be given to the qualified Local Villagers for direct and indirect employment as per level of production and profile requirement. Local Villagers trucks will be engaged in Mine as per capacity production and requirement. Mining Operations will be started after taking all the requisite permission and approvals.
45	**Mrs. Smith Sandeep Ghatwal- Absent**	
46	**Mr. Babuso Gaonkar** He stated that during the last hearing he suggested that a survey be done of the villages in the lease area, however it was not done. Mining was closed in the year 2012 because there was illegality in their operation of the mining companies.	Support the project appreciated. Mining Operations will be carried out in accordance with the approved Mining Plan and no Drilling and Blasting is involved. Approved Mining Plan of Block II and

	The people were facing problems hence it was closed. The names of the properties of the people in the villages are not mentioned in the EIA report. The Chowgule companies mining pits have to be filled. He questioned where the mining department has looked into the matter and whether the inspection is done. He questions how the lease agreement is done. He requests to test the well water of the villages. He stated that the temples, agricultural land and the water bodies etc have to be removed from the lease areas and the MDR road must be protected and maintained by the mining company. He states that the lease agreement has to be given only for 15yrs and not for 50yrs. He states that Vedanta has started their mines from Sirigao to Mulgao and the conditions are not complied by them and the authorities must keep a check on them. He States that he supports the operation of the mineral block -II at Sirigao Mayem Mineral Block	Draft EIA & EMP report safe guards Lairai temple and nearby habitation by maintaining safety buffer zone of 50 Meter from the periphery of nearest habitant As per the Mines and Minerals (Development and Regulation) Act, 1957, and its amendments, the Mining Lease Deed Agreement for Block II will be for 50 years. The State Government will execute the lease deed once the PP obtains all necessary approvals and permissions.
46	**Mr. Tushidas Chodankar** He stated that he is in support of mining however betterment of the village should be taken into account and the economic development must be for the villagers. He stated that the overall betterment of the village must be given full importance.	Support appreciated and observation noted. Once the Mining operation starts preference will be given to the qualified Local Villagers for direct and indirect employment as per level of production and profile requirement. Local trucks will be engaged in the mining operations. Work will be

		conducted as per the approved mining plan, and the involvement of trucks will depend on the capacity, level of production & requirement.

Action Plan on issues raised during public heaing & Written Submission					
Sl. Nos.	**Activities**	**Response by the Project Proponent (PP)**	**Year-1**	**Year-2**	**Year-3**
1	Local Employment	The Mine shall provide direct Employment of about 24 People which include Mine official and supervisors and and indirect employment of about 108 personnel which includes skilled semi skilled and unskilled labours in contractual works and transport. Job perefernce will be given to the qualified locals depending on the requirements and skills.	Employment will be given as per project requirements		
2	Health care for the local villagers	Providing Facilities towards Medical Emergencies such as Medical Camp, Ambulance and Medical Officers(Weekely once) etc	2,00,000	2,40,000	2,90,000
3	Support for the education & infrastructure development to the local schools and	Transportation to students, Books, Uniforms, Scholship , etc.	2,00,000	2,40,000	2,90,000
4	Maintenance of the local temples	During Annual Jatra road repair and Parking area maintance work will be carried out	1,00,000	1,00,000	1,00,000
5	Environment protection Measures to avoid pollution on the nearby plantation and crops/Field	Following Measures will be taken to Minimize Environmental Pollution due to Mining 1. Entire water from the catchment area within the mining lease will be diverted in the existing mining pit. The water accumulated in Mining Pit will be pumped and released in settling pond where it settled and lime and floculant will be added for faster setting of washed off materail and clear water willbe released in downstream nallah. 2. Construction and repair of Existing check dams, Retaining walls. 3. Green Belt Plantation on Backfilling and along the periphery of Block. 4. Retaining wall around dump area to reduce soil erosion. 5. Control of dust emission from Mining Operation and through ore transporataion	36,25,000	37,60,000	38,50,000
6	Habitation inside the Mineral Block Area Maintenance and Protection of Temples/ Schools within ML area	Mining operation will be carried out in accordance with the approved Mining Plan. No drilling and Blasting is involved in the project. 50 meter safety Buffer Zone is always maintaned between Temple and Habitation			
Total Cost			**41,25,000**	**43,40,000**	**45,30,000**

GOA STATE POLLUTION CONTROL BOARD
गोंय राज्य प्रदुशण नियंत्रण मंडळ
(An ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 Certified Board)

ANNEXURE-B

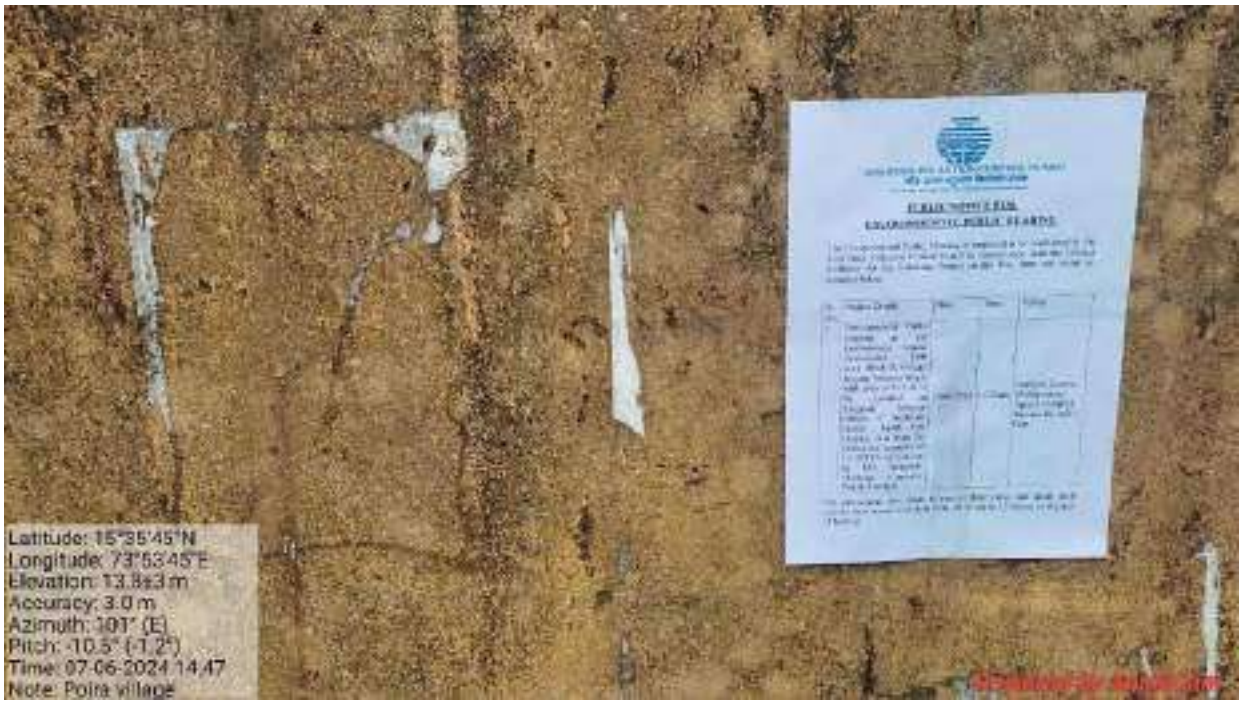
PUBLIC NOTICE FOR
ENVIRONMENTAL PUBLIC HEARING

The Environmental Public Hearing is proposed to be conducted by the Goa State Pollution Control Board in Consultation with the District Collector for the following Project on the Day, time and venue as mention below.

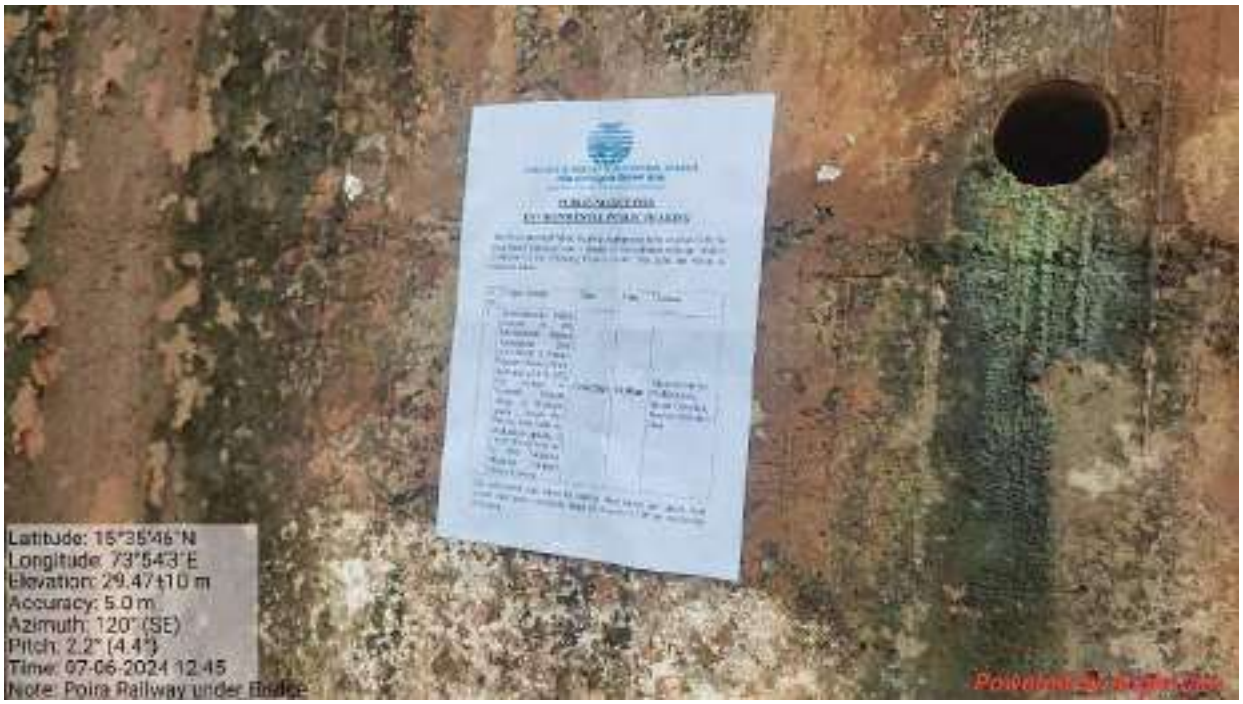
Sr. No.	Project Details	Date	Time	Venue
1.	Environmental Public Hearing as per Environment Impact Assessment 2006 w.r.t. Block II, Sirigao Mayem Mineral Block with area of 171.2472 Ha. Located in Sirigao & Mayem village of Bicholim taluka , North Goa District, Goa State for production capacity of 1.0 MTPA of Iron ore by M/s Salgaocar Shipping Company Private Limited	19/06/2024	10.30am	Narayan Zantye Multipurpose Sports Complex, Sarvan, Bicholim Goa.

The participants who intent to express their views and speak shall register their names separately from 10.00 am to 12.00 pm on the day of hearing.

NOTICE OF PUBLIC HEARING IN SIRIGAO VILLAGE



NOTICE OF PUBLIC HEARING IN POIRA VILLAGE



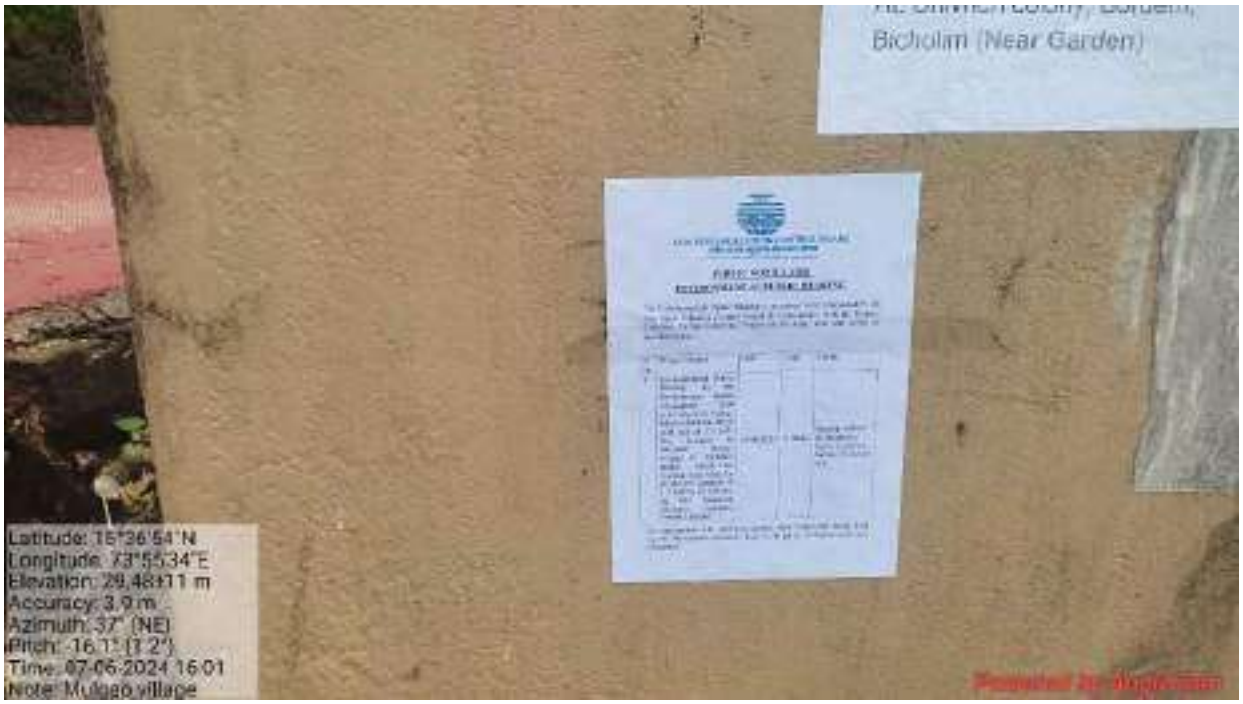
NOTICE OF PUBLIC HEARING AT POIRA RAILWAY UNDER BRIDGE

NOTICE OF PUBLIC HEARING AT MINE PLANT AREA(MAYEM)

NOTICE OF PUBLIC HEARING AT MAYEM VILLAGE PANCHAYAT

NOTICE OF PUBLIC HEARING AT MAYEM LAKE

NOTICE OF PUBLIC HEARING IN SINQUERIM VILLAGE

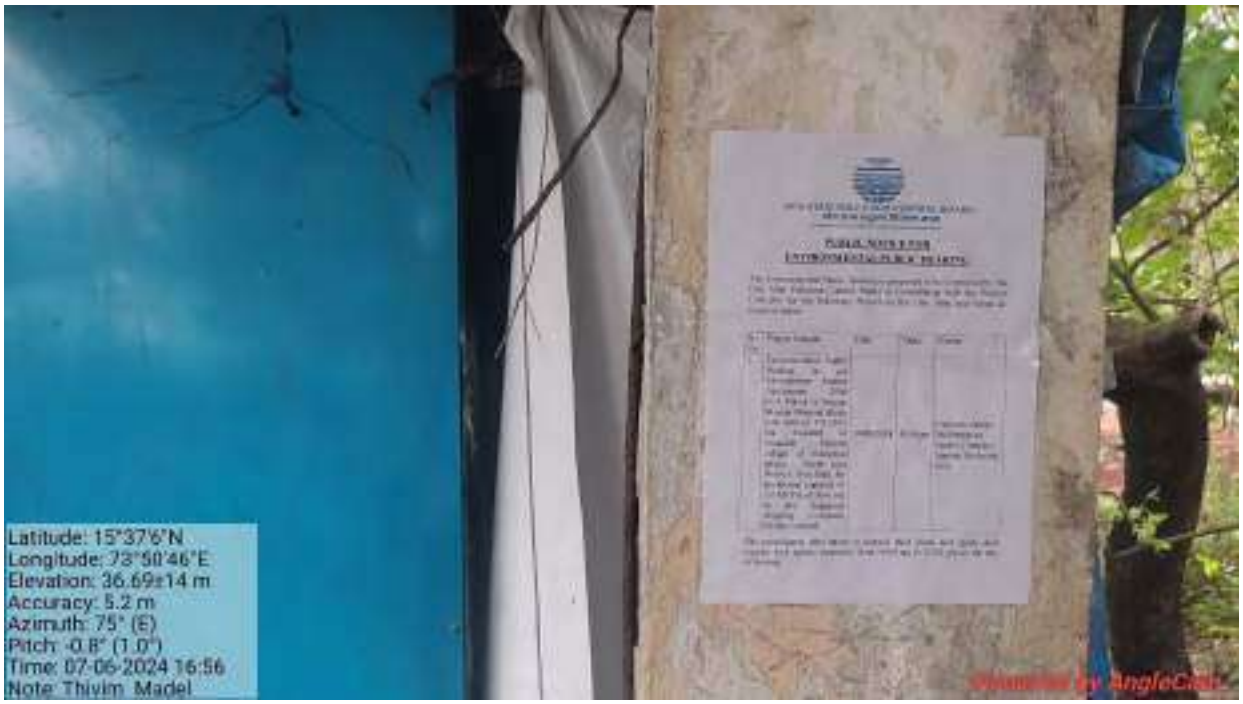


NOTICE OF PUBLIC HEARING IN MULGAO VILLAGE

NOTICE OF PUBLIC HEARING IN SIRSAI VILLAGE

NOTICE OF PUBLIC HEARING IN THIVIM VILLAGE

NOTICE OF PUBLIC HEARING IN THIVIM KOLVALE JUNCTION



NOTICE OF PUBLIC HEARING IN THIVIM- MADEL VILLAGE

NOTICE OF PUBLIC HEARING AT ASNODA BUS STAND

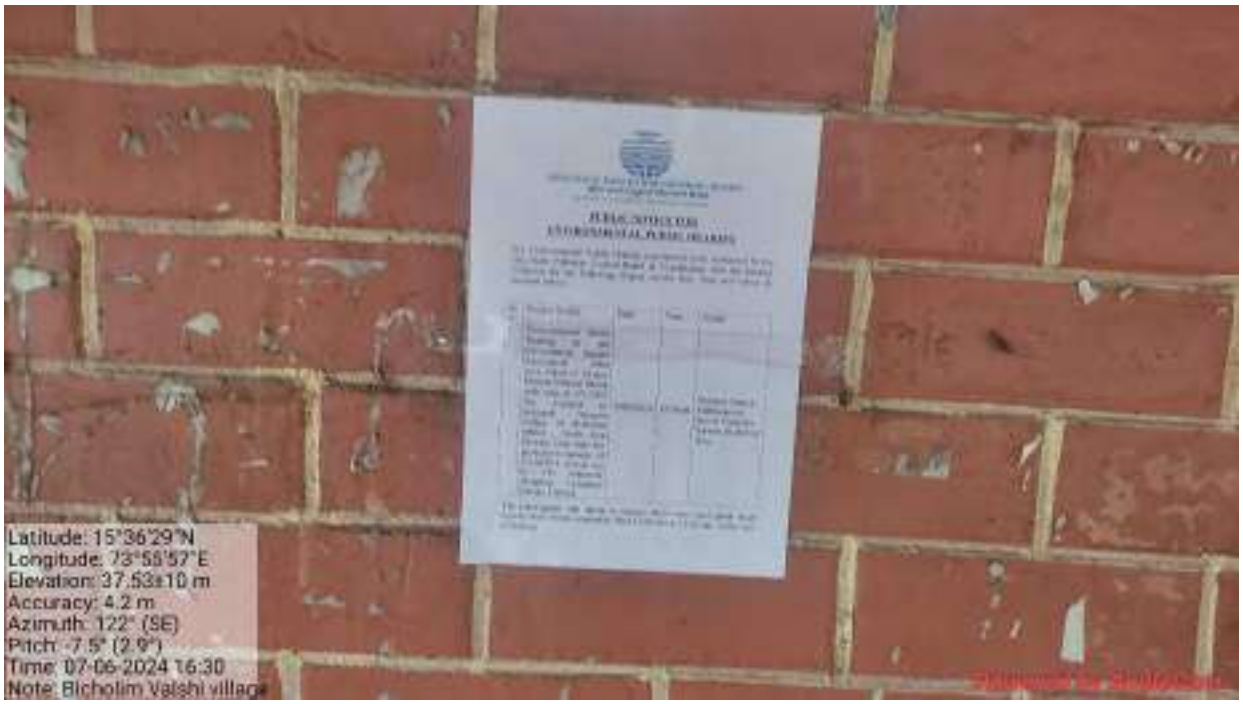
NOTICE OF PUBLIC HEARING AT ASNODA PARAR

NOTICE OF PUBLIC HEARING AT BICHOLIM BUS STAND

NOTICE OF PUBLIC HEARING AT BICHOLIM MUNCIPALTY GROUND

NOTICE OF PUBLIC HEARING AT BICHOLIM SARVAN BUS STOP

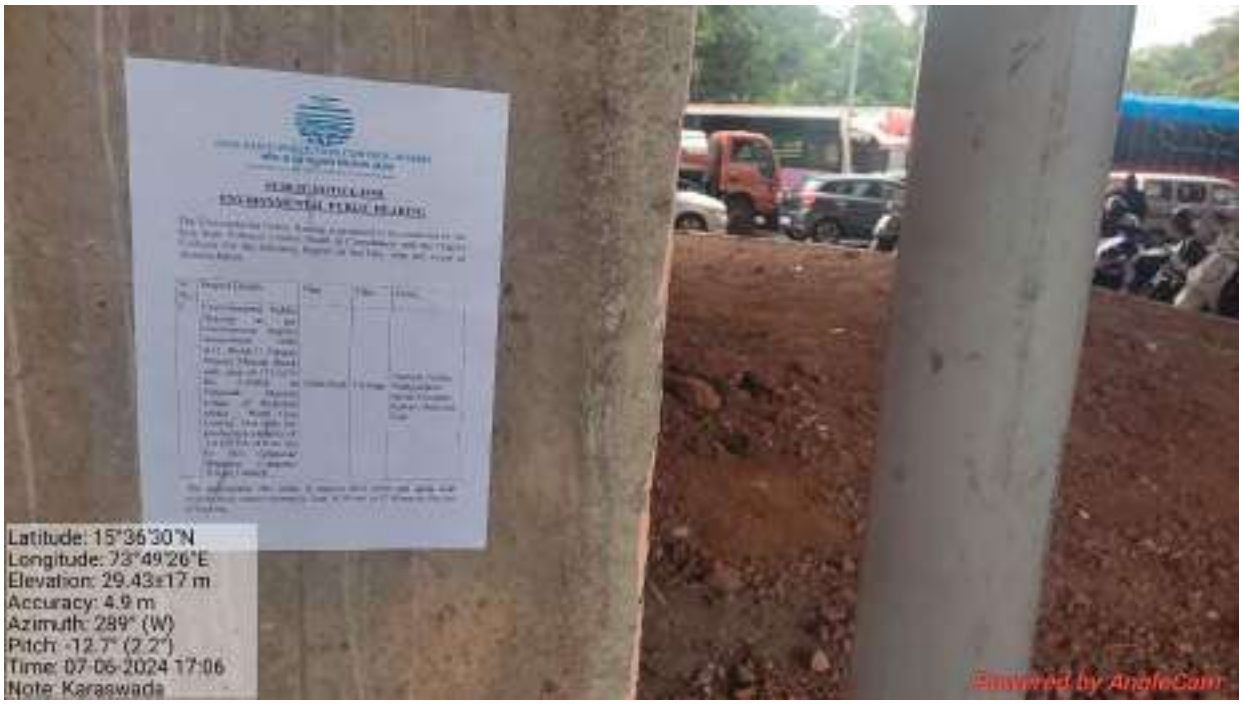
NOTICE OF PUBLIC HEARING AT BICHOLIM SHIVAJI CIRCLE



NOTICE OF PUBLIC HEARING AT BICHOLIM VALSHI VILLAGE

NOTICE OF PUBLIC HEARING AT BORDEM VILLAGE

NOTICE OF PUBLIC HEARING AT LAMGAO VILLAGE



NOTICE OF PUBLIC HEARING AT KARASWADA MAPUSA

NOTICE OF PUBLIC HEARING AT MAPUSA

ANNEXURE-C

PHOTOS OF PUBLICITY THROUGH LAUDSPEAKAR FOR PUBLIC HEARING OF BLOCK II SIRIGAO MAYEM MINERAL BLOCK

SIRIGAO VILLAGE

POIRA VILLAGE

969

MAYEM VILLAGE

SINQUERIM VILLAGE

970

THIVIM VILLAGE

MAULINGUEM VILLAGE

971

HANDANWADI MAYEM

KARASWADA MAPUSA

MAYEM LAKE

MULGAO VILLAGE

NARVE VILLAGE

ADVALPAL VILLAGE

ALDONA VILLAGE

ASNODA VILLAGE

ATURLI VILLAGE

BICHOLIM NARAYAN ZATYE COLLEDGE

976

BICHOLIM MARKET

BICHOLIM BORDEM

977

CHORAO VILLAGE

CORJUEM

978

GAONKARWADA MAYEM

GRAMPANCHAYAT VIAGIUNIM MAYEM

GOA STATE POLLUTION CONTROL BOARD

गोंय राज्य प्रदूषण नियंत्रण मंडळ

(An ISO 9001-2015, ISO 14001:2015, ISO 45001:2018 Certified Board)

Phone Nos : 0832- 2407700,
2407701, 2407703

Email Ids:
Chairman, GSPCB: chairman-gspcb.goa@nic.in
Member Secretary, GSPCB: ms-gspcb.goa@nic.in
Office: mail.gspcb@gov.in

No.11/15/2022-PCB/Leg/6517

Date:-24/06/2024

RECEIVED
27 JUN 2024

To,
M/s. Salgaocar Shipping Company Private Limited,
Salgaocar Bhavan, Altinho, Panaji - Goa.
Email:- info@smilindia.com .... for information

Sub: - Environmental Public Hearing.

Sir,

Please find enclosed herewith copy of objections received by the Board, for your information and necessary action.

Yours faithfully,

Dr. Shamila Monteiro
(Member Secretary)

Encl: As above.

Copy to:-

1	Office copy
2	Guard file

24/6/24
ISSUED

Received
18/6/24

From:
Anand Sadashiv Naik & Ors.,
C/o Poira Block-II Mining
Affected Forum,
Village Panchayat Mayem,
H. No. 1133, Poira-Mayem,
Bicholim-Goa, 403503.

Date : 16.06.2024

To,
1) The Members Secretary,
Goa State Pollution Control Board,
Government of Goa,
Panaji-Goa.

2) The Director,
The Directorate of Mines,
Government of Goa,
Panaji-Goa.

3) The Director,
The Directorate of Environment,
Government of Goa,
Panaji-Goa.

Subject : **Memorandum for Inclusion of Poira Village along with its specific mention in the Executive Summary of EIA & EMP - II Sirigao - Maem Mineral Block as well as Exclusion of said village beyond buffer zone of mining mineral block, Reg...**

Sir,

We the Villagers of Ward No. 9 of Poira Part of Mayem V.P. falling under Sirigao-Mayem Mineral Block-II who are directly affected due to all Mining Operators related activities in our part of Poira would like most humbly state, submit and pray as under:-

The area mentioned is the subject above having being land locked as well as sandwiched between effective mining operations on the one side and Konkan Railway Track on the other side within 50 metres, the ill effects of mining such as soil erosion,

silting of mines rejected mud, heavy dust pollution, noise, air and water pollution besides soil pollution, ponds and water locking, water stagnation, blockades of gutters and natural irrigation system detrimental and hazardous to human health and safety causing industrial occupational hazard to life are daily affairs to the local resident of this part of Poira Village.

It has caused enhanced quantum of loss to people, their assets including the live stock as a result we the local residents are the first and worst affected people since most of the mining operations as mentioned at para two above are taking place in our landed prosperities with survey Nos. from 48, 56, 57, 58 & 59.

Unfortunately however it is most pertinent to note that, even having being this area is the most mining affected pollution hot spot, there is no required and necessary mention of our area in the Executive Summary of EIA & EMP Sirigao-Mayem Mineral Block-II of Bicholim Taluka in North Goa District of Goa State. On account of this there is general feeling of discrimination which the Government having meted step motherly treatment to the residents of Poira.

On the other hand some of the far distance village areas and public places are included in the mining Block-II.

In view of the above facts and circumstances you are hereby most humbly requested to include part of Poira Village in Block-II in the Executive Summary of EIA & EMP.

Further it is requested to arrange for the protective and compensatory measures in this area in order to safeguard the life and property including live-stock of the local residents besides ensuring the grant of facilities such as pollution compensation, damages towards agricultural land loss, silting clearance of farming fields, cleaning of drains, medical facilities, disilting of water bodies including drinking water wells, provision of

medical facilities etc. etc. which the concern authorities as in law are required to undertake.

Under the above facts and circumstances you are hereby most humbly requested to ensure that direct specific mention of the Poira Village in Executive Summary of EIA & EMP, besides its exclusion from the Mining buffer zones be done in the larger interest of the residents of Poira as well as the protection and promotion of their basic and fundamental Human Rights to clean Environment.

Hope that your goodself will pursue into the content of this application and personally look into the matter on a most humanitarian grounds to ensure justice is done to these mining affected local residents.

Thanking you,

Yours faithfully,

(Siddhesh S. Ghatwal)
Secretary

(Siddhesh V. Surlikar)
Vice President

(Anand Naik)
President
Ex. Sarpanch V.P. Mayem
9822134734

CC to :
1. The Director,
M/s Salgaoncar Shipping Co. Pvt. Ltd.,
Salgaoncar Bhavan, Altinho, Panaji-Goa.

(2)

Date ~~29/03/24~~ 19-6-2024

To,

The Member Secretary, Goa State Pollution Control Board, Near Pilerne Industrial Estate, Opposite Saligao Seminary, Saligao-Bardez Goa-403511

SUB: Objection for processing of iron ore mining leases in Sirigao Mayem Mineral Block, and Environmental Clearance to Block No-II through Public Hearing scheduled on ~~29-03-2024~~ 19-06- at Bicholim

Respected Sir,

We the undersigned the Villagers of Sirigao, Bicholim-Goa here by strongly oppose and file strong objection for granting of Environmental Clearance to Block No-II Sirigao Mayem Block through Public Hearing scheduled on ~~29-03-~~ 19-06- 2024 at Bicholim pertaining to Sirigao Village, as proposed by the Government of Goa through Directorate of Mines and Geology.

A ISSUE OF OWNERSHIP OF SURFACE

1) The Mining concession/Lease No 5/49 were carried out in the property surveyed under Old Cadastral Survey No. 95 of Village Sirigao. The said Old Cadastral Survey No. 95 comprising of New Survey Numbers 62, 83, 84, 93, 6, 34, 33, 28, 29, 20, 13, 76, 78, and 81 part, Which are owned and inheritably possessed by Communidade of Shirgao since time immemorial. The said land was commonly used for public utility such as ponds for drinking water, paddy fields for cultivation, grazing ground for cattle, common place for prayers and common place for crematorium and cultivation of forest trees.

2) But way back in Portuguese regime around in the year 1949 Said Mining concession/Lease No 5/41 were allotted to concessioner's M/s. Chowgule and Company Pvt. Ltd. Sirigao mines and from then onwards the above mentioned

communidade along with the private property/Land illegally was used by the concessioner/Lease Holders namely M/s. Chowgule and Company Pvt. Ltd.

3) Further in the year around 1972 the Department of Settlement and Land Records had erroneously recorded the name of mining leases holders in the occupant column of property of Communidade of Shirgao where the mining leases were allowed. Wherein the Communidade of Sirgao is the lawful owner of the land/ property in active mining leases which are now again auctioned by the government.

4) The mining concession was allowed erstwhile Portuguese Government without mentioning survey numbers and demarcation of boundaries of the concession/ leases.

5) As per the Mining act the lease holder shall have to pay the royalty to the surface right holder and shall have to obtain surface right for extraction of mineral ore. but said mining lease holders had never obtained any surface right from the Communidad of Shirgao for carrying out any mining activity in mining leases No 5/49. The mining company is relying upon land records which were recorded erroneously in the year around 1972 by the Department of Settlement and Land Records of the Revenue Department of Goa State. The said mining company doesn't have title of Property/land where they have been succeeded to obtain mining concession/Lease by hook and crook method. Title of Land covered under said mining lease is under objection and therefore we are strongly against the auction which is proposed by the Government of Goa and said objection continues for Environmental Clearance to Block No-II through Public Hearing scheduled on ~~20-03-2024~~ 12-6-24 at Bicholim..

6) The deed of concessioners has conditions that the prospective concession holder shall file the ownership details of the surface right holder along with the right to extract mineral ore of particular land, by paying the surface right to the actual owners. Therefore, the Government shall come out with the documents

filed by the mining concession holders at the time of first allocation of concession and clarify who is the actual surface right holder at the time of first allocation of concession. This fact was totally neglected by the then Government.

7) In the landmark verdict in July, 2013, the Honorable Supreme Court of India in the case of Thressiamma Jacob & Others vs. Geologist, Department of Mining Geology & Others (Civil Appeal No. 4549 of 2000) has held that ownership over minerals that lie beneath the soil does not necessarily lie with the state.

8) A three member bench concluded: "there is nothing in the law which declares that all mineral wealth subsoil rights vest in the state; on the other hand, the ownership of subsoil/mineral wealth should normally follow the ownership of the land, unless the owner of the land is deprived of the same by some valid process." The Honorable Supreme Court means that the ownership of mineral rights vests with the landowners.

9) In this connection the land falling in above mentioned leases belongs to a private institute, Communidade of Shirgao and according to established law the Government of Goa cannot auction the ore below the land owned by the private institutions Communidade of Shirgao. The right of the ore beneath the land of institutions remains with the institutions and hence objection continues to auction the ore beneath land of private institutions that is Communidade of Shirgao of Bicholim Taluka. And said objection continues for Environmental Clearance to Block No-II through Public Hearing scheduled on ~~20-03-2024~~ 19-6-24 at Bicholim.

B DISASTER OF PADDY FIELD AND AGRICULTURE WHICH IS HUGE LOSS TO THE FARMERS OF SHIRGAO.

1) Due to Excessive extraction of mining from Lease No 5/41, A huge mining pit/crater is formed in survey no 93 and 84 and which is -40 to -50 meters below ground level. And due to said mining pit almost all water bodies were destroyed by polluting from the mining pit. There is 2 fit high polluted water in the paddy

field throughout the year and therefore farmers are not able to cultivate the paddy for more than 20 years. To grow paddy the surface needs to dry in the months of April and May which is not able to dry due to percolation of water from said mining pits throughout the year.

2) The existing mining pit is adjacent and close to the vicinity of Shree Lairai temple and residential houses at Deulwada Sirigao.

C- NO DRINKING WATER

1) Due to percolation and diverting the springs in the mining pit all springs and wells and water bodies of village Sirigao got polluted. For the last 20 years villagers have stopped drinking water from wells. Government has not made any permanent solution of drinking water for the villagers of Shirgao. Presently it is the responsibility of Government to provide potable drinking water the villagers whereas government fails to provide the same hence objection continues for Environmental Clearance to Block No-I through Public Hearing scheduled on ~~20-03-2024~~ 19-2-24 at Bicholim

TEMPLES, SCHOOL, HIGH SCHOOL, RESIDENTIAL HOUSES ARE NOT EXCLUDED FROM MINING LEASE

Details and description of the property -
Survey no.

1. Famous Laral temple, Aqarachi (Devachi) Tali & temple property
2. Government Primary School
3. Shree Saterl Temple & 13 houses
4. Shree Kulkar Bharman temple & 55 houses
5. Paddy fields bharad land
6. Shree Maringan temple, Manshechi tali, 5 houses & government water tank which is existing in the communidade land
7. Existing 35 houses

8. Survey no. 47 existing Mahadev temple, Shree Apevansh temple, chavata Shree Datta Mandir & 17 houses
9. Survey no. 48 Shree Ravalnath temple, temple property and houses, survey no. 84 communidade dongar belonging to Sirigao Communidade
10. Survey No. 90 private property destroyed by the mining company was full of Kaju nut trees, fruit bearing trees and Bharad Land
11. Survey no. 91 & 92 are the same as above.
12. Survey no. 93 communidade land belonging to Sirigao communidade was full of jungle trees, fruit bearing trees, party bharad land, fire wood, medicinal plants and grazing grounds at present existing huge mining pit.
13. Survey no. 94 existing mango trees, Panchayat Ghar and houses.
14. Survey no. 95 existing 35 houses.
15. Survey no. 96 existing houses and fruit bearing trees.
16. Survey no. 97 Bharad land, fruit bearing trees belonging to villagers/private property destroyed by the mining company.
17. Survey no. 98 existing Government high school, office of village Panchayat Sirigao and 30 houses

Taking into consideration all above mentioned factors the mining company operating in the village Sirigao since last 70 years have destroyed 80% of the village including water bodies, agricultural land, bharad land, coconut grooves, health of the people, total destruction of the environment and hence we object for granting of EC to MB Block No.-II Sirigao Mayem Mineral Block in view to protect the skeleton of the village

Thanking you,

Yours Faithfully

Ganesh C. Gaonkar

Yashwant B. Gaonkar

Session 2-7149-72

Leelkaay V. Patil - Bolne

Aaram S. Patil

Eknath S. Gaonkar

Deputy Oth S. Gaonkar - Bolne.

Suresh S. Goankar

Ravi Gaonkar

Vijay R. Gaonkar

Vijay Gaonkar

Ashvek Gharwal,

Bharat Wada, Poira,

Mayem, Bicholim, Goa.

Date : 19.06.2024

To,

The Member Secretary,

Goa State Pollution Control Board,

Panjim, Goa.

Sub: Objection for Environmental Clearance to Block II in Survey No 12 & 47 at Mayem Village.

I am aware that the Director of Mines & Geology have auctioned certain areas of the village for the purpose of mining and in this connection has issued letter of intent for mining blocks, particularly mining blocks II.

It is on record that the local Panchayat has not been consulted nor NOC taken for the purpose of granting the letter of intent and for auction of mining blocks. Village Panchayat is local body which is part of State, as defined under Article 12 of the Constitution of India and therefore its permission is required in such important matters that fall within its jurisdiction. Further No Panchayat was consulted before submission of EIA report. The present blocks will have direct major impact on all Panchayats and the same has not consulted for underrating the mining impact. This is major lapses in the EIA report. There are various flaws in the said report and prima facie it seems like to be biased favoring Mining Companies.

We being the tenant of the aforesaid area were not consulted by any authority/department/agency to understand the impact of mining activities on our fertile fields.

We are also aware that the mineral resources belong to the people of the state and not to the government and the people must benefit directly from development.

In past mining activities has caused grave environmental problem to the environment of the villages. The mining activity has resulted in displacement of soil and sediment, filling up of our water bodies, destruction of our water resources and productive agricultural lands, and permanent destruction of the hills. Inspite of all above facts the locals were not consulted for understanding the impact of mining.

I therefore have a strong objection for granting any such permission to operate mining blocks without taking local; farmers and stakeholders into confidence.

Thanking You,

Yours Sincerely,

Ashvek Ghatwal

॥ श्री लइराई प्रसन्न ॥

श्री लइराई संस्थान

शिरगांव, ता. डिचोली - गोवा

SHREE LAIRAI SAUNSTH

Village : Shirgao
Taluka : Bicholim
P.O. : Assonora,
Goa
Pin : 403 503
Tel : 0832-2215553

Ref. No.:

Date:19-06-2024

SUBMISSION FOR THE PUBLIC HEARING

Mineral Block II (Sirigao-Mayem Minaral Block).

The Petitioners would like to discuss on the agenda as follows:

I The primary grievance is that the village settlement including the Houses, the schools, the fields, Private Property and the temples are all included within the boundaries of the mining blocks auctioned, and that the government, when deciding on the boundaries of the mining blocks, did not apply its mind nor did it consider the unmitigated havoc caused by mining operations on the erstwhile mining lease during its earlier life or the fact that none of it had been remedied. The grant of fresh lease in relation to the same area is therefore the height of irresponsibility on the part of the department. If the mining block permitted, the entire village and its temples would become liable to wholesale destruction at some stage or the other during the next 50 years, and there would simply be no recourse at that point to any effective remedy. **Hence This Shree Lairaee Saunsthan has unanimously resolved to file appropriate objections at appropriate authority against the auction/operation of Mining Block I, II and III in the village of Shirgao which is proposed by the Government of Goa before exclusion of all the Houses, the schools, the fields, Private Property, the Temples and the Places of religious sentiment.** Said resolution is passed in the meeting of Annual General Body of Shree Lairaee Saunsthan heald on 18 February 2024.

Secretary, Shree Lairaee Saunsthan-Shirgao 19/6/2024.

19.06.2024

FROM:

1. Suresh Govind Gaonkar,
resident of H. No. 2090, Housing Board Colony, Near ITI, Bordem, Bicholim, Goa-403504, Mobile no. 9423057804

2. Vijay Ravalnath Gaonkar,
resident of H.No. 251/1, Madala Wada, Shirgao, Bicholim, Goa-403503, Mobile no. 7498438835.

3. Ganesh Chandrakant Gaonkar
H.No. 1165, Colleandongor, Santemol, Salcete, South Goa, Goa-403720, Mobile no. 9822102040.

4. Dinanath Shamba Gaonkar,
H. No. 269, Manaswada, Shirgao, Assonora, Goa 403503, Mobile no. 7775020411.

5. Krishna Raya Gaonkar
H. No. 11, Wadachawada, Shirgao, Bicholim, Goa 403503, Mobile no. 9158472715.

To
The Chairman/Collector North Goa
GOA STATE ENVIRONMENTAL ASSESSMENT AUTHORITY
4th floor, Dempo Tower,
Panaji - Goa

SUB: MEMORANDUM FOR OBJECTION FOR GRANTING EC TO MINING BLOCK (MB) NO. II M/s SALGAONKAR SHIPPING COMPANY PVT. LTD.

Kindly acknowledge the attached copy of the Plaint filed by the complainant/petitioners in the Hon'ble High Court of Bombay at Goa. Said Plaint is from villagers of Sirigao on behalf of the village and villagers of Sirigao taluka Bicholim, in North Goa District, in respect of mining blocks recently approved by the auction in village Sirigao Mayem by the Government of Goa for the extraction of the major mineral.

The present complainant/petitioners objecting the approval process of EC connected with Mining Block no. II Sirigao Mayem Mineral block on grounds of total non-application of mind and sheer injustice to the villagers of Sirigao and violation of their fundamental rights under Article 21

Therefore, the complainant/petitioners are requesting your good self to kindly look in to the matter of Plaint filled by the complainant/petitioners against successful bidder M/S SALGAONKAR SHIPPING COMPANY PVT. LTD. and restrict to grant EC to said bidder.

Thanking You,

Yours faithfully

1. Suresh Govind Gaonkar

2. Vijay Ravalnath Gaonkar

3. Ganesh Chandrakant Gaonkar

4. Dinanath Shamba Gaonkar,

5 Krishna Raya Gaonkar

A

IN THE HON'BLE HIGH COURT OF JUDICATURE OF BOMBAY AT PORVORIM, GOA

P.I.L. Writ Petition No. /2023

Shree Devi Lairai, through the President
of the Shree Devi Lairai Saunsthan and Ors ....Petitioners

V/s

Directorate of Mines and Geology & Ors ...Respondents

SYNOPSIS AND CHRONOLOGY OF

DATES AND EVENTS

This is a PIL filed by the principal deity of the Shri Devi Lairai Tample through the President of its trust and by villagers of Sirigao on behalf of the village and villagers of Shirgao located in North Goa district in respect of mining blocks recently approved for auction by the Government of Goa for the extraction of a major mineral, namely, iron ore located in their village. Though the auction process has commenced, even leading to approval of a successful bidder, the finalization of the agreements between the Goa Government and the new bidder are still in the pipeline and the successful bidder is still required to obtain mandatory environment clearance before

commencement of mining activity. This petition challenges primarily the state's decision to go ahead with the auction of the mining block on the grounds raised in the petition. Further, it challenges the order dated 13.01.2023 which issues the Letter of Intent (LOI) to the successful bidder. The petitioners contend that mining activity has been carried out in the village environment for several decades till it was halted by the Supreme Court in October 2012. The earlier lease which came to an end in 2007 was granted by the Portuguese through a manifest that did not include any Survey Nos. The village presently has a population of 2000 persons and 450 nos. of houses. Principal victim of mining operations would be the Devi Lairai Mandir, one of the most famous shrines of Goa, veneration of which is closely identified with the Shirgao jatra where more than a million devotees assemble from all over and across Goa. The primary grievances of the petitioners is that the village settlement including the homes, the schools, the fields and the temple are all included within the boundaries of the mining blocks auctioned, and that the government, when deciding on the boundaries of the mining blocks, did not apply its mind nor did it consider the unmitigated havoc earlier caused by mining operations on the environment of the village. Hence this P.I.L.,which is filed under Articles 226 and 21 of the Constitution of India for reliefs set out herein.

C

LIST OF DATES AND EVENTS

Sr. No.	Date	Particulars of events or documents if any	Annexure and page
1.	1949	Mining concession granted for small-scale manual mining without significant environmental impacts.	
2.	29.04.1960	Titular Concession/ Title of Concession of Mining lease granted to M/s Chowgule and Co Ltd..	**Ann. 4,** at pgs. 67 - 72
3.	1980 onwards	Intensive mining methods began to be used for mineral extraction causing serious problems for the villagers.	
4.	1987	Mineral concession is declared a deemed lease under the MMDR Act.	
5.	21.12.1990	First renewal of lease agreement with M/s. Chowgule and Co. Ltd.	**Ann. 5 Colly,** at pgs. 73 - 92
6.	1997	The Goa government sponsors a study by The Energy Research Institute (TERI), which found Sirigao village as one of the worst affected by mining operations.	

7.	25.11.2003	Inspection report of the Mines Dept. establishes widespread damage to Sirigao village	**Ann. 7**, at pgs. 101 - 118
8.	27.12.2005	The lease obtains its environment clearance for the first time under the 1994 EIA notification.	**Ann. 12**, at pgs. 139 – 144H
9.	08.03.2006	Study by Dr. Chachadi, Department of Geology (Goa University), regarding groundwater scarcity and water related problems in Sirigao village	**Ann. 11**, at pgs. 135 - 138
10.	2008	Villagers of Sirigao address a letter petition to this Hon'ble Court pleading with the Court to direct the respondents and authorities to restore their fields covered in mining silt and for other issues	
11.	17.03.2008	Inspection report of the Mines Dept. regarding widespread damage to agricultural lands of local farmers by mining activities	**Ann. 10**, at pgs. 133 - 134
12.	16.06.2008	This Hon'ble High Court directs NEERI to file a report on water scarcity	**Ann. 14**, at pgs. 151 - 154

		and whether it is mining related	
13.	2008	The Goa Government decided to incorporate leases within the Regional Plan (2021). Sirigao has a buffer line	**Ann. 19**, at pgs. 206 – 206A
14.	March 2009	NEERI submits report to HC, as directed by its order dt. 16.06.2008.	**Ann. 15**, at pgs. 155 - 169
15.	June 2010	Water Resources Dept. submits Feasibility Report to Goa State P.C.B regarding mitigation measures recommended by NEERI	**Ann. 17**, at pgs.174 - 191
16.	12.06.2012	Villagers of Sirigao write detailed letter to Chief Minister requesting for the Govt. not to renew mining leases of companies operating within the village	**Ann. 20**, at pgs. 207 - 224
17.	10.09.2012	The Goa Government suspends mining operations in Goa in the wake of the Justice Shah Commission of Inquiry	
18.	07.12.2012	Central Empowered Committee submits Report	

		to the Hon'ble Supreme Court in W.P. (C) 435/2012	
19.	31.01.2014	Mahajans of Shri Devi Lairai Saunsthan write to the D.M.G., ask for temples, places of religious attachment etc. within Sirigao village to be deleted from the mining lease area	**Ann. 21**, at pgs. 225 - 228
20.	21.04.2014	The Supreme Court of India declared mining leases of the state of Goa expired as of 2007 and all mining activity from 2007 to 2012 as illegal	**Ann. 31**, at pgs. 270 - 311
21.	31.10.2014	Villagers of Sirigao write to the Govt, ask for temples, places of religious attachment etc. within Sirigao village to be deleted from the mining lease area	**Ann. 22**, at pgs. 229 - 232
22.	2014	The lease of Resp.No. 4 is granted a second renewal from 2007-2027. However, EC has expired.	

23.	07.02.2018	The lease's second renewal order is cancelled by the judgement of the Hon'ble Supreme Court of India in *Goa Foundation vs. Sesa Sterlite Ltd. and Ors. [(2018) 4 SCC 218]*	
24.	30.05.2018	MOEFCC issues Office Memorandum regarding consideration of mining proposals involving violation of the EIA Notification 2006	**Ann. 28, at pgs. 260 - 261**
25.	19.02.2020	Letter by villagers of Sirigao to Directorate of Mines, asking for compliance with Mine Closure Plan with respect to leases in the village	**Ann. 24 Colly, at pgs. 235 - 239**
26.	24.08.2021	Dy. Collector Bicholim issues letter to 3 Mining companies regarding payment of outstanding water bills of residents of Sirigao village	**Ann. 29, at pgs. 262 - 263**
27.	04.05.2022	The Government of Goa issued orders to the Respondent No.4 to vacate the lease and return the area to the Government.	

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28.	August 2022	Directorate of Mines and Geology and Govt. of Goa decide to follow process of auction of Mineral Blocks for grant of new Mining Leases	**Ann. 26 Colly,** at pgs. 242 - 255
29.	December 2022	Lease boundaries of TC No.4/49 were passed off as the new boundaries of Mining Block No. 2 and were notified as part of a set of auctions conducted by the government and the lease returned to the same Respondent.	
30.	13.01.2023	The Goa government issues the Letter of Intent for Block II-Sirigao Mayem Mineral Block to the Resp. No.3, impugned in this petition.	**Ann. 30,** at pgs. 264 - 269
31.	02.09.2023	Present P.I.L. W.P. is filed	

PLACE: PORVORIM, GOA
DATE: 02.09.2023

ADVOCATE FOR THE PETITIONERS

IN THE HON'BLE HIGH COURT OF JUDICATURE OF BOMBAY AT PORVORIM, GOA

P.I.L. Writ Petition No. /2023

Shree Devi Lairai, through the President
of the Shree Devi Lairai Saunsthan and Ors ....Petitioners

V/s

Directorate of Mines and Geology & Ors ...Respondents

QUESTIONS FOR DETERMINATION & LIST OF ACTS & AUTHORITIES

1. Whether the Government was aware that the village of Sirigao, its houses, temples, public places, tanks, fields were part of the mining block that had been auctioned, and if so, whether the mining block could nonetheless have been awarded?

2. Whether the Government could have commenced with the auction and issued the LOI when the record indicated vast damage to village lands and natural resources and violation of fundamental rights of citizens through non-adherence to environment clearance conditions and conditions in the lease agreement signed between the erstwhile lease holder and the Goa government?

3. Whether the auctions for grant of mining blocks could have been initiated without prior policy in place, as required by the judgment dated 21.04.2014 of the Supreme Court of India (*Goa Foundation I*)?

4. Whether the approval of the Gram Sabha and Panchayat of Sirigao would not be required, under the provisions of the 73rd Constitutional Amendment prior to the grant of any auctions of lands and minerals falling within the jurisdiction of Sirigao village, especially as such auctions would have a bearing on the responsibilities of the Panchayat in terms of preparation of development plans for the welfare of the village population?

ACTS REFERRED

- Mines and Minerals (Regulation and Development) Act, 1957
- The Goa Panchayati Raj Act, 1994
- The Environment Impact Assessment Notifications of 1994 and 2006, issued under the Environment (Protection) Act, 1986.

JUDGMENTS/AUTHORITIES REFERRED:

- *Goa Foundation vs. Union of India & Ors. [(2014) 6 SCC 590] / AIR 2014 SC 6014*
- *Goa Foundation vs. Sesa Sterlite & Ors. [(2018) 4 SCC 218] / 2018 SCALE [2] 103*
- *Orissa Mining Corporation Ltd vs. MOEF (Niyamgiri judgment) (2013) 6 SCC 476*
- *Common Cause vs. Union of India (2017) 9 SCC 499*

PLACE: PORVORIM, GOA
DATE: 04.09.2023

ADVOCATE FOR THE PETITIONERS

IN THE HON'BLE HIGH COURT OF JUDICATURE OF BOMBAY AT PORVORIM, GOA

P.I.L. Writ Petition No. /2023

IN THE MATTER OF ARTICLE 21, 14, & 226 OF THE CONSTITUTION OF INDIA AND RULE 4(e) OF THE BOMBAY HIGH COURT PUBLIC INTEREST LITIGATION RULES, 2010

AND

IN THE MATTER OF NON-APPLICATION OF MIND IN PROCEEDING WITH DECISION TO AUCTION MINERAL RESOURCES LOCATED IN VILLAGE SIRIGAO

AND

IN THE MATTER OF GRANT OF MINING BLOCK IN THE SAME AREA AND WITHIN THE SAME BOUNDARIES ASSOCIATED WITH

EARLIER MINING LEASE WHICH HAD LEFT BEHIND IRREVERSIBLE AND PERMANENT ENVIRONMENTAL DAMAGE TO THE ENVIRONMENT AND ECOLOGY OF THE VILLAGE OF SIRIGAO;

AND

IN THE MATTER OF GRANT OF FRESH AUCTIONS WITHOUT REHABILITATION OF THE ENVIRONMENT OF THE VILLAGE AFTER 50 YEARS OF UNACCOUNTABLE AND RECKLESS MINING ACTIVITY THAT DEVASTATED THE VILLAGE;

AND

IN THE MATTER OF GRANT OF FRESH LEASES IN THE ABSENCE OF A POLICY FOR GRANT OF SUCH LEASES OR BLOCKS AS REQUIRED BY JUDGMENT OF THE SUPREME COURT OF INDIA DATED 21.4.2014.

1. **Shree Devi Lairai,**
   through the President of the
   Shree Devi Lairai Saunsthan,
   Mr. Ganesh Chandrakant Gaonkar,
   age 52 years, self employed,
   s/o Chandrakant Gaonkar,
   Approx. Annual Income - Rs 30,00,000/-,
   PAN Card No. AAKAS0162D,
   Mobile no. - 9822102040.
   Sirigao, Bicholim, Goa - 403503,

2. **Suresh Govind Gaonkar**
   age 72 years,pensioner, s/o Govind Gaonkar,
   resident of H. No. 2090,
   Housing Board Colony, Near ITI,
   Bordem, Bicholim, Goa - 403504,
   Approx. Annual Income - Rs 3,00,000/- p.a.,
   AADHAAR Card No. - 286459671305,
   Mobile no. - 9423057804.

3. **Vijay Ravalnath Gaonkar,**
   age 55 years, in business, s/o Ravalnath Gaonkar,
   resident of H.No. 251/1, Madala Wada,
   Shirgao, Bicholim, Goa - 403503,
   Approx. Annual Income - Rs 1,20,000/- p.a.,
   AADHAAR Card No. - 952258024992,
   Mobile no. - 7498438835.

4. **Dinanath Shamba Gaonkar,**
   age 69 years, in agricultural
   business, s/o Shamba Gaonkar
   H. No. 269, Manaswada,Shirgao,
   Assonora, Goa - 403503,
   Approx. Annual Income - Rs 3,00,000/- p.a.,
   AADHAAR Card No. - 642898365839,
   Mobile no. - 7775020411.

5. **Krishna Raya Gaonkar**
age 54 years, in business,
s/o Raya Gaonkar, H. No. 11,
Wadachawada, Shirgao,
Bicholim, Goa - 403503.
Approx. Annual Income - Rs 1,20,000/- p.a.,
AADHAAR Card No. - 559885507679,
Mobile no. - 9158472715.

.....**PETITIONERS**

v/s.

1. **THE DIRECTORATE OF MINES AND GEOLOGY**, Through its Director,
Ground Floor of Institute Menezes Braganza,
Panaji, Goa - 403001.

2. **THE STATE OF GOA,**
through its Chief Secretary,
Secretariat, Porvorim, Goa - 403521.

3. **SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED.**
Salgaocar Bhavan, Plot Number-15,
Altinho, Panaji
North Goa GA 403001 IN
salgaocarshipping@outlook.com

4. **M/S. CHOWGULE & CO PVT. LTD,**
Chowgule House, Mormugao Harbour,
Goa, 403 803, India
contact@chowgule.co.in

....**RESPONDENTS**

(Above addresses are registered addresses of parties)

To,

The Hon'ble Chief Justice
and His Companion Judges,
Bombay High Court at Porvorim, Goa

THIS HUMBLE PETITION OF THE PETITIONER MOST RESPECTFULLY SHOWS AS UNDER

PARTICULARS OF THE CAUSE AGAINST WHICH THIS PIL IS FILED

1. This is a PIL filed by the principal deity of the Shri Devi Lairai Temple through the President of its trust and by villagers of Sirigao on behalf of the village and villagers of Sirigao located in North Goa district in respect of mining blocks recently approved for auction by the Government of Goa for the extraction of a major mineral, namely, iron ore located in their village. Though the auction process has commenced leading to approval of a successful bidder (Resp.No.3), the finalization of the agreements between the Goa Government and the new bidder are still in the pipeline, and the successful bidder is also required to obtain mandatory environment clearance before commencement of mining activity. This petition challenges primarily the State's decision to go ahead with the auction of the mining block on the grounds raised in the petition. Further, it challenges the order dated 13.01.2023 which is the Letter of Intent (LOI) issued to the Resp.No.3.

2. The present PIL challenges the approval process connected with Mining Block (MB) No. II - SIRIGAO-MAYEM MINERAL BLOCK with names Cupleigaicho Guer-Dongar & Goignnem [*hereinafter,* 'impugned Mining block'] *inter alia* on grounds of total non-application of mind and sheer injustice to the villagers of Sirigao and violation of their fundamental rights under Article 21. Other similar PILs are being filed by the same petitioners challenging Mining Blocks (MB) Nos.I and III, also located in the same village. The grounds taken in all three PILs are substantially the same. However, the history, facts and respondents in each matter are different, necessitating the filing of separate petitions. The Mining Block II comprises two erstwhile mining leases with T.C. Nos.5/49 and 13/49. Both were operated by the Resp.No.4.

3. The petitioners contend that mining activity has been carried out in the village environment for a period exceeding 50 years till it was halted by the Supreme Court in October 2012. The earlier leases granted to Resp.No.4 which came to an end in 2007 were granted by the Portuguese through a manifest that did not include any Survey Nos. Thereafter, the position of the mining leases vis-à-vis the village settlement of Sirigao and the Devi Lairai temple became known to the authorities. The primary grievance of the petitioners is that the village settlement including the Devi Lairai temple, the homes, the schools, fields are all included within the boundaries of the mining blocks auctioned, and that the government, when

deciding on the boundaries of the mining blocks, did not apply its mind nor did it consider the unmitigated havoc caused by mining operations on the erstwhile mining leases during their earlier life or the fact that none of it had been remedied. The grant of fresh mining block in relation to the same area is therefore the height of irresponsibility on the part of the department. Further, these auctions have been held without a policy in place. The auctions have been processed without the consent or knowledge of the Gram Sabha of Sirigao, even though they concern areas that fall within the jurisdiction of the village. Hence this PIL which is filed under Article 21 of the Constitution of India, Panchayat Raj Act and MMDR Act for reliefs set out herein.

Particulars of the Petitioners

4. The petitioner No.1 is the principal deity of the Shri Devi Lairai temple, Goa's largest temple with thousands of devotees. The rest of the petitioners (2-6) are residing with their families in the village of Shirgao for several generations. They have actively pursued authorities for ensuring responsible mining. It is due to their persistent efforts to remedy the damage caused to the village and its environment that some amelioration has been possible after 50 years of mining in the village precincts. Undertaking of the petitioner No. 1 organization along with its resolution is enclosed is at Annexure 1 Colly.

Particulars of the Respondents

5. The Respondent No. 1 is the Directorate of Mines & Geology, which has issued the impugned Letter of Intent/LOI dt. 13.01.2023. The Resp. No. 2 is the State of Goa, and the Resp. No. 3 is a private company in whose favour the Mining Block has been granted *vide* the impugned LOI. The Resp. No. 4 is a private company which operated the two mining leases before they expired.

Declaration of the Petitioners

6. The Petitioner states that this petition is filed by way of public interest. Although the petitioners are locals and residents of the area within the mining block boundaries demarcated, the reliefs claimed are in the larger public interest of the survival of the village as a whole.

7. The Petitioners state that the entire litigation costs and other charges are being borne by the petitioners.

8. The Petitioners state that adequate research has been conducted in the matter raised through the petition and all relevant material has been annexed to the petition. More may be added, if necessary, at a later stage.

9. The Petitioners state that to the best of their knowledge and research the issues raised in the petition were not dealt with or decided and that a similar or identical petition was not

filed earlier by the petitioners on the same matter either in this Hon'ble Court or in the Supreme Court of India.

10. The Petitioners state that this Hon'ble Court has jurisdiction to hear and decide this matter.

11. The Petitioners have understood that in the course of hearing of this petition, the Court may require any security to be furnished towards costs or any other charges and the petitioners shall comply with such charges.

Facts constituting the cause

12. Sirigao is a village in Bicholim Taluka, North Goa district with a population of approximately 2,000 persons. According to the historian Luis Perreira, the Gaonkari Village System (The Communicade System) existed in 1054, and Sirigao Comunidade is a part of it (Goa Gaonkari Book, Volume II.) The village today has approximately 1450 voters. 80% of the villagers are engaged in agriculture and have suffered the most from the negative effects of past mining activity.

13. The village has enormous cultural and social significance in the state of Goa, as its temple is the home of Devi Lairai, a water goddess represented by a coconut on a kalash of water, not only famous in Goa but throughout India. A photograph of the temple, the largest temple of the state,

together with a picture of the mining of the village, taken by Rajan Parrikar on 13.07.2007; and a sketch/map showing the 3 Mining Blocks which include the Sirigao village in its entirety is enclosed at **Annexure 2 Colly**. An artwork containing a picture of the temple was presented to the Prime Minister of India by the Chief Minister of the State on 03.08.2023. A copy of the news item is at **Annexure 3**. More than a million devotees from all over the country visit Sirigao every year for the annual 5 day *'Jatra'* festival in the month of April/May. Many of the faithful (*dhonds*) walk on live coals. The Sirigao jatra, the Homkund, is the biggest 'Jatra' of Goa and it plays an important role in the lives of people living in Shirgao and other parts of Goa.

14. Devi Lairai symbolized the fact that the village was blessed with natural resources and with an abundance of water and streams, dense green cover, and wells in each home. The villege also had dense forest, mountains and hills on the eastern and southern side. Forestry species included sagwan, kindal, tirfal, shisav, and Marat. Fruits like mango and jackfruit were present in abundance, along with medicinal plants included kapna chuma, jambul, and ranmeka. It was a self-sustaining Goan village, which had not heard of tap water.

15. At the foot of the hills, there were cashew plantations and thereafter farmlands, meadows and grazing lands. On the western side, the village had vast agricultural lands called Karat and Savat khazans. The waters eventually fed a creek,

which supplied the villagers with fish. There was no shortage of water and even during the Jatra, lakhs of people could take bath 4-5 times a day, that too in the month of April/May. Neither did the village know anything about pollution.

16. Mining activity under the Resp. No. 4 destroyed all this. The mining lease holders were granted licence to mine – however the licence did not include permission to disrupt the entire ground water system, wells and streams of the village. The lands, agricultural lands, barad lands, pisciculture, cattle, fruits, cashew groves, and mango groves were all progressively ruined. Not a square metre of the village was left without significant negative impact, from water bodies to food lands, plantations and orchards, grazing grounds to the very air, which can be felt to this day. The Goa government simply abdicated all responsibility for more than 50 years.

17. The earlier mining lease was granted in 1949 to the Respondent No 4. The lease includes Sy. Nos 1, 2, 3, 4, 5, 6, 7, 47, 48, 84, 90, 91, 92, 93 , 94, 95, 96, 97, and 98 of Sirigao village. The Shri Devi Lairai temple is a part of this lease along with other temples such as Shri Sateri Temple, Shri Kulkar Brahmin Temple, Shri Mahadev temple, Apevansh Temple, Aquarachi Tali (Sacred Pond), Devachi Tali (Sacred Pond) Government Primary School. Govt High School, Agricultural land, Communidade land, Panchayat Ghar house, 9 houses and approximately 30 wells. The houses existing on the lease are all pucca houses with house numbers granted by the Panchayat for occupancy and villagers are

living there for generations. All these areas, without the consultation of the villagers or their panchayat including their agricultural areas have been included in the mining block whose boundaries are the same as the older, now expired, mining lease. There is no alternative plan drawn by the government to rehabilitate them for mining to carry on for 50 years. There is neither planning nor a definite policy in place.

18. The Portuguese colonial government issued three mining leases within the boundaries of the village which itself occupies an area of approximately 3.5 sq km. These leases, all now expired, included the following:

    a. Cupleigaicho Guer-Dongar (T.C. No. 5/49) and Goingonem (T.C. No.13/49) (MB II, *impugned herein*)
    b. Sirigao Hill (T.C. No. 4/49)
    c. Mandurbag (T.C. No. 15/41 and others)

All 3 mining blocks were heavily implicated, as this petition will show, in the total destruction of the natural assets of the village, its cultivated lands and ground water aquifers.

19. The original Portuguese mining concessions were granted for small-scale manual mining. The mining then was for lumpy iron ore and did not involve much destruction of the environment of the village, nor did the mining activity then

have any serious negative impacts, especially on the ground water, village springs and tanks and fields. The lease areas drawn up during the Portuguese era were without any firm exploration data and not up to G2 level, and therefore the existing mining blocks are just cut and paste of the old, and no significant exploration work has been carried out beyond the lease boundaries.

20. The original plan *titulo de concessao* (title of concession) document granting the lease did not include any survey numbers. A copy of the original *titulo de concessao* document issued to the Resp. No. 3 is enclosed at **Annexure 4**. It records detailed prohibitions against disruption of water and lands of third parties.

21. Since the time of grant of concession and even after the concession was converted into a deemed lease under the MMDR Act in 1987, the governments of the day have recognized the existence of the village and the natural rights of its inhabitants, and authorities including the Town and Country Planning department and most other departments have granted construction licenses, permits, permissions, subsidies for agriculture, and set up various other welfare measures for the benefit of the people of the village. Post liberation in 1961, the Panchayat of Sirigao was also created to represent the interests of the persons residing in the village, and is today the elected local body defined as part of "state" under Article 12 of the Constitution of India.

Hence the lease or mining block would necessarily have to be issued with its approval.

22. As is to be expected, however, once intensive mining methods began to be used for mineral extraction in the eighties and nineties with the reliance on heavy machineries mandated by the Japanese steel industry corporates to whom the ore was exported, the mining activity began to create serious problems for the villagers and their right to life under Article 21. Goa was never prepared for large scale mechanization, heavy earth moving machinery (HEMM) and heavy drilling and blasting. Mining on such a large scale has destroyed Goa and the environment including displacement of people and agriculture. Naturally, these were never envisaged by the erstwhile Portuguese colonial government when granting the lease, as the use of such machineries had not commenced then even in the industrialized world. These machineries, together with blasting operations, ensured large scale ripping of hills, slopes and plateaus and generation of millions of tonnes of wastes.

23. The mining leases T.C. No. 4/49 & 13/49 [*now re-labelled as M.B. No. II*] were located on the Kapilagalcho Gel Dongor hill, and the houses and fields are situated at a lower level. With the annual monsoons to the tune of 4000 mm spread over 04 months, there is a huge impact in terms of collapses of mine benches, breach of bunds, water surface run-off carrying all silt from top of the hill to the bottom into

the houses, fields, drains and muddy roads damaging the full environment and also the aesthetic beauty of the village. It was environmental tragedy waiting to happen, and it did.

24. The waste generated by the mining activity on these two leases alone was phenomenal. The EC granted to the Resp.No.4 indicated that an estimated 22.19 million cm of overburden had accumulated already from past operations. Expansion of production would raised another 35.99 million cm of waste. From 2007 to 2018, the mine generated approximately 1,54,9552 tonnes of minerals. If ore to waste ratio is assumed to be a conservative 1 : 4, then the total wastes generated by this mining would amount to 6,197,768 million tonnes. Most of this waste would be open to erosion during the monsoon, and as the mine is located on a mountain above the village, there would be no conceivable way to prevent such a mass of waste from descending into the village. And it did.

25. It must be borne in mind that the Resp.No.4 (like other miners elsewhere in the state) followed no rules and regulations after Goa was liberated in 1961 and brought under the Constitution of India on 20.12.1961. Miners resisted any regulation of their mines on the grounds that they were not leases under the Mines and Minerals Development and Regulation Act, 1957. Regulation became seriously possible only after Parliament passed the 1987 Abolition Act, by which the mineral concessions granted by the erstwhile Portuguese colonial government were declared

"deemed" leases under the MMDR Act, with effect from 20.12.1961.

26. The impugned Mining block has been granted to the Resp. No.3. The lease was granted first renewal under the MMDR Act, 1957, read with provisions of the 1987 Abolition Act, in 1988. The leaseholders continued to sign lease agreements with the government for not causing adverse impacts on third parties or the natural environment from their activity. A copy of the 1990/1991 lease agreements with the State of Goa for the first renewal of the lease is found at **Annexure 5 Colly**. Significant conditions laid down in the lease agreement (Form K) – which match the earlier conditions laid in the original grant – are set out hereinbelow:

> Part II, Clause 6
>
> *6. To use water from streams, etc.,—Liberty and power for or in connection with any of the purposes mentioned in this part but subject to the right of any existing or future lessees and with the written permission of Deputy Commissioner/Collector to appropriate and use water from any streams, watercourses, springs or other sources in or upon the said lands and to divert step up or dam any such stream or watercourse and collect or impound any such water and to make construct and maintain any water course culverts, drains or reservoirs but not as so to deprive any cultivated lands, villages, buildings or watering places for livestock of a reasonable supply of water as*

before accustomed nor in any way to foul or pollute any stream or springs. Provided that the lessee/lessees shall not interfere with the navigation in any navigable stream nor shall divert such stream without the previous written permission of the State Government.

27. This clause of the lease agreement regulates the liberty to use the water from streams and other water sources. Respondent No 3 and Respondent No 4 have with impunity violated this clause as the mining operations in the village have led to total collapse of the natural water stream flow in the village of Sirigaon. These facts are documented in the NEERI report ordered by this Hon'ble Court when this Court took cognizance of a letter petition filed by Sirigao villagers and registered as PIL WP 1/2008. All natural streams have either dried out or have been polluted with mining silt. Adjoining water bodies including the Asnoda river are layered with silt and silt islands. Water from natural sources cannot be used for drinking and other household purposes. Sirigao was known as a water-surplus village, but the activity of the lease holder turned the village into a drought area.

Part III, Clause I

1. No building, etc. upon certain places.—No building or thing shall be erected, set up or placed and no surface operations shall be carried on in or upon any public pleasure ground, burning or burial ground or place held sacred by any class of persons or any house or village site, public road or other place which the

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State Government may determine as public ground nor in such a manner as to injure or prejudicially affect any buildings works property or rights of other persons and no land will be used for surface operations which is already occupied by persons other than the State Government for works or purposes not included in this lease. The lessee/lessees shall not also interfere with any right of way, well or tank.

28. All the wells in Sirigao have been rendered useless because of the mining operations. Mining pits have gone below the ground water level, draining out all the groundwater of the village into the mining pits. This has caused almost all the wells in the village to dry out. Regeneration pits installed by the Respondent 3 and 4 have been ineffective. Pursuant to the intervention of this Hon'ble Court in the aforementioned PIL 1/2008, tap water was provided to the villagers of Sirigaon who were deprived of any source of water because of the mining operations.

Part VII, Clause 5

5. To secure and keep in good condition pits, shafts, etc..—The lessee/lessees shall during the subsistence of this lease well and sufficiently secure and keep open with timber or other durable means all pits, shafts and workings that may be made or used in the said lands and make and maintain sufficient fences to the satisfaction of the State Government round every such

pit, shaft or working whether the same is abandoned or not and shall during the same period keep all workings in the said lands except such as may be abandoned accessible free from water and foul air as far as possible.

29. The mining pit was abandoned by Respondent Nos 3 and 4, without any safety measures in place after the closure of mining operations by the Supreme Court. There are no fences surrounding the mining pit as mandated by this clause. During the monsoon, the pit overflows and there is always the threat of a breach and resultant flood.

Part VII, Clause 11-C

11-C. The lessee shall take measures for the protection of the environment like planting of trees, reclamation of land, use of pollution control devices; and such other measures as may be prescribed by the Central or State Government, from time to time, at his own expense.

30. No pollution control measures were taken by the Respondent Mining Company during mining operations in the village. Dust pollution was rampant, water was severely polluted, agricultural fields and the river were silted heavily. Mining companies paid for the desiltation of the agricultural fields and the river only after the intervention of this Hon'ble High Court. Reclamation and planting of trees are non-existent.

Part VII, Clause 15

15. To pay compensation for injury of third parties.— The lessee/lessees shall make and pay reasonable satisfaction and compensation for all damage, injury or disturbance or person or property which may be done by or on the part of lessee/lessees in exercise of the liberties and power granted by these presents and shall at all times save harmless and keep indemnified the State Government from and against all suits claims and demands which may be brought or made by any person or persons in respect of any such damage, injury or disturbance.

31. The Respondent No.4 damaged the natural water supply system of the village of Sirigao by killing the groundwater aquifer. They damaged the hills and the fields. They damaged the health of the public. They ensured spread of mining silt contaminated with heavy metals across the entire environment of the village. They ensured zero agriculture for a period of twenty years. The government had directed Respondent No 4 (and other lease holders) to pay for the tap water supply to the villagers of Sirigao as a consequence.

32. Thus, major conditions imposed on the Resp.No.4 were simply violated, and the government took no action to ensure these conditions were adhered to despite continuous complaints.

33. In the year 1997, faced with several complaints from across the state relating to the negative impacts of intensive mining on local communities and the environment, the Goa government sponsored a study by The Energy Research Institute (TERI). Petitioners crave leave to produce a copy of the TERI report, titled "Areawide Environmental Quality Management (AEQM) Plan for the Mining Belt in Goa," if and when required in these proceedings. The TERI report, submitted to the Government in November 1997, clearly established that Sirigao village was one of the worst affected by mining operations by lease holders (which would include Resp.No.3).

34. On pages 163-164 of the report, the impacts of mining on land, air and water quality have been quantified village wise. Accordingly, a total impact index has been generated based on environmental impacts and the socio-economic conditions for every village under the study area. The total impact index (TII) is the summation of individual indices for air, land, water and socio-economic conditions. The indices are categorized as follows: Highly affected - 4; moderately affected - 3; less affected - 2 and not affected - 1.

According to this index, Sirigao was the worst impacted village in the entire state with a Total Impact index score of 15. All aspects of the environment -- air, land, water -- were severely impacted along with the socio-economic condition of people living in Sirigao.

35. On page 194 of the report, one finds "People's Perceptions about mining activity." About Sirigao (p.195), the report states: 'Sirigao is the other village in the cluster that is likely to experience the

expansion of mining activity in the future. However, the views of the people clearly indicate that the village does not want increased mining activity. The objection to mining emanates from the feeling that the mine companies do not provide benefits to the local people either through employment or facilities. Instead the locals suffer due to the problems of dust and water pollution as well as siltation of agricultural fields caused by mining operations. As per the Department of Agriculture approximately 40 ha of paddy fields are affected due to siltation. Many of the residents of Sirigao also complained about the fact that mining in the village has occupied most of the land leaving little available for undertaking other development activities in the village.'

36. The Relevant extract of the report is to be found at **Annexure 6**. Petitioners crave leave to produce and rely upon the full copy of the report, if and when required in these proceedings.

37. Even then, the powerful lease holders were able to resist the imposition of any environmental costs on mining profits, as recommended by the TERI report, for the purpose of mitigating environmental impacts recorded by TERI. The Government, fully under the influence of the mining lobby, eventually disregarded and simply ignored the recommendations in the report. Thus, the first major opportunity to cure the ill effects of mining seriously was squandered, though it emerged from a government-sponsored study.

38. The Resp. No. 4 has absolved itself of liability as the leases are now awarded to Resp. No. 3. The Resp. No. 3 is bound to refuse environmental liability on the ground that the damages have been done when the lease was in the name of the Resp.No.4. This aspect has not been considered at all in the decision to auction these leases or disclosed in the LOI.

39. On 25.11.2003, the Senior Geologist of the Mines Department conducted an inquiry into the damages caused by mining as a result of the mining operations of the three major leaseholders. The inspection report, carried out in the presence of mining personnel and persons from the village including panchas, established widespread contamination of rivers like the Asnoda river and other springs and water bodies. A copy of this revealing inspection report is enclosed at Annexure 7. This was already the situation before the mining boom would commence in the year 2004, stimulated by the Chinese boom.

40. A complaint dated 08.11.2005 was addressed to the Director of Mines Safety, drawing his attention to several violations of the lease agreement. One of the issues raised, in addition to several others, was the fact that no demarcation of the boundary of the lease had been done, enabling the ruin of public places and structures. Copy of the letter is enclosed at Annexure 8. Till the lease holder was forced to hand over the leases to the Govt. in 2023, the leases (now one mining block) did not have boundary pillars.

41. On 02.11.2005, based on representations filed by the Nagrik Kruti Samiti and other villagers of Sirigao, the Deputy Collector and SDO of Bicholim called for a meeting of all parties on 07.11.2005, and ordered an inspection which was conducted by an Assistant Geologist from the Department of Mines. Based on the report, the DC and SDO passed a two page order dt. 28.11.2005, issuing certain directions in respect of the last remaining water tank (holy tank) surviving in the village, named the Dhonachi Talli, and removal of mining silt from the Savat and Kharat khazan lands. Copy of the order dated 28.11.2005; the letter dated 02.11.2005, and the inspection report dated 09.11.2005 are enclosed at Annexure 9 Colly.

42. There is an inspection memo dated 17.03.2008 which is a follow-up of the order of the SDO dated 28.11.2005. The report paints a disturbing picture of destruction of agricultural lands. The mining companies, past masters in avoiding any sense of accountability for their actions, continued to provide sluggish adherence to the directions for cleanup of silt. Copy of the inspection memo dt. 17.03.2008 is enclosed at Annexure 10.

43. In 2006, the adjoining leaseholder (Rajaram Bandekar) invited the Department of Geology (Goa University) to conduct a study on the possible effects on groundwater from their mining activity. Dr Chachadi from the department visited the sites and filed a report dt. 08.03.2006, copy of which is enclosed at Annexure 11. The report concluded

that "the water scarcity and other water related problems in and around the mining areas will continue as long as the mining is on." The report made available 3 options to contain the damage. None was implemented to the best knowledge of the petitioners.

44. The lease obtained its mandatory combined environment clearance under the 1994 EIA notification only on 27.12.2005, a full ten years after the notification came into effect. The EC obtained in 2005, valid for 5 years, expired in the year 2010. A copy of the EC dated 27.12.2005, valid for 5 years, is enclosed at Annexure 12. By the time the EC was granted, it was already apparent that mining had intersected the water table and permanently damaged the groundwater aquifers of the village. The EC was issued with a validity period of 2 years, provided a hydrogeological study was carried out for extension. After a study was obtained, the EC was extended for balance 3 years in November 2007.

45. The EC required the lease holder to ensure the following:

a) Backfilling of the mine pit, with the mine wastes;
b) Backfilled area to be afforestated with indigenous species of plants;
c) Top soil to be maintained separately.
d) Management of the overburden wastes with anti-erosion plants;

e) Adequate number of catch drains and siltation ponds;

f) Garland drains to be constructed for both mine pit and waste dump.

g) Dimensions of retaining walls for dumps and OB benches to be based on rainfall data;

h) 2000 plants per ha density green belt in several areas including haul roads, etc.

i) Project to implement water conservation measures in consultation with the Central Ground Water Board.

j) Regular monitoring of ground water and quality four times a year through a network of wells and piezometres

k) Prior permission to be obtained from the authority for withdrawal of groundwater.

l) STP and ETP to be established on the premises.

m) and several other conditions.

46. However, none of the conditions of the environment clearances was adhered to, or met, including backfilling with vegetation using indigenous species or proper maintenance of dumps. One dump was in fact illegally located outside the lease. The mining waste was dumped on adjacent plots of villagers and after their land was encroached and was rendered useless for farming, meagre money was offered to them to purchase the land. Some 200 people eventually moved out of the village since mining activity pushed the village further into itself. The EC was not even transferred to the Resp.No.4.

47. Since the authorities were fully in collusion with the powerful lease-holders who were known to make regular contributions to politicians and political parties, the villagers were forced to write a letter in 2008 to this Hon'ble Court.

48. The Court was pleased to convert the letter into a petition. The villages of Sirigao pleaded with the Court to direct the respondents and authorities to restore their fields and demarcate the boundaries of their plots as these were covered in mining silt. The entire record of that judicial proceeding is available in P.I.L. W.P No. 1/2008 which is still pending final disposal in this Hon'ble Court, though many of the actions directed by this Court are nearing final stages of implementation.

49. This Court first stayed all movement of mining transport through the settlement to mitigate the difficulties faced by villagers and devotees during the days of the Lairai festival. (The mining trucks moved up and down the village roads often without tarpaulin.) By its order dated 05.05.2008, it directed sintex tanks of 500 litre capacity to be distributed to all households and it also directed the 3 mining companies to ensure delivery of drinking water to those houses. By a follow-through order on 06.05.2008, the Court ordered the companies not to pump out any water from the mining pits during the monsoon of 2008. These orders are enclosed at <u>Annexure I3 Colly</u>.

50. The Court also took into consideration other serious problems faced by the villagers from mining activity. One of the most significant of these was the conversion of a water surplus village into a village pushed into drought-like conditions by the mining activity. By a further order dated 16.06.2008, copy of which is at Annexure I4, the Court directed NEERI, Nagpur, to do a survey and examine the water resources of the village and mines. The terms of reference are provided below:

> "(i) Whether there is depletion in the water in the wells and surface water bodies (tanks, springs, streams) in Shirgaon village and if so, whether it is as a consequence of the mining operation in the vicinity of village by M/s.Rajaram Bandekar Mines Pvt Ltd, M/s. Chowgule & Co. Pvt. Ltd and M/s. Dempo Mining Corporation Pvt Ltd.;
>
> (ii) whether there is damage caused to the water resources (groundwater aquifers and surface water bodies) of Shirgao village as a result of mining operation of these 3 companies and if so, the extent thereof. The NEERI shall specify the measures to be taken for rehabilitation of water bodies and the costs of the same;
>
> (iii) Whether the damage caused to the agricultural field in the Shirgaon village is due to the mining operation of these 3 aforesaid companies and extent

thereof if any. The NEERI may list the measures required for rehabilitation of the agricultural field and costs for the same."

51. NEERI completed and submitted its report in April 2009. The conclusions drawn by NEERI were exceedingly damning. These are summarized in the Executive Summary, annexed to this petition as Annexure 15. The report was accepted by the Goa State Pollution Control Board. The mining companies were provided a hearing on the report, after which the Board issued certain directions under section 33(A) of the Water Act, as recommended by NEERI, to the mining companies.

52. According to the NEERI report, the mining activity killed all the 75 functioning wells of the village. The mining activity also damaged 80 odd hectares of agricultural land located within two khazans (Sawat and Karat) in addition to altering the ecology of the adjoining creek.

53. The NEERI report in its Executive Summary highlights: "It is evident that the mining activity has led to the loss of the recharge area. As a result, the dug wells in the village, which were previously recharged by the plateau, are getting dried up," and "The deepening of the mines has led to the loss of recharge area for the dug wells situated at the foothills of the plateau. Hence, the water scarcity in the village-dug wells is attributed to the loss of recharge area as well as the deepening of the mine." Petitioners crave leave to produce

the full NEERI report, as and when required in these proceedings.

54. Pursuant to the NEERI report, a meeting was called by the Sr. Hydrogeologist on 27.01.2010. A report of the meeting which was sent to the PCB is enclosed at Annexure 16. Thereafter, the Sr. Hydrogeologist produced an assessment/Feasibility Report of the mitigation measures recommended by NEERI to address water scarcity problem in Sirigao village (June 2010), a copy of which report is at Annexure 17. The recommendations made by NEERI for rejuvenation of the water supply of the village could not be implemented as they did not find favour with either the Water Resources Department or the Central Ground Water Board, not that these two organizations themselves had any better solution.

55. Thus the NEERI recommendations have not been implemented till the time of filing of this PIL, with the result that the community and individual wells provide no source of water even in the month of July during the period of heaviest monsoon. Currently, all the wells in Sirigao have polluted water which is not fit for consumption, nor can it be used for agriculture. As for water for irrigation, as provided freely by nature earlier, that prospect is irreversibly extinguished. Such actions violate the principle of intergenerational equity and the rights of future generations of the village to unpolluted water for domestic use as well as irrigation.

HIGH COURT OF

56. Efforts made by the authorities to improve the situation of groundwater and rejuvenate the wells in the village have failed miserably. The groundwater aquifers which supplied the village for a thousand years are now permanently damaged and rendered barren. In such a scenario, the state government, before restoring the water sources and water supply of the village, has thoughtlessly auctioned the leases again for mining. The government has not applied any mind whatsoever in granting the leases to the mining companies again, without thinking of the consequences the restart of mining can have on the groundwater-depleted village.

57. In terms of agricultural produce, the village was self-sufficient. People would take paddy and other region specific crops in abundance before mining silt destroyed their fields. In this regard the NEERI report clearly states: "The soil analysis results indicate that the silt deposition from the mining overburdens has degraded the soil fertility in the agricultural fields of Sirigaon village." NEERI conducted a lab analysis of the soil in the paddy fields and found they had a higher proportion of heavy metals.

58. Farmers in the village could not farm for nearly 2 decades because of the silting of their fields. They were compensated for lack of production upto 2004. Thereafter, between 2004 and 2012 (when mining was stopped by the Apex Court), some were compensated and some were deprived. After 2012, none have been compensated and matters are pending before the authorities for decision. Mining lease-holders

agreed to removal of quantities of mining silt from these fields. Petitioners are annexing at Annexure 18 Colly several documents from mining companies and agricultural officials relating to this issue. dt. 20.09.2006, 09.12.2005, and 08.12.2005. Only after this Hon'ble Court's persistent intervention in PILWP 1/2008 to remove the silt from the agricultural fields, have the farmers of Sirigao been finally able to restart agriculture in the village since last year.

59. In 2008, the Goa Government during the process of preparation of the statutory Regional Plan (2021) finally decided to incorporate leases with their boundaries within the RP. The village panchayat submitted a modified regional plan for excluding the entire village from the purview of the lease and for creation of a 200 mt buffer zone between the physical settlement and the area kept for mining activity. A copy of the Regional plan with regards to Sirigao Village notified with the buffer zone is herewith enclosed at Annexure 19. The RP 2021 is still in force. Despite the statutory requirement that all land use must follow the RP 2021, the auctions have disregarded the buffer zone altogether.

60. On 12.06.2012, the villagers addressed a fairly detailed letter to the Chief Minister, requesting him not to grant renewal of mining lease to the Respondent No.4. Petitioners crave leave to rely upon the facts made out in the said letter. A copy of the letter is enclosed at Annexure 20. By October 5, 2012, all mining had been shut down in the state of Goa,

first by executive order, and then by an order of the Hon'ble Apex Court dated 05.10.2012.

61. By their letter dated 31.01.2014, the Mahajans of the Shri Lairai Saunsthan wrote to the DMG asking him not to repeat past errors and to ensure deletion of all 15 temples and 10 places of religious attachment from any further lease granted in the village. Out of these, numerous temples [*such as Shri Sateri Temple, Shri Kulkar Brahmin Temple*] and places of religious attachment [*such as Aquarachi Tali (Sacred Pond), and Devachi Tali*] fall in the mining leases of Respondent no. 4. There was no response to this letter, copy of which is at Annexure 21.

62. However, on 21.04.2014, the Supreme Court of India announced its judgment known as **Goa Foundation I** *(2014 (6) SCC 590)*. Petitioners submit that the Supreme Court of India on 21.04.2014 declared mining leases of the state of Goa expired as of 2007. The Court also declared that all mining activity from 2007 to 2012 (when it was finally suspended by the Goa government on 10.09.2012) was illegal as it had been carried out without benefit of a valid lease. The Resp.No.4, by that judgment, was found doing illegal mining for 5 years (2007-2012). The Supreme Court also directed that new mining leases shall be granted in the state of Goa, and they would be allowed to operate only after obtaining fresh ECs.

63. From November 2014 till January 12, 2015, state of Goa granted second renewal to 88 mining leases including the leases of the Resp.No.4 for another 20 years, from 2007-2027, despite Supreme Court's explicit directions. The lease holder purported to resume mining operations despite the fact that its EC was no longer valid, having expired in the year 2010. Thus the operations of the lease-holder were in violation of provisions of the EPA, 1986. In Goa, mining lease holders can get whatsoever order they wish passed in their favour. Worse, they have been able to continue mining without having any valid clearances.

64. On 31.10.2014, the villagers of Sirigao, addressed another communication to the Government drawing its attention to a number of houses and properties in the village which should not be part of any lease in future. A copy of this letter is enclosed at Annexure 22. There was no response from the government. The villagers wrote a letter to the Pollution Control Board in August 2015, expressing their strong objections to grant of Consent by the Board for operations of the mining leases in the villages, on account of the immense environmental degradation caused by the mining activities in the past by the Respondent Nos. 3, 4 and other lessees. The letter dt. 10.08.2015 is enclosed herewith as Annexure 23.

65. Fortunately, the lease's second renewal order was cancelled by the Hon'ble Supreme Court, together with 87 other leases, by its judgement and order dated 07.02.2018 *(2018*

(4) SCC 218). Pursuant to further orders of the Apex Court and also this Hon'ble Court [*(2020 (12) SCC 56; 2020 SCC OnLine SC 830 and 2022 SCC OnLine Bom 3420*], the Government of Goa issued orders on 04.05.2022 to the Respondent No.4 to vacate the leases and return the area to the Government. Petitioners crave leave to produce these orders, if required by this Hon'ble Court.

66. Petitioners reiterate that till the lease holders were asked to vacate the lease premises, no effort had been made by the lease holder to remedy the phenomenal environmental damages caused to the villager and their environment with the mining activity that terminated on 10.09.2012, resumed briefly in 2015, and concluded finally by 15.03.2018. After 15.03.2018, the lease areas were left abandoned, with hardly any measures taken to ensure that the mined areas and their surroundings were not impaired further.

67. Such acts of omission are clearly in breach of the rules governing mining and lease agreement conditions. Neither was any attempt even made to restore the damaged environment of the village after several years of mining activity. Every ex-leaseholder is required to prepare and submit a progressive mine closure plan to the IBM. Petitioners do not see any steps of implementation in that direction. The ex-leaseholder is answerable and should have demonstrated good practices. However, none are available to be seen. The ex-leaseholder is answerable and should have demonstrated good practices. However, none are

available to be seen. The villagers of Sirigao including some of the Petitioners in fact wrote letters in 2020 and 2023 to the Directorate of Mines and Geology and other authorities, asking for implementation of the Mine Closure Plan and backfilling of mining pits, but no action either by the Department or the lessees was forthcoming in this regard. The letters dt. 19.02.2020 and 17.02.2023 are enclosed as **Annexure 24 Colly.**

68. Petitioners have made an approximate calculation of the amount of money generated for the Resp.No.4 through sale of iron ore from the said mining lease. At **Annexure 25** is a table setting out the production of ore with the data taken from various sources including the Goa Assembly and the auction document. Petitioners have used as benchmark the published reports of Sesa Goa for the purpose of assessing the sale value of the ores in those years. Since the sales invoices of the Resp.No.4 are not available in public domain, we have arrived at an approximation, which indicates that over the years from 2007 to 2012, and including the period from 2015-18, the Resp.No.4 took away mineral worth Rs.215.45 crores (approximate). The Goa government benefited marginally, and the Central government benefitted handsomely through export duty and corporate tax. The village of Sirigao obtained nothing, except permanent damage to its ecosystem and all that entails. Such transactions disproportionately benefiting private parties at the expense of public coffers are not only immoral, but they also violate Article 39 of the Indian

Constitution which calls for equitable sharing of resources for public benefit.

69. Without any commensurate response to the letters from the villagers ,the situation on the ground in the village of Sirigao, the Government of Goa took a decision to go for grant of mining leases via auction route in the latter half of 2022. To the utter dismay of the petitioners – and without any consideration of the above facts, complaints made and history of mining operations whatsoever – the combined lease boundaries of TC No.5/49 and 13/49 were simply passed of as the new boundaries of Mining Block No.II and hastily notified as part of a set of auctions conducted by the government in the month of December 2022. This was explicitly done on the assumption that the EC granted to the erstwhile lease holder could be transferred to the entity winning the auction, which assumption the government was later compelled to relinquish. Thus it is quite obvious that the mining block was approved on a consideration that had nothing to do with the feasibility of mining on the said block and was therefore clearly in violation of the law and orders of the Apex Court. The government was indeed so careless that it also included the Konkan railway line within the mining block!

70. There was no difference, in other words, between the leases as they stood earlier and the new MB granted in auction – which is completely contrary to law. What truly shocked the villagers was that the entire village of Sirigao as it stood and

the Devi Lairai Temple, together with all the developmental activity and households including the Panchayat Ghar were made part of the mining lease offered to the bidders without any application of mind. Neither the Panchayat nor the Gram Sabha of the village was consulted about the proposal. Nor was an effort made to make out the boundaries of the Mining Block on the ground, as is required in law.

71. After the auctions were announced, information was sought under RTI to find out whether in the decision-making process for grant of the MB, the attention of the Goa government had been drawn by the mines department to the existence of the village of Sirigao on the proposed MB. An inspection of the relevant files showed no such consideration. Neither did the decision making authority even consider the fact that the village had been already seriously mutilated by earlier mining by the earlier lease holder (in this case, the R. 4), and that serious rehabilitation was first required. A copy of the file notings on the impugned approvals granted for issuing the auction notice is at Annexure 26 Colly. They show that the decision to go ahead with the auctions was unsustainable and *de hors* the provisions of the MMDR Act and Rules.

72. The files in fact did not even disclose that huge sums of money had been spent on rehabilitation of the village fields, khazans and poim through removal of mining silt, and the extent of damage recorded to the ground water of the village in the NEERI report. Neither was there any consideration

of the number of times the matter had come up to trouble this Hon'ble Court due to the reckless manner in which mining activity was being conducted and for which there could be no sanction whatsoever, either in the EC granted or the lease agreement signed between the leaseholder and the Goa government.

73. In its report to the Supreme Court during the proceedings connected with Writ Petition No.435/2012, dealing with the impact of the Justice Shah Commission report on illegal mining in Goa, the Central Empowered Committee made a stern recommendation that mining should never be permitted to go below the ground water table. In para 115 of its report dated 7.12.2012, the CEC observed:

> "The CEC is of the view that it would be appropriate that the mining below the ground water level is permitted only in exceptional circumstances and with adequate checks and balances. The mining operations below the ground water level should be permitted only after a detailed study for such mining leases is carried out and it is conclusively established that mining operations are not likely to adversely affect the availability of potable water for the local population and will not have any adverse environmental impact on the water regime."

The relevant extract of this Report is enclosed as Annexure 27. Despite the above, and despite complete knowledge that

the mining activity in Sirigao had intersected and played havoc with the groundwater and groundwater table, including resultant streams and water bodies, and without a single consideration of this aspect, the government went ahead with the auction of the impugned lease, which ought to be wholly condemned.

74. It is respectfully submitted that the Resp.No. 3 could never have been entertained for the purpose of entering the auctions, much less being approved as the successful bidder on the following specific grounds and ought to have been permanently blacklisted from mining in Goa:

a) The format of bid letter in the tender document (Schedule I: Format of Technical Bid - Annexure 1 says:

11.1 We declare that:

e. I/We have not been convicted of illegal mining.

b) The Supreme Court of India issued a declaration that all mining had been carried out in the state of Goa (including the Resp.No.3's lease) without a valid lease. The apex court held that all mining carried out in that period was illegal. Thus, in addition to the earlier period of illegal mining, the Resp.No.4 faced a Supreme Court declaration that it had carried out mining without a valid lease from 2007 to 2012.

c) The Resp.No.4 could not have mined from 2015-2018 in the face of not possessing a valid EC.

d) During the period of the lease, the Resp. No. 4 was responsible through its mining practices, of violating provisions of the MMDR Act, the conditions in the lease agreements, and conditions laid down in the environment clearance order, as a result of which the entire environment of the village had been brutalized, and the underground water aquifer bankrupted permanently, for which there was no approval.

e) Mining had not only intersected the groundwater, it had damaged the aquifer permanently.

f) There is hardly any area for mine development, waste dumping, erecting a beneficiation plant, tailing ponds or ore stockpiling as an approach to scientific and sustainable mining and we anticipate pit and bench failures and other threats from mining.

g) From the new grant of existing leases we can only anticipate deep mining and bench/pit failures, collapses and disasters.

75. Instead of being rewarded by grant of Mining Block No.II, petitioners submit that this was a fit case for applying MoEFCC Office Memorandum dated 30th May 2018. The

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memorandum was issued post the Supreme Court judgment in *Common Cause (2017) 9 SCC 499*, which ruled that for environmental violations, 100% of the value of the ore would be recoverable. Copy of the MOEF memorandum is Annexure 28.

76. After having bankrupted the water supply of the village all these years, the leaseholders have shamelessly refused to pay the PWD bills for supply of drinking water after the closure of mining in 2018. After an intervention from the Chief Minister, the former lease holders agreed – as if they were making a magnificent and generous concession – to pay the bills till July 2021, and not thereafter. Some of the villagers have water bills worth lakhs of rupees pending and face disconnection notices. A copy of the letter dated 24.08.2021 directing the lease holders to pay the water charges is at Annexure 29.

77. Pursuant to the auctions conducted, and despite the opposition expressed by the villagers, the Goa government on 13.01.2023 issued the Letter of Intent to the Resp.No.3 which is impugned in this PIL. A copy of the impugned order/Letter of Intent dated 13.01.2023 is enclosed at Annexure 30. Under the circumstances recounted above, the villagers have no option but to approach this Hon'ble Court.

78. The DMG was duty bound to investigate compliance of the above conditions by the former lease holder and to file a

report on such compliance as part of the feasibility report for the auctions recently concluded. Its office had received endless numbers of letters and complaints from the villagers seeking justice. These were on record. This was not done, vitiating the entire process of decision-making. There was simply no application of mind throughout.

79. Finally, the Hon'ble Supreme Court had in its judgment dt. 21.04.2014 directed that there should be a policy in place before the grant of fresh mining leases. In 2013, the Goa Government had prepared and notified a Goa Mineral Policy which it had presented to the Court to prove its bona fides in handling the mining situation in the state of Goa. However, this was not a policy for fresh mining, and in fact, it prioritized dump mining ahead of fresh extraction on sound environmental grounds. Pursuant to the order of the Supreme Court, the Goa government issued a Goa Renewal of Mining Lease Policy 2014 in Jan-2015 on the basis of which it granted a second renewal to 88 leases. However, this policy became redundant after 12.01.2015 in view of amendments to the MMDR Act, 1957. A notification issued in 2016 revoked the policy. Till date, therefore, there is no policy in place. The resort to auctions of leases in the absence of a notified policy is contrary to the direction of the Supreme Court of India, and for this reason, cannot be permitted. The judgement dt. 21.04.2014 is enclosed as **Annexure 31.**

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80. Petitioners submit that the Goa Mineral Policy of 2013 made certain commitments in respect of sustainable mining, none of which are reflected in the decision-making that led to the order to auction the leases including the impugned mining block. The policy would have answered the following critical queries without which sustainable mining could not take place, and in the absence of which the old practices of unbridled and uncontrolled mining would restart:

a) It was required of the Goa government to incorporate the order dated 29.10.2014 issued by the MoEF in respect of location of villages in relation to mining leases. The circular carried detailed instructions for considering the grant of leases and the conduct of mining operations, especially those relating to transport through village roads. Copy of the MOEF circular dt. 29.10.2014 is enclosed at Annexure 32.

b) It was required of the Goa government to ensure a transparent assignment of the amount of ore that could be realized on each mining block, in view of the restraint of the Supreme Court restricting the extraction of ore to 20 million tonnes only.

c) It was required to assess the carrying capacity of the road system and other attendant infrastructure including distribution of monitoring systems to ensure mining activity adhered to the air and water pollution norms.

d) The policy would have considered whether it was fair to load 3 mining blocks on a single village as has been now done, on grounds extraneous to the Act itself. Three leases have been granted affecting one village alone, and this village has already been ransacked and its natural resources permanently damaged, even while attempts to salvage the situation and reverse it are still at discussion stage or in fact have been rejected as unfeasible.

e) The policy would also have had to examine whether it was reasonable to restart fresh extraction, when all mining leases had generated enormous damage to ecosystems and none of the erstwhile leaseholders were even willing to come forth to remedy the damage.

GROUNDS:

81. Petitioners state that the entire decision taken to create these mining blocks is unsustainable as it has been made without application of mind and for the reasons set out hereunder:

a) In *Goa Foundation vs. State of Goa (2014) 6 SCC 590*, the Hon'ble Supreme Court has declared that the constitutionality or legality of the decision of a State Government regarding grant of a mining lease can be examined by Courts in exercise of powers of judicial review. In this judgement, the S.C. has held as under:

" ... 81. We are of the considered opinion that it is for the State Government to decide as a matter of policy in what manner the leases of these mineral resources would be granted, but this decision has to be taken in accordance with the provisions of the MMDR Act and the Rules made thereunder and in consonance with the constitutional provisions and the decision taken by the State of Goa to grant a mining lease in a particular manner or to a particular party can be examined by way of judicial review by the Court. ..."

b) The respondent state could not have proceeded with auction of the mining leases in the absence of a policy as directed by the Hon'ble Supreme Court vide its order dated 21.04.2014 (Goa Foundation I).

c) The respondent state could not have proceeded with auction of the mining leases in the absence of consultation with the Panchayat of Sirigao or its Gram Sabha, considering the fact that the mining activity threatened the very existence of the village itself. Under the 73rd constitutional amendment, consultation and approval was a must, prior to proceeding with the auctions.

d) This Hon'ble Court has ensured the restoration of part of the village agricultural fields at an expense of Rs. 4 crores. Though these fields were not part of the erstwhile lease or the mining block that has now been granted to the

Resp.No.3 in auction, they are at the lowest point of the terrain and the scenario of destruction of these fields is bound to be repeated. This simple fact alone indicates complete non application of mind.

e) Despite all efforts of this Hon'ble Court, the problems caused to the permanent aquifers of the village remain irreparable. Though the PWD now supplies water in lieu of devastation of water supply and killing of all wells in the village settlement, sources of water for irrigation are non-existent. Only one *talli* (tank) remains, that too protected so far by Court's intervention. Any further mining would fatally destroy this *talli* as well. After such damage, miners cannot be allowed to inflict more. If mining continues, the village will be bereft of water for irrigation for coming generations as well and for the Devi Lairai festival. The lease holders were not permitted to disrupt water supplies or damage groundwater aquifers when issued ECs or lease agreements.

f) The government was already aware of the location of the village and temple in the expired lease area and had in RP 2021 drawn a buffer line in line with the demands of the Gram Sabha. It was therefore required to exclude the entire village, and the temple/s, and to maintain a safe buffer zone of 200 mts from the village settlement, as per the legitimate expectations of the village under the 73rd constitution amendment Act. However this has not been done and in its haste to commence mining, it has gone

ahead and has approved the auction of the erstwhile mining lease as a new mining block with no change.

g) None of the negative impacts of mining documented by TERI and other studies has yet been undone. Nevertheless the lease has been granted to the same agency that was operating the lease earlier despite the fact that the erstwhile lease holder and present successful bidder could not be able to pass a fit and proper person test to be allowed to do further mining in view of the gross damage done to the village, its natural environment, its ecosystems and the livelihoods of its inhabitants.

h) All the authorities including the Central Empowered Committee of the Supreme Court have recommended that no mining shall be permitted to go below the ground water level of the area. However, the mining pits of Resp.No.4 have already crossed the ground water level and therefore it is not known on what basis the government has sanctioned mining activity in the same area despite full knowledge that the mining activity has drawn the village water supplies into the mining pit as the pit had gone below the ground water level.

i) The mining blocks are only blocks in nomenclature. If one examines the block, one finds that they are the same TCs with a new name and in two cases the same operators who have earlier operated the lease. Without ensuring that the damage to the village environment had been undone,

it is not clear how the same mining lease can end up in the hands of the same leaseholders without any condition and in this case without restoring the village eco system including its water sources and agricultural lands despite all the conditions laid down in the EC and lease agreements. In fact, if mining resumes in this area the water problem will become even more permanent and the paddy fields will be destroyed all over again.

j) The tender documents produced do not require the new bidder to repair any of the previous damages due to mining. It does not require them to produce a cast iron plan which will ensure that these problems do not occur in the future. It does not indicate at any place in the tender documents that the lease also encompasses the entire village, the heritage temple of Devi Lairai and the other infrastructures that go in the village including playground, school, medical centre, etc. The tender document only states that 9151441 tonnes are available in the lease for exploitation and does not lay down any conditions to ensure that the extraction of this would not be to the detriment of the villagers of Sirigao, compromising their right to life and those of coming generations.

k) Petitioners submit that the villagers have survived under great distress now for several decades. Some 200 families have left the villages due to the draconian conduct of the leaseholders. The new blocks are now given for a period

of 50 years which is a wholesale condemnation of the village to full and final destruction at the hands of the new bidder.

l) There are already indications that the new bidders in the case of mining block I and III are disowning any of the ecological problems caused to the village and its environment from the mining activities carried out by the erstwhile leaseholder. If the government has been singularly incompetent and unwilling to enforce the conditions laid down on the erstwhile leaseholder, there is no point in issuing fresh lease agreements or ECs, as it means the earlier clearances were little more than pieces of paper.

Source of Information

82. The Petitioners are relying on information received under the provisions of the RTI Act, 2005, and on official documents/ records as available from govt. websites from time to time.

Delay, if any, in filing the petition

83. There is no delay in the filing of this petition. The impugned L.O.I. was issued in January 2023. Thereafter, the petitioners have had to pursue information under the RTI Act from the Mines Department in relation to the auctions, and only thereafter could the same be studied in order to move this Hon'ble Court, after complete research. Hence there is no delay in the filing of this petition. In any case, the Govt. has

already been informed in writing by the petitioners that they would not entertain the auction of any of these leases, if no efforts were made to restore the village environment from the deleterious effects of the past 5 decades of mining.

Representations made

84. Various representations have been made from time to time by the villagers of Shirgao, including some of the Petitioners herein, dt. 08.11.2005 [*Ann. 8*]; 12.06.2012 [*Ann. 21*]; 31.01.2014 [*Ann. 21*]; and 31.10.2014 [*Ann. 22*], asking for key village areas such as the temple, houses, schools etc. to be excluded from the lease boundaries. Representations were also made to the Pollution Control Board vide a letter dt. 10.08.2015 [*Ann. 23*], and to the Directorate of Mines and Geology and other department vide letters dt. 19.02.2020 and 17.02.2023 [*Ann. 24 Colly*]. However, these seem to have fallen on deaf ears, as in the new e-auction of the impugned Mining Block, the very same boundaries including the village area of Sirigao have been included in the Mining Lease.

Documents relied upon

85. List of documents to be relied upon is provided in the index.

Nature and extent of injury:

86. The village of Sirigao has already suffered for more than 50 years from totally indiscriminate, unregulated, unmonitored, and unaccountable mining by the Resp No. 4. Today, besides the settlement, the rest of the village environment including its productive lands, groves and grazing grounds, have been

erased. As the petitioners describe in detail in the preceding paragraphs, the entire ground water regime of the village has been permanently impaired. Even the agricultural fields from which silt has been removed pursuant to this Court's orders are still not as per the original bill of health, with cultivation that has far lesser yields than fields in other non mining villages. If the mining block is permitted, the entire village and its temples would become liable to wholesale destruction at some stage or the other during the next 50 years, and there would simply be no recourse at that point to any effective remedy.

Prayers:

87. Petitioners therefore are approaching this Hon'ble Court for the following reliefs in public interest:

A. For an order to Quash and set aside the decision/order granting approval for auction of Mining Block II, as reflected in the file notings at Ann. 26 Colly.

B. For an order to Quash and set aside the Letter of Intent for Block II - dated 13.01.2023, bearing No. DMG/25/AuctionCell/LOI-Function/2023/2802;

C. In the alternative, direct the Resp. No.s 1 and/or 2 to delete the Sirigao village settlement and buffer zone from the boundary of the Mining Block II; as indicated in the RP – 2021 at Ann. No. 19;

D. For a direction to the Respondents jointly and severally to restore the environmental damages to Sirigao village from past mining operations, as specified in paragraph 16 and subsequent paras of this petition;

E. For a declaration that till the environmental damages of Sirigao village from past mining operations are undone and remedied to the satisfaction of the Gram Sabha of Sirigao village, no further auctions may be carried out for this area;

F. For the costs of this petition;

G. For any other reliefs this Hon'ble Court may be pleased to grant in the facts and circumstances of this case.

Interim relief:

H. Pending hearing and final disposal of this petition, for an order restraining the Resp.No.3 from conducting any mining operation on the impugned Mining Block II.

Caveat

88. No notice has been received of lodging a caveat by the opposite parties.

For the above, the Petitioners are very grateful.

PLACE: PORVORIM, GOA
DATE: 01/09/2023

PETITIONER NO. 1

PETITIONER NO. 2

PETITIONER NO. 3

PETITIONER NO. 4

PETITIONER NO. 5

6389

Neabh-desai 21/6/2024

Ramesh S. Gauuns
Hose No.:1724
Pajwada -Bicholim
Date:20th June 2024.

To
The Member Secretary
Goa State Pollution Control Board
Saligao –Bardes
Goa.

Subject: Submission on EIA on Block-II Sirigao-Mayem Mineral Block.

Madam

I was present for the Public Hearing from the beginning ,but sad to say.that since I failed to register my name in speakers register ,the Chair did not allow me to speak and abruptly told to disconnect mike as well as shut the video off and got up from the chair and went away. There fore following are my submission submitting in writing .

1.The village Poira which is in the core zone of Block-II is missing. No sudy is done on the said village. Even the name is not mentioned in EIA. Therefore the EIA becomes Incomplete and in adequate. Yet the Public Hearing was conducted Such Public Hearing does not attain legal status .Hence No processing be done to grant EC.

2.Block –I of Vedanta is adjacent to Block-II. There are in all 3 Mines and hence a cumulative Impact assessment is necessary and, which is not done and made a part of the EIA. Hence the Public Hearing by itself becomes in valid. Based on Invalid Public Hearing processing and considering the project for EC also become unlawful. So the PH report should be rejected for want of the mandatory thins which are not complied.

3.It is also see that the lake by name GOIGANE lake in Maye bearing survey number 79 and having an area of 218250sq m.(Two lakhs eighteen thousand and two hundred fifty). This information is concealed. There are also two more perennial water bodies in Mayem at Tirthbag these water bodies are also missing in EIA .

This possible only if the physical study is not done in person by the consultant.

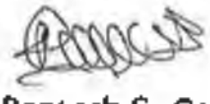
4.On page 6 of the Executive Summery it is stated " As the area is located on the foot hills of western Ghats,....." Infact the Western Ghats are nearly 40km away from Block-II. This also proves that the ground level study is not carried out by the consultant. They are also ignorant about the Bicholim taluka in which Block-II is located.

It is also interesting to see the above statement in the Executive Summary of Vedanta Block –I. page no. 7, " The area is located on the foot hills of Western Ghats belt....." It seems that the Mineral Engineering Services have done the business is cut and paste/.copy paste.

So based on omission of one village from core zone, concealment of facts and copy paste business EAC should not entertain the pracess of granting EC but ask to incorporate the facts and conduct fresh Public Hearing or no EC should be granted to the project proponent.

Thanking you

Yours truly



(Ramesh S. Gauns)

Mob: 9270085105.

APPENDIX

Appendix-1

HYDROGEOLOGY AND IMPACT ASSESSMENT OF GROUND WATER

IN RESPECT OF

BLOCK-II SIRIGAO-MAYEM MINERAL BLOCK

LOCATED AT
SIRIGAO & MAYEM VILLAGES,
BICHOLIM TALUKA, NORTH GOA DISTRICT, GOA

PROJECT PROPONENT

SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED.,

Submitted to

Water resources department of Goa

Prepared By

M.C. REDDY
Consultant
Former Regional Director,
Central Ground Water Board
Ministry of Water Resources, Govt.of India
NABET & CGWA Accredited

M.C.REDDY

Former Regional Director
Central Ground Water Board
Ministry of Water Resources
Govt. of India

Phone: 08048521486
Mobile: 9448864873
e: mcreddycgwb@yahoo.co.in
PAN No.AERPK 1910J

DECLARATION

I, M.C.Reddy, Former Regional Director, Central Ground Water Board and Accredited Consultant of Central Ground Water Authority for mining projects & NABET (HG & GEO) declare that I have carried out Hydrogeological Surveys and prepared are report on "HYDROGEOLOGICAL AND IMPACT ASSESSMENT STUDIES IN AND AROUND BLOCK-II SIRIGAO- MAYEM MINERAL BLOCK, LOCATED IN MAYEM & SIRIGAO VILLAGES OF BICHOLIM TALUKA, NORTH GOA DISTRICT,GOA STATE.", and submitted to the Lessee Salgaocar Shipping Company Private Limited (SSCPL).in October, 2023

(M.C. Reddy)

Date: 27-10-2023

Accreditation Board of CGWA

Certificate of Accreditation

Mr. M. C. Reddy

Has been accredited as a Ground Water Professionals to prepare reports in the Functional Areas of

- *Impact Assessment of Existing / Proposed GW Extraction*
- *GW Modelling*
- *Hydrogeological conditions in mining projects.*

Valid from : 15.02.2021

Valid thru : 14.02.2026

Certificate No. : CGWA/RGI/028

Dated : 07.07.2021

क्षेत्रीय निदेशक
Regional Director
आरजीएनजीडब्ल्यूटीआरआई
RGNGWT&RI

सदस्य
Member
आरजीएनजीडब्ल्यूटीआरआई
RGNGWT&RI

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HYDROGEOLOGY IN AND AROUND BLOCK-II SIRIGAO-MAYEM MINERAL BLOCK
, SIRIGAO &MAYEM VILLAGES,
BICHOLIM TALUKA, NORTH GOA DISTRICT, GOA

1. INTRODUCTION

Salgaocar Shipping Company Private Limited (SSCPL), declared as the preferred bidder by Directorate of Mines & Geology, Government of Goa, for Block-II Sirigao - Mayem Mineral Block, located in Mayem & Sirigao villages of Bicholim Taluka, North Goa District, Goa State. SSCPL intends to obtain prior Environmental clearance from SEIAA Goa, for the production of 1.0 MTPA of Iron Ore.

The Government of Goa, in pursuant to the Mines and Minerals (Development and Regulation) Act 1957, and the Mineral (Auction) Rules, 2015, issued notice inviting tender dated 30.09.2022 to commence the auction process of iron ore mineral blocks for grant of mining leases. The e-auction was conducted for the mineral blocks in accordance with the Tender Document. Salgaocar Shipping Company Private Limited was declared as the **preferred bidder** under Rule 9(9) (iii) of auction Rules, for Block-II Sirigao - Mayem Mineral Block, located in Mayem & Sirigao villages of Bicholim Taluka, North Goa District, Goa State.

Further, upon payment of the first instalment, being 20% of the upfront payment, Directorate of Mines & Geology, Government of Goa issued **Letter of Intent (LOI) vide letter no. DMG/25/Auction Cell/LOI-function/2023/2802 dated 13.01.2023** for the grant of a mining lease for Block-II – Sirigao-Mayem Mineral Block, located in Mayem & Sirigao villages, of Bicholim Taluka, North Goa District, Goa State over an area of 171.2472 Ha for a period of 50 years. Copy of the Letter of Intent is enclosed as ***Annexure No. 1***

The Mining Plan has been approved by Indian Bureau of Mines, Goa vide letter No. MCDR-MPC0FE/3/2023-GOA-IBM_RO-GOA dated 07/08/2023. The approval letter is enclosed as **Annexure No. 2.**

The project proponent had applied via online mode to Expert Appraisal Committee (EAC), SEIAA for the grant of Terms of Reference(TOR) for the production of 1.0

MTPA of Iron Ore and subsequently, the TOR was granted by SEIAA vide its letter no. 115/3/2023-24/GSEIAA/Project-Prop/166 dated 18.10.2023 and is enclosed as ***Annexure No.3***

1.1 Location Details

The Block-II-Sirigao-Mayem mineral block is located in Sirigao & Mayem villages of Bicholim Taluka of North Goa District, Goa State, over and an area of 171.2472Ha. The Block-II Sirigao-Mayem mineral block area comes under Toposheet No. 48E/14 of Survey of India, bounded by latitudes and longitude shown in Table -1. The State Highway SH-1 is at a distance of 2.19kms, the nearest Railway station is Tivim Railway station, at a distance of 6.0 kms, and the nearest airport is Mopa Airport at a distance of 23.1 kms. The location plan is enclosed as **Plate-1**., DGPS plan of the mineral block as **Plate-2,** key plan as **Plate-3, &** Google Plan of the project area as **Plate-4.**

1.2 The Mineral Block Boundary Co-ordinates are given below

Table-1. Boundary Pillars

Mineral Block Boundary Pillar No.	DGPS Co-ordinates	
	Latitude	Longitude
A	15^0 36' 14.310"	73^0 53' 40.069"
B	15^0 36' 21.621"	73^0 53' 40.938"
C	15^0 36' 17.421"	73^0 54' 06.524"
D	15^0 35' 57.409"	73^0 54' 34.906"
E	15^0 35' 51.801"	73^0 54' 30.296"
F	15^0 35' 41.907"	73^0 54' 50.014"
G	15^0 35' 20.233"	73^0 54' 36.040"
H	15^0 35' 35.315"	73^0 54' 01.582"
I	15^0 35' 48.817"	73^0 54' 06.775"

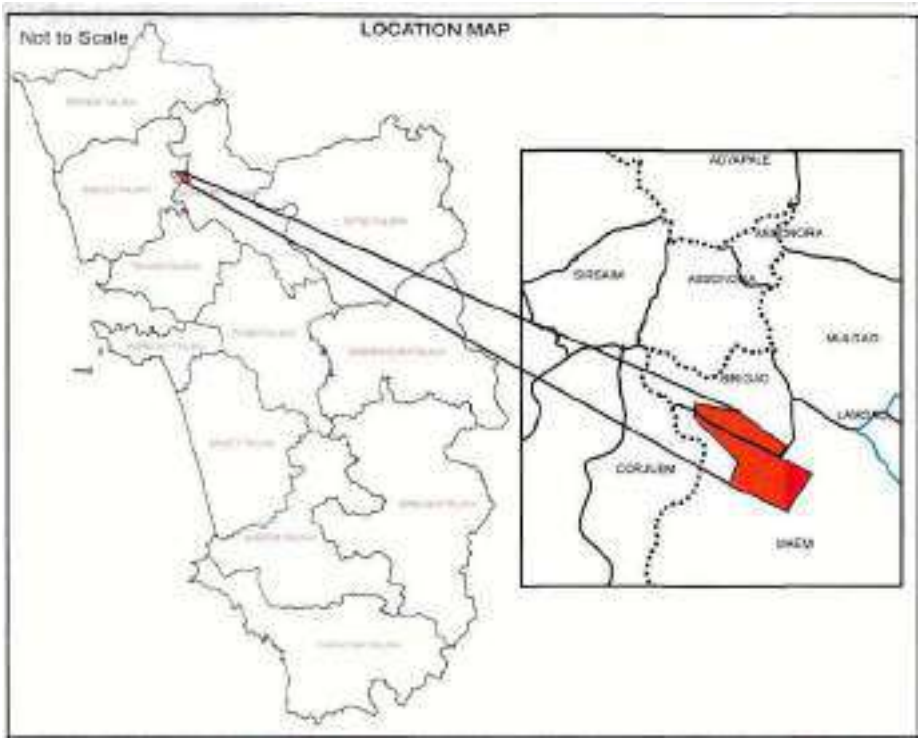


Plate-1 Location of Block-II Sirigao-Mayem Mineral Block

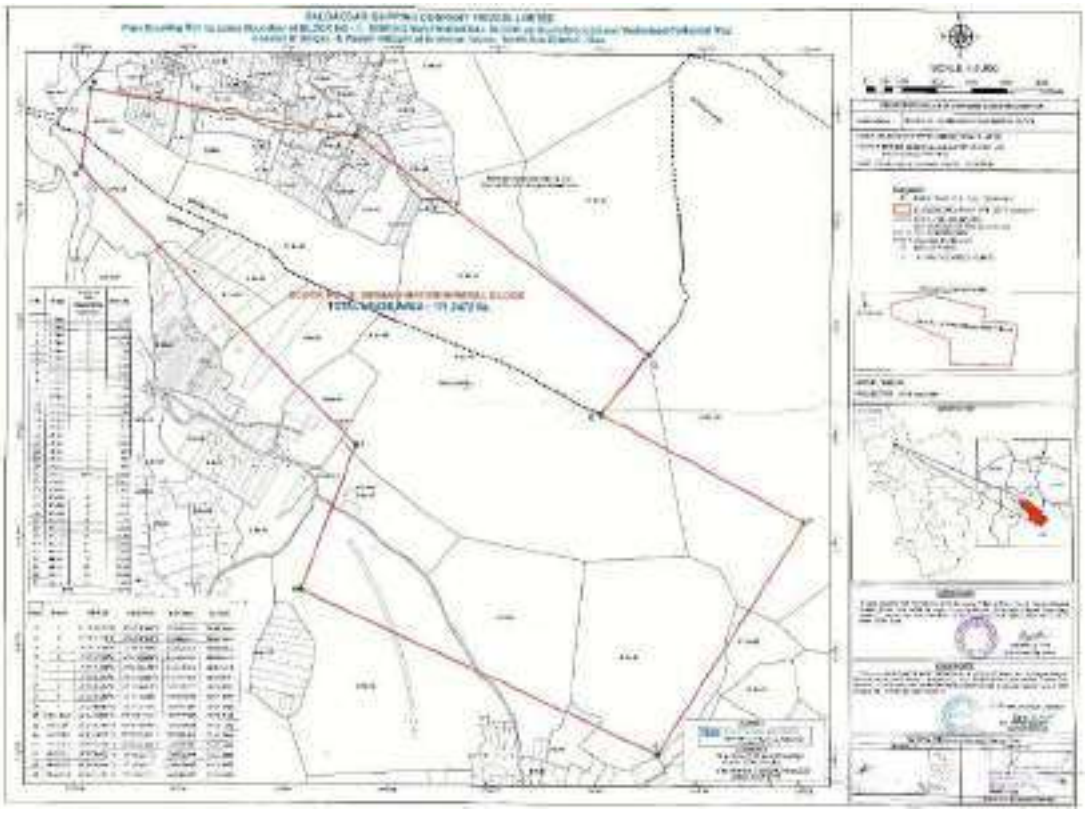


Plate-2 DGPS of the Block-II Sirigao-Mayem Mineral Block

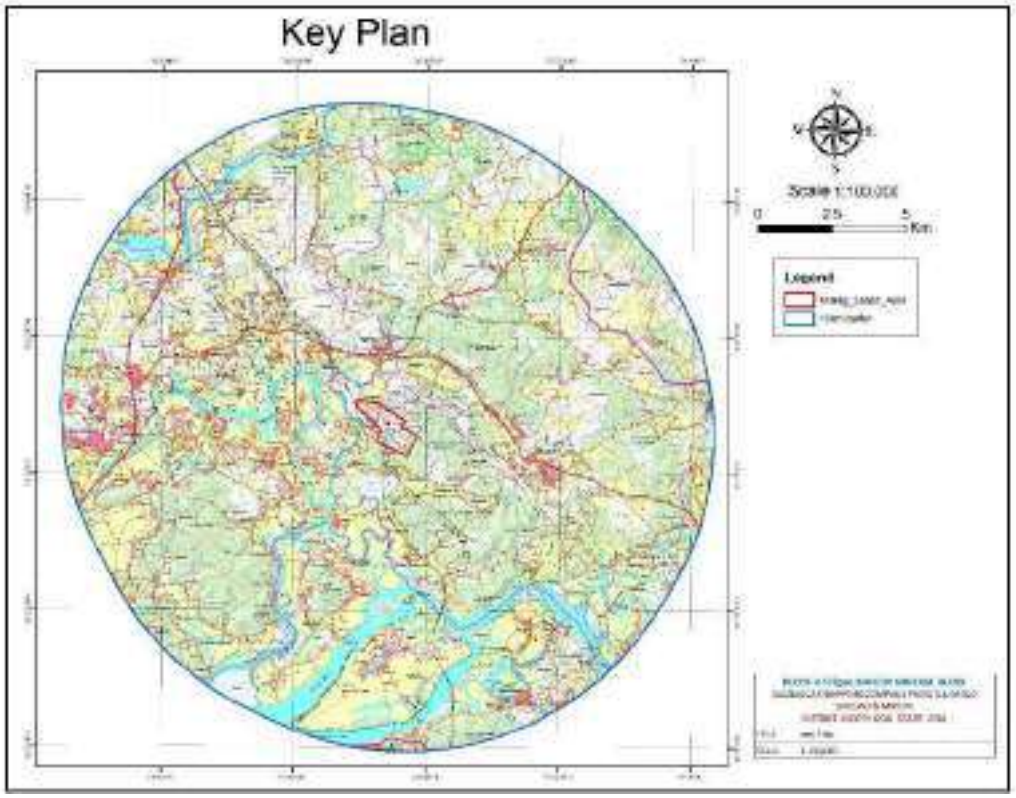


Plate-3 Topo Sheet of the Block-II Sirigao-Mayem Mineral Block

Plate-4 Google Earth plan of the Block-II Sirigao-Mayem Mineral Block

1.3 Details of the Project

Salgaocar Shipping Company Private Limited is proposing iron ore production from Block- II Sirigao-Mayem Mineral Block situated in Mayem & Sirigao villages of Bicholim Taluka, North Goa District, Goa State.

Mining will be carried out by opencast mechanised method using heavy earth moving machinery, without drilling and blasting.

The ore and waste formations are soft & friable in nature, excavation will be carried out using combination of ripper dozer, excavators and dumpers.

This approach not only minimizes the impact on the surrounding landscape but also promotes safe and sustainable mining practices.

1.4 Lessee/ Project Proponent Details

Registered Address: Salgaocar Shipping India Pvt Ltd,
Plot No. 15,SalgaocarBhavan
Altinho, Tiswadi
Panjim
Phone No.: 9423320259
Email:finance@smilindia.com

1.5 Type of the Project

Mining Lease was granted for mining of Iron Ore. The total Mineral Reserves and Resources of Iron ore in the Mining Lease is about 23.587Million Tonnes as on 01/04/2023. The proposed production and dispatch capacity of this mine is 1.0 Million Tonnes Per Annum (MTPA) of Iron Ore.

1.6 Mining Method

Opencast Mining Method will be practiced using Heavy Earth Moving Machinery such as Ripper & dozers, excavators, wheel Loaders, dumpers, etc. Hard material will be loosened using Ripper Dozer. Excavators with bucket capacity of 0.9 to 1.7 cum. will be deployed in the mines for digging/ excavation. Tippers/dumpers will be

engaged for transporting the excavated material to designated backfilling/ore stacking site. Wheel loader with bucket capacity of 1.7 cum. will be used for loading/dozing and other miscellaneous works. Hydraulic rock breakers will be used for secondary breaking of hard material. Water tankers with capacities of 8000-10,000 litres will be used for dust suppression on the haul roads within the mining lease. Mine will be worked under the supervision of technically qualified professionals like Mines Manager, Asst. Mines Managers, Mining Engineers, Geologists, Mechanical Engineers, Environmental Engineer, Surveyor, etc., having relevant qualification and experience in their respective fields.

In general, mining and mine development related activities are being carried out since early 1950s in the State of Goa. Natural resources in the area need tobe continuously monitored for the dynamic changes in the water and land environment caused by mining activities in Goa.

1.7 Layout of Mine Workings

Iron Ore deposit within the mineral block is found up to a maximum depth of -33m Amsl, hence the maximum depth of the pit will be maintained at -33mAMSL. The height of the mine benches will be 6 m and the width of the bench will be more than the height. The haul road gradient will be maintained at 1:16. Overall pit slope will be maintained at 28 degrees. The width of the haulage road will be maintained as required under statutes. Safety bunds will be maintained along the main haulage roads.

2 OBJECTIVE OF THE STUDY

The objective of the study is to fulfil the requirements of conditions stipulated in Terms of Reference approved by the Goa State Environment Impact Assessment Authority vide their letter No. letter no. 115/3/2023-24/GSEIAA/Project-Prop/166 dated 18.10.2023. Subsequent to site visit and after several discussions with the management, review of pertinent reports and maps of the mine area, various ground water and surface water sources, the following objectives were summed up for detailed study to fulfil the stipulated requirements.

i. Based on actual monitored data, it should be established whether working will intersect ground water. Necessary data and documentation in this regard may be provided.
ii. In case the working will intersect ground water table, a detailed hydrogeological study should be undertaken and report furnished. The report inter-alia shall include aquifers present and impact of mining activities on these aquifers.
iii. Information on site elevation, working depth and ground water table should be provided both in AMSL and bgl (below ground level). A schematic diagram may also be provided for the same.
iv. The water requirements of the project, its availability and source should be provided. A detailed water balance should also be provided. Fresh water requirements of the project should be prepared.
v. Carry out monitoring of ground water levels and quality in and around the buffer and core zone of the mine to study the impact of project on the ground water regime – Depth to water level, Water table elevation with reference to the Above Mean Sea Level (A MSL) and Ground Level (GL), water quality study for various constituencies including Fluoride, Iron, Nitrate etc.,
vi. Conduct an aquifer performance test to understand the occurrence and movement of ground water.
vii. Study of the long-term National Hydrograph Stations water level data for the trend analysis (rise and fall of water levels)

viii. Monitor the ground water conditions in the mining area to ensure the accumulated rainwater, surface water and seepage ground water into the storage pit is effectively put to use.

ix. Implement suitable conservation measures to augment Ground Water resources in the area

x. Establishing a network of existing wells during the mining operations for monitoring water levels and quality. The monitoring should be carried out 4 times in a year vis-a-vis Pre-monsoon (April-May), Monsoon (August), Post-monsoon (November) and Winter (January) and the data thus collected may be analyzed and suitable drawings and maps are to be prepared.

2.1 Scope of the study

The studies are concentrated within the study area comprising of the mining lease (Core area) and an area of 10 km radius from the mine lease boundary (Buffer area) on the following aspects:

i. Collection, preparation and presentation of the historical data on ground water available from different agencies.

ii. Monitoring of ground water levels and quality from select wells in Core and Buffer area.

iii. Conducting aquifer test to evaluate the aquifer conditions in the area.

iv. Preparation of ground water level and quality regime maps for the area – depth to water level (with reference to GL), water table elevation (with reference to AMSL), water quality with reference to Bureau of Indian Standards (BIS)

a) Study on change of ground water level and quality over space
b) Impact assessment of mining activities on ground water quantity and quality.

v. Plan for Augmentation of Recharge to Ground Water through various conservation measures. Implementing Rainwater Harvesting through Rainfall Run-off management and Roof Top Rainwater Harvesting.

vi. Preparation of water budget for the project

2.2 Methodology

Historical real time data and pertinent reports on groundwater available with Central and state agencies connected with Ground Water development and management were collected and discussions held with the representatives of the Lessee, forms the base for the study. To prepare a mitigation plan it becomes essential to evaluate the exact hydro-geological conditions and aquifer parameters. To achieve the aims, geology of the area and surface conditions has to be interpreted based on the exploratory data and geological studies made by different agencies.

Intensive well inventory represented by phreatic aquifers of the area have to be undertaken to measure the status of the water level and impact of ground water development in the study area. The water samples are to be collected and analyzed to establish the water quality regime. The seasonal fluctuation of water level in response to groundwater recharge due to rainfall have to be estimated based on local information, field observations and secondary data.

To evaluate the aquifer characteristics, aquifer performance test on the existing dug well in the project study area is to be conducted at constant pumping rate. The data will be analyzed using standard analytical technique suited to field conditions of testing site.

The groundwater resources of the study area estimated based on the norms of the Ground Water Estimation Committee, Govt. of Goa and Govt. of India, will be the guiding factor for development of resources. The ground water flow regime estimated using network and Piezometer data, will be an indicator for the impact of ground water development in the area, vis-à-vis to decipher ”SAFE“, “SEMI CRITICAL“, “CRITICAL“, “OVER-EXPLOITED” and “WATER LOGGED” based on stage of development and long-term water level trend. The detailed explanation of the above categorization and remedial measures are as below:

Status (state wise) of ground water development of the area as defined by the Central Ground Water Authority

a. Safe (Stage of development < 70 %)

a. Areas where stage of ground water development is less than 70 % and there is no significant long-term decline of pre-monsoon or post-monsoon water level trend. Such areas have potential for ground water development.

b. To be brought under the purview if quantity of abstraction exceeds 10000 m^3/ day in hard rock areas and 2000 m^3/ day in alluvial areas. RWH (Rain Water Harvesting) to be adopted.

b. Semi Critical (Stage of development 70 - 90 %)

Areas where stage of ground water development is 70 – 90 %, and water table during either pre or post-monsoon shows a significant long term declining water level trend. Caution may be exercised in future ground water development in such areas and if necessary, the density of network monitoring in such areas are to be increased to have better data based on the long-term behavior of water table.

i. Efficient utilization of recycle and reuse of water should be mandatory; Water audit to be adopted.

ii. Withdrawal may be permitted subject to undertaking of recharge measures at least 50 % recharge compared to withdrawal quantity may be made mandatory.

c. Critical (Stage of development 90 - 100 %)

i. Areas where stage of ground water development is more than 90 % and long-term water level trend during pre-monsoon or post-monsoon shows a falling trend.

ii. Areas where stage of ground water development is less than or equal to 100% and water table trend during pre-monsoon or post-monsoon shows a significant long term falling trend. There is very marginal scope for future ground water development in critical areas.

Following measures are to be adopted in these areas:

❖ Density of observation wells for monitoring may be increased

- ❖ Water conservation measures may be adopted
- ❖ Micro level ground water studies may be carried out to reassess ground water resources more precisely.

iii. Efficient utilization of recycle and reuse of water should be mandatory Water audit to be adopted.

Withdrawal may be permitted subject to quantum of recharge should be equal or more than the proposed withdrawal.

d. Over-Exploited (Stage of development 100 – 200 % & 200 – 300 %)

i. Areas where stage of ground water development is more than 100 % and long term water table trend during pre-monsoon or post-monsoon show a significant declining trend and categorized as over exploited areas. There is no scope for future ground water development in over exploited areas indicates alarming situations. All three measures as suggested in case of critical areas may be adopted in over exploited areas also.

ii. Efficient utilization of recycle and reuse of water should be mandatory. Water audit to be adopted, withdrawal may be permitted up to 60% of proposed recharge.

iii. The proposed mining area falls under **SAFE** Category of classification of Ground water resource estimation

e. Water Logged areas

Where water levels are shallow i.e. 2 m. from ground level in post – monsoon period and 3 m. from ground level in pre – monsoon period resulting in salinization and fertile land is lost. In such cases extraction of ground water is encouraged by recommending change of cropping pattern so that water level will be lowered and prevent salinization of fertile land. This phenomenon is commonly seen near canal command areas.

Surface run-off management in respect of the monsoon period forms the source water for augmentation of recharge to ground water body and various conservation structures are to be designed for the project area taking into consideration the rainfall and site conditions.

3 GEOMORPHOLOGY, LAND USE LAND COVER, PHYSIOGRAPHY & DRAINAGE

3.1 Geomorphology,

The mining block area comprises of a major ridge running northwest-southeast direction. The ridge separates the two villages, Sirigao in northeast and Poira (Mayem) in the southwest. The block area falls in the northern most part of Bicholim - Sirigao iron ore deposit of North Goa and attains about 120 metres (MSL) as highest level towards North eastern boundary. The present lowest level is -33.7metres (MSL) at Pit No.1 Rain water flows along the first order streams. The geomorphology of the area is shown in plate No-5

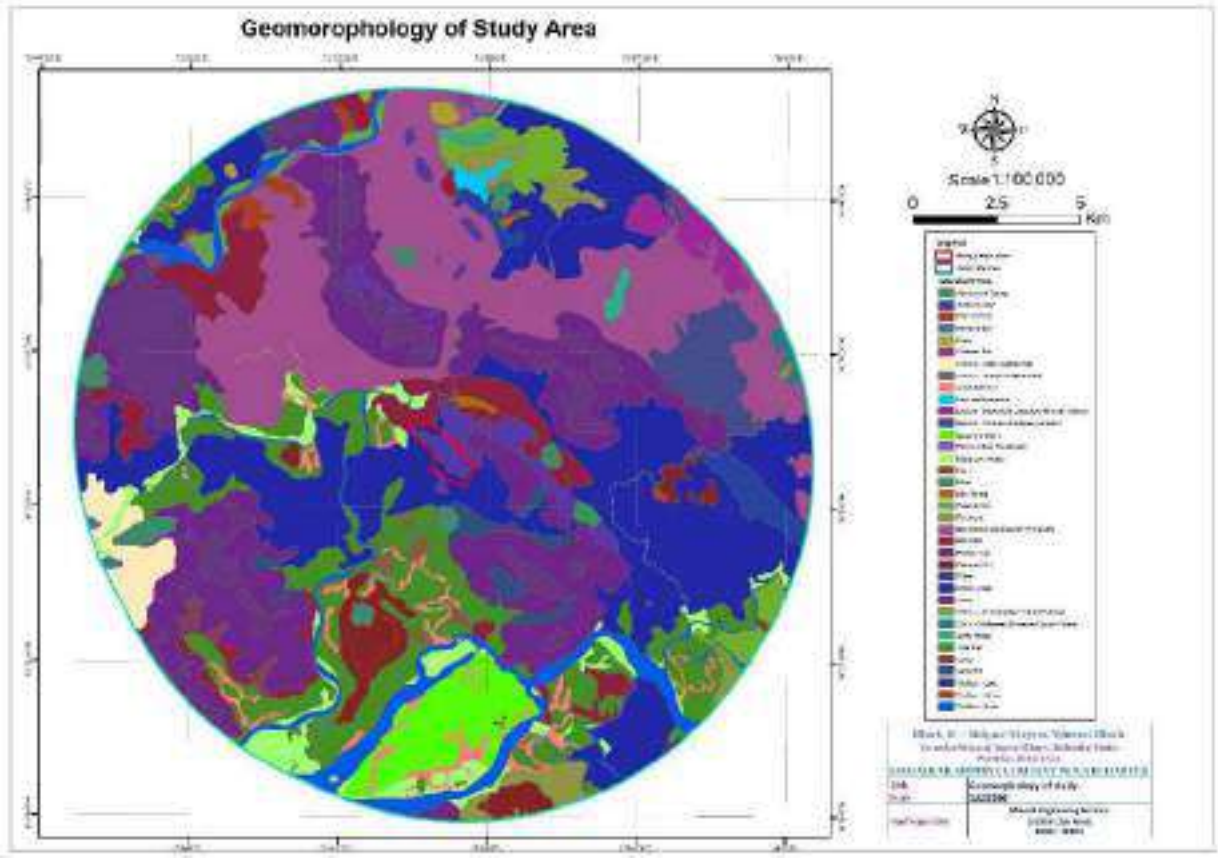
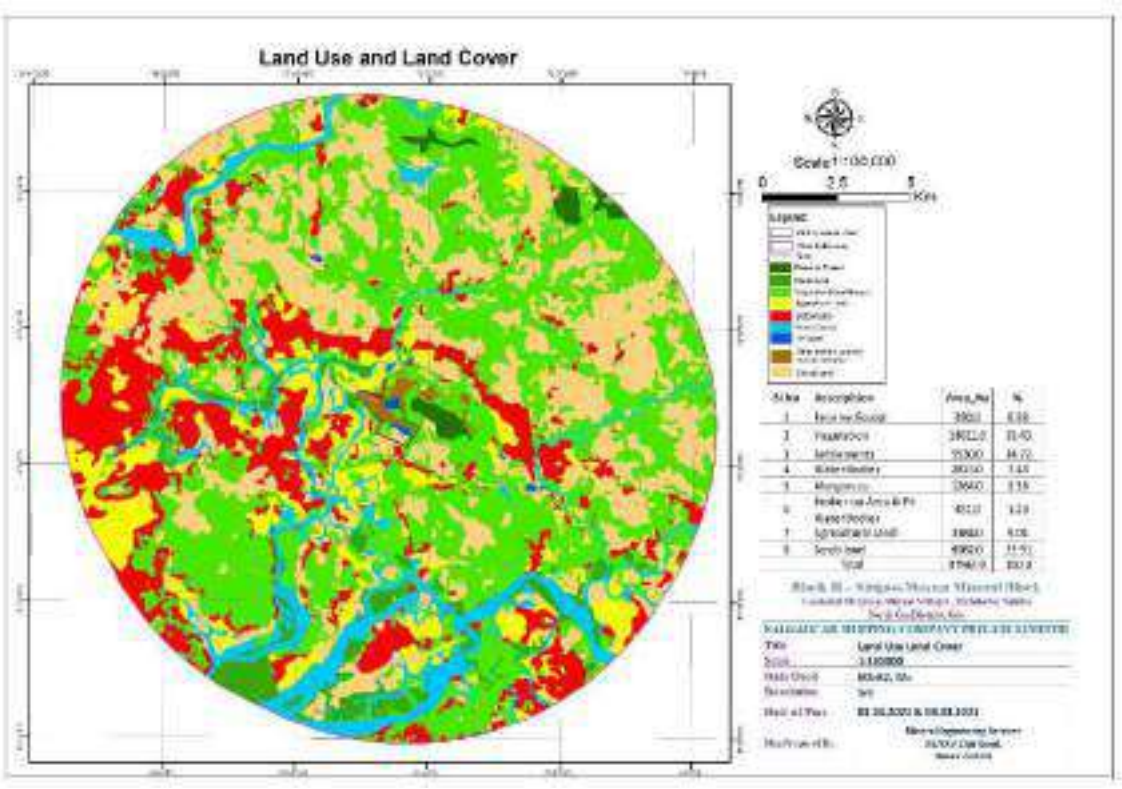


Plate-5 Geomorphology Study area of Block-II Siriogao-Mayem Mineral Block

3.2 Land Use Land Cover (LULC)

Land Use Land Cover buffer area is presented in Plate-6. Buffer area is essentially falling in the Vegetations/open mixed jungle constituting 39.83 % of the study area. Constitutes 0.88% Reserve Forest area. The project area falls under low dissected hills and valleys. In study area 7.49% are Water body as nalla, Rivers and Wet Lands course. Major water bodies are Mandovi, Assonora River and Chopara River The Mayem Lake is towards south eastern part of the study area. The remaining 51.8% of the land constitutes Agricultural land, built-up area & Scrub land etc.



LULC map is presented as **Plate-6.**

The Current Land Use

PRESENT STATUS	
Pre Mining Use	**AREA** (Ha)
Barren / Waste land with small bushes & shrubs	2.30
Land under Agriculture / Crops	0.00
Land covered with Plants	0.00
Land under Grass Cover	0.00
Land under Public Infrastructure / Utilities (water bodies,	12.07

roads, railways, electric lines, telephone lines etc.)	
Land under Habitation & temples	11.4
Land under Monuments & places of Historical Importance	0.00
Degraded by Pits & Excavation	81.70
Degraded by Dumps & Material Staking	40.83
Covered under Mine Infrastructure (plants, shades, buildings etc.)	0.27
Land under Forest	0.000
Any Other, please specify below	22.6772
	171.2472

The Conceptual Land Use

Conceptual Land use	
Post mining land use	**AREA** (Ha)
Barren / Waste land with small bushes & shrubs	2.30
Land under Agriculture / Crops	0.00
Land covered with Plants	0.00
Land under Grass Cover	0.00
Land under Public Infrastructure / Utilities (water bodies, roads, railways, electric lines, telephone lines etc.)	8.38
Land under Habitation & temples	11.40
Land under Monuments & places of Historical Importance	0.00
Degraded by Pits & Excavation	106.65
Degraded by Dumps & Material Staking	21.78
Covered under Mine Infrastructure (plants, shades, buildings etc.)	0.00
Land under Forest	0.00
Any Other, please specify below	20.7372
	171.2472

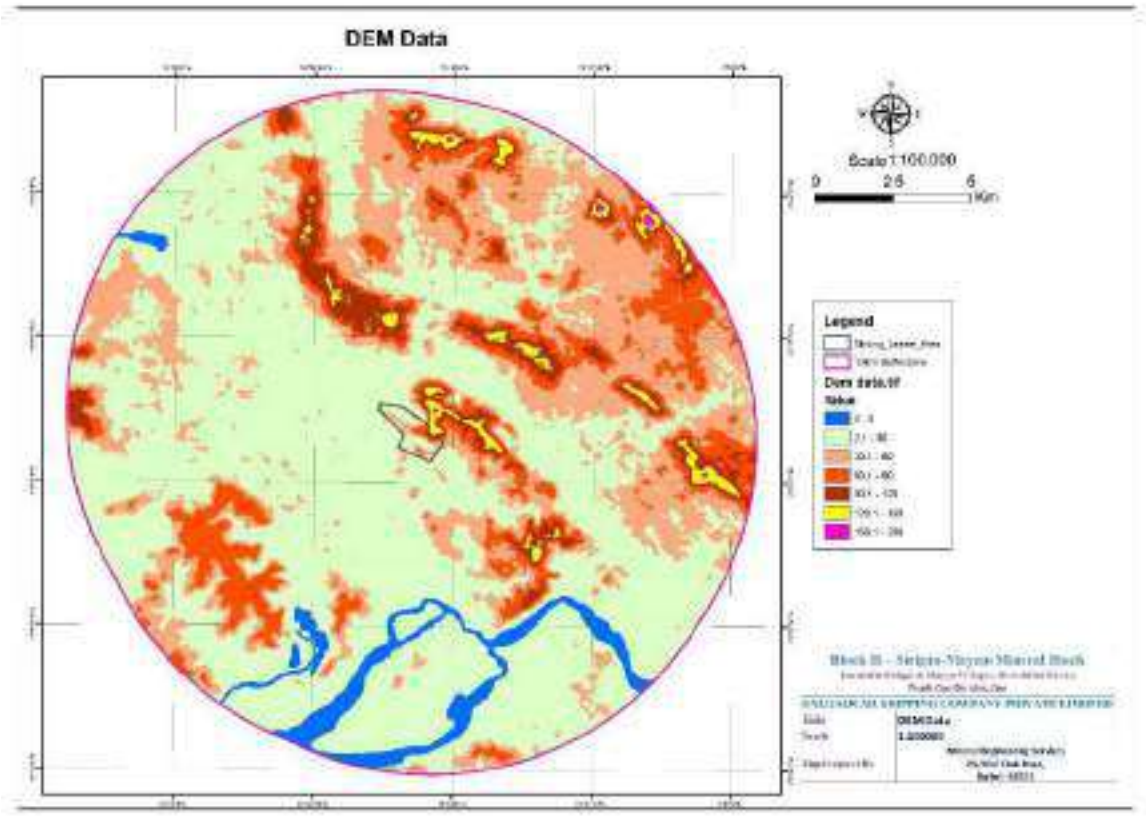
3.3 Physiography

The state is divided into four morphological units namely;

- The coastal plains with dominant marine land forms on the west,
- Vast etch plain,
- Low dissected denudational hills with valleys

- Deeply dissected high Western Ghats with denudational hills rising to a maximum elevation of 832m amsl and occurring all along the eastern part of the state.

  The Digital Elevation Map is given vide plate. No.6A



Digital Elevation Map-6A

3.4 Drainage

No specific drainage pattern is observed in the Mineral Block area. SirigaoMayem Mineral block study area fall under Mondovi River basin of Taluka Bicholim, Bardez, Sattari, Sanguem, Tiswadi & Ponda. The catchment area of Mondovi River is 1580 Sqkm. The Sahyadri hill ranges in the east forms the main watershed. The streams originating here flow in west and north west direction to join the Arabian Sea. The study area drainage pattern is dendritic and sub dendritic. The drainage pattern in regional scale is sub-dendritic in nature. Principal perennial rivers draining through

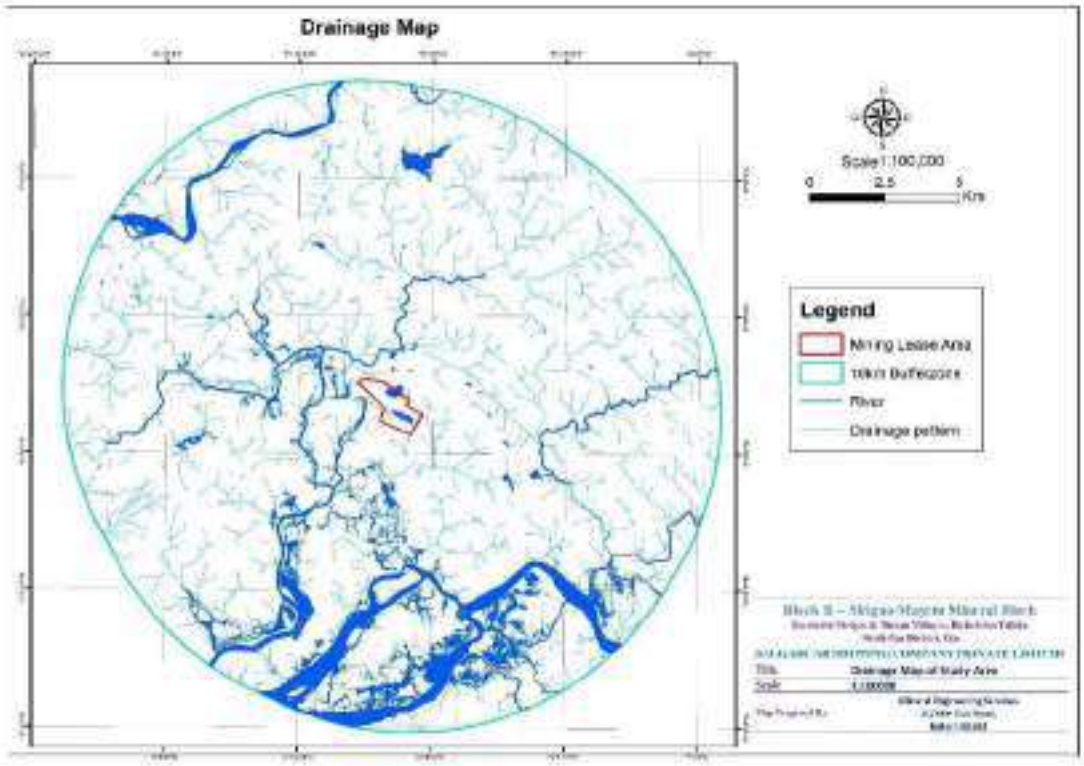
the district are, Terekhol, Chapora, Mandovi & Zuari and non – perennial (seasonal) river Baga.

The river basin of all these westerly flowing short rivers originates from Sahyadri Hill ranges and drain in the Arabian Sea in the west under estuarine environment. Primarily the underlying rocks govern the drainage system in the area. The drainage pattern is generally dendritic type. As the area is part of the midlands which are called as foot hills of Western Ghats belt and receives heavy rainfall during monsoon season and the average annual rainfall is about 3500 mm. Dendritic to sub dendritic type of drainage is observed in study area. RainWater shall accumulate in the mine pits during monsoon rainfall. The eastern border of the state generally marks the water divide between easterly and westerly flowing rivers.

Rivers in study area (*Aerial Distance*)

Mandovi River - 4.56Km at Pilgao Village

Assonora River - 0.56 km from ML Area



Drainage of the study area is shown in Plate-7.

3.5 Soil Characteristics

Soils of the district can be classified into 4 types namely (i) Laterite soil (ii) Saline soil (iii) Marshy soil and (iv) Alluvial soil.

The soil types observed within the buffer area are as follows:

(i) Lateritic soil is the major soil type in the district. It is highly porous & permeable, slightly acidic with low pH values, low in organic matter, Calcium and Phosphorus.

(ii) Saline soil in the district occurs in the flood plains of rivers in Bicholim, Bardez and Tiswadi taluka. Soil is deep and poorly drained, high in pH and high in organic matter (iii) Marshy soil occurs in large extent in n low-lying waterlogged and tidal-affected area

(iv) Alluvial Soil This soil is very fertile in nature. Alluvial soil is mainly used for the production of vegetables.

Various proportions of sand, silt, and clay in different amounts form the alluvial soil

4 HYDROMETEOROLOGY

4.1 Climate

The study area experiences hot summer and mild winter climate with well-defined three seasons, namely winters followed by summer and rainy season. The weather parameters recorded in the observatory at the Panjim are considered as representative of the meteorological conditions for the study area. The various mean climatological parameters for the period 1968-2010 are presented in Table-2.

4.2. Temperature

Mean maximum temperature is around 33 °C during April -May. It falls to around 29°C during monsoon period i.e. during July and August. The mean minimum temperature is around 26°C during April – May, which decreases to around 15°C during January - February period. Graph showing monthly minimum maximum temperature is given in Fig.1.

Month	Mean Temperature (°C)		Mean Total Rain fall (mm)	Mean Number of Rainy Days	Mean Number of days with			
	Daily Minimum	Daily Maximum			Hail	Thunder	Fog	Squall
Jan	19.6	31.6	1.0	0	0	0	0.4	0
Feb	20.5	31.5	0.2	0	0	0	0.6	0
Mar	23.2	32	0.1	0.1	0	0.4	0.5	0
Apr	25.6	33	10	0.8	0	1.8	0	0
May	26.3	33	64.4	4.2	0	3.3	0	0
Jun	24.7	30.3	957.5	21.9	0	4.8	0	0.1
Jul	24.1	28.9	1264.9	27.2	0.1	0.9	0.1	0.2
Aug	24	28.8	659.6	23.3	0	0.4	0.1	0
Sep	23.8	29.5	312.1	13.5	0	2.5	2.2	0.1
Oct	23.8	31.6	196.7	6.2	0	4.7	3.9	0
Nov	22.3	32.8	50	2.5	0	2.6	0.8	0
Dec	20.6	32.4	3.6	0.4	0	0.1	0.2	0
Annual	**23.2**	**31.3**	**3520.1**	**100.1**	**0.1**	**21.5**	**8.8**	**0.4**

Table-2. Climate & Temperature

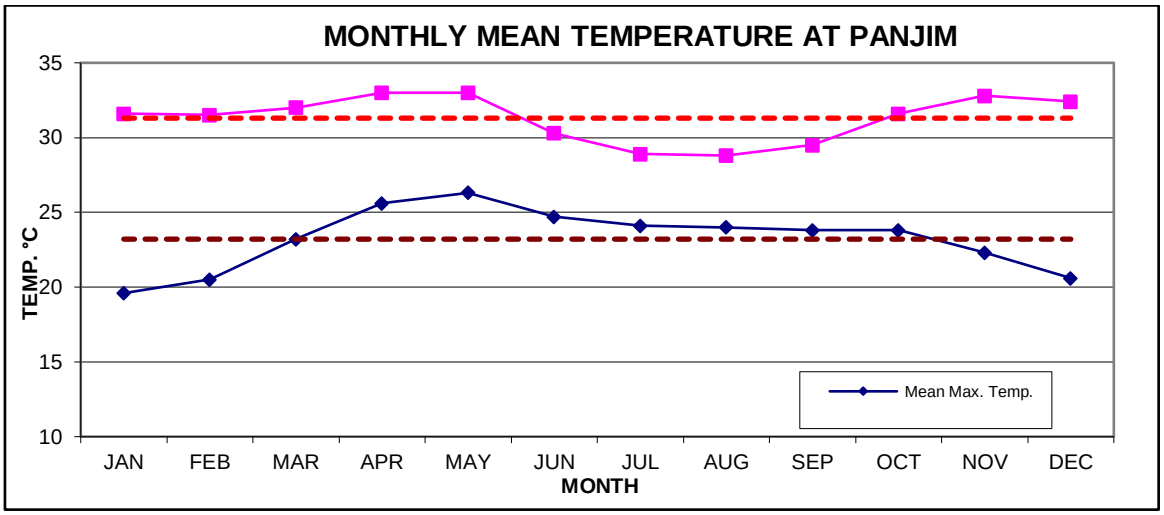


Fig.1 Monthly Mean Temperature

4.3 Rainfall

Rainfall is the primary source of ground water recharge. Other sources are seepage from surface water bodies. An attempt has been made to study rainfall, its distribution, and periodicity etc., based on statistical approach.

4.4 Rainfall normal

Normal are essentially averages pertaining to a period of sufficiently long duration. There are two rain gauge stations in and around the study area. These two rain gauge stations having consistence rainfall data for longer period. The monthly and annual normal rainfall and seasonal percentages stations are given in table-2.

4.5 Rainfall analysis

The monthly normal rainfall in Ponda station ranges from almost nil rainfall during February and March to 1117mm during August. The station annual average works out to 3948mm, the monthly normal rainfall in Valpoi station ranges from nil rainfall during February to 1320mm during August. The station annual average works out to 3948mm (Table.3) and the graph is shown in Fig.2.

Long Term Normal of monthly and annual Rainfall, Goa state for 30 years average based on data obtained from IMD, Pune.													
Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
BICHOLIM	1.0	0.2	0.1	10.0	64.4	957.5	1264.9	659.6	312.1	196.7	50.0	3.6	3520.1
PONDA	1.2	0.1	0.3	21.0	91.0	1072.6	1358.0	691.2	323.3	177.4	46.4	2.7	3785.2

Table-3. Normal of Monthly and annual Rainfall

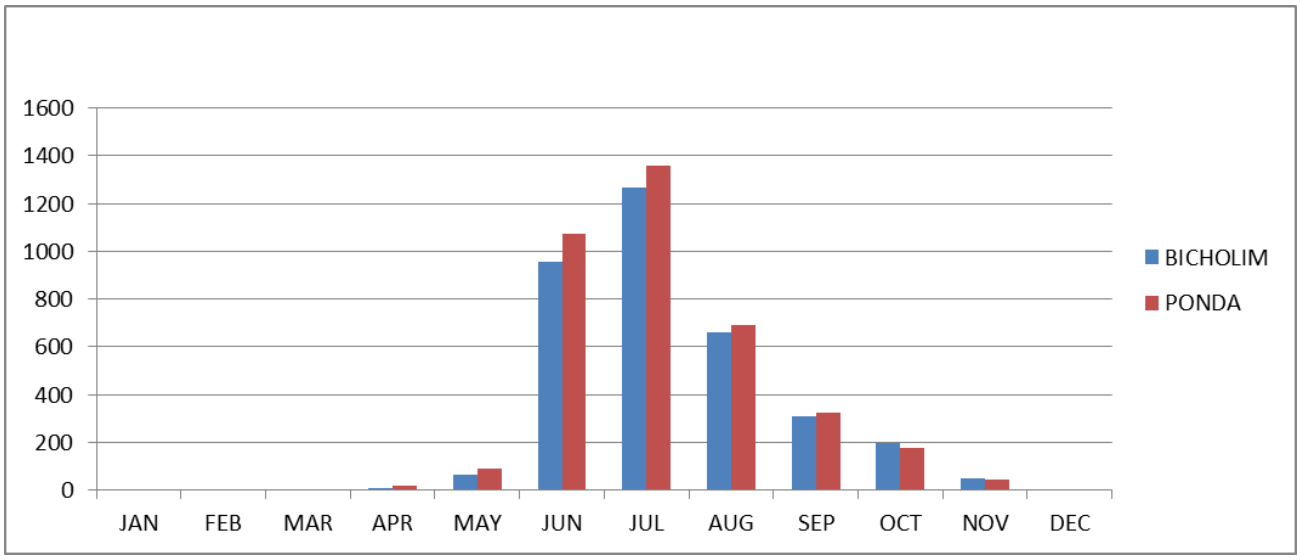


Fig-2 Hydrograph showing Long term Normal of Monthly Rainfall

5 GROUND WATER CONDITIONS & QUALITY

5.1 Brief Geology of the Area

Goa is dominantly covered by the rocks belonging to Dharwad Super group of Archean-Proterozoic age, except for a narrow strip along the North-eastern corner occupied by the Deccan Traps of Upper Cretaceous to Lower Eocene age. Iron Ore Formations of Goa indicate two successive and transitional epochs and environments of deposition. Based on the prominent structural discordance and environment of deposition, the Goan Iron Ore Formations can be broadly categorized into two formations namely, North Goa and South Goa Formations. Precambrian at North Goa form the extension of Dharwar Formations noted in Karnataka.

This forms a part and continuation of a major geosyncline, showing a general NNW-SSE elongation. Evolution of geosyncline is accompanied by sub-marine volcanism represented by metavolcanics.

This is followed by the deposition of Metagraywacke and Tilloid. Furthermore, the submarine volcanism and Greywacke deposition is accompanied by the deposition of Ferruginous Quartzite mainly along the borders of geosyncline. The evolutionary stage ends up with three phases of folding, metamorphism and basic intrusions. The impressions of these folding are marked in North Goa Iron Ore Formations. Dharwar super group of rocks in Goa are locally named as Goa Group of rocks which have characteristic NNW-SSE strike and dips are moderate. Of the above, Bicholim formation has pink phyllite horizon with banded ferruginous and manganiferous quartzite constitute the economically mineable manganese and iron ore bearing horizon and extends over the entire length of Goa from north to south. Litho units are highly folded and the rocks have attained green schist facies grade ofmetamorphism. Extensive development of laterite in the form of capping over the rocks is seen and further, the rocks show the effect of deep weathering

Table 1 Stratigraphic sequence of North Goa district, Goa

Eon/Era/Epoch	Supersuite/Suite/Group	Formation	Litho assemblage
Quaternary			Beach sands and River alluvium
Pliocene to Pleistocene			Laterite and aluminous laterite
Late Cretaceous to Palaeocene	Deccan Trap		Continental flood basalts-mainly tholeiitic type with dykes
Palaeo Proterozoic to Meso-Proterozoic	Closepet Granite	Chandranath Granite, Dudsagar Granite, Canacona Granite	Alkaline granites mainly; also variants from monzo granite to granodiorite
	Mafic –ultramafic Layerd Complex		Peridotite-cromitite, dunite-Gabro-Norite, Pyroxinite
Archaean to Palaeo Proterozoic	Goa Group = Chitradurga Group of Dharwar Super Group	Vageri	Carbonite-quartz-chlorite Schist/greywacke
		Bicholim	Dolomite limestone
			Quartz-sericite -schist
			Banded Iron Formation
			Quartz-chlorite-biotite-schist inter-layered with chert, iron and Mn Oxides, carbonates, metabasalt and meta-gabbro
		Sanvordem	Quartzite/greywcke with conglomerate
		Barcem	Quartz-chlorite-schist
			Meta-acid volcanic (meta-rhyodacite), quartz Porphyry, tuff
			Meta basalt meta-gabbro and meta-anorthositic Gabbro, quartzite
Archaean	Peninsular Gneiss-II	Ankola Gneiss,Anmod Ghat Gneiss	Migmatite and granites(s.1) tonolite-trondjhmite-granodiorite

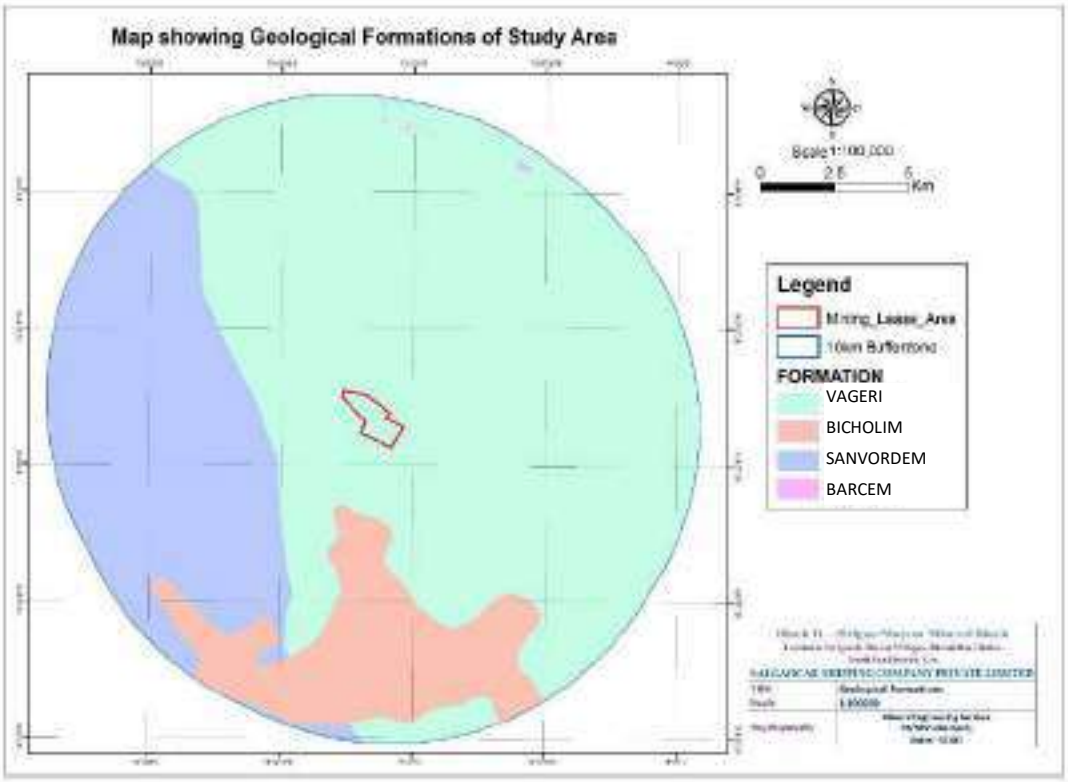


Plate No-8 Geological Formation of Study Area

5.2 REGIONAL GEOLOGY

5.2.1 Geology of the Study area

Major part of the Goa State is underlain by rocks of Precambrian age comprising of banded biotite gneisses, Meta volcanics, phyllites, biotite and chlorite schists, greywacke, conglomerate (tilloid), pink phyllites with associated banded ferruginous quartzite and chart breccia. These rocks are intruded by ultra basic, basic sills and dykes, followed by granites and pegmatites. Dolerite dykes and quartz veins form the youngest intrusives in the area. The Deccan Trap basalts of Late Cretaceous to Early Eocene age occupy a small portion in the northeastern part in the high altitudes. Almost all formations in the state have undergone lateritisation to various degrees depending upon the climate and rock type. The lateritisationis more pronounced in the coastal areas than in the hilly regions Phyllites, Schists and Meta volcanics are more susceptible to lateritisation and the gneissic / granitic rocks are least susceptible.

In general the thickness of laterites varies from about 3 to 30 mts. Laterites are highly porous due to the process of leaching and weathering. Hence they have very good capacity to hold and transmit groundwater. Groundwater in laterites occurs under phreatic conditions. Major portion of the state is occupied mainly by crystalline rocks and consolidated and metamorphosed sedimentaries, which do not possess primary porosity. Secondary porosity introduced through weathering, fracturing and jointing, produces the void spaces to hold and transmit ground water. Groundwater in these rocks occurs under water table conditions in the weathered zone and under semi confined and confined conditions in the deeper fractured zone.

Regionally most part of Goa area is covered by rocks of the DharwarSupergroup of the Archaean to Proterozoic age. The Dharwar rocks which extend in a general NE- SW trend are represented by Vageri Formation, BicholimFormation ,SanvordemFormation and Barcem formation at the base, overlain by a younger rocks. The Dharwarsupergroup (Devaraju et al., 2010) is represented essentially by Quartz-Sericite Schist and Phyllite with BIF and Metagraywake and argillite, very small portion is Metabasalt and metasediment (Ramakrishnan,1994, Radhakrishnan and Vaidyanadhan, 1997, Radhakrishnan and Vaidyanadhan, 2008). The Goan iron ore depositsbelong toBicholim group of rocks. Generally iron ore formations are capped with thick cap of laterite of 15 to 20m thickness, followed by lateritic lumpy ore, powdery iron ore with manganiferous and phyllitic clay intercalations as shown in the plate No -9

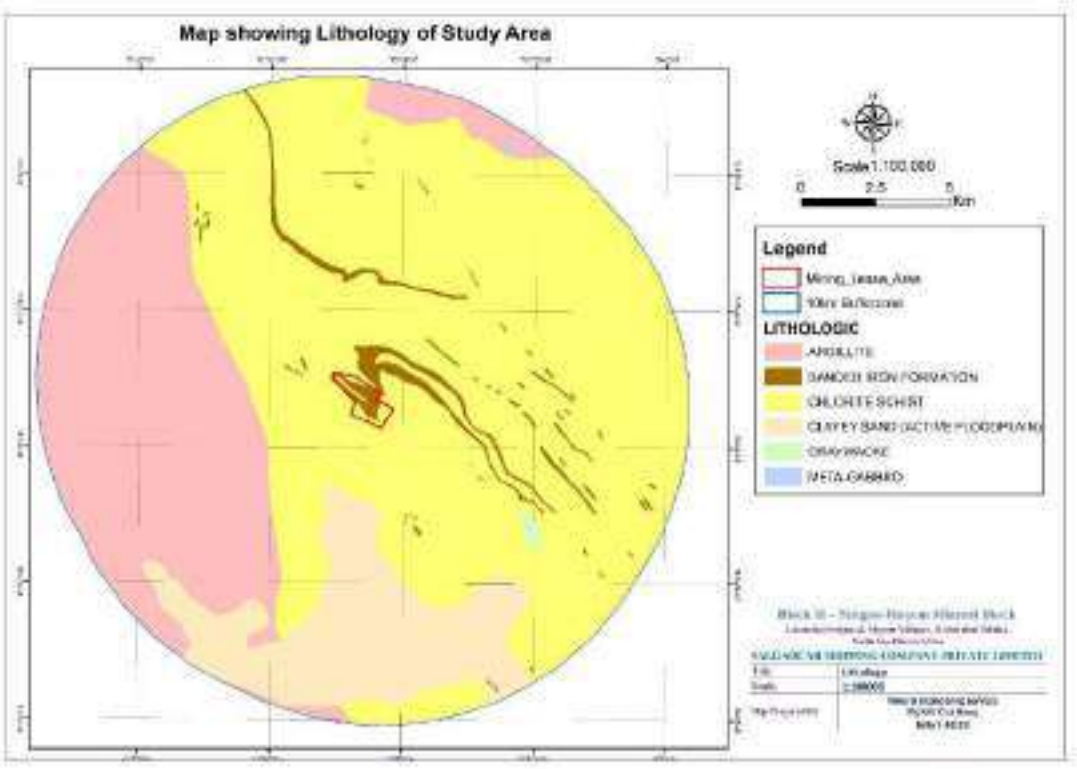


Plate No -9Lithology of Study Area

5.1.2 Local Geology

The mining block area comprises of a major ridge running northwest-southeast direction. The ridge separates the two villages, Sirigao in northeast and Poira (Mayem) in the south west. Geologically the auction block comprises of the Bicholim Group of rocks formation belonging to Dharwar Supergroup. The ore deposits of Block-II - Sirigao-Mayem Mineral Block is a part of the SirigaoBicholim deposits. Northern or Sirigao band shows shallow to medium dips towards NE whereas southern or Poira band shows north-easterly shallow to steep dips. The ore body extends over a strike length of 2065M with a variable width of 30-35M dipping on either side with varying angles of dip. The ore occurs at shallow depths from the surface at the crustal part of the anticline, the ore body dips on either side of the ridge and is deep seated at the foot of the ridge on either side.

Structure: The ore body is a north-westerly plunging overturned anticline. The axis of the anticline follows the NW-SE trending Sirigao ridge. General strike of the deposit is

N-60-W S-60-E. Both north-easterly and south-westerly dips are observed. The geological Plan are given vide Plate.No-10

Details of Active Pits in the Mineral Block

Sl. No	Pit ID	Area Covered by Pit(Ha)
1	Pit - 1 Active	29.53
2	Pit - 2 Active	34.68
3	Pit - 3 Reclaimed and rehabilitated	17.31

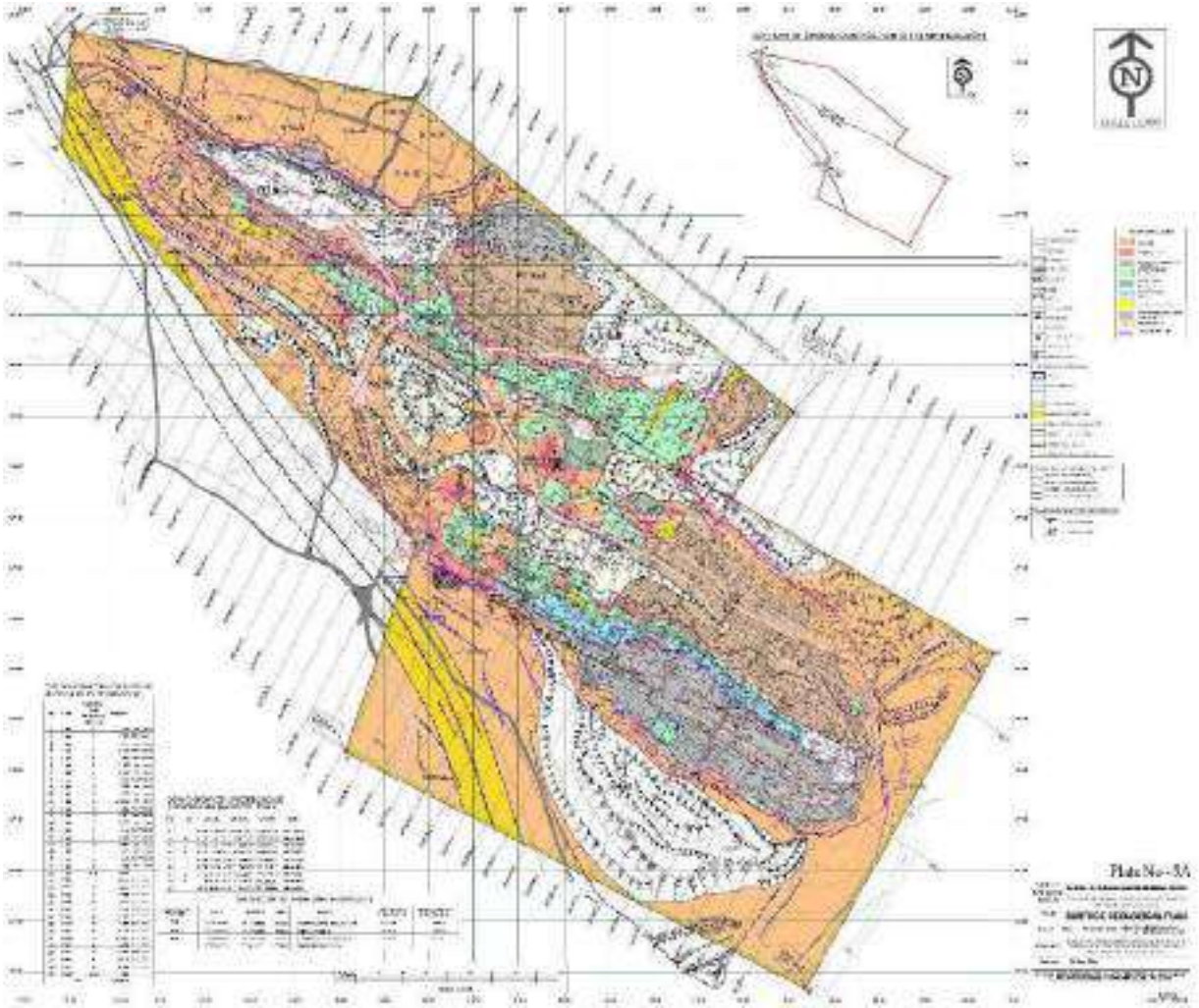


Plate.No-10 Geological Plan

5.3 Hydrogeology

Hydrogeological conditions based on the monitoring of water levels in core and buffer area is presented in Plate- 11 Water levels in the study area in general are represented by Phreatic aquifers. Deep aquifers represented by bore wells are not common in the area especially for irrigation. Very sparsely seen bore wells are located for domestic use. Depth to water level in the area varies from less than 2 m below ground level (bgl) to to about 15 m bgl. Most of the wells are in the range of 5-7 m bgl water levels.

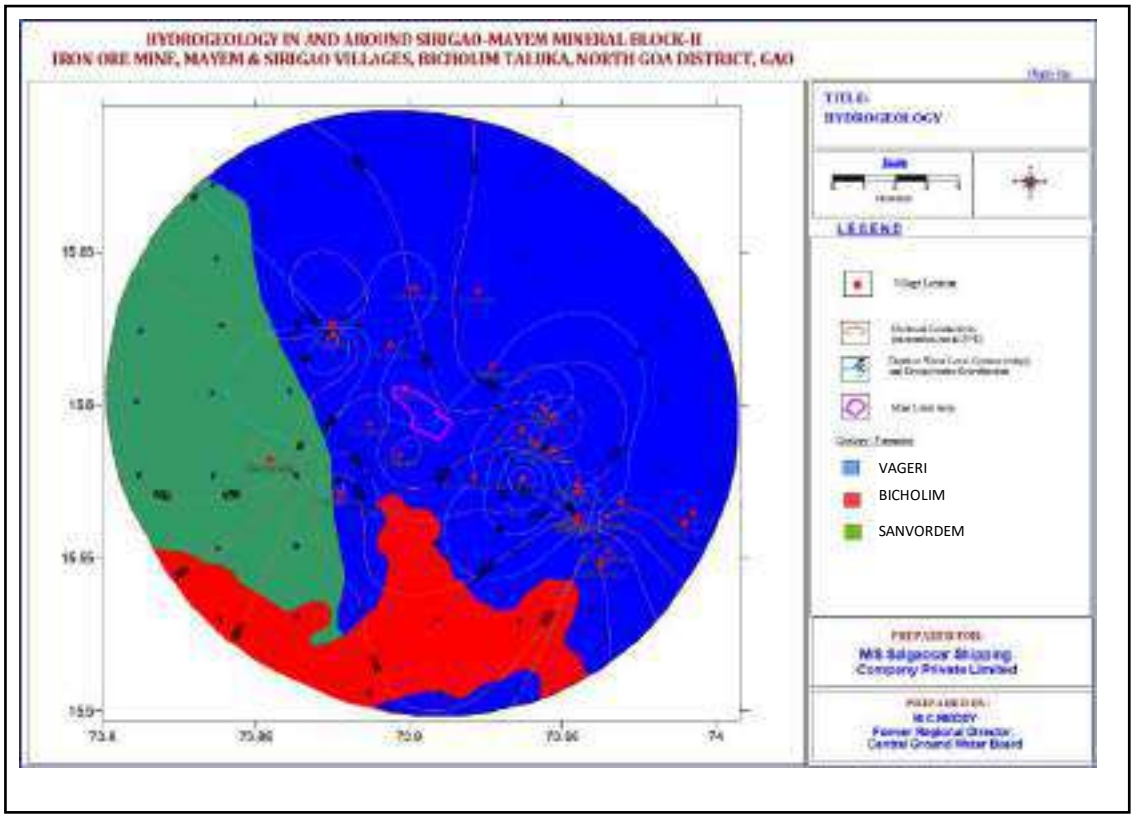


Plate-11 Hydrogeology of the area

5.4 Aquifer description

The area is comprised of two types of Aquifers

1: The top Phreatic aquifer which is tapped through dug wells, which sustain yield of about 2 hours at the rate of one lps.

Hydrogeological surveys were carried out in Mineral block Area (core area) and in the area falling within 10 Km from Block-II Sirigao- Mayem Mineral Block \

(buffer area) during January 2023 to evaluate the groundwater regime. The core area forms a part of Sirigao & mayemVillages of Bicholim Taluka of North Goa District, Goa. Water levels were monitored in 30 villages tapping shallow aquifers to delineate the ground water regime in the study area. The location and details of the abstraction structures in the core and buffer area in parts of Bicholim Taluka of North Goa District are shown in **Plate-1**.

The location details, coordinates, elevation and water levels of the abstraction structures in core and buffer area is given in **Table-7.**

The abstraction structures inventoried are essentially open wells tapping phreatic aquifers. Well density with respect to the unit area as an index to assess the ground water development, vis-à-vis the potential of the area show the density of the wells as observed during the present hydrogeological surveys indicate the area falls in the range 3-4 wells / km.

Water samples were collected from 30 shallow aquifer wells in buffer area. The details of the water quality analysis carried out by NABL Accreditated Laboratory is given in **Table-8** and the lab results are presented as **Annexure-4.**

Table-7: Details of open wells inventoried for water level in study area of Sirigao-Mayem Mineral Block

Code No.	Locations	latitude			longitude			Elevation (m)	Water Levels
		D	M	S	D	M	S		
GW1	Bicholim Open Well	15	35	8	73	56	47.6	29	6.30
GW2	Bicholim Open Well	15	34	28.6	73	57	16.7	28	4.40
GW3	Pilgao Open Well	15	33	42.7	73	57	15.9	35	7.65
GW4	Pilgao Open Well	15	33	45.2	73	57	14.7	36	3.10
GW5	Pilgao Open Well	15	33	48.2	73	57	16.6	40	7.73
GW6	Mathwada Open	15	33	9.4	73	57	52.5	31	3.30
GW7	Sarmanas Open Well	15	32	52.7	73	57	43.7	17	2.50
GW8	Batwada Open Well	15	33	48.7	73	57	52.2	21	1.80
GW9	Dab Daba Open Well	15	34	19.6	73	57	20	31	9.00
GW10	Mayem Open Well	15	34	36.4	73	56	13.6	30	14.70
GW11	Lamgao Open Well	15	35	17.6	73	56	27.3	29	5.00
GW12	Lamgao Open Well	15	35	31.1	73	56	12	32	6.60
GW13	Bordam Open Well	15	35	48.8	73	56	48.1	32	5.70
GW14	Walsi Open Well	15	35	57.2	73	56	37.3	35	9.70
GW15	Mulgao Open Well	15	36	47.8	73	55	37.6	29	3.77
GW16	Sirigao Open Well	15	36	20.6	73	53	55.1	22	1.90
GW17	Tivim Open Well	15	37	36.8	73	52	28.6	27	3.06
GW18	Sirsaim Open Well	15	37	22.4	73	52	30	33	10.70
GW19	Assnora Open Well	15	37	10.6	73	53	37.9	31	4.40
GW20	Adwalpale Open	15	38	18.5	73	54	7.5	38	5.00
GW21	Kalapur Open Well	15	33	40.4	73	59	22.7	22	3.60
GW22	Bolwada Open Well	15	33	55.3	73	59	32.8	32	2.96
GW23	Sarvana Open Well	15	34	6.5	73	58	8.6	27	3.78
GW24	Corquem Open Well	15	35	39	73	53	13.3	28	4.58
GW25	Shikari Open Well	15	35	2	73	53	48.4	24	5.80
GW26	Kumbarwada Open	15	34	35.7	73	55	16	33	5.75
GW27	Calivim Open Well	15	34	3.9	73	53	23.4	22	4.70
GW28	Lamkona Open Well	15	34	17.1	73	52	37.5	27	6.15
GW29	Nachinala Open	15	34	55.8	73	51	16.9	28	5.50
GW30	Nanoda Open Well	15	38	15.1	73	55	20.5	33	2.15

Table-8: Details of open wells inventoried for water Quality in study area of Sirigao-mayem Mineral Block

Sl. No.	Parameters	Method of Testing	Desirable Limts	Permissible Limts	Result																											
					GW1	GW2	GW3	GW7	GW8	GW9	GW10	GW11	GW12	GW13	GW14	GW15	GW16	GW17	GW18	GW19	GW20	GW21	GW22	GW23	GW24	GW25	GW26	GW27	GW28	GW29	GW30
i	Colour (Hazen Units), Max	IS:3025 (Part-4)	5	15	1.0	<1	2.0	1.0	<1	<1	<1	2.0	1.0	<1	<1	<1	1.0	1.0	<1	<1	<1	<1	<1	1.0	1.0	<1	1.0	<1	<1	<1	<1
ii	Odour	IS:3025 (Part-5)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
iii	pH	IS:3025 (Part-11)	6.5 to 8.5	6.5 - 8.5	6.55	7.95	7.37	7.05	5.88	8.95	8.10	8.16	7.01	6.62	5.85	5.53	7.50	7.80	5.92	7.70	8.20	6.07	5.96	7.82	7.85	5.73	7.46	7.83	7.56	8.12	8.85
iv	Taste	IS:3025 (Part- 8)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
v	Turbidity,NTU, Max	IS:3025 (Part-10)	1	5	2.5	3.60	1.5	3.8	3.7	4.5	3.1	2.8	4.1	3.5	4.7	3.0	1.2	4.6	2.7	5.0	4.2	2.7	1.8	3.2	4.0	2.1	1.2	0.7	4.0	2.8	4.0
vi	Total Dissolved Solids,mg/l, Max	IS:3025 (Part-16)	500	2000	98	118	236	172	72	50	118	152	156	150	108	34	130	178	54	134	98	50	46	66	172	84	162	178	260	66	54
vii	Aluminium (as Al) mg/l, Max	IS:3025 (Part-55)	0.03	0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
viii	Ammonia (as total Ammonia -N),mg/l, Max	IS:3025 (Part-34)	0.5	0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
ix	Anionic Detergents (as MBAS),mg/l , Max	Annex K of Is:13428	0.2	1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
x	Barium (as Ba), mg/l, Max	IS:15302 & APHA 21st	0.7	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
xi	Boron (as B), mg/l, Max	IS:3025 (Part-57)	0.5	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
xii	Calcium (as Ca),mg/l, Max	IS:3025 (Part-40)	75	200	24.0	27.2	52.1	24.0	5.6	8.0	24.1	20.0	23.2	26.4	11.2	4.8	17.6	38.4	7.2	32.0	20.0	6.4	5.6	8.0	32.0	8.8	36.8	32.0	48.9	9.6	8.0
xiii	Chloramines (as Cl_2), mg/l. Max	APHA 21st	4.0	4.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
xiv	Chloride as Cl (mg/l),mg/l, Max	IS:3025 (Part-32)	250	1000	12.0	13.0	25.0	34.0	24.0	12.0	16.0	20.0	30.0	22.0	30.0	12.0	16.0	22.0	14.0	20.0	14.0	14.0	12.0	14.0	20.0	28.0	22.0	30.0	68.0	12.0	10.0
xv	Copper (as Cu),mg/l, Max	IS:3025 (Part-42)	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
xvi	Fluoride (as F),mg/l, Max	IS:3025 (Part-60)	1	1.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.12	0.20	0.15	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.11	0.22	0.24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
xvii	Residual, Free Chlorine,mg/l, Max	IS:3025 (Part-26)	0.2	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
xviii	Iron (as Fe),mg/l, Max	IS:3025 (Part-53)	1.0	1.0	0.18	<0.05	<0.05	0.15	0.11	0.12	0.05	0.08	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
xix	Magnesium (as Mg)mg/l, Max	IS:3025 (Part-46)	30	100	4.9	5.3	7.3	6.8	2.4	2.9	5.3	16.5	5.8	7.3	3.0	1.0	7.3	7.3	2.0	5.4	5.8	2.9	2.4	2.9	12.6	2.4	6.8	9.7	8.7	4.8	2.9
xx	Manganese (as Mn),mg/l, Max	IS:3025 (Part-59)	0.1	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
xxi	Mineral Oil,mg/l, Max	Clause 6 of IS 3025 (part -39)	0.5	0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
xxii	Nitrates (as NO_3),mg/l, Max	IS:3025 (Part-34)	45	45	3.7	2.8	12.0	10.7	1.5	1.4	2.3	6.2	30.2	7.0	24.8	<0.1	1.4	4.6	4.0	2.0	1.8	4.5	1.6	1.2	4.2	5.6	1.3	18.2	1.1	1.5	1.0
xxiii	Phenolics (as C_6H_5OH),mg/l, Max	IS:3025 (Part-43)	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
xxiv	Selenium (as Se),mg/l, Max	IS:3025 (Part-56)	0.01	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
xxv	Silver (as Ag), mg/l. Max	Annex J of Is:13428	0.1	0.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
xxvi	Sulphates (as SO_4),mg/l, Max	IS:3025 (Part-24)	200	400	6.0	7.2	22.0	30.0	16.0	11.0	20.0	22.0	26.0	28.0	20.0	4.0	10.0	20.0	8.0	24.0	8.0	8.0	5.0	16.0	14.0	8.0	10.0	25.0	22.4	6.2	4.4
xxvii	Sulphide (as H_2S) , mg/l, Max	IS:3025 (Part-29)	0.05	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
xxviii	Alkalinity (as $CaCO_3$) mg/l, Max	IS:3025 (Part-23)	200	600	76	90	164	80	20	20	78	110	60	86	20	8	100	130	20	98	74	12	24	26	132	26	122	100	130	40	30
xxix	Total Hardness (as $CaCO_3$),mg/l, Max	IS:3025 (Part-21)	200	600	80	90	160	88	24	32	82	118	82	96	40	16	74	126	26	102	74	28	24	32	132	32	120	120	158	44	32
xxx	Zinc (as Zn),mg/l, Max	IS:3025 (Part-49)	5	15	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
xxxi	Cadmium (as Cd),mg/l, Max	IS:3025 (Part-41)	0.003	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
xxxii	Cyanide (as CN),mg/l, Max	IS:3025 (Part-27)	0.05	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
xxxiii	Lead (as Pb),mg/l, Max	IS:3025 (Part-47)	0.01	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
xxxiv	Molybdenum (as Mo), mg/l, Max	APHA 21st	0.07	0.07	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
xxxv	Mercury (as Hg),mg/l, Max	IS:3025 (Part-48)	0.001	0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
xxxvi	Nickel (as Ni),mg/l, Max	IS:3025 (Part-54)	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
xxxvii	Pesticides,mg/l, Max	APHA 21st	Absent	0.001	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
xxxviii	Polychlorinated biphenyls mg/l, Max	APHA 21st Edition	0.0005	0.0005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
xxix	Polynuclear Aromatic Hydrocarbons (as PAH),mg/l, Max	APHA 21st Edition	0.0001	0.0001	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
XL	Arsenic (as As),mg/l, Max	IS:3025 (Part-37)	0.01	0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
XLi	Chromium (as Cr^{+6}),mg/l, Max	IS:3025 (Part-52)	0.05	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
XLii	Trihalomethanes,mg/l, Max	APHA 21st	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
XLiii	Radioactive materials,Bq/l,mg/l	APHA 21st	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
XLiv	Total Coliform (per 100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
XLv	E-Coli (per 100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
XLvi	Eelectric conductivity µs/cm	IS:3025 (Part-14)			169	203	407	390	131	334	297	124	86	203	262	269	259	186	59	224	307	93	231	169	86	79	114	297	145	279	307
XLv	Water levels in well from surface (m)	--	--	--	6.30	4.40	7.65	2.50	1.80	9.00	14.70	5.00	6.60	5.70	9.70	3.77	1.90	3.06	10.70	4.40	5.00	3.60	2.96	3.78	4.58	5.80	5.75	4.70	6.15	5.50	2.15

A: Depth to water level

Water levels based on the abstraction structures inventoried in the study areais shown in depth to water level map prepared for the shallow aquifers in **Plate-12**. Depth to water level varied from less than 2 m below ground level (bgl)tomore than 7 m bgl. Shallow water levels of less than 2m bgl is found to occur in and around Sirigao and Batwada;2-5 m bgl in and around Adwalpale, Nanoda, Calivim, Corquem, Sarvana, Bolwada, Kalapur, Assnora, Mulgao, Lamgoa, Sarmanas, Tivim, Bicholim, Mathwada and Pilgao; between 5 and 7 m bgl in and around Nachinala, Lamkona , Kumbarwada, Shikari, Bordam, Pilgao, Lamgoa and Bicholim. Water levels of more than 7 m bglis found to occur in and around Walsi, Sirsaim, Mayem, Pilgao and Dab Daba.

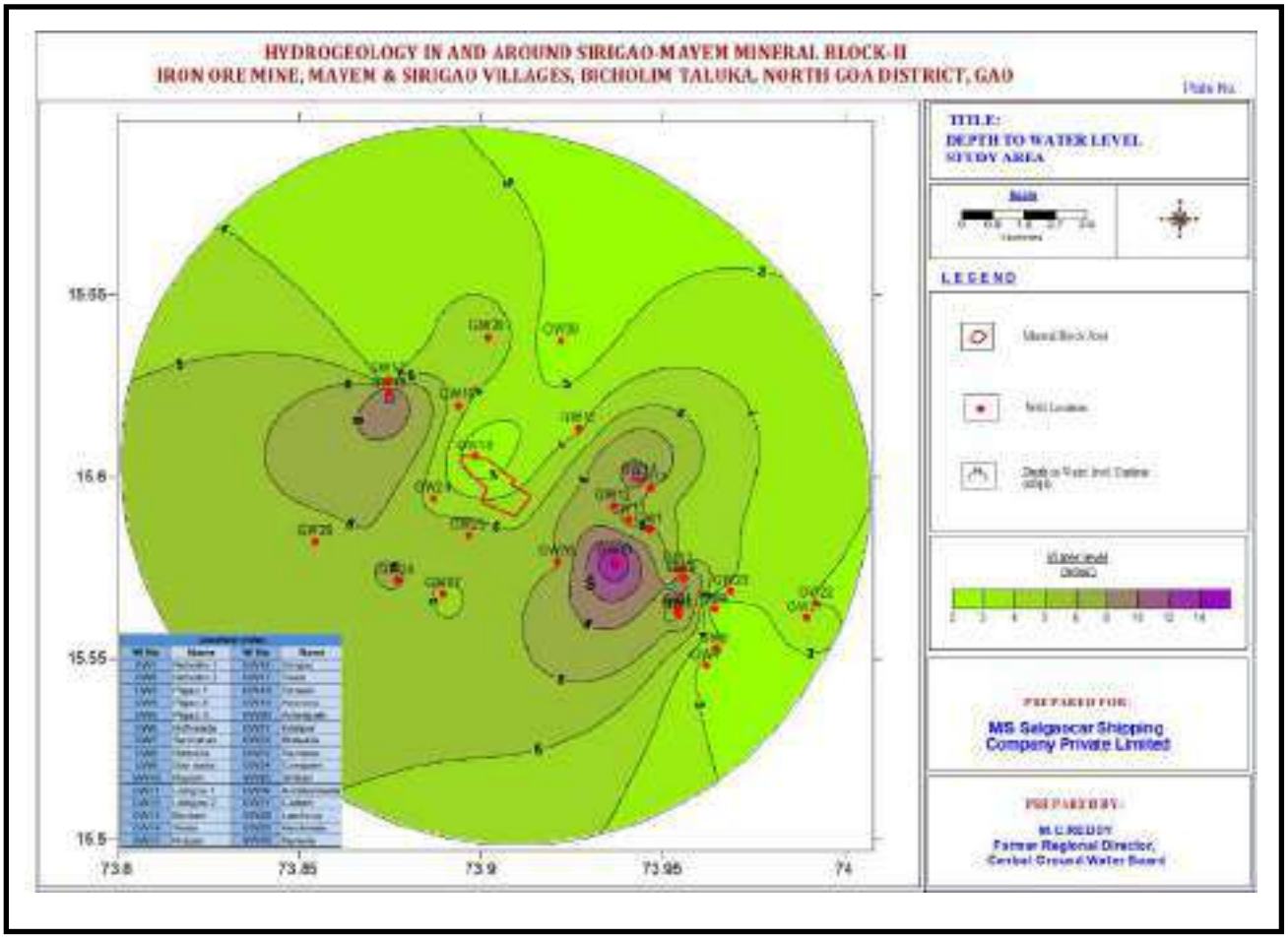


Plate-12. Depth to Water Level of Study Area

B: Water Table Elevation

Water table elevation for the study area tapping shallow aquifer is shown in Plate-13. Water table elevation is in the range of less than 20m. above mean sea level (amsl) to more than 35m amsl. The water table elevation is less than 20 m amslin and around Calivim, Sarmanas and Lamkona; between 20 and 25 m amsl in and around Batwada, Dab Daba, Mayem, Mulgao, Kalapur, Shikari, Sirigao, Sarvana, Bicholim, Lamgoa, Tivim and Sirsaim; Water table elevation is between 25 and 30 m amsl in and around Corquem, Mathwada, Kumbarwada, Nanoda, Bolwada, Nachinala, Bicholim, Pilgao, Pilgao, Lamgoa, Bordam, Walsi, Pilgao; Water table elevation is between 30 and 35 m amsl in and around Assnora and Adwalpale.Ground water flow direction is following the topography.

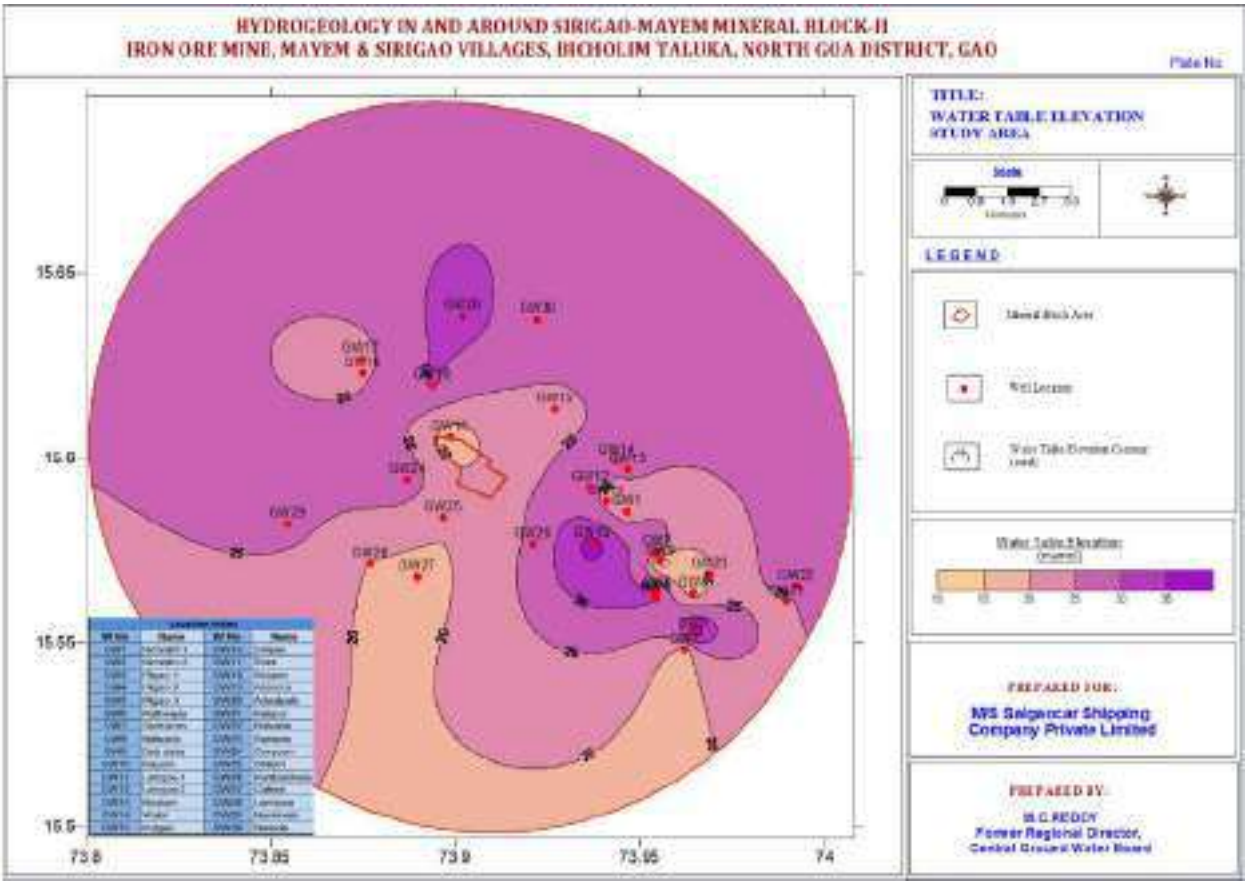


Plate-13. Water Table Elevation of sirigao-mayem Mineral Block study area

C: Ground water level trend analysis (Phreatic Aquifer)

In all 3 National Hydrograph stations maintained by Central Ground Water Board is considered for the analysis. Long-term trends for Pre-monsoon, Post monsoon and all seasons were attempted. Rise in water level is recorded at two hydrograph stations and Fall in water levels were recorded at three hydrograph stations. Details of water levels for trend analysis attempted for the 10 years period is given in **Table-9-11** and the hydrographs are presented in **Fig 5 – Fig 13**.

Ground water trend analysis attempted for the 10 years period. Water level data of national network of hydrograph stations of CGWB (dugwells monitoring station)atAdavapal, MulgaonShivalkherwad and Sal, of Bicholim Taluk, Goa State

Table-9. Water Level Data for the 10 years period of national network of hydrograph stations of CGWB (DUGWELLS)

Water level data of national network of hydrograph station at Adavapal, Bicholim Taluk, Goa				
Year	Jan	May	Aug	Nov
2011	-	-	-	-
2012	-	-	-	-
2013	-	6.4	4.3	4.09
2014	-	5.64	4.41	-
2015	-	-	5.1	5.51
2016	5.57	5.78	4.51	5.46
2017	5.39	5.99	4.29	3.39
2018	5.55	5.46	4.53	4.45
2019	5.53	5.25	4.29	3.67
2020	3.79	-	-	5.08
2021	4.89			
Source: https://indiawris.gov.in/				

Table-10. Water Level Data for the 10 years period of national network of hydrograph stations of CGWB

Water level data of national network of hydrograph station at Mulgaon Shivalkherwad, Bicholim Taluk, Goa				
Year	Jan	May	Aug	Nov
2011	3.29	3.74	1.08	2.21
2012	4.3	2.66	-	3.89
2013	4.12	2.93	0.93	2.98
2014	1.91	0.8	0.21	2.22
2015	3.48	3.13	2.53	2.8
2016	-	2.89	2.36	2.95
2017	-	2.62	-	2.93
2018	3.36	3.1	1.97	-
2019	3.55	3.64	-	2.55
2020	2.74	-	-	2.82
2021	2.82			

Table-11. Water Level Data for the 10 years period of national network of hydrograph stations of CGWB

Water level data of national network of hydrograph station at Sal, Bicholim Taluk, Goa				
Year	Jan	May	Aug	Nov
2011	3.07	3.4	1.03	2.86
2012	2.9	3.21	-	3.17
2013	2.86	3.31	0.96	2.7
2014	2.75	2.82	1.86	1.72
2015	2.72	3.17	2.25	2.41
2016	-	2.86	2.08	2.71
2017	2.91	2.63	1.41	2.91
2018	2.68	2.74	1.58	-
2019	2.56	2.57	2.11	2.29
2020	2.65	-	-	-
2021	2.53			

Fig. 5

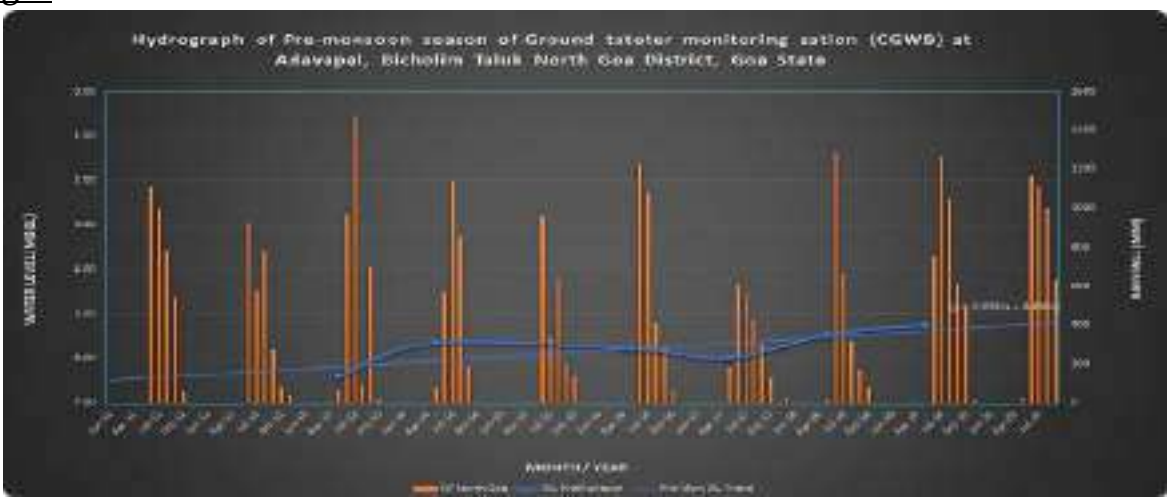


Fig. 6

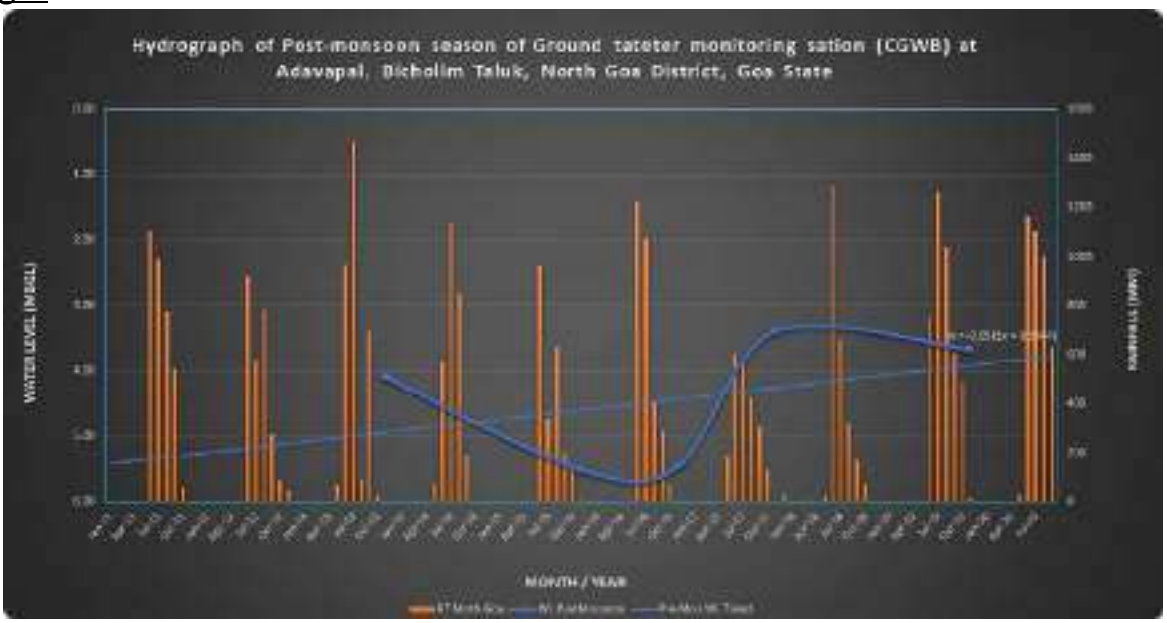


Fig. 7

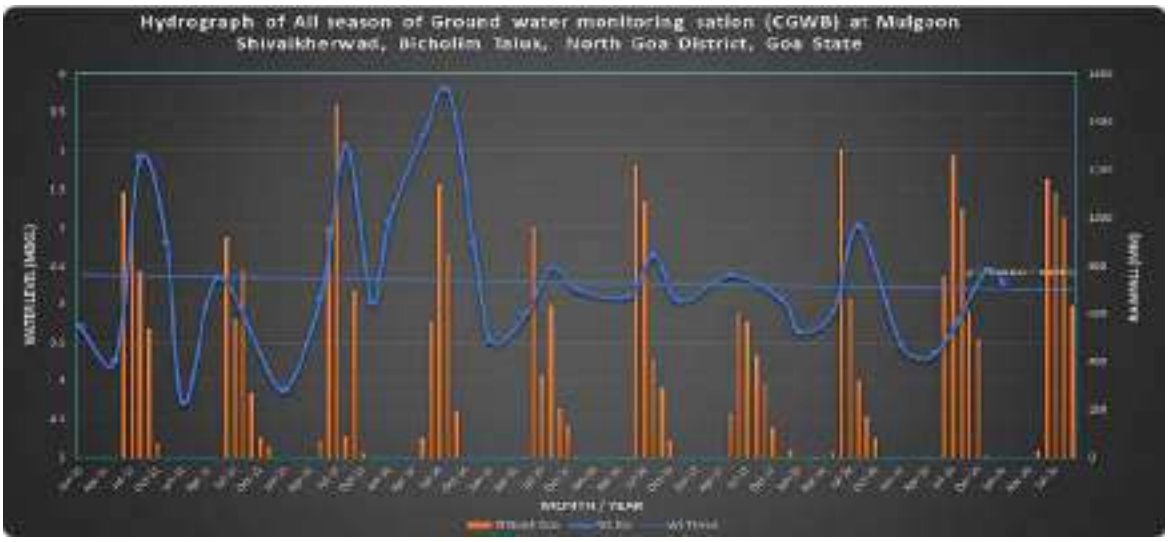


Fig. 8

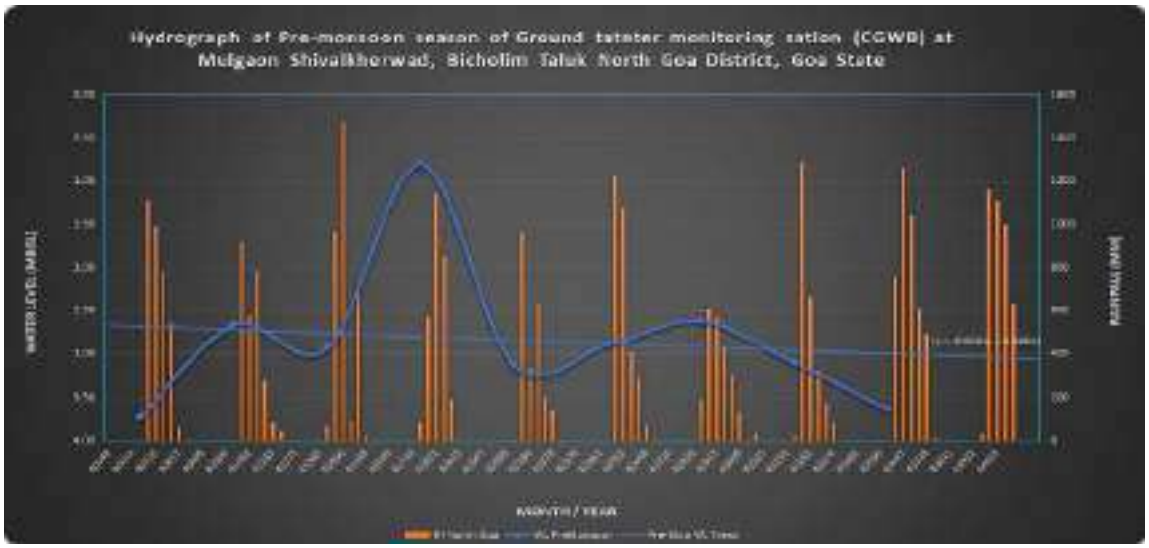


Fig. 9

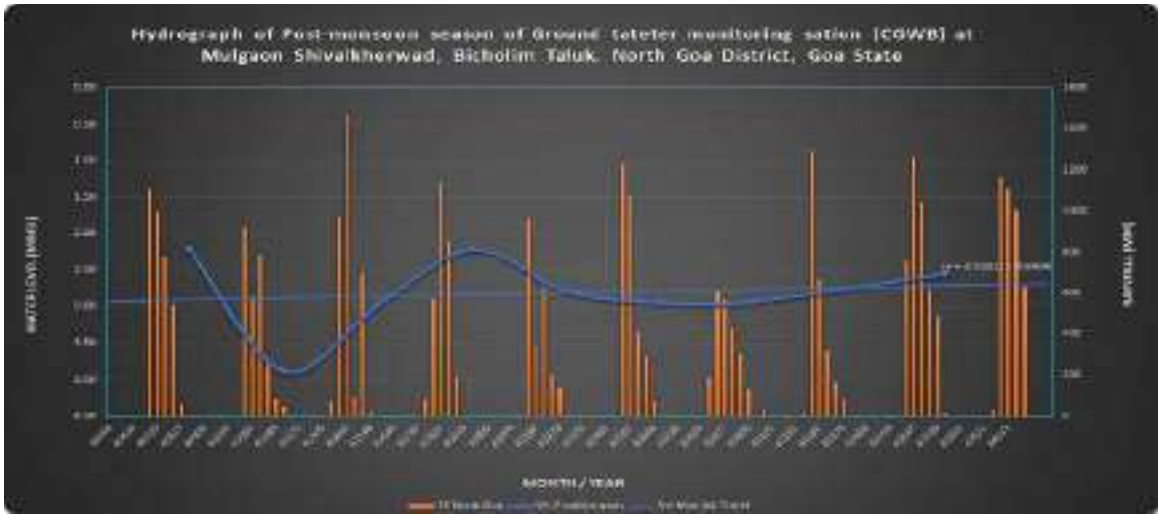


Fig. 10

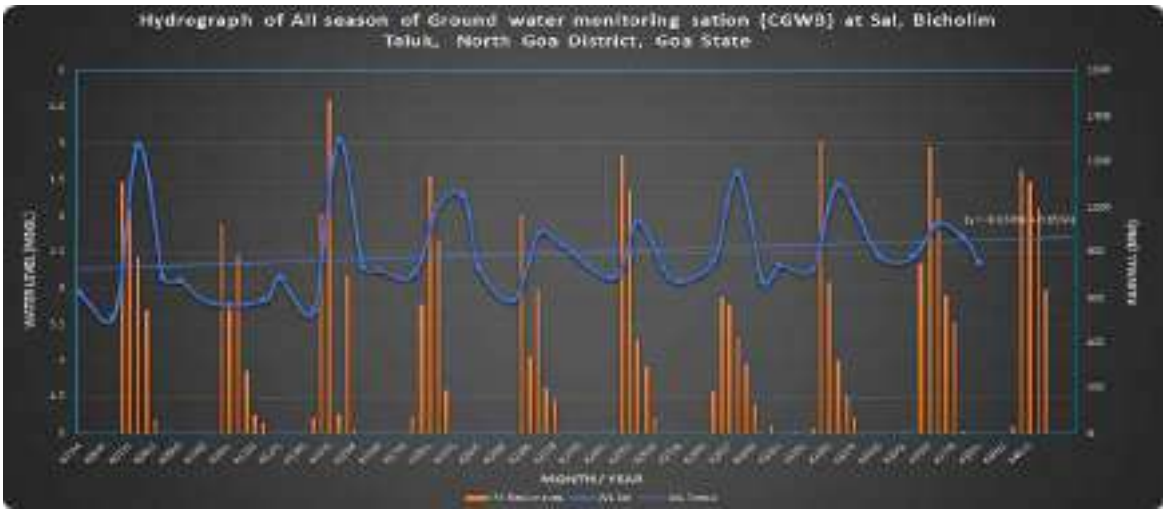


Fig. 11

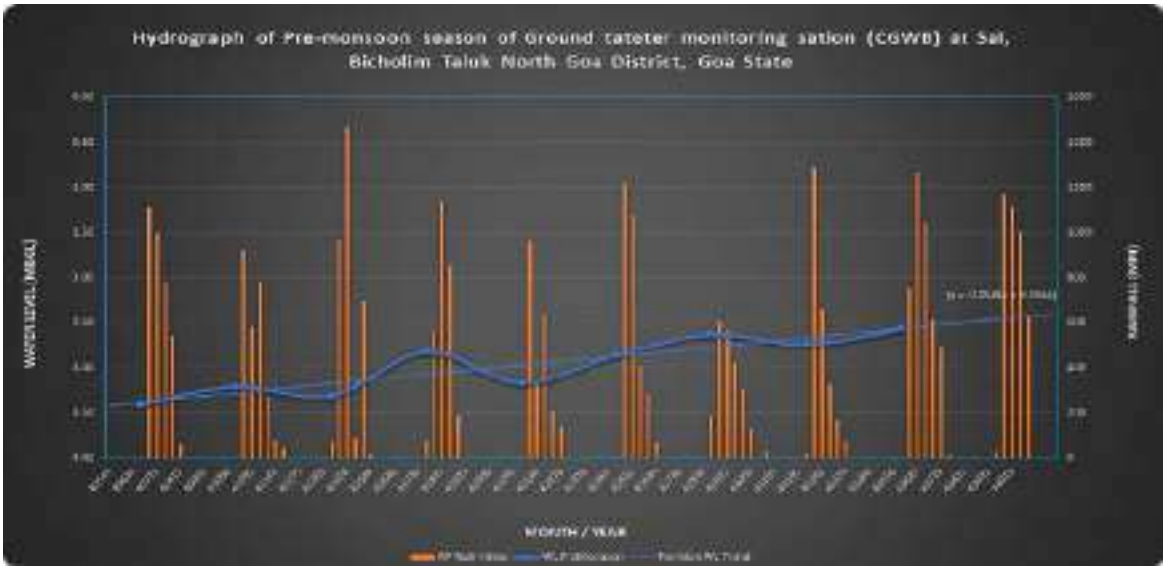


Fig. 12

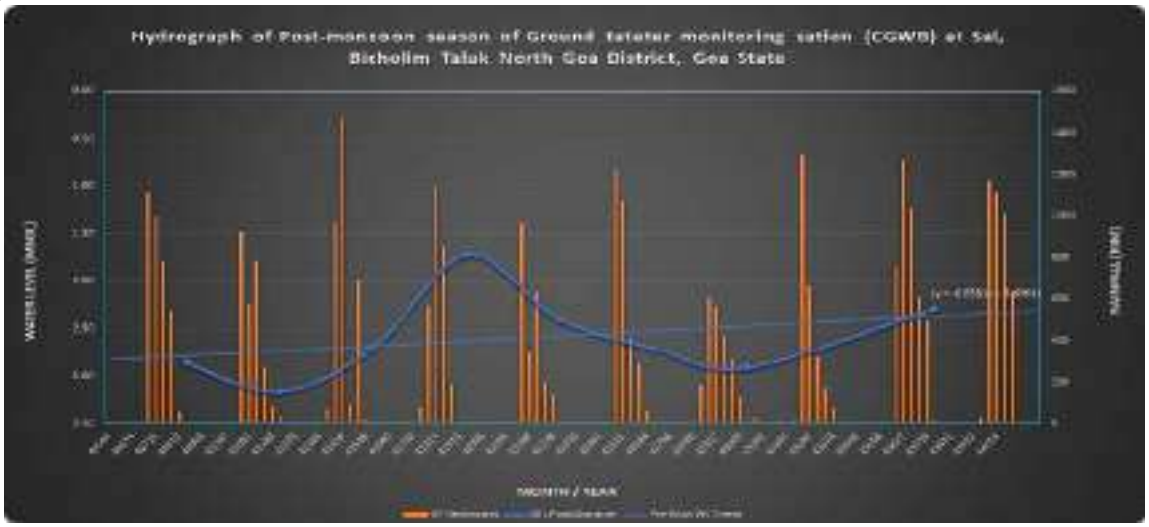


Fig. 13

D: Hydrograph for 5 years and Predicted Water Levels

Water level trend analysis carried out on data collected from 3 Ground water monitoring stations of Central Ground Water Board (CGWB). The data available with these observation wells is from 2011 to 2021 i.e., for 11 years and considered to be long enough to carry out trend analysis. All the three wells are monitoring the shallow aquifers of Bicholim taluk, which are considered to extrapolate the trend analysis results to the study area. Trend analysis is calculated for pre-monsoon and post-monsoon water level using 'linear regression' method is applied using 'Microsoft Excel trend analysis tool'. Based on current water level trend, the ground water regime is also projected for after five years and presented in Table-12 and upon which, following observations are also made:

Table-12. Water level trend analysis and 5 years projected water level

Stationwise Ground water level Trend Analysis (2011- 2021) of CGWB Stations in Bicholim Taluk, North Goa district, Goa				
Station	Ground water level Trend (m/ Year)		Projected DTW after 5 years based on present trend	
	Pre-Monsoon	Post-monsoon	Pre-Monsoon	Post-monsoon
Adavapa	0.13	0.18	4.55	2.80
Mulgaon Shivalkher	-0.04	0.03	3.25	2.58
Sal	0.11	0.06	1.88	1.98

1. The Pre-monsoon Water level trend in two stations are rising, except for the station Mulgaon Shivalkherwad where it showing declining trend of 0.04 m/year. The two stations which are showing positive trend in the range of 0.13 to 0.11 m/year in Adavapal and Sal respectively.
2. During post-monsoon season all three stations are showing rising water level trend in the range of 0.03 to 0.18 m/year.
3. The declining water level trend during pre-monsoon at Mulgaon Shivalkherwad station indicates the ground water abstraction is more, which may attribute to more irrigation practices in the region.
4. The water level trend of these three wells is projected for five years based on the present water level trend and following observations are made.

a. The water level in Adavapal and Sal monitoring continue to rise in both the seasons, indicating the ground water development in non-monsoon and monsoon seasons is less and the regime in this area is undisturbed.

b. The pre-monsoon projected water level observed around five meters in Adavapal and around two meters in Sal. The declining trend station Mulgaon Shivalkherwad the projected water levels is 3.25m and which is not so alarming.

c. The post-monsoon projected water level is around two to three meters in all the stations indicating the expected waterlogging conditions in these areas may be after few years.

2: Deeper Semi-Confined to Confined Aquifer which extending from 25m to about 100m dominated by clay intercalation with less drilling discharge.

A: The Sub Surface Geological Formation And Hydrogeological Scenario Of Deeper Semi Confined To Confined Aquifers Around The Mining Block

The proposed mining activities are at deeper levels. Hence, the aquifer disposition and lithological configurations where the maximum mining activities are taking place is of utmost importance to assess the impact of mining on ground water regime. To know the sub surface configuration of geological setting and aquifer characteristics of the area around the mining blocks, the basic data report of the exploratory bore hole/piezometers at Mayem constructed by CGWB (drilled under the Hydrology Project-II) in Bicholim taluk of North Goa district for monitoring the groundwater level examined

B: GENERAL FEATURES.

Mayem village is located South West of Bicholim at a distance of about 8 kms. The village lies at the latitude 15^0 34'40" and longitude $73^0$55'05" falling in survey of India toposheet number 48E/14.The site is located in the premises of government Primary School ,Mayem.

C: GEOLOGICAL DATA

The area is underlain by Bicholim formation of Goa Super Group. The Bicholim formation overlies the Sanvordem formation conformably and it includes quartz-

chlorite-amphibole schist, ferruginous pink phyllite, manganiferous chert breccias and banded ferruginous quartzite. The quartz-chlorite-amphibole schist is light to dark green in color, fine to medium grained, schistose and contains quartz, chlorite and magnetite. These rocks covered by a mantle of laterite. The ground water occurs in laterite, weathered zones, jointed and fractured.

D: LITHOLOGY

During the drilling, the drill cutting samples were collected after every meter of drilling. The samples collected were dried and stored in labelled sample bags and were examined for the preparation of lithological log and presented in below.

Lithological log of Mayem bore well

Sr.No	Depth (m)	Lithology
1	0-22	Laterite reddish brown colour mixed with clay
2	22-34	Lateritic gravel,reddishbrowncolour,gravel size 2-3mm
3	34-40	Manganes Clay black in colour
4	40-45	Quartz gravel white in colour, gravel size 2-3mm
5	45-67	ManganesClay black in colour
6	67-75	Quartz gravel white in colour, with sand
7	75-87.40	Sand with clay

E: WELL CONSTRUCTION:

The well assembly was recommended on the basis of litholog and the detail well assembly is given in below:

Details of well assembly of bore well at Mayem, North Goa district

Depth (m)		***Length of pipe (m)***	**Diameter (inches)**	**Description**
From	**To**			
0	0.60 agl	0.6	4	Blank PVC pipe
0.60	23.40 bgl	22.80	4	Blank PVC pipe
23.40	26.40 bgl	3.0	4	Slotted PVC pipe
26.40	41.40 bgl	15.0	4	Blank PVC pipe
41.40	44.40 bgl	3.0	4	Slotted PVC pipe
44.40	62.40 bgl	18.0	4	Blank PVC pipe
62.40	65.40bgl	3.0	4	Slotted PVC pipe
65.40	83.40bgl	18.0	4	Blank PVC pipe
83.40	86.40 bgl	3.0	4	Slotted PVC pipe
86.40	87.40 bgl	1.00	4	Blank PVC pipe& Bail Plug

F: HYDROGEOLOGICAL DATA:

1. Static Water Levels: Depth to Water of bore well was 6.40mbgl a
2. Discharge: The discharge during development was 0.40 lps.

G: WELL HYDRAULICS:

No Pumping test was conducted at the time of constructing the piezometer due to low discharge. **A perusal of the lithology and the well assembly clearly shows that out of 87.40 meter zone drilled, the well-constructed portion by providing slotted pipe is only16 meter and the remaining thickness of 71.4 m of formation is made of impermeable loose clayey materials devoid of aquifer and they act as aquicludes . Even the 16 m aquifer zone tapped yields only 0.40 liter per second(LPS), which clearly shows that Aquifer is less potential and mining does not result in any adverse impact on the ground water regime.**

Chemical quality parameters of Ground water from bore hole at Mayem Vilage, Bicholim Taluk, Goa, is given below:

pH	EC µS/cm at 25°	Concentration in mg/l											
		TDS	C03	HC03	CI $^{-}$	N0$_3$	S0$_4$	F -	Ca $^{++}$	Mg $^{++}$	TH	Na $^{+}$	K $^{+}$
7.0	190	122	0	43	28	1	16	0.16	16	2.4	50	17	5.1

Chemical Quality result of deeper aquifer shows that all parameters are within the permissible limit of potable standards as per BIS.

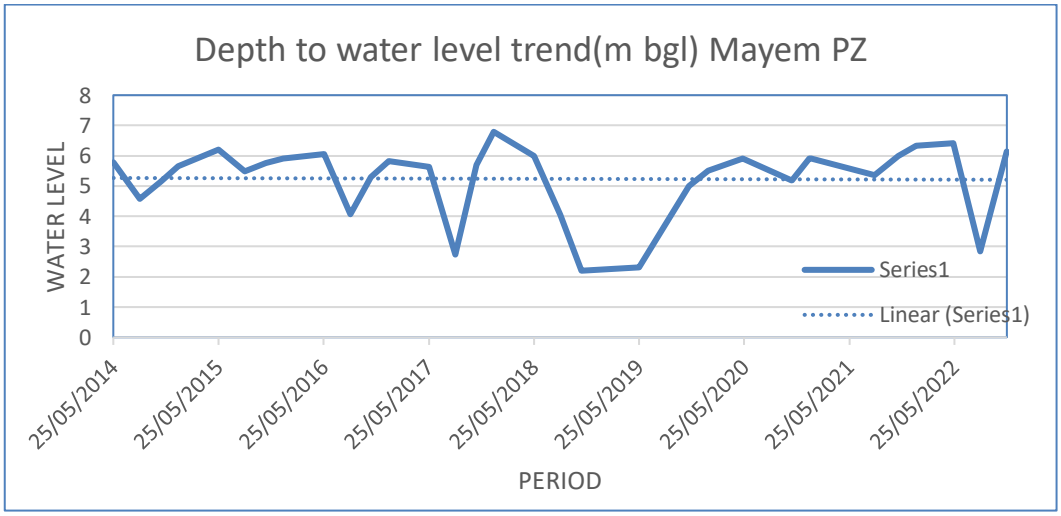
5.5 LONG TERM TREND IN PIEZOMETRIC SURFACE

To know the long term trend in Ground water level (Piezometric surface) of the deeper aquifer, the water level monitored from the piezometer at Mayem by CGWB is collected for a decade and presented below.

Long term water level recorded at Piezometer Mayem						
District	**Tahsil / Taluk**	**Village**	**Latitude**	**Longitude**	**Date**	**DEPTH TO Water Level(MBGL)**
North Goa	Bicholim	Mayam	15.344	78.505	25-05-2014	5.77
North Goa	Bicholim	Mayam	15.344	78.505	25-08-2014	4.58
North Goa	Bicholim	Mayam	15.344	78.505	05-11-2014	5.15
North Goa	Bicholim	Mayam	15.344	78.505	05-01-2015	5.66
North Goa	Bicholim	Mayam	15.344	78.505	25-05-2015	6.2
North Goa	Bicholim	Mayam	15.344	78.505	25-08-2015	5.48
North Goa	Bicholim	Mayam	15.344	78.505	05-11-2015	5.75
North Goa	Bicholim	Mayam	15.344	78.505	05-01-2016	5.9
North Goa	Bicholim	Mayam	15.344	78.505	25-05-2016	6.05
North Goa	Bicholim	Mayam	15.344	78.505	25-08-2017	2.74
North Goa	Bicholim	Mayam	15.344	78.505	25-08-2016	4.06
North Goa	Bicholim	Mayam	15.344	78.505	25-05-2017	5.63
North Goa	Bicholim	Mayam	15.344	78.505	05-11-2017	5.7
North Goa	Bicholim	Mayam	15.344	78.505	05-01-2018	6.79
North Goa	Bicholim	Mayam	15.344	78.505	25-05-2018	6
North Goa	Bicholim	Mayam	15.344	78.505	05-11-2016	5.29
North Goa	Bicholim	Mayam	15.344	78.505	05-01-2017	5.83
North Goa	Bicholim	Mayam	15.344	78.505	25-08-2018	4.05
North Goa	Bicholim	Mayam	15.344	78.505	05-11-2018	2.2
North Goa	Bicholim	Mayam	15.344	78.505	25-05-2019	2.3
North Goa	Bicholim	Mayam	15.344	78.505	05-01-2021	5.9
North	Bicholim	Mayam	15.344	78.505	05-11-2020	5.19

Goa						
North Goa	Bicholim	Mayam	15.344	78.505	15-11-2019	5
North Goa	Bicholim	Mayam	15.344	78.505	20-01-2020	5.5
North Goa	Bicholim	Narve	15.331	78.535	20-05-2020	5.9
North Goa	Bicholim	Mayam	15.344	78.505	07-11-2020	5.19
North Goa	Bicholim	Mayam	15.344	78.505	11-01-2021	5.9
North Goa	Bicholim	Mayam	15.344	78.505	20-08-2021	5.35
North Goa	Bicholim	Mayam	15.344	78.505	11-11-2021	6
North Goa	Bicholim	Mayam	15.344	78.505	12-01-2022	6.33
North Goa	Bicholim	Mayam	15.344	78.505	21-05-2022	6.41
North Goa	Bicholim	Mayam	15.344	78.505	22-08-2022	2.84
North Goa	Bicholim	Mayam	15.344	78.505	22-11-2022	6.13

The piezometric surface trend over a decade is plotted and graph is presented below. A perusal of the trend shows that steady state trend with slight rising trend a period. Absence of falling trend is also indicates that the mining will not cause any deteriorating effects on ground water regime.



5.6. AQUIFER PERFORMANCE TEST (LONG DURATION)

To know the aquifer characteristic, long duration pumping test is conducted in a bore well at Lamgaon village near to the mining block Bicholim near the core area. The salient details of the borewell conducted pumping test along with the pump test data (Time versus draw down data are furnished below

Aquifer Performance Test Data		
1	Location	Vishwas Nagar Residents Association,Joggers Park Lamgaon, Bicholim
	Taluk & District	Bicholim Taluka, Goa
	Latitude	15.35211
	Longitude	73.56303
2	**Data of pumped well**	
	a. Measuring point	0.25mtrs AGL
	b. Method of discharge measurement	Orifice Method and volumetric method
	c. Water level measurement by	Water level recorder
3	**Details of pump setting**	
	Type of pumps	Submersible
	Hp	1.5
	Depth of pump setting	15Mtrs
	Dia of column pump	0.05 mtrs
4	Duration of pumping	8 Hrs 30 Min
5	Discharge	1.08 lps
6	Pump started on	10.00 Am
7	Pump stopped on	6.30 Pm
8	Static water level of pumped well	3.64mtrsBMp
9	Date of Testing	26/12/2023
10	Depth of borewell/zones tapped	87.40/41-44,62-65 m bgl

Pumping data

Time in Minutes	Water level Pumped well 'm' bmp	Drawdown 'm'
1	4.08	0.44
2	4.13	0.49
3	4.15	0.51
4	4.18	0.54
5	4.19	0.55
6	4.20	0.56
7	4.22	0.58
8	4.22	0.58
9	4.23	0.59
10	4.24	0.60
12	4.26	0.62
14	4.28	0.64
16	4.28	0.64
18	4.28	0.64
20	4.28	0.64
25	4.30	0.66
30	4.32	0.68
35	4.33	0.69
40	4.34	0.70
45	4.35	0.71
50	4.35	0.71
55	4.36	0.72
60	4.36	0.72
65	4.37	0.73
70	4.38	0.74
75	4.38	0.74
80	4.38	0.74
85	4.39	0.75
90	4.39	0.75
95	4.40	0.76
100	4.40	0.76
110	4.40	0.76
120	4.41	0.77
130	4.41	0.77
140	4.42	0.78
150	4.42	0.78
160	4.42	0.78
170	4.42	0.78

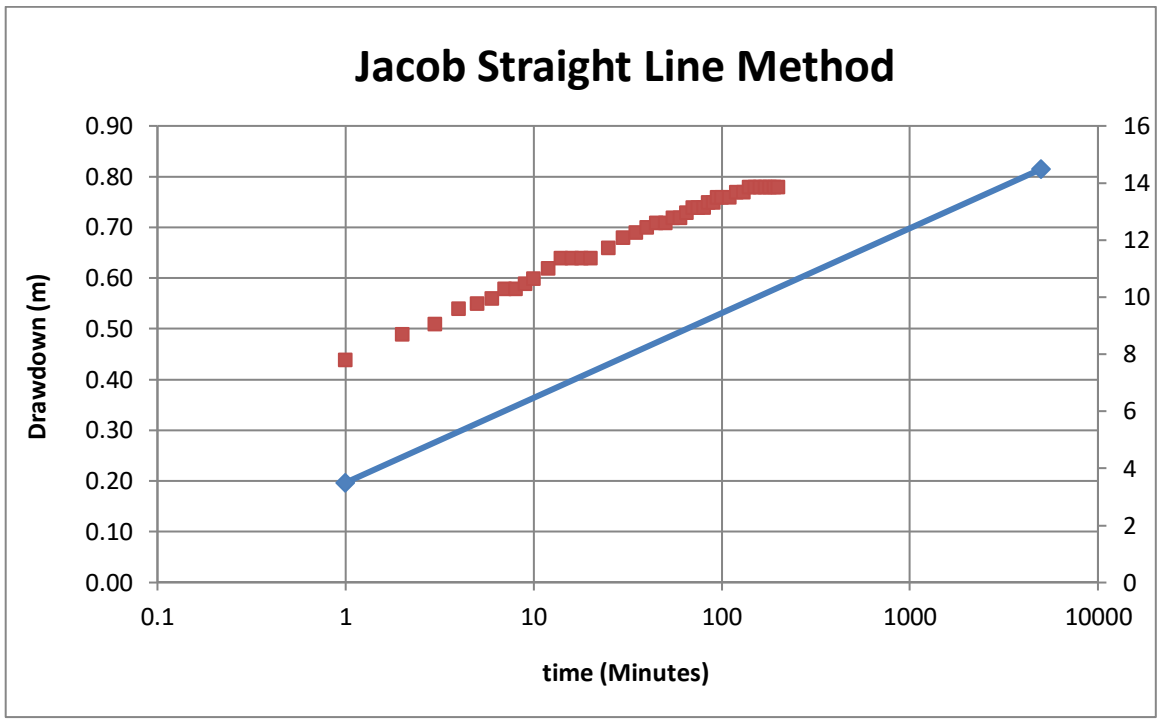
180	4.42	0.78
190	4.42	0.78
200	4.42	0.78
220	4.42	0.78
240	4.43	0.79
260	4.43	0.79
280	4.43	0.79
300	4.43	0.79
330	4.44	0.80
360	4.44	0.80
390	4.44	0.80
420	4.44	0.80
450	4.45	0.81
480	4.45	0.81
510	4.45	0.81

Recovery data

Time in Minutes Since pumping stopped 'T'	Time since Pumping started T	T/ T′	Water level Pumped well 'm' bmp	Residual drawdown 'm'
1	511	511	3.86	0.22
2	512	256	3.79	0.15
3	513	171	3.75	0.11
4	514	128.5	3.73	0.09
5	515	103	3.72	0.08
6	516	86	3.71	0.07
7	517	73.857	3.70	0.06
8	518	64.75	3.69	0.05
9	519	57.667	3.69	0.05
10	520	52	3.69	0.05
12	522	43.5	3.68	0.04
14	524	37.429	3.68	0.04
16	526	32.875	3.68	0.04
18	528	29.333	3.68	0.04
20	530	26.5	3.68	0.04
25	535	21.4	3.67	0.03
30	540	18	3.66	0.02
35	545	15.571	3.65	0.01

5.7. PUMPING TEST ANALYSIS

The time draw down data of pump test is analyzed as per the Jacob straight-line method. Delta S value obtained is 0.22-.The discharge rate is 119.23 m^3/day



Data		
Q	93.31	m3/day
	0	m

s	0.25	D'less
t0	0.066372	minutes
t0	4.61E-05	days
T	68.3	m2/day
S	NA	D'less

The transmissivity obtained as per Jacob straight line method is 68.3 m^2/day, Storage coefficient is not calculated because there is no observation well.

6. GROUND WATER RESOURCES

Water Resources Department, Government of Goa in association with Central Ground Water Board has been making all efforts to assess the quality of ground water estimation since last ten years. Of late, the ground water has gained more importance due to scarcity of surface water and frequent fluctuations in supply of water to the various consumers. Keeping this in view, the Government of Goa has enacted Goa Ground Water Regulation Act 2002; wherein various measures have been adapted to keep the control over extraction of ground water. At present the entire commercial establishment throughout Goa has been covered by computerized metering and billing.

The attempt has been made by the Department of Water Resources, Government of Goa and Central Ground Water Board, South Western Region, Bangalore to assess the resources of State of Goa as per the Ground Water Estimation Methodology 2015 on administrative unit basis. The Annual Extractable Ground Water Resources as on March 2020 in the state of Goa is 32169.66 HAM and stage of ground water extractions is 23.48%.

The average stage of ground water development in North Goa district is 24.26% with Bicholim taluk recording the lowest stage of development of 13.01%, while Bardez taluk recording the highest stage of development of 32.81%.

In respect of south Goa district, the average stage of development is 21.49% with Cancona taluk recording the lowest stage of development of 8%, while Marmagao taluk has recorded the highest stage of development of 40.07%. The overall stage of ground water development in the state of Goa is 23.48% and all the taluks are falling under safe category.

The salient features of the groundwater resources of the state during 2020 as compared to that in 2017 is presented below:

Particulars	As on 2017	As on 2020
Annual Extractable Ground Water Resources (HAM)	16033	32169.66
Existing Ground water Extraction for Irrigation (HAM)	2058	2425.14
Existing Ground water Extraction for domestic and Industrial water supply (HAM)	3314	5129.58
Existing Ground water Extraction for all uses (HAM)	5371	7554.75
Provision for domestic and industrial requirement supply for 2025	3669	5168.79
Net annual ground water availability for future irrigation development (HAM)	6993	24190.33
Stage of Ground water Extraction (%)	34	23.48
Category	Safe	Safe

Since the methodology is also dynamic with provision for improvement and refinements based on field data, the same has been applied in respect of Goa State. The major refinements are in the assessment of net groundwater availability, Groundwater draft and in the provision for domestic and industrial requirements as explained in the preceding chapters. The stage of development has changed from 34 to 23.48%. During 2020 assessment all the 12 taluka were categorized under Safe Category.

6.1 Ground Water Fluctuations

Taluk wise categorisation of water level fluctuation (Decadal mean 2012-2021 & Jan 2022)

S.No	Taluk Name	No of wells analysed	Rise_Range of Fluctuation (m)						Fall_Range of Fluctuation (m)					
			0-2m		2-4m		>4m		0-2m		2-4m		>4m	
			No of wells	%	No of wells	%	No of wells	%	No of wells	%	No of wells	%	No of wells	%
1	Bardez	12	2	16.7	0	0	0	0	8	66.7	1	8.3	1	8.3
2	Bicholim	7	0	0	0	0	0	0	4	57.1	2	28.6	1	14.3
3	Tiswadi	4	0	0	0	0	0	0	4	100	0	0	0	0
	Total	23	2	9	0	0	0	0	16	70	3	13	2	9

Source CGWA Goa

In study area taluka CGWA Monitored 23 wells out of which 2wells (9%) have are corded rise in water level and 21 wells(91%)have fall in waterlevel during January 2012 to 2022. Rise of water level in the range 0 to 2m is observed in 16 wells accounting for 69.8%of the analyzed wells. Rise in water level in the range of 2 to 4m and >4 m is recorded in 3 wells and 2 wells respectively.

6.2 Water quality

Water samples were collected from thirty abstraction structures representing the shallow aquifers (Open wells)in buffer area. The water samples collected were analyzed at Accredited Laboratory. The details of the various constituents prevailing in the area are given in **Table-8**. Water quality in general is safe and potable in all the sites and is within the maximum permissible limits of the Bureau of Indian Standards (BIS). Fluoride, Nitrate, Total dissolved solids, Chloride and Iron are within the maximum permissible limits as per Bureau of Indian Standards (BIS). pH is less than desirable limit varying from 5.73 to 6.07 at Kalapur, Bolwada and Shikar villages. pH is more than the permissible limits of 8.95 at Dab Daba village. **Electrical conductivity, Chlorides** distribution, Nitrate and Fluoride concentration in the study area is shown in **Plate-14**, **Plate-15**, **Plate-16 and Plate-17.**

i. **Electrical conductivity (EC)**

Distribution of Electrical Conductivity in the core and buffer area ranges from less than 250 to more than 350 micro mhos / cm are within the fresh water standards and is potable in all the sites.ElectricalConductancefromdistribution is shown in **Plate-12.**

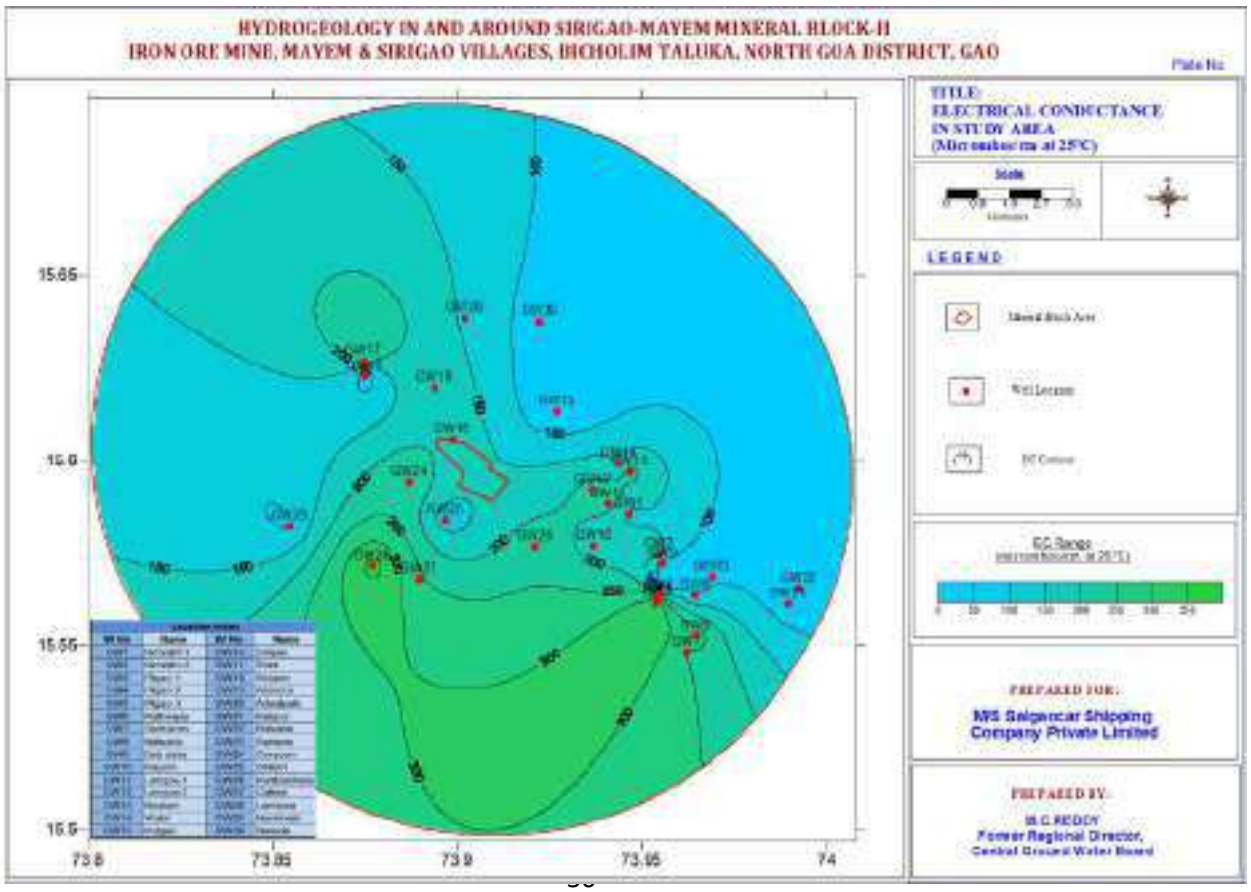


Plate-14. Electrical Conductance

ii.Chlorides

Chloride distribution in the study area and ranges from 10 ppm to 18 ppm and is within the permissible limits prescribed by BIS Standards for drinking water. Chlorides in the Project area and 10 kms radius is shown in **Plate-13.**

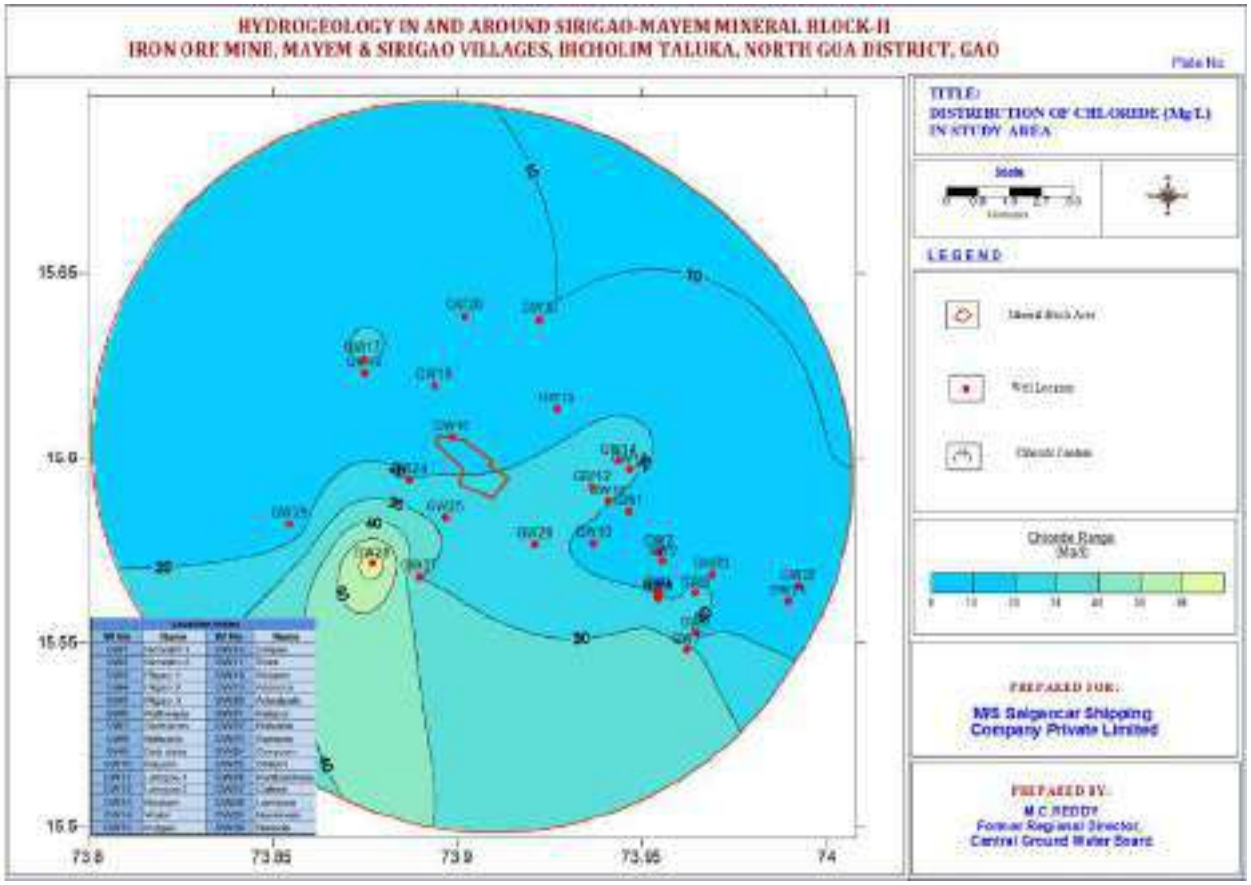


Plate-15. Chlorides Contour Map of Study Area

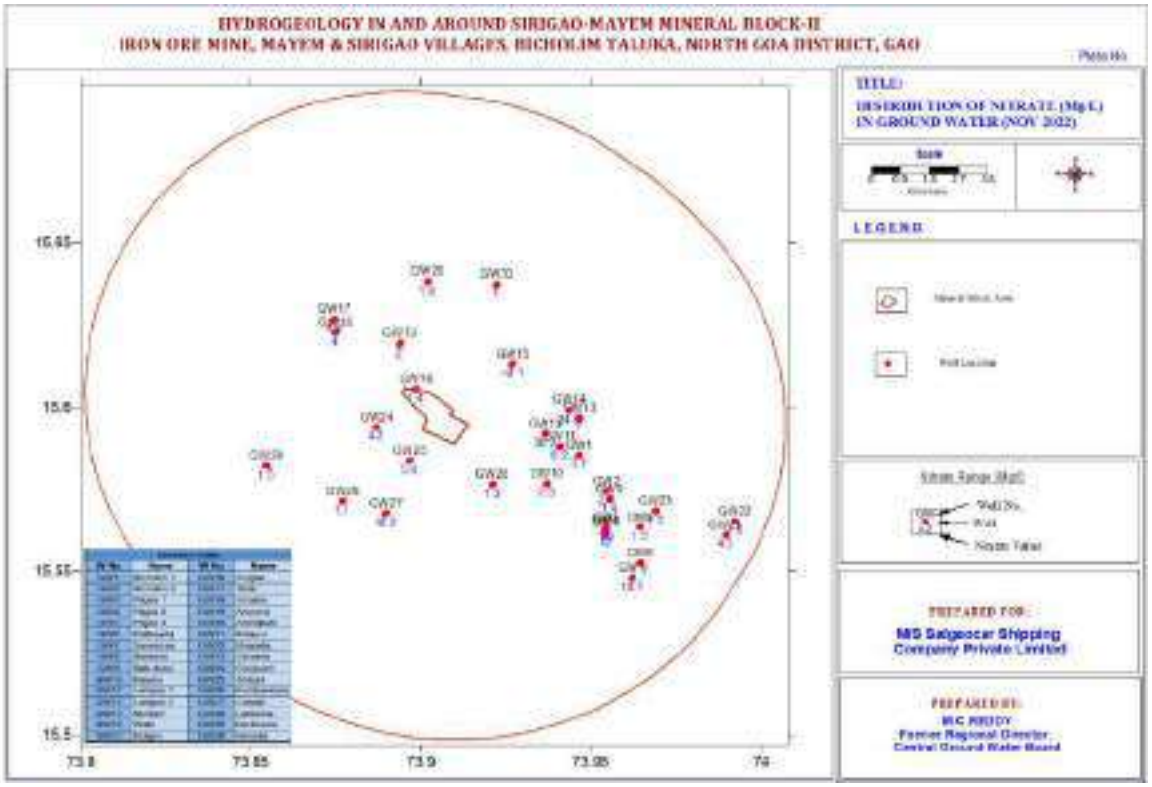


Plate-16. Nitrate concentration in Study Area

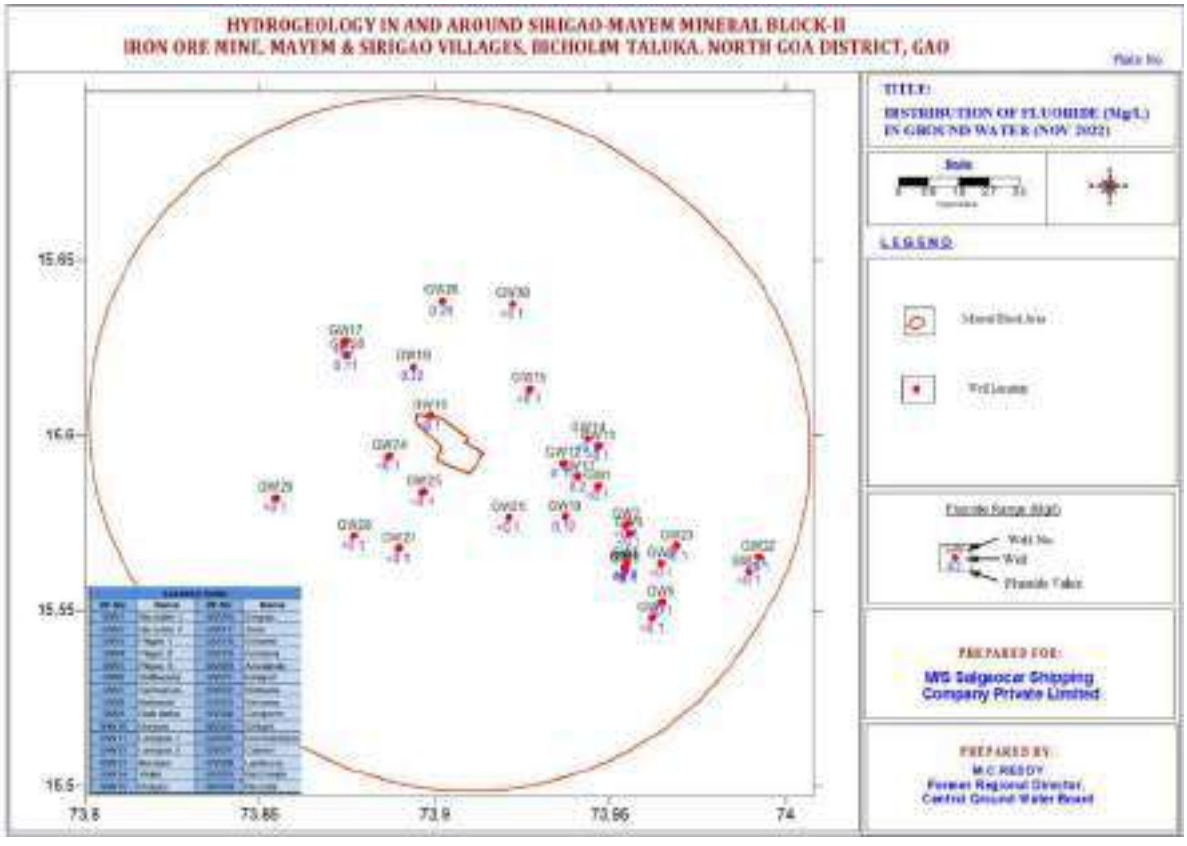


Plate-17. Fluoride concentration in Study Area

6.3 BIS Standards

The suitability of water with reference to the BIS standards vis-à-vis desirable limits and maximum permissible limits in respect of phreatic and deep aquifers are shown in **Fig. 14 to Fig 25**.

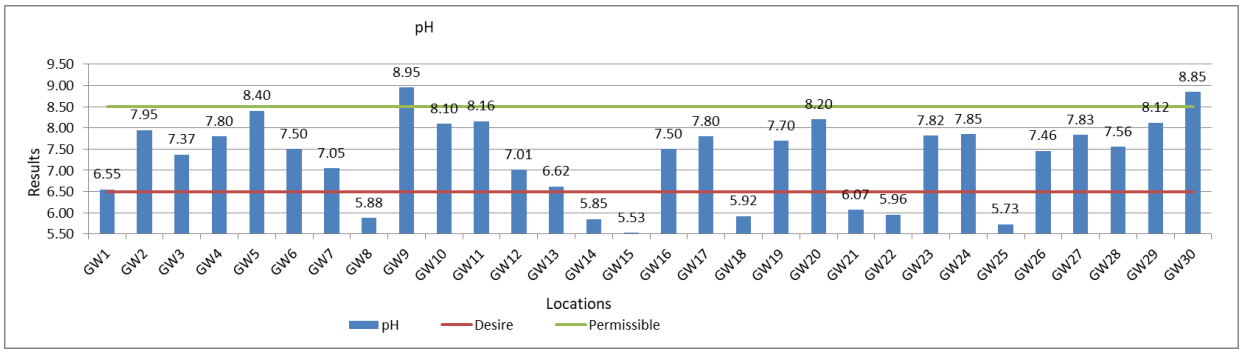


Fig.14

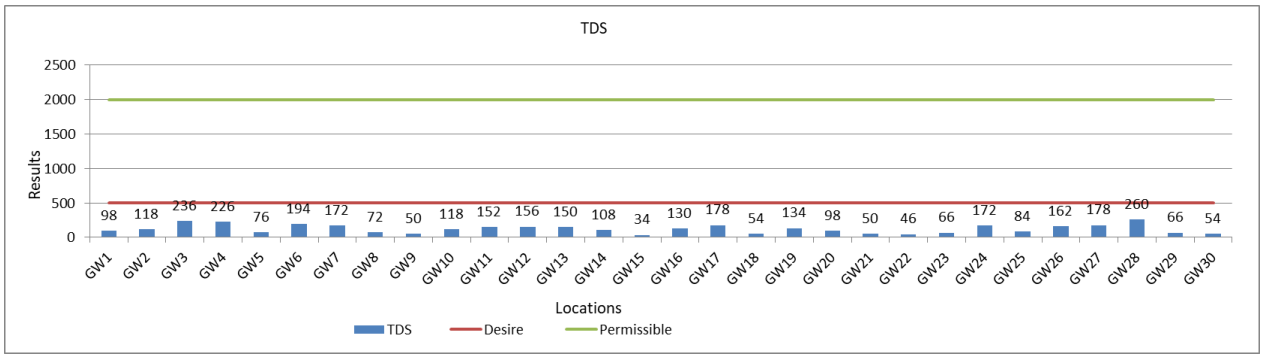


Fig.15

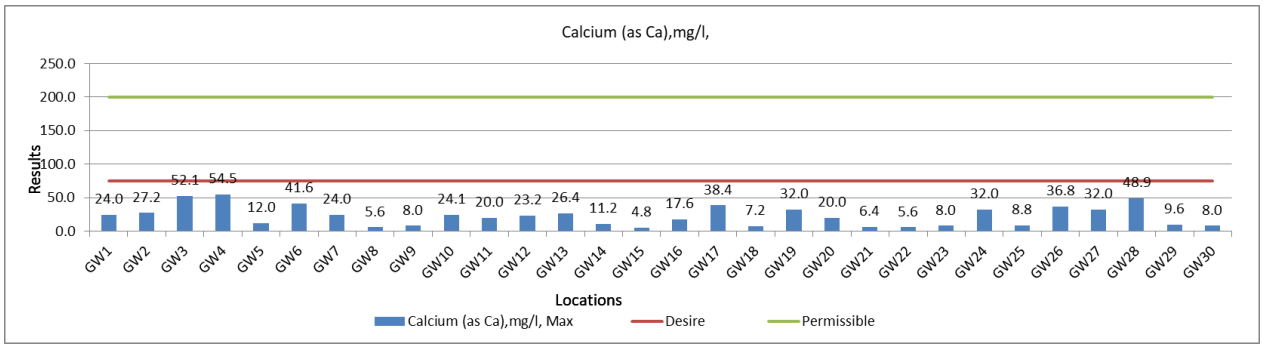


Fig.16

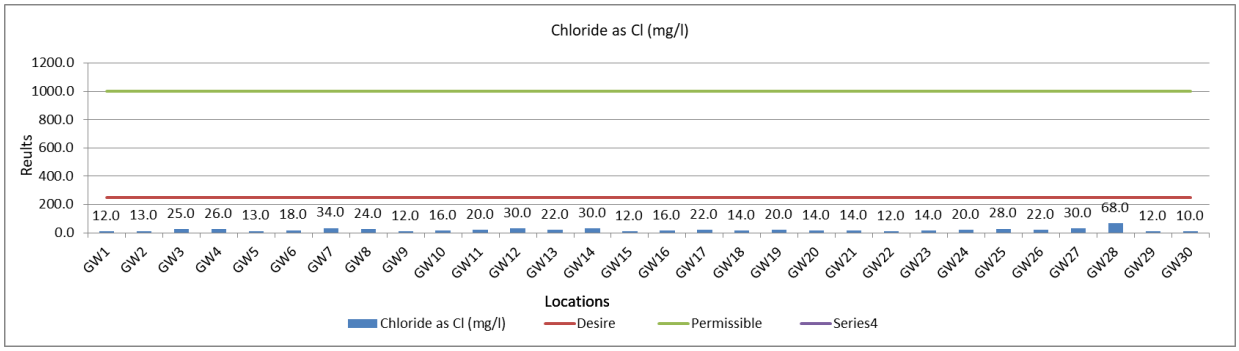


Fig.17

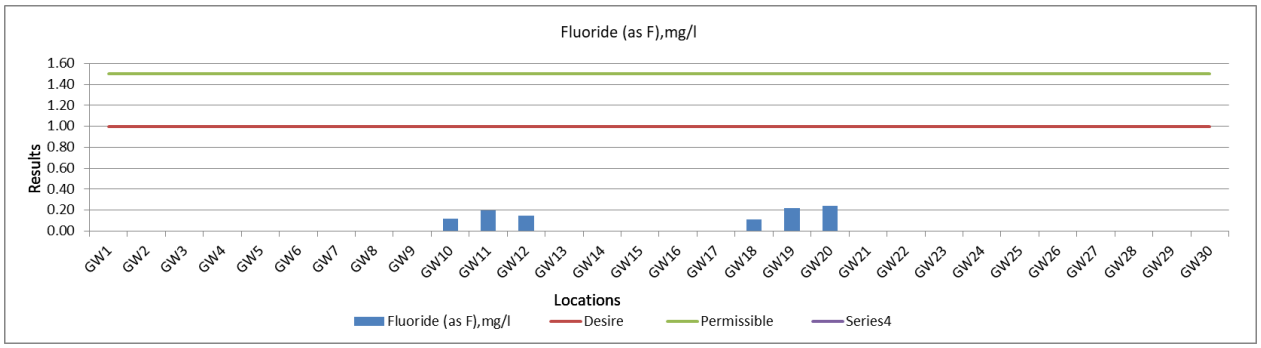


Fig.18

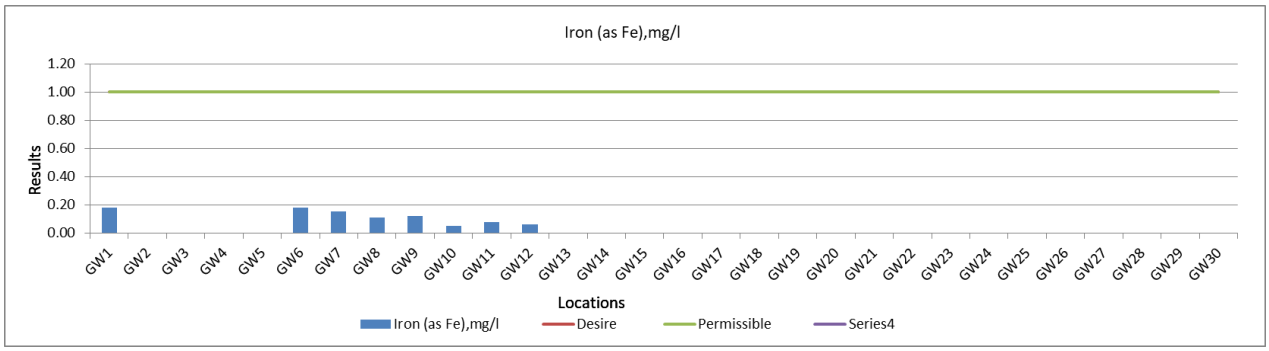


Fig.19

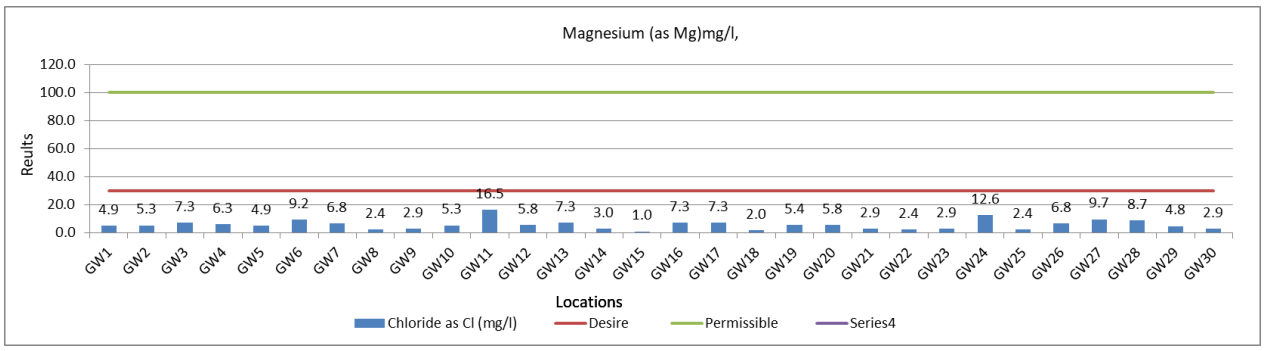


Fig.20

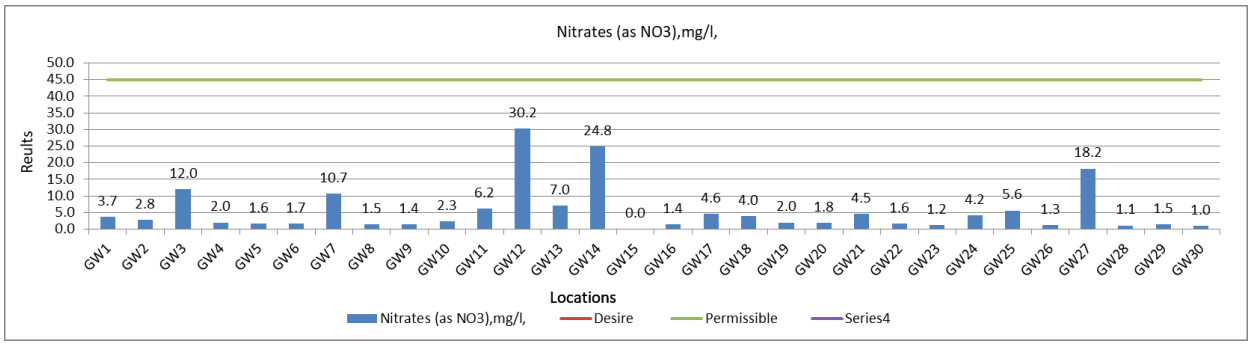


Fig.21

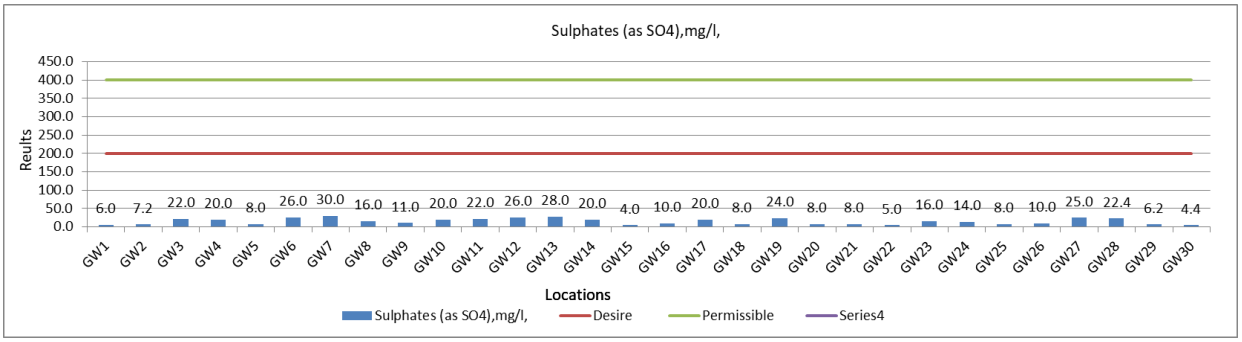


Fig.22

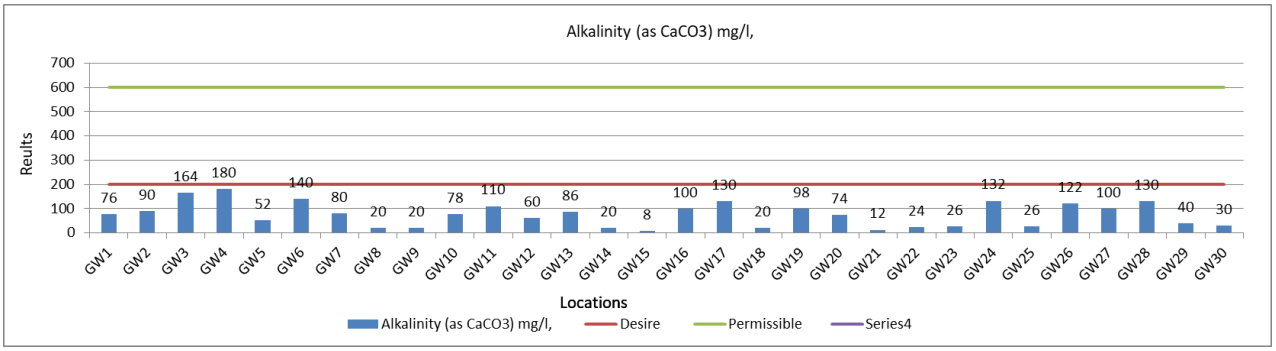


Fig.23

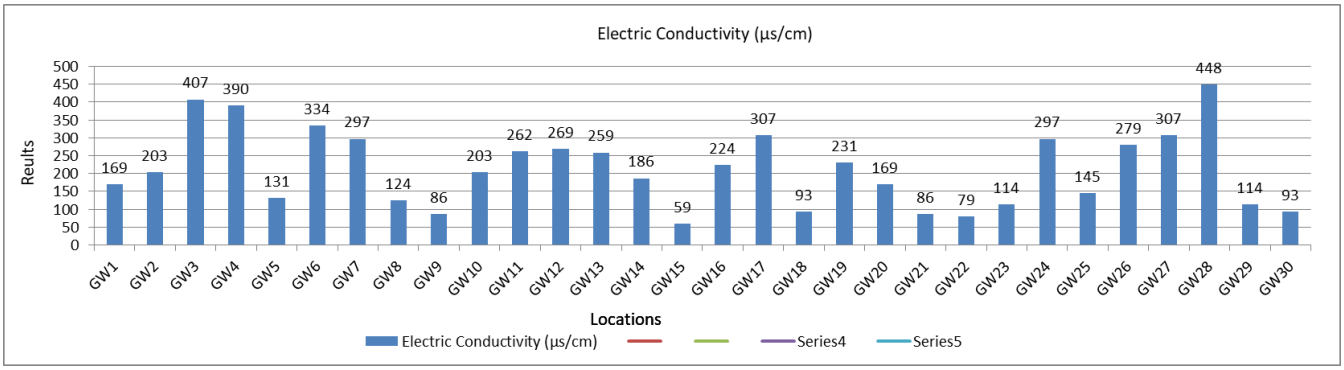


Fig. 24

PREPARED BY: M.C. Reddy, Former Regional Director, Central Ground Water Board,
Accredited by NABET for Geology & Hydrogeology and CGWA. mcreddycgwb@yahoo.co.in

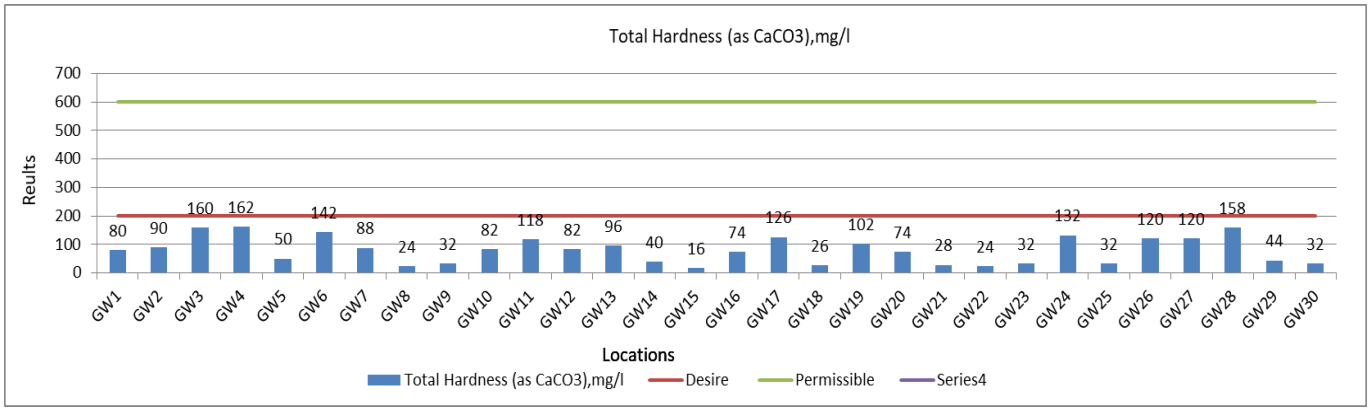


Fig.25

6.4 Observation Wells for monitoring ground water levels in the study area

Based on the inventory of abstraction structures, established seven network of existing open wells in buffer area for monitoring water levels on monthly basis and water quality monitoring once in a year, during Pre-monsoon,(first week of May). Details of the well location are given in **Table-13.** Data is to be submitted to the Water Resources Department, Goa and Regional Director, Central Ground Water Board, South Western Region, Bangalore.

Table-13: Established Network of existing wells in and around Sirigao-Mayem Mineral for monitoring Water Levels and Water Quality

Code No.	Locations	latitude			longitude		
		D	M	S	D	M	S
GW1	Bicholim	15	35	8	73	56	47.6
GW10	Mayem Open Well	15	34	36.4	73	56	13.6
GW11	Lamgao	15	35	17.6	73	56	27.3
GW16	Sirigao Open Well	15	36	20.6	73	53	55.1
GW17	Tivim	15	37	36.8	73	52	28.6
GW24	Corquem	15	35	39	73	53	13.3
GW27	Calivim	15	34	3.9	73	53	23.4

6.5 Water Budget

The water requirement for Sirigao-Mayem Mineral Block is 221m ^{3} / day, intends to collect from the rainwater harvesting pits within the mineral block area. The water requirements are essentially for various activities such as green belt, dust suppression and mine maintenance. The Project proponentplans to conserve rain waterby diverting all the rain water falling within the broken up area to the mine pit. For domestic consumption water will be sourced from private wells adjacent to the mineral block. As per Ground Estimation Committee (GEC) norms of year 2020, Ground Water Department, Government of Goa and Central Ground Water Board, Government of India has categorized Sirigao-Mayem Mineral Block located in Sirigao&mayemvillges of Bicholim Taluk, N Goa is categorized as "SAFE" category in ground water development. The details of the water requirements and utilization plan are given below.

6.6 Projected Water Requirements and utilization plan

I. Water Requirement:

Purpose	QTY (KLD)	Source
Dust Suppression	200	Rain water harvested in mine pit
Green Belt	10	
Vehicle Washing	10	
Domestic	1	Open Well water from buffer zone villages
Total	221	

II. Rainfall Run-off Management (Proposed)

Total Mining Lease area : 1712472sq m 171.2472 Ha

Vegetated / Green area : 469300 Sqm

Township Area : 114000 Sq m (not required)

Railways : 77300 Sq m (not required)

Open area : 1051872Sq m

Avg. rainfall of the study area : 3500 mm

Run off coefficient for greenbelt is: 0.15

Run off coefficient for Open Area is: 0.3

RWH (Green area)	:2,46,382.5 m ³ / annum
	: 675 m ³ / day
RWH (Open area)	: 11,04,465.6 m ³ / annum
	: 3,026 m ³ / day
Total available water (A)	**: 3701 m ³ / day**

III. Use of Water

i.	Domestic Use	: 1 m ³ / day (open Well Water)
ii.	Greenbelt development	: 10 m ³ / day
iii.	Dust Suppression	: 200 m ³ / day
iv.	Wheel Washing	: 10 m ³ / day
	Total (B)	: 221 **m ³ / day**

IV. Recharge to groundwater (A-B) :3481 m ³ / day

V. Total Recharge to Ground Water

i.	Return flow from applied greenbelt	: 5 m ³ / day
ii.	Return flow from dust suppression	: 100 m ³ / day
iii.	Water available for recharge to ground water body	: 105 m ³ / day
	Total	: **3586 m ³ / day**

VI. Proposed to withdraw ground water :1 m ³ / day

The ground water of 1m ³ / day for domestic use for staff. Rainwater harvesting and recharge to the ground water body through conservation structures like Check dams, Gulley plugs, Toe wall, Garland drains, Trenches, and Percolation tanks have been constructed in the mineral block area. Every year the conservation structures will be well maintained. Withdrawal of accumulated rainwater in the mine pit of Block-II Sirigao-Mayem Mineral Block, Sirigao&Mayem Villages of Bicholim Taluka of North Goa District, Goa will not create any impact on Ground Water body in the core and buffer area.

7. COMPREHENSIVE ASSESSMENT OF THE IMPACT ON GROUND WATER, RISKS AND MANAGEMENT STRATEGY.

7.1 Impact on ground water sources

The ground water extraction in the Mining Lease area is negligible and hence no adverse impact is created due to the mining activities. The project area falls under Bicholim Taluk, North Goa District, Goais categorised as SAFE in Ground Water extraction point of view. The stage of Ground Water Development is 23.48% in the year 2020.

7.2 Impact on Ground Water

Since the proposed mining activities are at deeper level, the Lithological variations and aquifer configurations at deeper levels are thoroughly investigated and detailed above in the sub head '**The sub surface geological formation and hydrogeological scenario of deeper semi confined to confined aquifers around the mining block' above** which clearly establish that the aquifer potential/yield of bore wells/ are very less and deeper geological formation are dominated by clayey formations which are impermeable and **aquicludes** which scientifically prove that mining activities will not have any adverse impact on ground water regime.

The Lessee proposes to actively implement rainwater harvesting activities to recharge the ground water body through the percolation tanks and other conservation structures. There are no major rivers/streams in the project site. No adverse impact on the groundwater will be observeddue to drawl of harvested rainwater from the Mine pit in the core area. The core and buffer area of Sirigao-Mayem mineral Block area is categorized as **SAFE**inrespect of ground water development and management. The water Quality Analysis from the accredited laboratory has shown all the parameters are well within the maximum permissible limits of the BIS for drinking water.

7.3 Likely Impacts – because of any past Ground water abstraction

The ground water extraction in the project area is negligible and hence no adverse impact is likely to be created. The proponent monitors established observation wells

for water level and water quality. The data will be regularly sent to the Goa Ground Water Department and Central Ground Water Board, Bangalore. The proponent undertakes to take immediate remedial measures if any adverse effects are noticed

7.4 Dependency on source of water

The Buffer area consists of many lower order streams & nallahs. Most of the water is sourced from Ground water resources. Villages located in the buffer area are dependent on availability of surface water through tanks located locally for the household chores and Ground water from community open wells or rural water supply schemes. The agriculture is dependent on monsoon for the seasonal crops like Rice & etc.

7.5 Ground water users

Ground water in the buffer area is mainly used for domestic purpose and to a lesser extent for irrigation through bore wells.

8. PROPOSED MEASURE FOR DISPOSAL OF WASTE WATER BY INDUSTRIES DRAWING SALINE WATER

The Mining project is not extracting any saline water and hence no measures are in practice.

9. MEASURES TO BE ADOPTED FOR WATER CONSERVATION

Existing Ground Water Recharge Measures

The proposed project is planning to implement various conservation measures to recharge to ground water body and to meet the water requirement The proposal to implement rainwater conservation in Sirigao-Mayem mineral Block area is as follows:

1. The surface rainwater within mining lease (broken up area) is proposed to be channelized into mining pit through a network of trenches. The collected water in the mine pit will act as water harvesting measure thereby recharging the groundwater table through percolation.
2. The overburden dumps will be terraced and the rainwater shall be channelized through garland drains and trenches into the mine pit.
3. The laterite boulder wall is constructed at the toe of the dump to control erosion in monsoon.

Poira Pit

SETTLING POND

Water in monsoon is channelized into the settling ponds. In our mineral block we have total 32 settling ponds including mining pit which acts as settling pond in monsoon. These settling ponds are desilted every year and capacity of each settling pond is surveyed prior to monsoon.

OVERFLOW ARRANGEMENTS TO SETTLING PONDS

Water is allowed to settle in the settling pond and only clean overflow then enters next settling pond through overflow arrangements. Proper overflow arrangements are provided to all the settling ponds

FILTER BEDS

PREPARED BY: M.C. Reddy, Former Regional Director, Central Ground Water Board,
Accredited by NABET for Geology & Hydrogeology and CGWA. mcreddycgwb@yahoo.co.in

SURFACE WATER QUALITY/MINES DISCHARGE POINT

- Water is properly treated within mining lease area and only clean water is discharged out
- Truck speed is controlled and administered by Director of Mines & Geology via mega-software
- Wheel wash system is installed at all mine exits to reduce the dust emission due to truck movement.
- Road Sweeping machines are used to collect the dust from the transport roads, which further control the emissions.
- After transportation hours, manual washing of junctions is practiced.
- Erection of green fencing at habitation areas of transport route.

10. PROPOSED GROUND WATER RECHARGING MEASURES / ARTIFICIAL RECHARGE OF GROUND WATER.

Rainwater harvesting in the Mining Lease area is one of the main conservations of water for direct use / recharge to the ground water body. The structures planned for the project is given below:

A. Recharge Pits

To strengthen the recharge to ground water body, the best-practiced conservation method is construction a recharge pits. The surface runoff water will be diverted in the mining pit and settling ponds through trenches and garland drains.Synoptic view of recharge pit is shown below.

Fig showing settling ponds and filter beds settling ponds through trenches and garland drains

Water Utilization chart for Block-II Sirigao –Mayem Mineral Block in Sirigao&Mayem Villages of Bicholim taluk North Goa District Goa

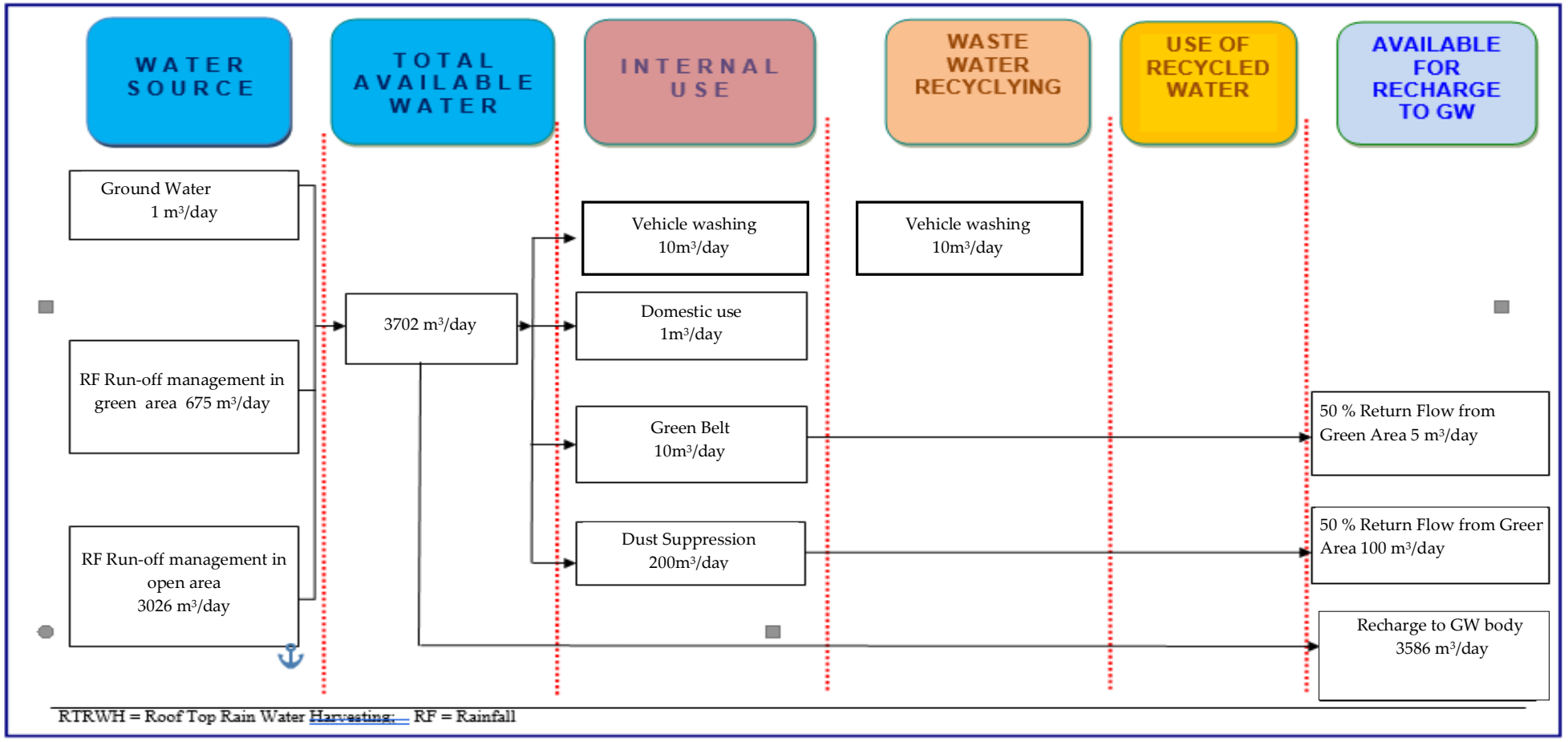


Fig.25Flow Chart showing water Utilization

B. CONCLUSION

1. The core and buffer area of the Mining Lease is declared as SAFE in respect of ground water development and management.
2. The groundwater extraction in the Mining Lease is negligible and hence there is no adverse impact is created due to mining & allied activities in the surrounding 10 Km radius of buffer area
3. No adverse impact is observed on the environment because of any past groundwater abstraction in the area.
4. Water quality tested for various parameters in the monitored open wells andborewellswere found to be within the permissible limits prescribed by the Bureau of Indian Standards and thereby considered safe and potable.
5. There is no proposal to establish any ground water structure in the mine lease area for the Withdrawal of groundwater, thus, the ground water withdrawal in the core area will be nil.
6. Block-II Sirigao-Mayem Mineral Block Iron Ore Mine is situated on a hilly region at an elevation of about 120m amsl and does not have any surface water bodies. It was observed from the studies carried out on the open wells, that water levels in Phreatic aquifer is mostly shallow where the ground water abstraction structures are located at an elevation of -33m to 120m (a msl).

   Since the proposed mining activities are at deeper level, the Lithological variations and aquifer configurations at deeper levels are thoroughly investigated and detailed above in the sub head '**The sub surface geological formation and hydrogeological scenario of deeper semi confined to confined aquifers around the mining block'** above which clearly establish that the aquifer potential/yield of bore wells/ are very less and deeper geological formation are dominated by clayey formations which are impermeable and **aquicludes,** which scientifically prove that **mining activities will not have any adverse impact on ground water regime.**

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Government of Goa
Directorate of Mines & Geology
Institute Menezes Braganza, Panaji-Goa
Website: www.dmg.goa.gov.in **e-mail: auction-dmg@goa.gov.in**

No.DMG/25/Auction Cell/LOI-function/2023/7802 Date:13/01/2023

Letter of Intent for Block II - Sirigao-Mayem Mineral block

To,
Salgaocar Shipping Company Private Limited,
Salgaocar Bhavan, Altinho,
Panjim 403001 Goa, India.

***Sub:** Letter of intent with reference to e-auction dated December 15, 2022 for grant of a mining lease for Block II - Sirigao-Mayem Mineral block for Iron Ore mineral in Sirigao & Mayem village, Bicholim Taluka, North Goa District on 171.2472 Hectare Area.*

1. **Background**:

1.1 Government of Goa, pursuant to the Mines and Minerals (Development and Regulation) Act, 1957 (the "**Act**") and the Mineral (Auction) Rules, 2015 as amended from time to time (the "**Auction Rules**"), issued the notice inviting tender dated September 30, 2022 to commence the auction process for grant of mining lease for **Block II - Sirigao-Mayem Mineral block** located in North Goa. The e-auction process was conducted in accordance with the tender document for the said mineral block and **Salgaocar Shipping Company Private Limited** was declared as the 'Preferred Bidder' under Rule 9(9)(iii) of Auction Rules, having quoted a Final Price Offer of **99.25% (Ninety nine point two five percent)**.

1.2 As required under Rule 10(1) of the Auction Rules and the tender document for the said mineral block, **Salgaocar Shipping**

Company Private Limited has made payment of the first instalment, being 20% (twenty per cent) of the upfront payment of Rs. 7,54,44,823 (Rupees Seven Crore Fifty Four Lakh Forty Four Thousand Eight Hundred Twenty Three) through e-Challan (e-Challan No. 202300005994) dated January 3, 2023, which was received at Goa.

2. Grant of Letter of Intent

2.1. Accordingly, pursuant to Rule 10(2) of the Auction Rules and the terms of the Tender Document, the Government of Goa is issuing this letter of intent for grant of Mining Lease for **Block II - Sirigao-Mayem Mineral block** for Iron Ore in Sirigao & Mayem village, Bicholim Taluka, North Goa District on 171.2472 Hectare Area to **Salgaocar Shipping Company Private Limited** for a period of 50 (fifty) years.

3. Conditions

3.1. This letter of intent and the subsequent grant of aforementioned mining lease shall be subject to the provisions of the Act and the Rules made thereunder, as amended from time to time, and the **Salgaocar Shipping Company Private Limited** shall be designated as the 'Successful Bidder' and subsequently granted the mining lease only upon satisfactory completion of all the requirements under the Acts and Rules made thereunder.

The State Government may impose such other conditions in the Mine Development and Production Agreement (MDPA) and/or Mining Lease as may be considered by the State Government to be in the interest of mineral development and in public interest.

Salgaocar Shipping Company Private Limited shall be bound by (i) the enactment, bringing into effect, adoption, promulgation,

amendment, modification or repeal of any Applicable Laws (including the Act and Rules) occurring at any time, including prior to or after the Bid Due Date; (ii) any amendments made by the State Government to this effect in the Tender Document, the letter of intent, the MDPA and/or the mining lease deed at any time, including prior to or after the Bid Due Date.

3.2. For reference, the requirements under the Auction Rules for designation of **Salgaocar Shipping Company Private Limited** as the "successful bidder" and subsequent grant of the mining lease are reiterated below. It is clarified that the requirements mentioned below are only for reference and in the event of any change in the Act or the Rules made thereunder, the requirements under the modified Act or the Rules made thereunder, as the case may be, shall be applicable.

(a) Designation as the "Successful Bidder":

Salgaocar Shipping Company Private Limited shall be considered to be the "Successful Bidder" upon:

(i) continuing to be in compliance with all the terms and conditions of eligibility;

(ii) payment of the second instalment being 20% (twenty per cent) of the upfront payment;

(iii) furnishing an irrevocable and unconditional performance security to the State Government from an Acceptable Bank and payable at Goa, pursuant to the Auction Rules;

(iv) satisfying the conditions specified in clause (b) of sub-section (2) of Section 5 of the Act with respect to a mining plan ; and

(b) Signing of the Mine Development and Production Agreement

Salgaocar Shipping Company Private Limited shall sign the Mine Development and Production Agreement with the Government of Goa upon obtaining all consents, approvals, permits, no-objections and the like as may be required under applicable laws for commencement of mining operations.

(c) Grant of Mining Lease

Subsequent to signing of the Mine Development and Production Agreement, **Salgaocar Shipping Company Private Limited** shall make payment of the third instalment being 60% (sixty per cent) of the upfront payment and thereafter the Government of Goa shall grant the aforementioned mining lease.

3.3. The State Government reserves the right, but not the obligation, to appropriate and dispose of (whether by way of sale, auction or such other means as the State Government may, in its sole discretion, determine) all or any part of the dumps presently located within the Mineral Block. Provided that such right shall be exercised by the State Government no later than 12 (twelve) months from the date of issuance of this Letter of Intent. It is clarified that the Successful Bidder shall, in accordance with Applicable Law, be entitled to dispose of only such part of the dumps in respect of which the State Government does not exercise the aforesaid right.

4. Validity

4.1. This Letter of Intent shall be valid only if **Salgaocar Shipping Company Private Limited** ensures that the Bid Security is valid until the Performance Security is furnished to the Government of Goa failing which this letter of intent shall become invalid from the

date of expiry of the Bid Security.

4.2. This letter of intent is valid for a period of 3 (three) years from the date of its issuance, within which time all the above conditions must be fulfilled and the Mining Lease deed must be executed between the **Salgaocar Shipping Company Private Limited** and the Government of Goa. In case there is a delay in execution of Mining Lease Deed due to reasons beyond the control of the Preferred Bidder, then it may submit an application to Government of Goa, requesting for further extension

4.3. If the Government of Goa is satisfied that there is a delay in execution of Mining Lease Deed due to reasons beyond the control of the Preferred Bidder and a longer period is required to enable the Preferred Bidder to satisfy all or any of the above conditions, it may extend the validity of this letter of intent for such period or periods as the Government of Goa may specify. Provided that: (a) this letter of intent shall be extended for a maximum period of 2 (two) years; and (b) the total period for which this letter of intent would remain valid must not exceed 5 (five) years from the date of issuance.

Kindly return the duplicate copy of this letter of intent duly signed by authorized signatory in token of having accepted the above terms and conditions. The accepted copy of Letter of Intent along with Board resolution should be submitted latest by **January 27, 2023.**

(Dr. S. Shanbhogue)
Director

By e-mail

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES
OFFICE OF THE REGIONAL CONTROLLER OF MINES, GOA

Approved

No. MCDR-MPC0FE/3/2023-GOA-IBM_RO_GOA Dt : 07/08/2023

Shri/M/s. SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED ,
plot no. 15, Salgaocar Bhavan Altinho Tiswadi

Sirigao mayem Mineral Block-II (PB73)

Sub : Approval of Mining Plan in respect of your BLOCK II – SIRIGAO MAYEM MINERAL BLOCK over an area of 171.2472 Ha. situated in Sirigao Village, Bicholim Taluka, North Goa District of Goa State submitted under Rule 16(1) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016.

Ref : (i) Online submission/receipt of draft Mining Plan in respect of your aforesaid Block in the MPAS portal on 21.04.2023.

(ii) This office scrutiny comments on the examination of draft Mining Plan in respect of your aforesaid Block was sent through MPAS Portal on 06.06.2023.

(iii) Online submission/receipt of modified Mining Plan in respect of your aforesaid Block in the MPAS portal on 20.06.2023, 07.07.2023, and 02.08.2023.

Sir,

In exercise of the powers conferred by clause (b) of sub-section (2) of section 5 of the Mines & Minerals (Development & Regulation) Act, 1957 read with Government of India Order No. S.O. 1857(E) dated 18.05.2016; and in the exercise of the powers conferred under sub-rule (3) of Rule 16 of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016, I hereby **approve** the Mining Plan with Progressive Mine Closure Plan in respect of your Block No. II – Sirigao Mayem Mineral Block over an extent of 171.2472 Ha. situated in Sirigao Village, Bicholim Taluka, North Goa District of Goa State submitted under Rule 16(1) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules 2016. This approval is subject to the following conditions: -

1. That the Mining Plan is approved without prejudice to any other Law applicable to the mine area from time to time whether made by the Central Government, State Government, or any other authority, and without prejudice to any order or direction from any court of competent jurisdiction.
2. The proposals shown on the plates and/or given in the document are based on the auctioned Mineral Block/lease map/sketch submitted by the applicant/lessee and are applicable from the date of approval.
3. It is clarified that the approval of the aforesaid Mining Plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines & Minerals (Development & Regulation) Act, 1957 or the Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016 and any other laws including Forest (Conservation) Act, 1980, Environment (Protection) Act, 1986 or the rules made there under, Mines Act, 1952 and Rules and Regulations made thereunder.
4. Indian Bureau of Mines has not undertaken verification of the auctioned Mineral Block / Mining Lease Boundary on the ground and does not undertake any responsibility regarding the correctness of the boundaries of the Mineral Block/leasehold shown on the ground with reference to the lease map & other plans furnished by the applicant.
5. At any stage, if it is observed that the information furnished, or data incorporated in the document is incorrect or misrepresents facts, the approval of the document shall be revoked with immediate effect.
6. If the approval conflicts with any other law or court order/direction under any statute, it shall be revoked immediately.
7. Terms and conditions of the Mine Development and Production Agreement (MDPA), whenever signed with State Govt; shall be complied with. The preferred bidder shall submit a copy of the Mine Development & Production Agreement & Mining Lease deed executed with the State Govt. to this office within 15 days of their execution along with a copy of Performance Security furnished.
8. The preferred bidder has to comply with the terms & conditions laid down in the LOI issued by the State Govt. If any comments are received from the State Govt. then the necessary action as per comments shall be taken immediately.
9. It shall be mandatory for the project proponent, abstracting groundwater to obtain a No Objection Certificate from Central Ground Water Authority or the Goa State Ground Water Authority.
10. The preferred bidder of the auctioned block shall complete detailed exploration (G1 level exploration) over the potential mineralized area in accordance with Rule 12(4) of MCDR Amendment Rules 2021 (notified dated 03.11.2021) and prepare a detailed feasibility study report conforming to Part IV and V of the Mineral (Evidence of Mineral Contents) Rules, 2015 over the entire area, within five years from the date of commencement of such mining lease.

Yours faithfully,

(Naresh Kumar Katariya)

Deputy Controller of Mines & OIC

Copy forwarded for kind information to: -

1. The Controller of Mines (SZ), Indian Bureau of Mines, Bangalore.
2. The Director, Directorate of Mines & Geology, Government of Goa, Institute of Menezes Braganza Building, Panaji – Goa, 403001.
3. The Director, Directorate of Mines Safety, Goa Region, Agali, Fatorda – Goa, 403602.
4. M.S.Raju, Plot No. 15, Salgaocar Bhawan, Altinho – Tiswadi, Goa

(Naresh Kumar Katariya)

Deputy Controller of Mines & OIC

Singai Iniyan Mineral Block-II (PB73)

Approved

GOA STATE ENVIRONMENT IMPACT ASSESSMENT AUTHORITY

Constituted by the Ministry of Environment, Forest and Climate Change,
Government of India
C/o Department of Environment and Climate Change
4th Floor, Dempo Towers, Patto Panaji Goa - 403001.
e-mail: goaseac@gmail.com

No.115/3/2023-24/GSEIAA/Project-Prop/166 Date: 18 /10/ 2023

To,

Salgaocar Shipping Company Limited.
Salgaocar Bhavan, Plot No. 15,
Althino, Panjim, North Goa,
GOA-403001.

Sub:- Issuance of Terms of Reference - (ToR) for Salgaocar Shipping Company Limited for Block-II – Sirigao - Mayem Mineral Block, over an extent of 171.2472 Ha in Survey No. 1, 2, 3, 4, 5, 6, 7, 46, 47, 48, 84, 90, 91, 92, 93, 94, 95, 96, 97, 98 & Road, 12, 47, 60, 61, 62, 79, 80, 84, Road, 48, 56, 57, 58 & 59 located in Sirigao & Mayem Villages respectively of Bicholim Taluka North Goa District- reg.

Ref : Proposal No: SIA/GA/MIN/428213/2023 dated 06/05/2023.
Project Category: Covered under schedule B1.

Sir,

With reference to your Proposal No.SIA/GA/MIN/428213/2023 matter pertaining to issuance of Terms of Reference (ToR's) for conducting the Environment Impact Assessment (EIA) study in plot / survey No. 1, 2, 3, 4, 5, 6, 7, 46, 47, 48, 84, 90, 91, 92, 93, 94, 95, 96, 97, 98 & Road, 12, 47, 60, 61, 62, 79, 80, 84, Road, 48, 56, 57, 58 & 59, Sirigao & Mayem Villages respectively of Bicholim Taluka of North Goa District, Goa.

The Goa SEAC in its 184th meeting held on 12th July 2023 recommended the said proposal to Goa State Environment Impact Assessment Authority (SEIAA) for grant of ToR.

Further, Goa State Environment Impact Assessment Authority (SEIAA) in its 109th meeting held on 28th July 2023 considered Committee's recommendation and decided to grant ToR.

In this regard it is decided to issue the Standard Terms of reference for conducting EIA study

Accordingly the ToR's is enclosed herewith (**refer Annexure - 1**) to enable the Project Proponent (PP) to initiate EIA study.

Yours faithfully

(Dr. Sneha S. Gitte, IAS)
Director (Envt. &CC) &
Member Secretary, Goa-SEIAA

Encl: As Above.

Annexure - 1

TERMS OF REFERENCE (TOR)

1. Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to1994.

2. A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.

3. All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.

4. All corner coordinates of the mine lease area, super imposed on a High Resolution Imagery/toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).

5. Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing mineral sand mining history of the area, important water bodies, streams and rivers and soil characteristics.

6. Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.

7. It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/ deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.

8. Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safe guard measures in each case should also be provided.

9. The study rea will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine/lease period

10. Land use of the study rea delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.

11. Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.

12. A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.

13. Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.

14. Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.

15. The vegetation in the RF / PF areas in the study area, with necessary details, should be given.

16. A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wild life in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.

17. Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.

18. A detailed biological study of the study area [core zone and buffer zone (10km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled- I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.

19. Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.

20. Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).

21. R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village (s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.

22. One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.

23. Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.

24. The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.

25. Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.

26. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.

27. Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.

28. Based on actual monitored data, it may clearly be shown whether working will intersect ground water. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.

29. Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.

30. Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. Aschematic diagram may also be provided for the same.

31. A time bound Progressive Green belt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed upfront on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should

have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which hare tolerant to pollution

32. Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.

33. Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.

34. Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.

35. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining may be detailed.

36. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.

37. Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.

38. Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.

39. Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.

40. Details of litigation pending against the project, if any, with direction/ order passed by any Court of Law against the Project should be given.

41. The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.

42. A Disaster management Plan shall be prepared and included in the EIA/EMP Report.

43. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.

44. Besides the above, the below mentioned general points are also to be followed:-

a) Executive Summary of the EIA/EMP Report

b) All documents to be properly referenced with index and continuous page numbering.

c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.

d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/ NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.

e) Where the documents provided are in a language other than English, an English translation should be provided.

f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.

g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.

h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.

i) As per the circular no. J-11011/618/2010-IA.II (I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.

MINERAL ENGINEERING SERVICES

Recognised by GOI, MOEF&CC Under E(P)A 1986 Vide Gazette Notification
No. S.O. 857(E) dated 26.02.2018. Recognition Valid Upto 25.02.2023

NABET ORC0000756
MTIC ISO 9001:2015 ISO 45001:2018

Table No. 1

WATER ANALYSIS REPORT

MES/WTR/11/00

Name of the Client	:	Salgaocar Shipping Company Private Limited
Name of the Project	:	Block - II, Birigao - Mayem Mineral Block, Birigao & Mayem village, Bicholim Taluka, North Goa, Goa
Date of sampling	:	29.01.2023
Date of Report	:	10.02.2023
Report No.	:	MES/WS/WRN/94

Ref : IS.10500-2012 Norms (Drinking Water Standards)

Sl. No.	Parameters	Method of Testing	Desirable Limits	Permissible Limits	Result		
					GW1	GW2	GW3
1	Colour (Hazen Units), Max	IS:3025 (Part-4)	5	15	1.0	<1	2.0
2	Odour	IS:3025 (Part-5)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	pH	IS:3025 (Part-11)	6.5 to 8.5	6.5 - 8.5	6.55	7.85	7.37
4	Taste	IS:3025 (Part- 8)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity,NTU, Max	IS:3025 (Part-10)	1	5	2.5	3.60	1.6
6	Electrical Conductivity (µmhos/cm)	IS 3025 (P-14)	-	-	188	203	407
7	Total Dissolved Solids,mg/l, Max	IS:3025 (Part-16)	500	2000	98	115	236
8	Aluminium (as Al) mg/l, Max	IS:3025 (Part-55)	0.03	0.2	<0.01	<0.01	<0.01
9	Ammonia (as total Ammonia -N),mg/l, Max	IS:3025 (Part-34)	0.5	0.5	<0.1	<0.1	<0.1
10	Anionic Detergents (as MBAS),mg/l , Max	Annex K of Is 13428	0.2	1.0	<0.1	<0.1	<0.1
11	Barium (as Ba), mg/l, Max	IS:15302 & APHA 21st	0.7	0.7	<0.5	<0.5	<0.5
12	Boron (as B), mg/l, Max	IS:3025 (Part-57)	0.5	1	<0.1	<0.1	<0.1
13	Calcium (as Ca),mg/l, Max	IS:3026 (Part-40)	75	200	24.0	27.2	52.1
14	Chloramines (as Cl_2), mg/l, Max	APHA 21st	4.0	4.0	NA	NA	NA
15	Chloride as Cl (mg/l),mg/l, Max	IS:3025 (Part-32)	250	1000	12.0	13.0	26.0
16	Copper (as Cu),mg/l, Max	IS:3026 (Part-42)	0.05	1.5	<0.01	<0.01	<0.01
17	Fluoride (as F),mg/l, Max	IS 3025 (Part-60)	1	1.5	<0.1	<0.1	<0.1
18	Residual, Free Chlorine,mg/l, Max	IS:3026 (Part-26)	0.2	1	<0.1	<0.1	<0.1
19	Iron (as Fe),mg/l, Max	IS:3025 (Part-53)	1.0	1.0	0.16	<0.05	<0.05
20	Magnesium (as Mg)mg/l, Max	IS 3025 (Part-46)	30	100	4.9	5.3	7.3
21	Manganese (as Mn),mg/l, Max	IS 3025 (Part-59)	0.1	0.3	<0.03	<0.03	<0.03
22	Mineral Oil,mg/l, Max	Clause 6 and 7 of IS 3025 (part 39)	0.5	0.6	<0.01	<0.01	<0.01
23	Nitrates (as NO_3),mg/l, Max	IS:3025 (Part-34)	45	45	3.7	2.8	12.0
24	Phenolics (as C_6H_5OH),mg/l, Max	IS:3025 (Part-43)	0.001	0.002	<0.001	<0.001	<0.001
25	Selenium (as Se),mg/l, Max	IS:3025 (Part-56)	0.01	0.01	<0.005	<0.005	<0.005
26	Silver (as Ag), mg/l, Max	Annex J of Is:13428	0.1	0.1	<0.002	<0.002	<0.002
27	Sulphates (as SO_4),mg/l, Max	IS:3025 (Part-24)	200	400	6.0	7.2	22.0
28	Sulphide (as H_2S) , mg/l, Max	IS:3025 (Part-29)	0.05	0.05	<0.01	<0.01	<0.01
29	Alkalinity (as $CaCO_3$) mg/l, Max	IS:3025 (Part-23)	200	600	78	90	164
30	Total Hardness (as $CaCO_3$),mg/l, Max	IS:3025 (Part-21)	200	600	80	90	160
31	Zinc (as Zn),mg/l, Max	IS.3025 (Part-49)	5	15	<0.005	<0.005	<0.005
32	Cadmium (as Cd),mg/l, Max	IS:3025 (Part-41)	0.003	0.003	<0.002	<0.002	<0.002
33	Cyanide (as CN),mg/l, Max	IS:3025 (Part-27)	0.05	0.05	<0.01	<0.01	<0.01
34	Lead (as Pb),mg/l, Max	IS:3025 (Part-47)	0.01	0.01	<0.005	<0.005	<0.005
35	Molybdenum (as Mo), mg/l, Max	APHA 21st	0.07	0.07	NA	NA	NA
36	Mercury (as Hg),mg/l, Max	IS:3025 (Part-48)	0.001	0.001	<0.0005	<0.0005	<0.0005
37	Nickel (as Ni),mg/l, Max	IS.3025 (Part-54)	0.02	0.02	<0.01	<0.01	<0.01
38	Pesticides,mg/l, Max	APHA 21st	Absent	0.001	NA	NA	NA
39	Polychlorinated biphenyls mg/l, Max	APHA 21st Edition	0.0005	0.0005	NA	NA	NA
40	Polynuclear Aromatic Hydrocarbons (as PAH),mg/l, Max	APHA 21st Edition	0.0001	0.0001	NA	NA	NA
41	Arsenic (as As),mg/l, Max	IS 3025 (Part-37)	0.01	0.01	<0.002	<0.002	<0.002
42	Chromium (as Cr^{+6}),mg/l, Max	IS:3025 (Part-52)	0.05	0.05	<0.03	<0.03	<0.03
43	Trihalomethanes,mg/l, Max	APHA 21st	-	-	NA	NA	NA
44	Radioactive materials, Bq/l,mg/l	APHA 21st	-	-	NA	NA	NA
45	Total Coliform (per 100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
46	E-Coli (per 100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
47	Water levels in well from surface (m)	-	-	-	6.30	4.40	7.65

SAMPLE TYPE : GW1 - Open Well water-1 Bicholim , GW2 - Open Well water-2 Bicholim , GW3 - Open Well-1 water Pilgao
Samples Collected & Analysed by Mineral Engineering Services, Ballari NA - Not Analysed

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S.RAJU)
HEAD OF LABORATORY

MINERAL ENGINEERING SERVICES

Recognised by GOI, MOEF&CC Under E(P)A 1986 Vide Gazette Notification No S.O. 857(E) dated 28.02.2018 Recognition Valid Upto 25.02.2023

NABET ORG00756

ISO 9001:2015
ISO 45001:2018

Table No. 2

WATER ANALYSIS REPORT

MES/WWTR/11/00

Name of the Client	:	Salgaocar Shipping Company Private Limited
Name of the Project	:	Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem village, Bicholim Taluka, North Goa, Goa
Date of sampling	:	29.01.2023
Date of Report	:	10.02.2023
Report No.	:	MES/WS/WRN/65

Ref : IS 10500-2012 Norms (Drinking Water Standards)

Sl. No.	Parameters	Method of Testing	Desirable Limits	Permissible Limits	Result		
					GW4	GW5	GW6
1	Colour (Hazen Units), Max	IS:3025 (Part-4)	5	15	4.0	1.0	1.0
2	Odour	IS:3025 (Part-5)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	pH	IS:3025 (Part-11)	6.5 to 8.5	6.5 - 8.5	7.60	8.40	7.50
4	Taste	IS 3025 (Part- 8)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity,NTU, Max	IS 3025 (Part-10)	1	5	2.5	1.8	4.0
6	Electrical Conductivity (µmhos/cm)	IS 3025 (P-14)	-	-	390	181	334
7	Total Dissolved Solids,mg/l, Max	IS:3025 (Part-16)	500	2000	226	76	194
8	Aluminium (as Al) mg/l, Max	IS:3025 (Part-55)	0.03	0.2	<0.01	<0.01	<0.01
9	Ammonia (as total Ammonia -N),mg/l, Max	IS:3025 (Part-34)	0.5	0.5	<0.1	<0.1	<0.1
10	Anionic Detergents (as MBAS),mg/l , Max	Annex K of IS:13428	0.2	1.0	<0.1	<0.1	<0.1
11	Barium (as Ba), mg/l, Max	IS:15302 & APHA 21st	0.7	0.7	<0.5	<0.5	<0.5
12	Boron (as B), mg/l, Max	IS:3025 (Part-57)	0.5	1	<0.1	<0.1	<0.1
13	Calcium (as Ca),mg/l, Max	IS:3025 (Part-40)	75	200	54.8	12.0	41.6
14	Chloramines (as Cl_2), mg/l Max	APHA 21st	4.0	4.0	NA	NA	NA
15	Chloride as Cl (mg/l),mg/l, Max	IS:3025 (Part-32)	250	1000	26.0	13.0	18.0
16	Copper (as Cu),mg/l, Max	IS:3025 (Part-42)	0.05	1.5	<0.01	<0.01	<0.01
17	Fluoride (as F),mg/l, Max	IS:3025 (Part-60)	1	1.5	<0.1	<0.1	<0.1
18	Residual, Free Chlorine,mg/l, Max	IS:3025 (Part-26)	0.2	1	<0.1	<0.1	<0.1
19	Iron (as Fe),mg/l, Max	IS:3025 (Part-53)	1.0	1.0	<0.05	<0.05	0.18
20	Magnesium (as Mg)mg/L Max	IS:3025 (Part-46)	30	100	6.3	4.9	8.2
21	Manganese (as Mn),mg/l, Max	IS 3025 (Part-59)	0.1	0.3	<0.03	<0.03	<0.03
22	Mineral Oil mg/l, Max	Clause 4 of IS 3025 (part -39)	0.5	0.5	<0.01	<0.01	<0.01
23	Nitrates (as NO_3),mg/l, Max	IS 3025 (Part-34)	45	45	2.0	1.6	1.7
24	Phenolics (as C_6H_5OH),mg/l, Max	IS:3025 (Part-43)	0.001	0.002	<0.001	<0.001	<0.001
25	Selenium (as Se),mg/l, Max	IS:3025 (Part-56)	0.01	0.01	<0.005	<0.005	<0.005
26	Silver (as Ag), mg/l, Max	Annex J of IS:13428	0.1	0.1	<0.002	<0.002	<0.002
27	Sulphates (as SO_4),mg/l, Max	IS:3025 (Part-24)	200	400	20.0	8.0	26.0
28	Sulphide (as H_2S) , mg/l, Max	IS:3025 (Part-29)	0.05	0.05	<0.01	<0.01	<0.01
29	Alkalinity (as $CaCO_3$) mg/l, Max	IS:3025 (Part-23)	200	600	160	52	140
30	Total Hardness (as $CaCO_3$),mg/l, Max	IS:3025 (Part-21)	200	600	162	50	142
31	Zinc (as Zn),mg/l, Max	IS:3025 (Part-49)	5	15	<0.005	<0.005	<0.005
32	Cadmium (as Cd),mg/l, Max	IS:3025 (Part-41)	0.003	0.003	<0.002	<0.002	<0.002
33	Cyanide (as CN),mg/l, Max	IS:3025 (Part-27)	0.05	0.05	<0.01	<0.01	<0.01
34	Lead (as Pb),mg/l, Max	IS:3025 (Part-47)	0.01	0.01	<0.005	<0.005	<0.005
35	Molybdenum (as Mo), mg/l, Max	APHA 21st	0.07	0.07	NA	NA	NA
36	Mercury (as Hg),mg/l, Max	IS:3025 (Part-48)	0.001	0.001	<0.0005	<0.0005	<0.0005
37	Nickel (as Ni),mg/l, Max	IS:3025 (Part-54)	0.02	0.02	<0.01	<0.01	<0.01
38	Pesticides,mg/l, Max	APHA 21st	Absent	0.001	NA	NA	NA
39	Polychlorinated biphenyls, mg/l, Max	APHA 21st Edition	0.0005	0.0005	NA	NA	NA
40	Polynuclear Aromatic Hydrocarbons (as PAH),mg/l, Max	APHA 21st Edition	0.0001	0.0001	NA	NA	NA
41	Arsenic (as As),mg/l, Max	IS:3025 (Part-37)	0.01	0.01	<0.002	<0.002	<0.002
42	Chromium (as Cr^{6+}),mg/l, Max	IS 3025 (Part-52)	0.05	0.05	<0.03	<0.03	<0.03
43	Trihalomethanes,mg/l, Max	APHA 21st	--	--	NA	NA	NA
44	Radioactive materials,Bq/l,mg/l	APHA 21st	--	--	NA	NA	NA
45	Total Coliform (per 100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
46	E-Coli (per 100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
47	Water levels in well from surface (m)	--	--	--	3.10	1.71	3.30

SAMPLE TYPE : GW4 - Open Well-2 water Pilgao, GW5 - Open Well-3 water Pilgao, GW6 - Open Well water Mathwada
Samples Collected & Analysed by Mineral Engineering Services, Ballari NA - Not Analysed

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

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MINERAL ENGINEERING SERVICES

Recognised by GOI, MOEF&CC Under E(P)A 1986 Vide Gazette Notification
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NABET ORC000754
ISO 9001:2015
ISO 45001:2018

Table No. 3

WATER ANALYSIS REPORT

MES/AW/TR/11/80

Name of the Client	:	Salgaocar Shipping Company Private Limited
Name of the Project	:	Block - R, Srigao - Mayem Mineral Block, Srigao & Mayem village, Bicholim Taluka, North Goa, Goa
Date of sampling	:	28.01.2023
Date of Report	:	10.02.2023
Report No.	:	MES/WS/WR/N66

Ref : IS:10500-2012 Norms (Drinking Water Standards)

Sl. No.	Parameters	Method of Testing	Desirable Limits	Permissible Limits	Result GW7	Result GW8	Result GW9
1	Colour (Hazen Units), Max	IS:3025 (Part-4)	5	15	1.0	<1	<1
2	Odour	IS:3025 (Part-5)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	pH	IS:3025 (Part-11)	6.5 to 8.5	6.5 - 8.5	7.05	5.88	8.95
4	Taste	IS 3025 (Part- 8)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity,NTU, Max	IS 3025 (Part-10)	1	5	3.8	3.7	4.5
6	Electrical Conductivity (µmhos/cm)	IS 3025 (P-14)	-	-	297	124	68
7	Total Dissolved Solids,mg/l, Max	IS:3025 (Part-16)	500	2000	172	72	50
8	Aluminium (as Al) mg/l, Max	IS:3025 (Part-55)	0.03	0.2	<0.01	<0.01	<0.01
9	Ammonia (as total Ammonia-N),mg/l, Max	IS:3025 (Part-34)	0.5	0.5	<0.1	<0.1	<0.1
10	Anionic Detergents (as MBAS),mg/l, Max	Annex K of Is 13428	0.2	1.0	<0.1	<0.1	<0.1
11	Barium (as Ba), mg/l, Max	IS:15302 & APHA 21st	0.7	0.7	<0.5	<0.5	<0.5
12	Boron (as B), mg/l, Max	IS:3025 (Part-57)	0.5	1	<0.1	<0.1	<0.1
13	Calcium (as Ca) mg/l Max	IS:3025 (Part-40)	75	200	24.0	5.6	8.0
14	Chloramines (as Cl_2), mg/L Max	APHA 21st	4.0	4.0	NA	NA	NA
15	Chloride as Cl (mg/l),mg/l, Max	IS:3025 (Part-32)	250	1000	34.0	24.0	12.0
16	Copper (as Cu),mg/l, Max	IS:3025 (Part-42)	0.05	1.5	<0.01	<0.01	<0.01
17	Fluoride (as F),mg/l, Max	IS:3025 (Part-60)	1	1.5	<0.1	<0.1	<0.1
18	Residual, Free Chlorine,mg/l Max	IS:3025 (Part-26)	0.2	1	<0.1	<0.1	<0.1
19	Iron (as Fe),mg/l, Max	IS:3025 (Part-53)	1.0	1.0	0.15	0.11	0.12
20	Magnesium (as Mg)mg/l, Max	IS:3025 (Part-46)	30	100	6.8	2.4	2.9
21	Manganese (as Mn),mg/l, Max	IS:3025 (Part-59)	0.1	0.3	<0.03	<0.03	<0.03
22	Mineral Oil,mg/l, Max	Clause 4 of IS 2490 (part 1)	0.5	0.5	<0.01	<0.01	<0.01
23	Nitrates (as NO_3),mg/l, Max	IS:3025 (Part-34)	45	45	10.7	1.5	1.4
24	Phenolics (as C_6H_5OH),mg/l, Max	IS:3026 (Part-43)	0.001	0.002	<0.001	<0.001	<0.001
25	Selenium (as Se),mg/l, Max	IS:3026 (Part-56)	0.01	0.01	<0.005	<0.005	<0.005
26	Silver (as Ag), mg/l, Max	Annex J of Is 13428	0.1	0.1	<0.002	<0.002	<0.002
27	Sulphates (as SO_4),mg/l, Max	IS:3025 (Part-24)	200	400	30.0	16.0	11.0
28	Sulphide (as H_2S) , mg/l, Max	IS:3025 (Part-29)	0.05	0.05	<0.01	<0.01	<0.01
29	Alkalinity (as $CaCO_3$) mg/l, Max	IS:3025 (Part-23)	200	600	80	20	20
30	Total Hardness (as $CaCO_3$),mg/l, Max	IS:3025 (Part-21)	200	600	68	24	32
31	Zinc (as Zn),mg/l, Max	IS:3025 (Part-49)	5	15	<0.005	<0.005	<0.005
32	Cadmium (as Cd),mg/l, Max	IS:3025 (Part-41)	0.003	0.003	<0.002	<0.002	<0.002
33	Cyanide (as CN),mg/l, Max	IS:3025 (Part-27)	0.05	0.05	<0.01	<0.01	<0.01
34	Lead (as Pb),mg/l, Max	IS:3025 (Part-47)	0.01	0.01	<0.005	<0.005	<0.005
35	Molybdenum (as Mo), mg/l, Max	APHA 21st	0.07	0.07	NA	NA	NA
36	Mercury (as Hg),mg/l, Max	IS:3025 (Part-48)	0.001	0.001	<0.0005	<0.0005	<0.0005
37	Nickel (as Ni),mg/l, Max	IS:3025 (Part-54)	0.02	0.02	<0.01	<0.01	<0.01
38	Pesticides,mg/l, Max	APHA 21st	Absent	0.001	NA	NA	NA
39	Polychlorinated biphenyls mg/l, Max	APHA 21st Edition	0.0005	0.0005	NA	NA	NA
40	Polynuclear Aromatic Hydrocarbons (as PAH),mg/l, Max	APHA 21st Edition	0.0001	0.0001	NA	NA	NA
41	Arsenic (as As),mg/l, Max	IS:3025 (Part-37)	0.01	0.01	<0.002	<0.002	<0.002
42	Chromium (as Cr^{+6}),mg/l, Max	IS:3025 (Part-52)	0.05	0.05	<0.03	<0.03	<0.03
43	Trihalomethanes,mg/l, Max	APHA 21st	–	–	NA	NA	NA
44	Radioactive materials,Bq/l,mg/l	APHA 21st	–	–	NA	NA	NA
45	Total Coliform (per 100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
46	E-Coli (per 100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
47	Water levels in well from surface (m)	–	–	–	2.50	1.60	8.00

SAMPLE TYPE : GW7 - Open Well water Sancoale, GW8 - Open Well water Bainada , GW9 - Open Well water Dab Dabo

Samples Collected & Analysed by Mineral Engineering Services, Bellari NA - Not Analysed

(M.R. DURGA PRASAD)
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MINERAL ENGINEERING SERVICES

Recognised by GOI, MOEF&CC Under E(P)A 1986 Vide Gazette Notification
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NABET ORG/00756
ISO 9001:2015
ISO 45001:2018

Table No. 4

WATER ANALYSIS REPORT

MES/WTR/11/06

Name of the Client	:	Salgaocar Shipping Company Private Limited
Name of the Project	:	Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem village, Bicholim Taluka, North Goa, Goa
Date of sampling	:	29.01.2023
Date of Report	:	10.02.2023
Report No.	:	MES/WS/WTR/67

Ref : IS-10500-2012 Norms (Drinking) Water Standards)

Sl. No.	Parameters	Method of Testing	Desirable Limit	Permissible Limit	Result GW10	Result GW11	Result GW12
1	Colour (Hazen Units), Max	IS:3025 (Part-4)	5	15	<1	2.0	1.0
2	Odour	IS:3025 (Part-5)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	pH	IS:3025 (Part-11)	6.5 to 8.5	6.5 - 8.5	8.10	8.10	7.01
4	Taste	IS:3025 (Part- 8)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity NTU, Max	IS 3025 (Part-10)	1	5	3.1	2.8	4.1
6	Electrical Conductivity (µmhos/cm)	IS 3025 (P-14)	-	-	209	262	269
7	Total Dissolved Solids,mg/l, Max	IS:3025 (Part-16)	500	2000	118	152	156
8	Aluminium (as Al) mg/l, Max	IS 3025 (Part-55)	0.03	0.2	<0.01	<0.01	<0.01
9	Ammonia (as total Ammonia -N),mg/l, Max	IS:3025 (Part-34)	0.5	0.5	<0.1	<0.1	<0.1
10	Anionic Detergents (as MBAS),mg/l , Max	Annex K of Is-13428	0.2	1.0	<0.1	<0.1	<0.1
11	Barium (as Ba), mg/l, Max	IS:15302 & APHA 21st	0.7	0.7	<0.5	<0.5	<0.5
12	Boron (as B), mg/l, Max	IS:3025 (Part-57)	0.5	1	<0.1	<0.1	<0.1
13	Calcium (as Ca),mg/l Max	IS:3025 (Part-40)	75	200	24.1	20.0	23.2
14	Chloramines (as Cl_2), mg/l Max	APHA 21st	4.0	4.0	NA	NA	NA
15	Chloride as Cl (mg/l),mg/l, Max	IS:3025 (Part-32)	250	1000	16.0	20.0	30.0
16	Copper (as Cu),mg/l, Max	IS:3025 (Part-42)	0.05	1.5	<0.01	<0.01	<0.01
17	Fluoride (as F),mg/l, Max	IS:3025 (Part-60)	1	1.5	0.12	0.20	0.15
18	Residual, Free Chlorine,mg/l, Max	IS:3025 (Part-26)	0.2	1	<0.1	<0.1	<0.1
19	Iron (as Fe),mg/l, Max	IS:3025 (Part-53)	1.0	1.0	0.05	0.08	0.06
20	Magnesium (as Mg)mg/l, Max	IS:3025 (Part-46)	30	100	6.3	16.5	5.8
21	Manganese (as Mn),mg/l, Max	IS:3025 (Part-59)	0.1	0.3	<0.03	<0.03	<0.03
22	Mineral Oil,mg/l, Max	Clause 5 of IS 2296 (part -6)	0.5	0.5	<0.01	<0.01	<0.01
23	Nitrate (as NO_3),mg/l, Max	IS:3025 (Part-34)	45	45	2.3	6.2	30.2
24	Phenolics (as C_6H_5OH),mg/l, Max	IS:3025 (Part-43)	0.001	0.002	<0.001	<0.001	<0.001
25	Selenium (as Se),mg/l, Max	IS:3025 (Part-56)	0.01	0.01	<0.005	<0.005	<0.005
26	Silver (as Ag), mg/l, Max	Annex J of Is:13428	0.1	0.1	<0.002	<0.002	<0.002
27	Sulphates (as SO_4),mg/l, Max	IS:3025 (Part-24)	200	400	20.0	22.0	28.0
28	Sulphide (as H_2S) , mg/l, Max	IS:3025 (Part-29)	0.05	0.05	<0.01	<0.01	<0.01
29	Alkalinity (as $CaCO_3$) mg/l, Max	IS 3025 (Part-23)	200	600	78	110	80
30	Total Hardness (as $CaCO_3$),mg/l, Max	IS 3025 (Part-21)	200	600	82	118	82
31	Zinc (as Zn),mg/l, Max	IS:3025 (Part-49)	5	15	<0.005	<0.005	<0.005
32	Cadmium (as Cd),mg/l, Max	IS 3025 (Part-41)	0.003	0.003	<0.002	<0.002	<0.002
33	Cyanide (as CN),mg/l, Max	IS:3025 (Part-27)	0.05	0.05	<0.01	<0.01	<0.01
34	Lead (as Pb),mg/l, Max	IS:3025 (Part-47)	0.01	0.01	<0.005	<0.005	<0.005
35	Molybdenum (as Mo), mg/l, Max	APHA 21st	0.07	0.07	NA	NA	NA
36	Mercury (as Hg),mg/l, Max	IS:3025 (Part-48)	0.001	0.001	<0.0005	<0.0005	<0.0005
37	Nickel (as Ni),mg/l, Max	IS:3025 (Part-54)	0.02	0.02	<0.01	<0.01	<0.01
38	Pesticides,mg/l, Max	APHA 21st	Absent	0.001	NA	NA	NA
39	Polychlorinated biphenyls mg/l, Max	APHA 21st Edition	0.0005	0.0005	NA	NA	NA
40	Polynuclear Aromatic Hydrocarbons (as PAH),mg/l, Max	APHA 21st Edition	0.0001	0.0001	NA	NA	NA
41	Arsenic (as As),mg/l, Max	IS:3025 (Part-37)	0.01	0.01	<0.002	<0.002	<0.002
42	Chromium (as Cr^{+6}),mg/l, Max	IS:3025 (Part-52)	0.05	0.05	<0.03	<0.03	<0.03
43	Trihalomethanes,mg/l, Max	APHA 21st	-	-	NA	NA	NA
44	Radioactive materials,Bq/l,mg/l	APHA 21st	-	-	NA	NA	NA
45	Total Coliform (per 100ml)	IS.1622	Absent	Absent	Absent	Absent	Absent
46	E-Coli (per 100ml)	IS 1622	Absent	Absent	Absent	Absent	Absent
47	Water levels in well from surface (m)	-	-	-	14.70	5.00	6.60

SAMPLE TYPE : GW10 - Open Well water Mayem, GW11 - Open Well water-1 Langoa, GW12 - Open Well water-2 Langoa
Samples Collected & Analysed by Mineral Engineering Services, Ballari NA - Not Analysed

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MINERAL ENGINEERING SERVICES

Recognised by GOI, MOEF&CC Under E(P)A 1986 Vide Gazette Notification
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NABET ORG000756
MTIC ISO 9001:2015 ISO 45001:2018

Table No. 6

WATER ANALYSIS REPORT

MES/WTR/11/08

Name of the Client : Salgaocar Shipping Company Private Limited
Name of the Project : Block - II, Sirigao - Mayem Mineral Block,
Sirigao & Mayem village, Bicholim Taluka, North Goa, Goa
Date of sampling : 29.01.2023
Date of Report : 10.02.2023
Report No. : MES/WS/WRN/68
Ref : IS.10500-2012 Norms (Drinking Water Standards)

Sl. No.	Parameters	Method of Testing	Desirable Limits	Permissible Limits	Result		
					GW13	GW14	GW15
1	Colour (Hazen Units), Max	IS:3025 (Part-4)	5	15	<1	<1	<1
2	Odour	IS:3025 (Part-5)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	pH	IS:3025 (Part-11)	6.5 to 8.5	6.5 - 8.5	6.62	5.03	5.83
4	Taste	IS:3025 (Part- 8)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity,NTU, Max	IS:3025 (Part-10)	1	5	3.5	4.7	3.0
6	Electrical Conductivity (µmhos/cm)	IS 3025 (P-14)	-	-	259	188	59
7	Total Dissolved Solids,mg/l, Max	IS 3025 (Part-16)	500	2000	150	109	34
8	Aluminium (as Al) mg/l, Max	IS:3025 (Part-55)	0.03	0.2	<0.01	<0.01	<0.01
9	Ammonia (as total Ammonia -N),mg/l, Max	IS 3025 (Part-34)	0.5	0.5	<0.1	<0.1	<0.1
10	Anionic Detergents (as MBAS),mg/l , Max	Annex K of Is.13428	0.2	1.0	<0.1	<0.1	<0.1
11	Barium (as Ba), mg/l, Max	IS:15302 & APHA 21st	0.7	0.7	<0.5	<0.5	<0.5
12	Boron (as B), mg/l, Max	IS 3025 (Part-57)	0.5	1	<0.1	<0.1	<0.1
13	Calcium (as Ca),mg/l, Max	IS:3025 (Part-40)	75	200	28.4	11.2	4.8
14	Chloramines (as Cl_2), mg/l, Max	APHA 21st	4.0	4.0	NA	NA	NA
15	Chloride as Cl (mg/l),mg/l, Max	IS:3025 (Part-32)	250	1000	22.0	30.0	12.0
16	Copper (as Cu),mg/l, Max	IS:3025 (Part-42)	0.05	1.5	<0.01	<0.01	<0.01
17	Fluoride (as F),mg/l, Max	IS:3025 (Part-60)	1	1.5	<0.1	<0.1	<0.1
18	Residual, Free Chlorine,mg/l, Max	IS:3025 (Part-26)	0.2	1	<0.1	<0.1	<0.1
19	Iron (as Fe),mg/l, Max	IS:3025 (Part-53)	1.0	1.0	<0.05	<0.05	<0.05
20	Magnesium (as Mg)mg/l, Max	IS:3025 (Part-46)	30	100	7.3	3.0	1.0
21	Manganese (as Mn),mg/l, Max	IS:3025 (Part-59)	0.1	0.3	<0.03	<0.03	<0.03
22	Mineral Oil,mg/l, Max	Clause 6 of IS 3025 part 39	0.5	0.5	<0.01	<0.01	<0.01
23	Nitrates (as NO_3),mg/l, Max	IS:3025 (Part-34)	45	45	7.0	24.8	<0.1
24	Phenolics (as C_6H_5OH),mg/l, Max	IS:3025 (Part-43)	0.001	0.002	<0.001	<0.001	<0.001
25	Selenium (as Se),mg/l, Max	IS:3025 (Part-56)	0.01	0.01	<0.005	<0.005	<0.005
26	Silver (as Ag), mg/l Max	Annex J of Is.13428	0.1	0.1	<0.002	<0.002	<0.002
27	Sulphates (as SO_4),mg/l, Max	IS 3025 (Part-24)	200	400	28.0	20.0	4.0
28	Sulphide (as H_2S) , mg/l, Max	IS.3025 (Part-29)	0.05	0.05	<0.01	<0.01	<0.01
29	Alkalinity (as $CaCO_3$) mg/l, Max	IS.3025 (Part-23)	200	600	60	20	8
30	Total Hardness (as $CaCO_3$),mg/l, Max	IS 3025 (Part-21)	200	600	96	40	16
31	Zinc (as Zn),mg/l, Max	IS:3025 (Part-49)	5	15	<0.005	<0.005	<0.005
32	Cadmium (as Cd),mg/l, Max	IS 3025 (Part-41)	0.003	0.003	<0.002	<0.002	<0.002
33	Cyanide (as CN),mg/l, Max	IS.3025 (Part-27)	0.05	0.05	<0.01	<0.01	<0.01
34	Lead (as Pb),mg/l, Max	IS:3025 (Part-47)	0.01	0.01	<0.005	<0.005	<0.005
35	Molybdenum (as Mo), mg/l, Max	APHA 21st	0.07	0.07	NA	NA	NA
36	Mercury (as Hg),mg/l, Max	IS:3025 (Part-48)	0.001	0.001	<0.0005	<0.0005	<0.0005
37	Nickel (as Ni),mg/l, Max	IS:3025 (Part-54)	0.02	0.02	<0.01	<0.01	<0.01
38	Pesticides,mg/l, Max	APHA 21st	Absent	0.001	NA	NA	NA
39	Polychlorinated biphenyls mg/l, Max	APHA 21st Edition	0.0005	0.0005	NA	NA	NA
40	Polynuclear Aromatic Hydrocarbons (as PAH),mg/l, Max	APHA 21st Edition	0.0001	0.0001	NA	NA	NA
41	Arsenic (as As),mg/l, Max	IS:3025 (Part-37)	0.01	0.01	<0.002	<0.002	<0.002
42	Chromium (as Cr^{+6}),mg/l, Max	IS:3025 (Part-52)	0.05	0.05	<0.03	<0.03	<0.03
43	Trihalomethanes,mg/l, Max	APHA 21st	-	-	NA	NA	NA
44	Radioactive materials,Bq/l,mg/l	APHA 21st	-	-	NA	NA	NA
45	Total Coliform (per 100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
46	E-Coli (per 100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
47	Water levels in well from surface (m)	-	-	-	5.70	9.70	3.77

SAMPLE TYPE GW13 - Open Well water Bordem, GW14 - Open Well water Waist, GW15 - Open Well water Mulgao
Samples Collected & Analysed by Mineral Engineering Services, Ballari NA - Not Analysed

(MR. DURGA PRASAD)
GOVT. ANALYST

(M.S.RAJU)
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MINERAL ENGINEERING SERVICES

Recognised by GOI, MOEF&CC Under E(P)A 1986 Vide Gazette Notification
No. S.O 857(E) dated 26.02.2018. Recognition Valid Upto 25.02.2023

NABET ORG00U756
MTIC
ISO 9001:2015
ISO 45001:2018

Table No. 6

WATER ANALYSIS REPORT

MES/WATR/1100

Name of the Client	:	Salgaocar Shipping Company Private Limited
Name of the Project	:	Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem village, Bicholim Taluka, North Goa, Goa
Date of sampling	:	29.01.2023
Date of Report	:	10.02.2023
Report No.	:	MES/WS/WR/N69

Ref : IS 10500-2012 Norms (Drinking Water Standards)

Sl. No.	Parameters	Method of Testing	Desirable Limits	Permissible Limits	Result GW16	Result GW17	Result GW18
1	Colour (Hazen Units), Max	IS:3025 (Part-4)	5	15	1.0	1.0	<1
2	Odour	IS:3025 (Part-5)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	pH	IS:3025 (Part-11)	6.5 to 8.5	0.5 - 8.5	7.50	7.60	9.92
4	Taste	IS:3025 (Part- 8)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity,NTU, Max	IS 3025 (Part-10)	1	5	1.2	4.6	2.7
6	Electrical Conductivity (µmhos/cm)	IS 3025 (P-14)	-	-	224	307	83
7	Total Dissolved Solids,mg/l, Max	IS:3025 (Part-16)	500	2000	130	178	54
8	Aluminium (as Al) mg/l, Max	IS 3025 (Part-55)	0.03	0.2	<0.01	<0.01	<0.01
9	Ammonia (as total Ammonia -N),mg/l, Max	IS:3025 (Part-34)	0.5	0.5	<0.1	<0.1	<0.1
10	Anionic Detergents (as MBAS),mg/l , Max	Annex K of Is:13428	0.2	1.0	<0.1	<0.1	<0.1
11	Barium (as Ba), mg/l, Max	IS:15302 & APHA 21st	0.7	0.7	<0.5	<0.5	<0.5
12	Boron (as B), mg/l, Max	IS:3025 (Part-57)	0.5	1	<0.1	<0.1	<0.1
13	Calcium (as Ca),mg/l, Max	IS:3025 (Part-40)	75	200	17.6	38.4	7.2
14	Chloramines (as Cl_2), mg/l, Max	APHA 21st	4.0	4.0	NA	NA	NA
15	Chloride as Cl (mg/l),mg/l, Max	IS:3025 (Part-32)	250	1000	16.0	22.0	14.0
16	Copper (as Cu),mg/l, Max	IS:3025 (Part-42)	0.05	1.5	<0.01	<0.01	<0.01
17	Fluoride (as F),mg/l, Max	IS:3025 (Part-60)	1	1.5	<0.1	<0.1	0.11
18	Residual, Free Chlorine mg/l, Max	IS:3025 (Part-26)	0.2	1	<0.1	<0.1	<0.1
19	Iron (as Fe),mg/l, Max	IS:3025 (Part-53)	1.0	1.0	<0.05	<0.05	<0.05
20	Magnesium (as Mg),mg/l, Max	IS:3025 (Part-46)	30	100	7.3	7.3	2.0
21	Manganese (as Mn),mg/l, Max	IS:3025 (Part-59)	0.1	0.3	<0.03	<0.03	<0.03
22	Mineral Oil,mg/l, Max	Annex K of IS:13428 (part 20)	0.5	0.5	<0.01	<0.01	<0.01
23	Nitrates (as NO_3),mg/l, Max	IS:3025 (Part-34)	45	45	1.4	4.6	4.0
24	Phenolics (as C_6H_5OH),mg/l, Max	IS:3025 (Part-43)	0.001	0.002	<0.001	<0.001	<0.001
25	Selenium (as Se),mg/l, Max	IS:3025 (Part-56)	0.01	0.01	<0.005	<0.005	<0.005
26	Silver (as Ag), mg/l, Max	Annex J of Is:13428	0.1	0.1	<0.002	<0.002	<0.002
27	Sulphates (as SO_4),mg/l, Max	IS:3025 (Part-24)	200	400	10.0	20.0	8.0
28	Sulphide (as H_2S) , mg/l, Max	IS 3025 (Part-29)	0.05	0.05	<0.01	<0.01	<0.01
29	Alkalinity (as $CaCO_3$),mg/l, Max	IS:3025 (Part-23)	200	600	100	130	20
30	Total Hardness (as $CaCO_3$),mg/l, Max	IS:3025 (Part-21)	200	600	74	126	26
31	Zinc (as Zn),mg/l, Max	IS:3025 (Part-49)	5	15	<0.005	<0.005	<0.005
32	Cadmium (as Cd),mg/l, Max	IS:3025 (Part-41)	0.003	0.003	<0.002	<0.002	<0.002
33	Cyanide (as CN),mg/l, Max	IS:3025 (Part-27)	0.05	0.05	<0.01	<0.01	<0.01
34	Lead (as Pb),mg/l, Max	IS:3025 (Part-47)	0.01	0.01	<0.005	<0.005	<0.005
35	Molybdenum (as Mo), mg/l, Max	APHA 21st	0.07	0.07	NA	NA	NA
36	Mercury (as Hg),mg/l, Max	IS:3025 (Part-48)	0.001	0.001	<0.0005	<0.0005	<0.0005
37	Nickel (as Ni),mg/l, Max	IS:3025 (Part-54)	0.02	0.02	<0.01	<0.01	<0.01
38	Pesticides,mg/l, Max	APHA 21st	Absent	0.001	NA	NA	NA
39	Polychlorinated biphenyls mg/l, Max	APHA 21st Edition	0.0005	0.0005	NA	NA	NA
40	Polynuclear Aromatic Hydrocarbons (as PAH),mg/l, Max	APHA 21st Edition	0.0001	0.0001	NA	NA	NA
41	Arsenic (as As),mg/l, Max	IS:3025 (Part-37)	0.01	0.01	<0.002	<0.002	<0.002
42	Chromium (as Cr^{+6}),mg/l, Max	IS 3025 (Part-52)	0.05	0.05	<0.03	<0.03	<0.03
43	Trihalomethanes,mg/l, Max	APHA 21st	-	-	NA	NA	NA
44	Radioactive materials,Bq/Lmg/l	APHA 21st	-	-	NA	NA	NA
45	Total Coliform (per 100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
46	E-Coli (per 100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
47	Water levels in well from surface (m)	-	-	-	1.90	3.06	10.70

SAMPLE TYPE : GW16 - Open Well water Sirigao, GW17 - Open Well water Tivim, GW18 - Open Well water Sirigao
Samples Collected & Analysed by Mineral Engineering Services, Ballari NA - Not Analysed

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S.RAJU)
HEAD OF LABORATORY

MINERAL ENGINEERING SERVICES

Recognised by GOI, MOEF&CC Under E(P)A 1986 Vide Gazette Notification No. S.O. 857(E) dated 26.02.2018 Recognition Valid Upto 25.02.2023

NABET ORGP00756 MTIS ISO 9001:2015 ISO 45001 2018

Table No. 7

WATER ANALYSIS REPORT

MES/AW/TP/1180

Name of the Client	:	Sesgaocar Shipping Company Private Limited
Name of the Project	:	Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem village, Bicholim Taluka, North Goa, Goa
Date of sampling	:	29.01.2023
Date of Report	:	10.02.2023
Report No.	:	MES/WS/AWRN/70

Ref : IS:10500-2012 Norms (Drinking Water Standards)

Sl. No.	Parameters	Method of Testing	Desirable Limits	Permissible Limits	Result GW19	Result GW20	Result GW21
1	Colour (Hazen Units), Max	IS:3025 (Part-4)	5	15	<1	<1	<1
2	Odour	IS:3025 (Part-5)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	pH	IS:3025 (Part-11)	6.5 to 8.5	6.5 - 8.5	7.70	8.20	8.07
4	Taste	IS:3025 (Part-8)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity,NTU, Max	IS:3025 (Part-10)	1	5	5.0	4.2	2.7
6	Electrical Conductivity (µmhos/cm)	IS 3025 (P-14)	-	-	231	169	88
7	Total Dissolved Solids,mg/l, Max	IS:3025 (Part-16)	500	2000	134	98	50
8	Aluminium (as Al) mg/l, Max	IS:3026 (Part-55)	0.03	0.2	<0.01	<0.01	<0.01
9	Ammonia (as total Ammonia -N),mg/l, Max	IS:3025 (Part-34)	0.5	0.5	<0.1	<0.1	<0.1
10	Anionic Detergents (as MBAS),mg/l , Max	Annex K of IS:13428	0.2	1.0	<0.1	<0.1	<0.1
11	Barium (as Ba), mg/l, Max	IS 15302 & APHA 21st	0.7	0.7	<0.5	<0.5	<0.5
12	Boron (as B), mg/l, Max	IS:3025 (Part-57)	0.5	1	<0.1	<0.1	<0.1
13	Calcium (as Ca),mg/l, Max	IS:3026 (Part-40)	75	200	32.0	20.0	6.4
14	Chloramines (as Cl_2), mg/l, Max	APHA 21st	4.0	4.0	NA	NA	NA
15	Chloride as Cl (mg/l),mg/l, Max	IS 3025 (Part-32)	250	1000	20.0	14.0	14.0
16	Copper (as Cu),mg/l, Max	IS:3026 (Part-42)	0.05	1.5	<0.01	<0.01	<0.01
17	Fluoride (as F),mg/l, Max	IS 3025 (Part-60)	1	1.5	0.22	0.24	<0.1
18	Residual, Free Chlorine,mg/l, Max	IS:3025 (Part-26)	0.2	1	<0.1	<0.1	<0.1
19	Iron (as Fe),mg/l, Max	IS:3025 (Part-53)	1.0	1.0	<0.05	<0.05	<0.05
20	Magnesium (as Mg)mg/l, Max	IS 3025 (Part-46)	30	100	5.4	5.8	2.9
21	Manganese (as Mn),mg/l, Max	IS 3025 (Part-59)	0.1	0.3	<0.03	<0.03	<0.03
22	Mineral Oil,mg/l, Max	[illegible]	0.5	0.5	<0.01	<0.01	<0.01
23	Nitrates (as NO_3),mg/l, Max	IS:3025 (Part-34)	45	45	2.0	1.8	4.5
24	Phenolics (as C_6H_5OH),mg/l, Max	IS:3025 (Part-43)	0.001	0.002	<0.001	<0.001	<0.001
25	Selenium (as Se),mg/l, Max	IS:3025 (Part-56)	0.01	0.01	<0.005	<0.005	<0.005
26	Silver (as Ag), mg/l, Max	Annex J of IS:13428	0.1	0.1	<0.002	<0.002	<0.002
27	Sulphates (as SO_4),mg/l, Max	IS:3025 (Part-24)	200	400	24.0	8.0	8.0
28	Sulphide (as H_2S) , mg/l, Max	IS:3025 (Part-29)	0.05	0.05	<0.01	<0.01	<0.01
29	Alkalinity (as $CaCO_3$) mg/l, Max	IS:3025 (Part-23)	200	600	96	74	12
30	Total Hardness (as $CaCO_3$),mg/l, Max	IS:3025 (Part-21)	200	600	102	74	28
31	Zinc (as Zn),mg/l, Max	IS:3025 (Part-49)	5	15	<0.005	<0.005	<0.005
32	Cadmium (as Cd),mg/l, Max	IS:3025 (Part-41)	0.003	0.003	<0.002	<0.002	<0.002
33	Cyanide (as CN),mg/l, Max	IS:3025 (Part-27)	0.05	0.05	<0.01	<0.01	<0.01
34	Lead (as Pb),mg/l, Max	IS:3025 (Part-47)	0.01	0.01	<0.005	<0.005	<0.005
35	Molybdenum (as Mo), mg/l, Max	APHA 21st	0.07	0.07	NA	NA	NA
36	Mercury (as Hg),mg/l, Max	IS:3026 (Part-48)	0.001	0.001	<0.0005	<0.0005	<0.0005
37	Nickel (as Ni),mg/l, Max	IS:3025 (Part-54)	0.02	0.02	<0.01	<0.01	<0.01
38	Pesticides,mg/l, Max	APHA 21st	Absent	0.001	NA	NA	NA
39	Polychlorinated biphenyls mg/l, Max	APHA 21st Edition	0.0005	0.0005	NA	NA	NA
40	Polynuclear Aromatic Hydrocarbons (as PAH),mg/l, Max	APHA 21st Edition	0.0001	0.0001	NA	NA	NA
41	Arsenic (as As),mg/l, Max	IS 3025 (Part-37)	0.01	0.01	<0.002	<0.002	<0.002
42	Chromium (as Cr^{+6}),mg/l, Max	IS:3026 (Part-52)	0.05	0.05	<0.03	<0.03	<0.03
43	Trihalomethanes,mg/l, Max	APHA 21st	-	-	NA	NA	NA
44	Radioactive materials,Bq/l,mg/l	APHA 21st	-	-	NA	NA	NA
45	Total Coliform (per 100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
46	E-Coli (per 100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
47	Water levels in well from surface (m)	-	-	-	4.40	5.00	3.60

SAMPLE TYPE : GW19 - Open Well water Assonora, GW20 - Open Well water Advalpale, GW21 - Open Well water Kalapar

Samples Collected & Analysed by Mineral Engineering Services, Ballari NA - Not Analysed

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MINERAL ENGINEERING SERVICES

Recognised by GOI, MOEF&CC Under E(P)A 1986 Vide Gazette Notification
No S.O. 857(E) dated 26.02.2018. Recognition Valid Upto 25.02.2023

NABET CERTIFICATE NO. NABET/EIA/1720/RA 0154
ISO 9001:2015
ISO 45001:2018

Table No. 8

WATER ANALYSIS REPORT

MES/WATR/11/20

Name of the Client	:	Salgaocar Shipping Company Private Limited
Name of the Project	:	Block - II, Sirigao - Mayem Mineral Block, Sirigao & Mayem village, Bicholim Taluka, North Goa, Goa
Date of sampling	:	29.01.2023
Date of Report	:	10.02.2023
Report No.	:	MES/WS/WR/171

Ref : IS:10500-2012 Norms (Drinking Water Standards)

Sl. No.	Parameters	Method of Testing	Desirable Limits	Permissible Limits	Result GW22	Result GW23	Result GW24
1	Colour (Hazen Units), Max	IS:3025 (Part-4)	5	15	<1	1.0	1.0
2	Odour	IS:3025 (Part-5)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	pH	IS 3025 (Part-11)	6.5 to 8.5	6.5 - 8.5	6.96	7.82	7.85
4	Taste	IS:3025 (Part - 8)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity,NTU, Max	IS 3025 (Part-10)	1	5	1.8	3.2	4.0
6	Electrical Conductivity (µmhos/cm)	IS 3025 (P-14)	-	-	79	114	287
7	Total Dissolved Solids,mg/l, Max	IS:3025 (Part-16)	500	2000	46	66	172
8	Aluminium (as Al) mg/l, Max	IS:3025 (Part-55)	0.03	0.2	<0.01	<0.01	<0.01
9	Ammonia (as total Ammonia - N),mg/l, Max	IS:3025 (Part-34)	0.5	0.5	<0.1	<0.1	<0.1
10	Anionic Detergents (as MBAS),mg/l , Max	Annex K of Is:13428	0.2	1.0	<0.1	<0.1	<0.1
11	Barium (as Ba), mg/l, Max	IS:15302 & APHA 21st	0.7	0.7	<0.6	<0.6	<0.6
12	Boron (as B), mg/l, Max	IS:3025 (Part-57)	0.5	1	<0.1	<0.1	<0.1
13	Calcium (as Ca),mg/l, Max	IS:3025 (Part-40)	75	200	5.6	8.0	32.0
14	Chloramines (as Cl_2), mg/l, Max	APHA 21st	4.0	4.0	NA	NA	NA
15	Chloride as Cl (mg/l),mg/l, Max	IS:3025 (Part-32)	250	1000	12.0	14.0	20.0
16	Copper (as Cu),mg/l, Max	IS:3025 (Part-42)	0.05	1.5	<0.01	<0.01	<0.01
17	Fluoride (as F),mg/l, Max	IS:3025 (Part-60)	1	1.5	<0.1	<0.1	<0.1
18	Residual, Free Chlorine,mg/l, Max	IS 3025 (Part-26)	0.2	1	<0.1	<0.1	<0.1
19	Iron (as Fe),mg/l, Max	IS 3025 (Part-53)	1.0	1.0	<0.05	<0.05	<0.05
20	Magnesium (as Mg)mg/l, Max	IS:3025 (Part-46)	30	100	2.4	2.9	12.6
21	Manganese (as Mn),mg/l, Max	IS:3025 (Part-59)	0.1	0.3	<0.03	<0.03	<0.03
22	Mineral Oil mg/l, Max	Clause 6 of IS 3025 (part-39)	0.5	0.5	<0.01	<0.01	<0.01
23	Nitrates (as NO_3),mg/l, Max	IS:3025 (Part-34)	45	45	1.6	1.2	4.2
24	Phenolics (as C_6H_5OH),mg/l, Max	IS:3025 (Part-43)	0.001	0.002	<0.001	<0.001	<0.001
25	Selenium (as Se),mg/l, Max	IS:3025 (Part-56)	0.01	0.01	<0.005	<0.005	<0.005
26	Silver (as Ag), mg/l, Max	Annex J of Is:13428	0.1	0.1	<0.002	<0.002	<0.002
27	Sulphates (as SO_4),mg/l, Max	IS:3025 (Part-24)	200	400	5.0	16.0	14.0
28	Sulphide (as H_2S) , mg/l, Max	IS:3025 (Part-29)	0.05	0.05	<0.01	<0.01	<0.01
29	Alkalinity (as $CaCO_3$) mg/l, Max	IS:3025 (Part-23)	200	600	24	26	132
30	Total Hardness (as $CaCO_3$),mg/l, Max	IS:3025 (Part-21)	200	600	24	32	132
31	Zinc (as Zn),mg/l, Max	IS:3025 (Part-49)	5	15	<0.005	<0.005	<0.005
32	Cadmium (as Cd),mg/l, Max	IS:3025 (Part-41)	0.003	0.003	<0.002	<0.002	<0.002
33	Cyanide (as CN),mg/l, Max	IS:3025 (Part-27)	0.05	0.05	<0.01	<0.01	<0.01
34	Lead (as Pb),mg/l, Max	IS:3025 (Part-47)	0.01	0.01	<0.005	<0.005	<0.005
35	Molybdenum (as Mo), mg/l, Max	APHA 21st	0.07	0.07	NA	NA	NA
36	Mercury (as Hg),mg/l, Max	IS:3025 (Part-48)	0.001	0.001	<0.0005	<0.0005	<0.0005
37	Nickel (as Ni),mg/l, Max	IS 3025 (Part-54)	0.02	0.02	<0.01	<0.01	<0.01
38	Pesticides,mg/l, Max	APHA 21st	Absent	0.001	NA	NA	NA
39	Polychlorinated biphenyls mg/l, Max	APHA 21st Edition	0.0005	0.0005	NA	NA	NA
40	Polynuclear Aromatic Hydrocarbons (as PAH),mg/l, Max	APHA 21st Edition	0.0001	0.0001	NA	NA	NA
41	Arsenic (as As),mg/l, Max	IS:3025 (Part-37)	0.01	0.01	<0.002	<0.002	<0.002
42	Chromium (as Cr^{+6}),mg/l, Max	IS:3025 (Part-52)	0.05	0.05	<0.03	<0.03	<0.03
43	Trihalomethanes,mg/l, Max	APHA 21st	-	-	NA	NA	NA
44	Radioactive materials,Bq/l,mg/l	APHA 21st	-	-	NA	NA	NA
45	Total Coliform (per 100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
46	E-Coli (per 100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
47	Water levels in well from surface (m)	--	-	-	2.95	3.75	4.58

SAMPLE TYPE : GW22 - Open Well water Bolwade, GW23 - Open Well water Sarvana, GW24 - Open Well water Corgaum
Samples Collected & Analysed by Mineral Engineering Services, Ballari NA - Not Analysed

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S.RAJU)
HEAD OF LABORATORY

MINERAL ENGINEERING SERVICES

Recognised by GOI, MOEF&CC Under E(P)A 1986 Vide Gazette Notification No. S.O. 957(E) dated 26.02.2016. Recognition Valid Upto 25.02.2020

NABET ORG000756

ISO 9001:2015 TSO 45001:2018

Table No. 9

WATER ANALYSIS REPORT

MES/WATR/11/00

Name of the Client : Salgaocar Shipping Colliery Private Limited
Name of the Project : Block - II, Sirigao - Mayem Mineral Block, Shigao & Mayem village, Bicholim Taluka, North Goa, Goa
Date of sampling : 29.01.2023
Date of Report : 10.02.2023
Report No. : MES/WS/WRN/72
Ref IS:10500-2012 Norms (Drinking Water Standards)

Sl. No.	Parameters	Method of Testing	Desirable Limits	Permissible Limits	Result GW25	Result GW26	Result GW27
1	Colour (Hazen Units), Max	IS 3025 (Part-4)	5	15	<1	1.0	<1
2	Odour	IS:3025 (Part-5)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	pH	IS:3025 (Part-11)	6.5 to 8.5	6.5 - 8.6	5.73	7.46	7.63
4	Taste	IS 3025 (Part- 8)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity,NTU, Max	IS:3025 (Part-10)	1	5	2.1	1.2	0.7
6	Electrical Conductivity (µmhos/cm)	IS 3025 (P-14)	-	-	145	279	307
7	Total Dissolved Solids,mg/l, Max	IS:3025 (Part-16)	500	2000	84	162	178
8	Aluminium (as Al) mg/l, Max	IS:3025 (Part-55)	0.03	0.2	<0.01	<0.01	<0.01
9	Ammonia (as total Ammonia -N) mg/l, Max	IS:3025 (Part-34)	0.5	0.5	<0.1	<0.1	<0.1
10	Anionic Detergents (as MBAS),mg/l , Max	Annex K of Is.13428	0.2	1.0	<0.1	<0.1	<0.1
11	Barium (as Ba), mg/l, Max	IS:15302 & APHA 21st	0.7	0.7	<0.5	<0.5	<0.5
12	Boron (as B), mg/l, Max	IS:3025 (Part-57)	0.5	1	<0.1	<0.1	<0.1
13	Calcium (as Ca),mg/l, Max	IS:3025 (Part-40)	75	200	6.8	36.8	32.0
14	Chloramines (as Cl_2), mg/l, Max	APHA 21st	4.0	4.0	NA	NA	NA
15	Chloride as Cl (mg/l),mg/l, Max	IS:3025 (Part-32)	250	1000	25.0	22.0	30.0
16	Copper (as Cu),mg/l, Max	IS:3025 (Part-42)	0.05	1.5	<0.01	<0.01	<0.01
17	Fluoride (as F),mg/l, Max	IS:3025 (Part-60)	1	1.5	<0.1	<0.1	<0.1
18	Residual, Free Chlorine,mg/l, Max	IS:3025 (Part-26)	0.2	1	<0.1	<0.1	<0.1
19	Iron (as Fe),mg/l, Max	IS:3025 (Part-53)	1.0	1.0	<0.05	<0.05	<0.05
20	Magnesium (as Mg)mg/l, Max	IS:3025 (Part-46)	30	100	2.4	6.8	9.7
21	Manganese (as Mn),mg/l, Max	IS 3025 (Part-59)	0.1	0.3	<0.03	<0.03	<0.03
22	Mineral Oil,mg/l, Max	Clause 5 of IS 3025 (part -39)	0.5	0.5	<0.01	<0.01	<0.01
23	Nitrates (as NO_3),mg/l, Max	IS 3025 (Part-34)	45	45	5.8	1.3	18.2
24	Phenolics (as C_6H_5OH),mg/l, Max	IS:3025 (Part-43)	0.001	0.002	<0.001	<0.001	<0.001
25	Selenium (as Se),mg/l, Max	IS:3025 (Part-56)	0.01	0.01	<0.005	<0.005	<0.005
26	Silver (as Ag), mg/l, Max	Annex J of Is;13428	0.1	0.1	<0.002	<0.002	<0.002
27	Sulphates (as SO_4),mg/l, Max	IS:3025 (Part-24)	200	400	6.0	10.0	25.0
28	Sulphide (as H_2S) , mg/l, Max	IS 3025 (Part-29)	0.05	0.05	<0.01	<0.01	<0.01
29	Alkalinity (as $CaCO_3$) mg/l, Max	IS:3025 (Part-23)	200	600	26	122	100
30	Total Hardness (as $CaCO_3$),mg/l, Max	IS:3025 (Part-21)	200	600	37	120	120
31	Zinc (as Zn),mg/l, Max	IS:3025 (Part-49)	5	15	<0.005	<0.005	<0.005
32	Cadmium (as Cd),mg/l, Max	IS:3025 (Part-41)	0.003	0.003	<0.002	<0.002	<0.002
33	Cyanide (as CN),mg/l, Max	IS:3025 (Part-27)	0.05	0.05	<0.01	<0.01	<0.01
34	Lead (as Pb),mg/l, Max	IS:3025 (Part-47)	0.01	0.01	<0.005	<0.005	<0.005
35	Molybdenum (as Mo), mg/l, Max	APHA 21st	0.07	0.07	NA	NA	NA
36	Mercury (as Hg),mg/l, Max	IS:3025 (Part-48)	0.001	0.001	<0.0005	<0.0005	<0.0005
37	Nickel (as Ni),mg/l, Max	IS:3025 (Part-54)	0.02	0.02	<0.01	<0.01	<0.01
38	Pesticides,mg/l, Max	APHA 21st	Absent	0.001	NA	NA	NA
39	Polychlorinated biphenyls mg/l, Max	APHA 21st Edition	0.0005	0.0005	NA	NA	NA
40	Polynuclear Aromatic Hydrocarbons (as PAH),mg/l, Max	APHA 21st Edition	0.0001	0.0001	NA	NA	NA
41	Arsenic (as As),mg/l, Max	IS:3025 (Part-37)	0.01	0.01	<0.002	<0.002	<0.002
42	Chromium (as Cr^{+6}),mg/l, Max	IS:3025 (Part-52)	0.05	0.05	<0.03	<0.03	<0.03
43	Trihalomethanes,mg/l, Max	APHA 21st	-	-	NA	NA	NA
44	Radioactive materials,Bq/l,mg/l	APHA 21st	-	-	NA	NA	NA
45	Total Coliform (per 100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
46	E-Coli (per 100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
47	Water levels in well from surface (m)	-	-	-	5.80	5.75	4.70

SAMPLE TYPE : GW25 - Open Well water Shikari , GW26 - Open Well water Kurubarwada, GW27 - Open Well water Cultivtn
Samples Collected & Analysed by Mineral Engineering Services, Bellari NA - Not Analysed

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S.RAJU)
HEAD OF LABORATORY

MINERAL ENGINEERING SERVICES

Recognised by GOI, MOEF&CC Under E(P)A 1986 Vide Gazette Notification
No S O. 857(E) dated 26.02.2018. Recognition Valid Upto 25.02.2023

NABET ORG/00756
TTC ISO 9001:2015 ISO 45001:2018

Table No. 10

WATER ANALYSIS REPORT

MES/WW/TP/11/00

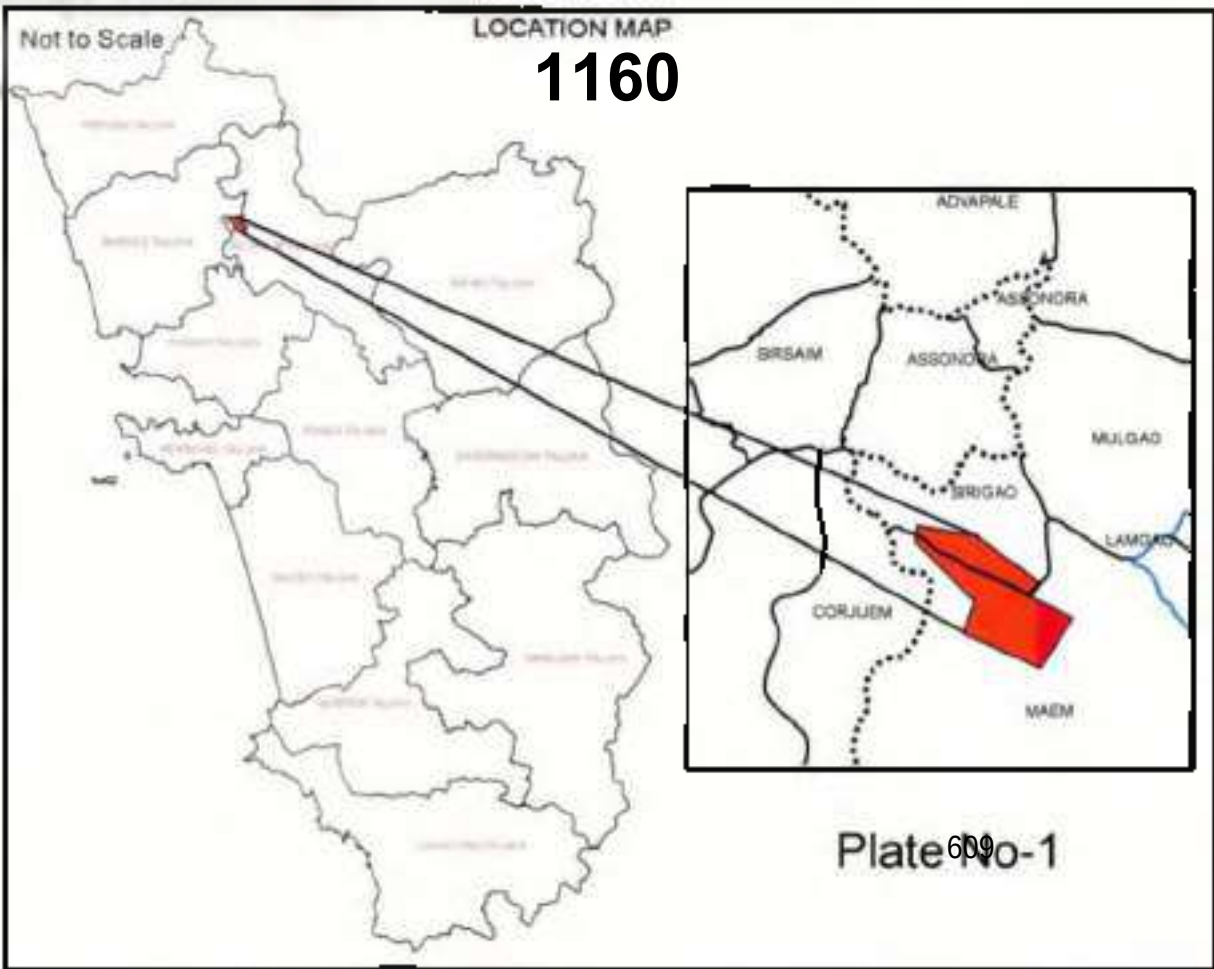
Name of the Client : Salgaocar Shipping Company Private Limited
Name of the Project : Block - II, Sirigao - Mayem Mineral Block,
Sirigao & Mayem village, Bicholim Taluka, North Goa, Goa
Date of sampling : 28.01.2023
Date of Report : 10.02.2023
Report No. : MES/WS/WR/N73
Ref : IS:10500-2012 Norms (Drinking Water Standards)

Sl. No.	Parameters	Method of Testing	Desirable Limits	Permissible Limits	Result GW28	Result GW29	Result GW30
1	Colour (Hazen Units), Max	IS 3025 (Part-4)	5	15	<1	<1	<1
2	Odour	IS:3025 (Part-5)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	pH	IS:3025 (Part-11)	6.5 to 8.5	6.5 - 8.5	7.56	8.12	8.85
4	Taste	IS:3025 (Part- 8)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity,NTU, Max	IS:3025 (Part-10)	1	5	4.0	2.8	4.0
6	Electrical Conductivity (µmho/cm)	IS 3025 (P-14)	-	-	448	114	93
7	Total Dissolved Solids,mg/l, Max	IS:3025 (Part-16)	500	2000	260	66	54
8	Aluminium (as Al) mg/l, Max	IS:3025 (Part-55)	0.03	0.2	<0.01	<0.01	<0.01
9	Ammonia (as total Ammonia -N),mg/l Max	IS:3025 (Part-34)	0.5	0.5	<0.1	<0.1	<0.1
10	Anionic Detergents (as MBAS),mg/l , Max	Annex K of IS:13428	0.2	1.0	<0.1	<0.1	<0.1
11	Barium (as Ba), mg/l, Max	IS:15302 & APHA 21st	0.7	0.7	<0.5	<0.5	<0.5
12	Boron (as B), mg/l, Max	IS 3025 (Part-57)	0.5	1	<0.1	<0.1	<0.1
13	Calcium (as Ca),mg/l, Max	IS:3025 (Part-40)	75	200	48.9	9.6	8.0
14	Chloramines (as Cl_2), mg/l, Max	APHA 21st	4.0	4.0	NA	NA	NA
15	Chloride as Cl (mg/l),mg/l, Max	IS:3025 (Part-32)	250	1000	68.0	12.0	10.0
16	Copper (as Cu),mg/l, Max	IS 3025 (Part-42)	0.05	1.5	<0.01	<0.01	<0.01
17	Fluoride (as F),mg/l, Max	IS:3025 (Part-60)	1	1.5	<0.1	<0.1	<0.1
18	Residual, Free Chlorine,mg/l, Max	IS 3025 (Part-26)	0.2	1	<0.1	<0.1	<0.1
19	Iron (as Fe),mg/l, Max	IS:3025 (Part-53)	1.0	1.0	<0.05	<0.05	<0.05
20	Magnesium (as Mg)mg/l, Max	IS:3025 (Part-46)	30	100	8.7	4.8	2.8
21	Manganese (as Mn),mg/l, Max	IS:3025 (Part-59)	0.1	0.3	<0.03	<0.03	<0.03
22	Mineral Oil,mg/l, Max	Clause 6 of IS 3025 (part-39)	0.5	0.5	<0.01	<0.01	<0.01
23	Nitrates (as NO_3),mg/l, Max	IS:3025 (Part-34)	45	45	1.1	1.5	1.0
24	Phenolics (as C_6H_5OH),mg/l, Max	IS:3025 (Part-43)	0.001	0.002	<0.001	<0.001	<0.001
25	Selenium (as Se),mg/l, Max	IS:3025 (Part-56)	0.01	0.01	<0.006	<0.006	<0.006
26	Silver (as Ag), mg/l, Max	Annex J of IS:13428	0.1	0.1	<0.002	<0.002	<0.002
27	Sulphates (as SO_4),mg/l, Max	IS:3025 (Part-24)	200	400	22.4	5.2	4.4
28	Sulphide (as H_2S) , mg/l, Max	IS:3025 (Part-29)	0.05	0.05	<0.01	<0.01	<0.01
29	Alkalinity (as $CaCO_3$) mg/l, Max	IS:3025 (Part-23)	200	600	130	40	30
30	Total Hardness (as $CaCO_3$),mg/l, Max	IS:3025 (Part-21)	200	600	158	44	32
31	Zinc (as Zn),mg/l, Max	IS 3025 (Part-49)	5	15	<0.005	<0.005	<0.005
32	Cadmium (as Cd),mg/l, Max	IS 3025 (Part-41)	0.003	0.003	<0.002	<0.002	<0.002
33	Cyanide (as CN),mg/l, Max	IS 3025 (Part-27)	0.05	0.05	<0.01	<0.01	<0.01
34	Lead (as Pb),mg/l, Max	IS:3025 (Part-47)	0.01	0.01	<0.005	<0.005	<0.005
35	Molybdenum (as Mo), mg/l, Max	APHA 21st	0.07	0.07	NA	NA	NA
36	Mercury (as Hg),mg/l, Max	IS:3025 (Part-48)	0.001	0.001	<0.0005	<0.0005	<0.0005
37	Nickel (as Ni),mg/l, Max	IS:3025 (Part-54)	0.02	0.02	<0.01	<0.01	<0.01
38	Pesticides,mg/l, Max	APHA 21st	Absent	0.001	NA	NA	NA
39	Polychlorinated biphenyls mg/l, Max	APHA 21st Edition	0.0005	0.0005	NA	NA	NA
40	Polynuclear Aromatic Hydrocarbons (as PAH),mg/l, Max	APHA 21st Edition	0.0001	0.0001	NA	NA	NA
41	Arsenic (as As),mg/l, Max	IS:3025 (Part-37)	0.01	0.01	<0.002	<0.002	<0.002
42	Chromium (as Cr^{+6}),mg/l, Max	IS:3025 (Part-52)	0.05	0.05	<0.03	<0.03	<0.03
43	Trihalomethanes,mg/l, Max	APHA 21st	-	-	NA	NA	NA
44	Radioactive materials,Bq/l,mg/l	APHA 21st	-	-	NA	NA	NA
45	Total Coliform (per 100ml)	IS 1622	Absent	Absent	Absent	Absent	Absent
46	E-Coli (per 100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
47	Water levels in well from surface (m)	-	-	-	6.15	5.50	2.15

SAMPLE TYPE : GW28 - Open Well water Lamkona , GW29 - Open Well water Nachimole, GW30 - Open Well water Nanoda
Samples Collected & Analysed by Mineral Engineering Services, Ballari NA - Not Analysed

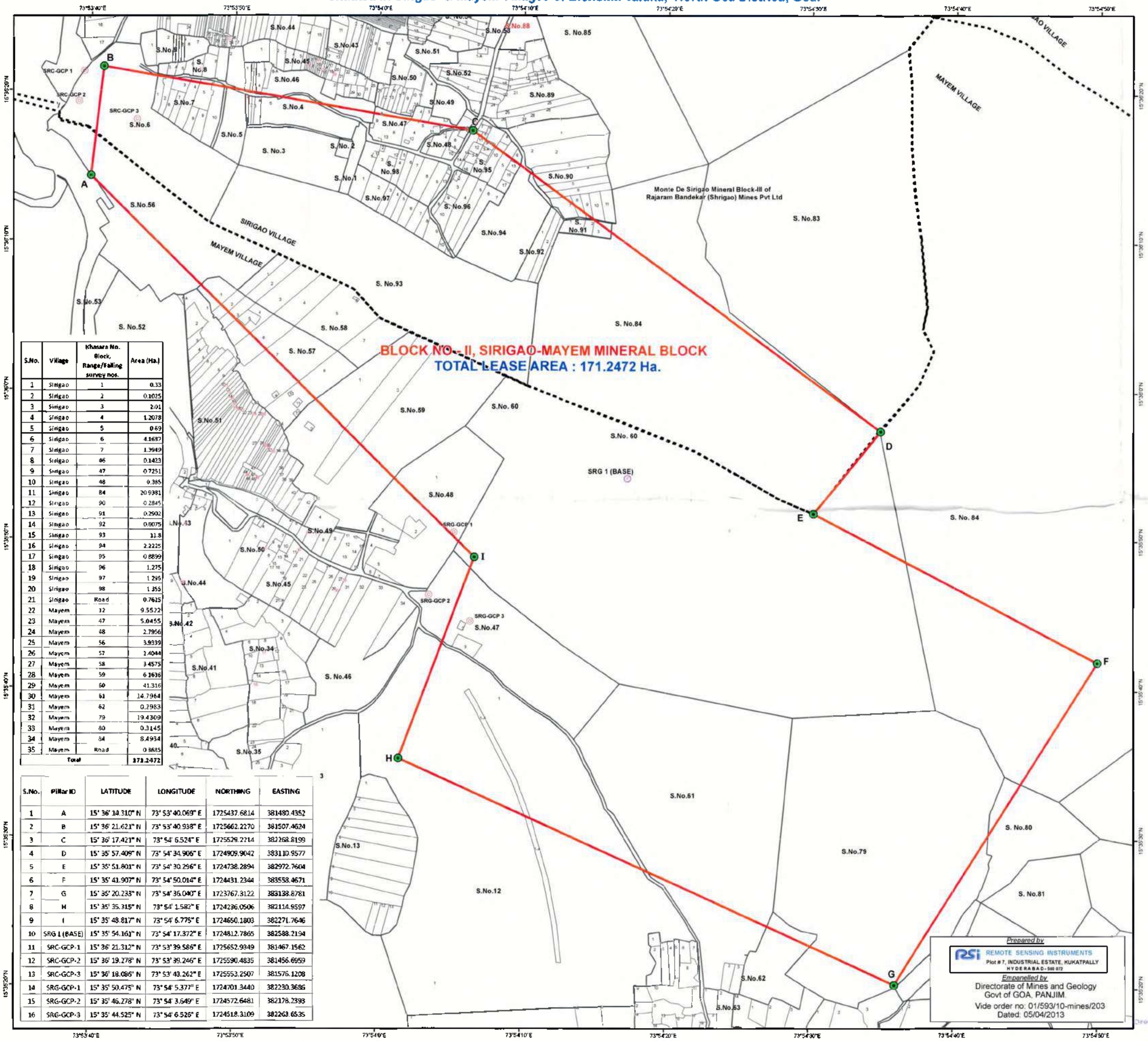
(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S.RAJU)
HEAD OF LABORATORY


Not to Scale
LOCATION MAP
1160
ADVAPALE
ASSONORA
SIRSAIM
ASSONORA
MULGAO
SIRIGAO
LAMGAO
CORJUEM
MAEM
Plate No-1

SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

Plan Showing Mining Lease Boundary of BLOCK NO - II, SIRIGAO-MAYEM MINERAL BLOCK on Georeferenced and Vectorised Cadastral Map situated in Sirigao & Mayem Villages of Bicholim Taluka, North Goa District., Goa.



S.No.	Village	Khasara No. Block, Range/Taking survey nos.	Area (Ha.)
1	Sirigao	1	0.33
2	Sirigao	2	0.1025
3	Sirigao	3	2.01
4	Sirigao	4	1.2078
5	Sirigao	5	0.69
6	Sirigao	6	4.1687
7	Sirigao	7	1.3949
8	Sirigao	46	0.1423
9	Sirigao	47	0.7251
10	Sirigao	48	0.385
11	Sirigao	84	20.9381
12	Sirigao	90	0.2845
13	Sirigao	91	0.2902
14	Sirigao	92	0.6075
15	Sirigao	93	11.8
16	Sirigao	94	2.2225
17	Sirigao	95	0.8899
18	Sirigao	96	1.275
19	Sirigao	97	1.295
20	Sirigao	98	1.355
21	Sirigao	Road	0.7625
22	Mayem	12	9.5522
23	Mayem	47	5.0455
24	Mayem	48	2.7956
25	Mayem	56	3.9339
26	Mayem	57	2.4044
27	Mayem	58	3.4575
28	Mayem	59	6.1636
29	Mayem	60	41.316
30	Mayem	61	14.7964
31	Mayem	62	0.2983
32	Mayem	79	19.4309
33	Mayem	80	0.3145
34	Mayem	84	8.4934
35	Mayem	Road	0.3685
Total			171.2472

S.No.	Pillar ID	LATITUDE	LONGITUDE	NORTHING	EASTING
1	A	15° 36' 14.310" N	73° 53' 40.069" E	1725437.6814	381480.4352
2	B	15° 36' 21.621" N	73° 53' 40.938" E	1725662.2270	381507.4624
3	C	15° 36' 17.421" N	73° 54' 6.524" E	1725529.2214	382268.8199
4	D	15° 35' 57.409" N	73° 54' 34.906" E	1724909.9042	383110.9577
5	E	15° 35' 51.801" N	73° 54' 30.296" E	1724738.2894	382972.7604
6	F	15° 35' 41.907" N	73° 54' 50.014" E	1724431.2344	383558.4671
7	G	15° 35' 20.233" N	73° 54' 36.040" E	1723767.3122	383138.8781
8	H	15° 35' 35.315" N	73° 54' 1.582" E	1724236.0506	382114.9597
9	I	15° 35' 48.817" N	73° 54' 6.775" E	1724650.1803	382271.7646
10	SRG 1 (BASE)	15° 35' 54.161" N	73° 54' 17.372" E	1724812.7865	382588.2194
11	SRC-GCP-1	15° 36' 21.312" N	73° 53' 39.586" E	1725652.9349	381467.1562
12	SRC-GCP-2	15° 36' 19.278" N	73° 53' 39.246" E	1725590.4835	381456.6959
13	SRC-GCP-3	15° 36' 18.086" N	73° 53' 43.262" E	1725553.2507	381576.1208
14	SRG-GCP-1	15° 35' 50.475" N	73° 54' 5.377" E	1724701.3440	382230.3686
15	SRG-GCP-2	15° 35' 46.278" N	73° 54' 3.649" E	1724572.6481	382178.2393
16	SRG-GCP-3	15° 35' 44.525" N	73° 54' 6.526" E	1724518.3109	382263.6535

Prepared by
REMOTE SENSING INSTRUMENTS
Plot # 7, INDUSTRIAL ESTATE, KUKATPALLY HYDERABAD - 500 072
Empanelled by
Directorate of Mines and Geology
Govt of GOA, PANJIM.
Vide order no: 01/593/10-mines/203
Dated: 05/04/2013

N
W E
S

SCALE 1:3,960

0 50 100 200 300 400 500 Meters

GEO-REFERENCED & VECTORISED CADASTRAL MAP OF:

LEASE NAMES:	BLOCK NO - II, SIRIGAO-MAYEM MINERAL BLOCK

LESSEE **SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED**

LOCATION **MAYEM & SIRIGAO** VILLAGES OF BICHOLIM TALUKA, NORTH GOA DISTRICT, GOA

MINING LEASE AREA AS PER DGPS SURVEY - **171.2472 Ha.**

Legend

- DGPS POINT OF LEASE BOUNDARY
- LEASE BOUNDARY AS PER DGPS SURVEY
- SURVEY No BOUNDARY
- SUB-DIVISION OF THE SURVEY No
- TALUKABOUNDARY
- VILLAGE BOUNDARY
- BASE STATION
- GROUND CONTROL POINTS

KEY PLAN OF SIRGAO MINES

DATUM : WGS 84

PROJECTION : UTM Zone 43N

LOCATION MAP

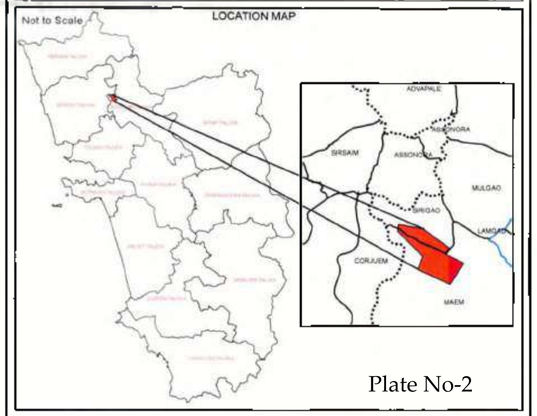


Plate No-2

CERTIFICATE

This is to certify that the Mining Lease Boundary Pillars of Block No - II, Sirigao-Mayem Mineral Block have been Surveyed by using DGPS (Differential Global Positioning System). The Survey was conducted earlier to comply with IBM Circular No. 2/2010 dated 06.04.2010.

SALGAOCAR SHIPPING COMPANY (I) LTD.

Sandeep M Naik
(Authorised Signatory)

CERTIFICATE

This is to certify that the Mining Lease Boundary Pillars of Block No - II, Sirigao-Mayem Mineral Block have been Surveyed by using DGPS (Differential Global Positioning System). The Survey was conducted earlier and this plan is as per requirement of IBM Circular No. 2/2010 dated 06.04.2010

REMOTE SENSING INSTITUTE HYD-7

For Remote Sensing Instruments
Shri. B.V. Ramana Kumar
(General Manager)

Directorate of Mines and Geology - Panaji - Goa

Checked by	Certified by
	Director of Mines & Geology, Directorate of Mines & Geology, Government of Goa, Panaji - Goa.
	Director of Mines and Geology

Key Plan

N
W E
S

Scale 1:100,000

0 2.5 5 Km

Legend

- Mining Lease Area
- 10km buffer Zone

Plate No-3

Block II – Sirigao-Mayem Mineral Block

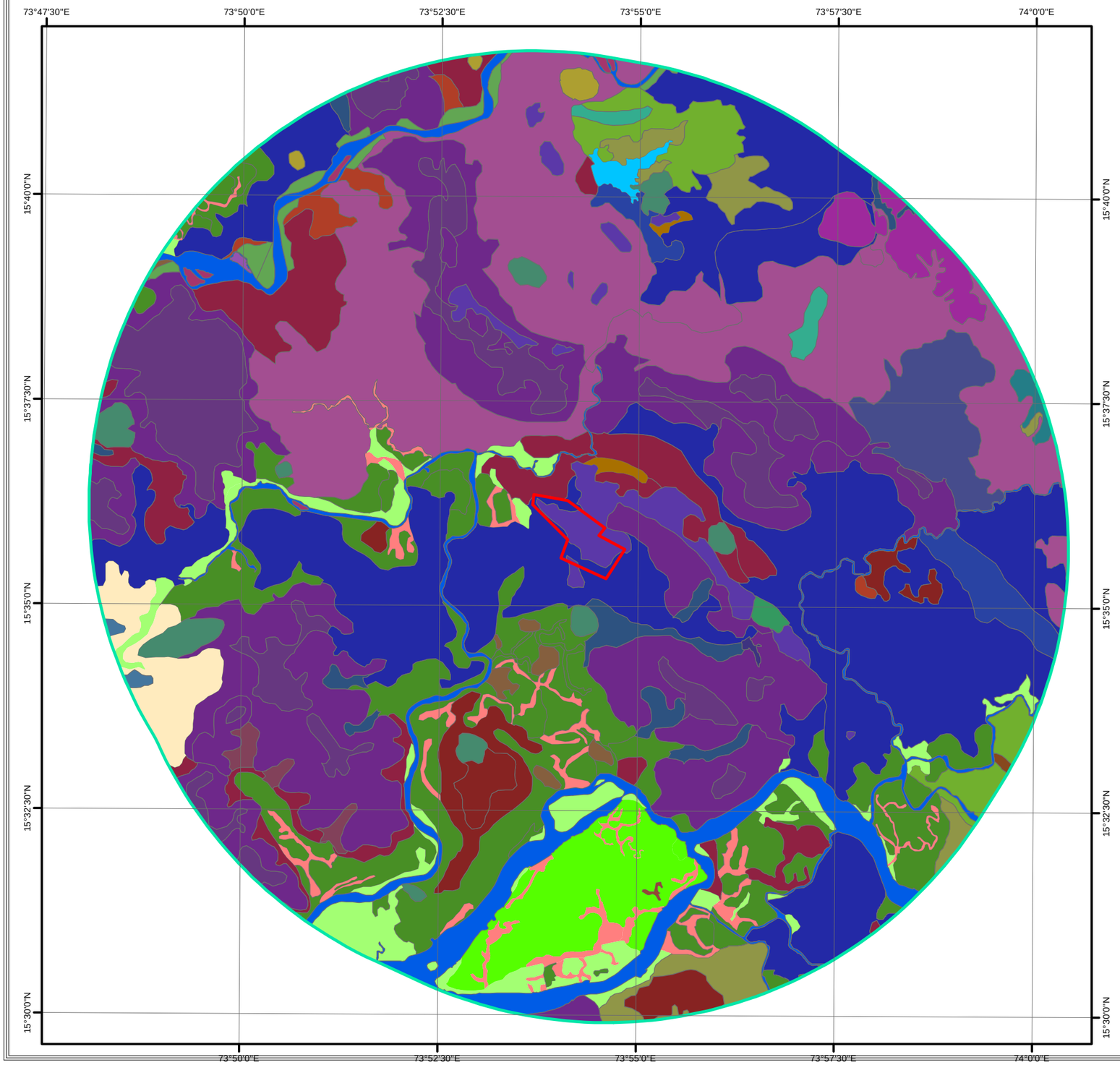
Located at Sirigao & Mayem Villages, Bichololim Taluka
North Goa District, Goa

SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

Scale	1:100000	
Topo Sheets No.	New	Old
	D43B14, D43B15, D43C2 & D43C3	48E/14, 48E/15, 48I/2 & 48I/3
Map Prepared By	Mineral Engineering Services 25/XXV Club Road, Ballari -58103	

1163
A
B
C
D
E
F
G
H
I
Plate No-4
Google Earth
© 2023 Google
700 m
N

Geomorophology of Study Area



N
W E
S

Scale1:100,000

0 2.5 5 Km

Legend

- Mining_Lease_Area
- 10km Bufferzone

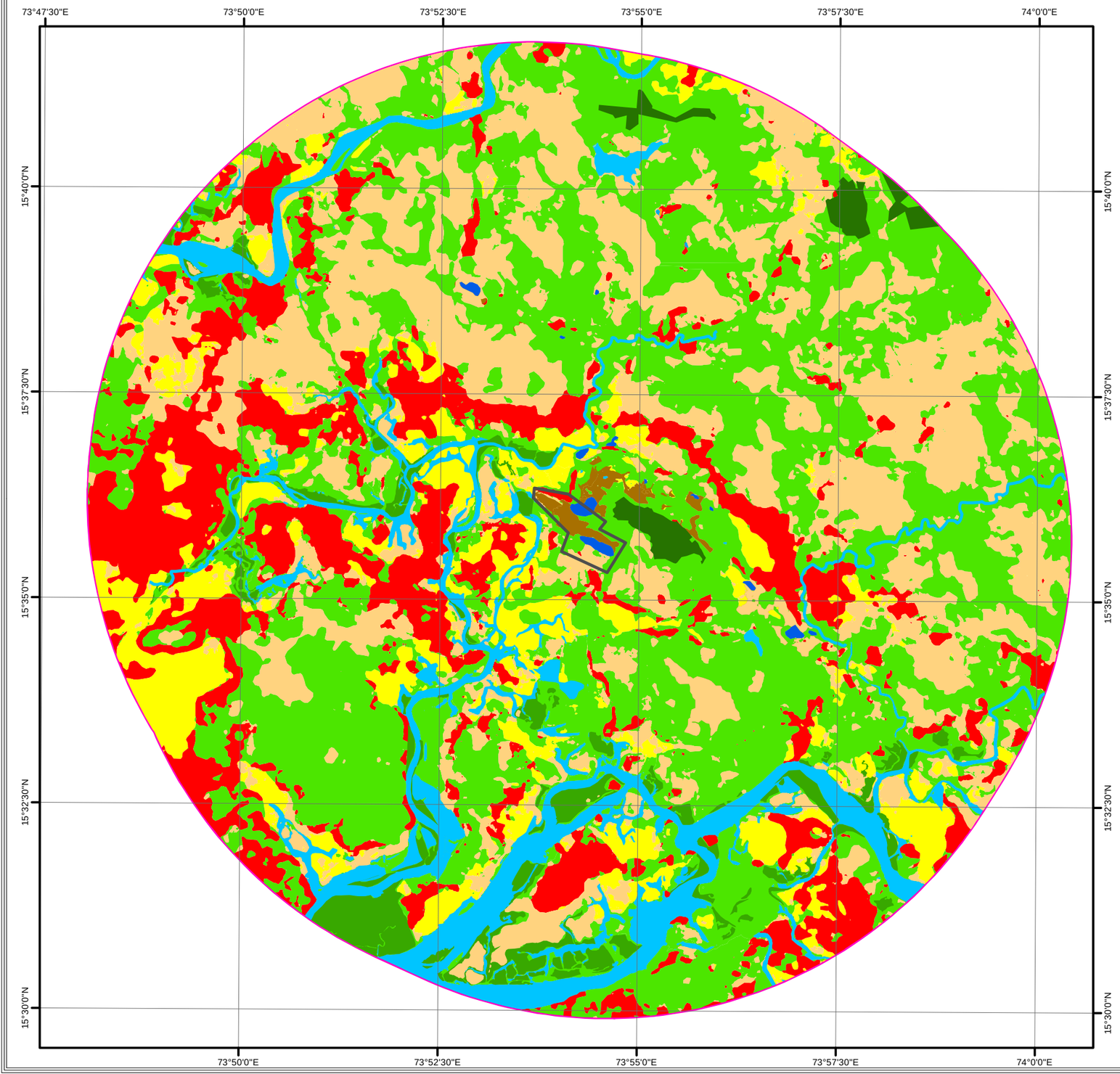
GEOMORPHOL

- Abandoned Quarry
- Active Quarry
- Back Swamp
- Beach Ridge
- Butte
- Channel Bar
- CosOri - Older Coastal Plain
- CosOri - Younger Coastal Plain
- Creek Network
- Dam and Reservoir
- DenOri - Moderately Dissected Hills and Valleys
- DenOri - Pediment-Pediplain Complex
- Estuarine Island
- FluOri - Older Flood plain
- Mangrove swamp
- Marsh
- Mesa
- Mine Dump
- Palaeolevee
- Pediment
- Pediment-Corestone-Tor Composite
- Pediplain
- Plateau Top
- Residual Hill
- Ridge
- Rolling Plain
- Scarp
- StrOri - Low Dissected Hills and Valleys
- StrOri - Moderately Dissected Upper Plateau
- Strike Ridge
- Tidal Flat
- Valley
- Valley Fill
- WatBod - Lake
- WatBod - Others
- WatBod - River

Plate No-5

Block II – Sirigao-Mayem Mineral Block Located at Sirigao & Mayem Villages, Bichololim Taluka North Goa District, Goa	
SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED	
Title	Geomorphology of study
Scale	1:100000
Map Prepared By	Mineral Engineering Services 25/XXV Club Road, Ballari -58103

Land Use and Land Cover



N
W E
S

Scale 1:100,000

0 2.5 5 Km

Legend

- Mining_Lease_Area
- 10km Bufferzone
- River
- Reserve Forest
- Mangroves
- Vegetation(Kaju/Mango)
- Agricultural Land
- Settlements
- Water Bodies
- Pit Water
- Mine Borken up area include pitwater
- Scrub Land

Plate No-6

Sl.No	Descripition	Area_Ha	%
1	Reserve Forest	330.0	0.88
2	Vegetation	14811.0	39.43
3	Settlements	5530.0	14.72
4	Water Bodies	2815.0	7.49
5	Mangroves	1264.0	3.36
6	Broken up Area & Pit Water Bodies	451.0	1.20
7	Agricultural Land	3384.0	9.01
8	Scrub land	8982.0	23.91
Total		37567.0	100.0

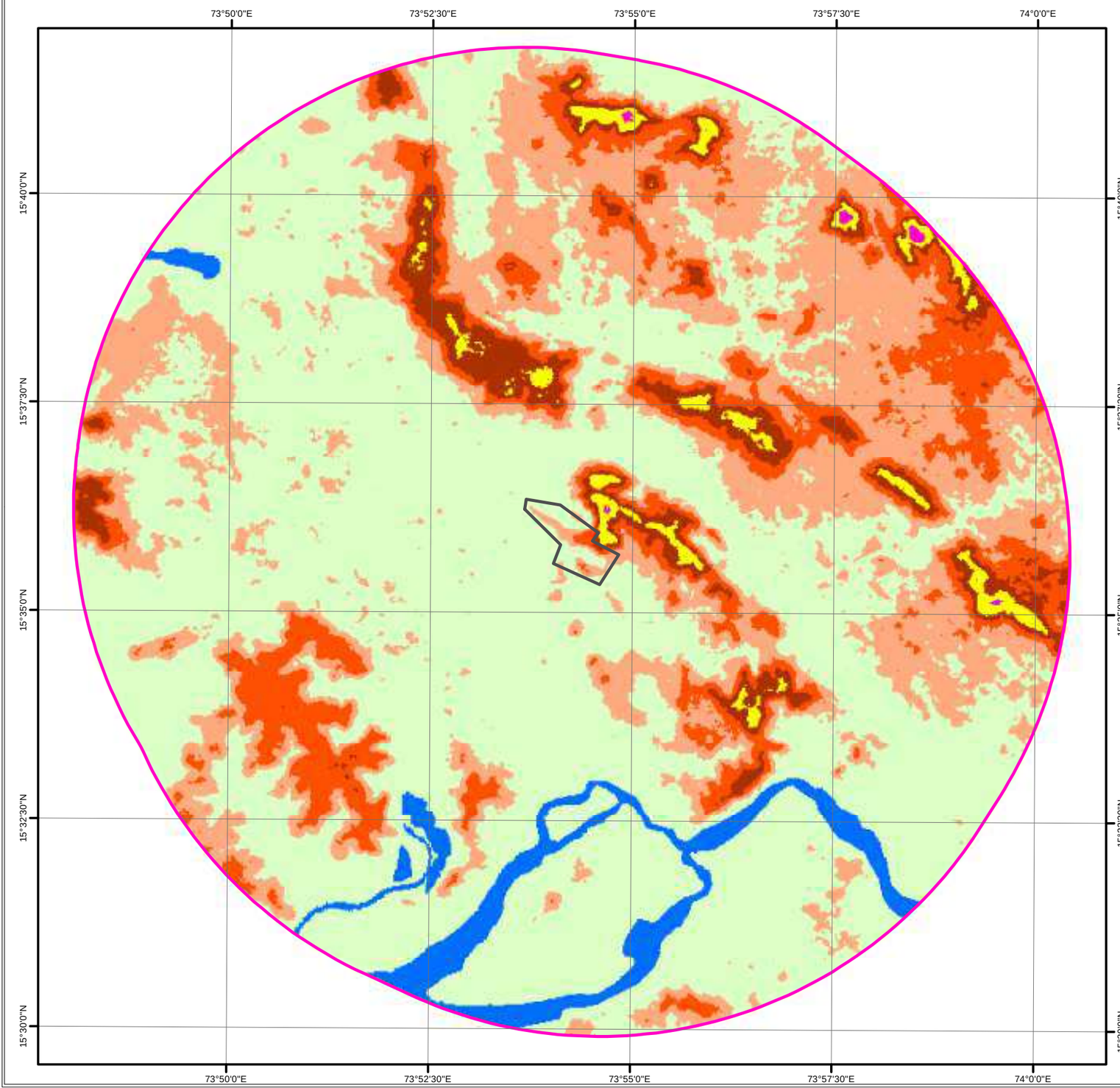
Block II – Sirigao-Mayem Mineral Block

Located at Sirigai & Mayem Villages, Bichololim Taluka
North Goa District, Goa

SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

Title	Land Use Land Cover
Scale	1:100000
Data Used	IRS-R2, Mx
Resolution	5m
Date of Pass	01.04.2023 & 08.03.2023
Map Prepared By	Mineral Engineering Services 25/XXV Club Road, Ballari -58103

DEM Data



N
W E
S

Scale 1:100,000

0 2.5 5 Km

Legend

- Mining_Lease_Area
- 10km Bufferzone

Dem data.tif

Value

- 0 - 2
- 2.1 - 30
- 30.1 - 60
- 60.1 - 90
- 90.1 - 120
- 120.1 - 160
- 160.1 - 206

Plate No-6A

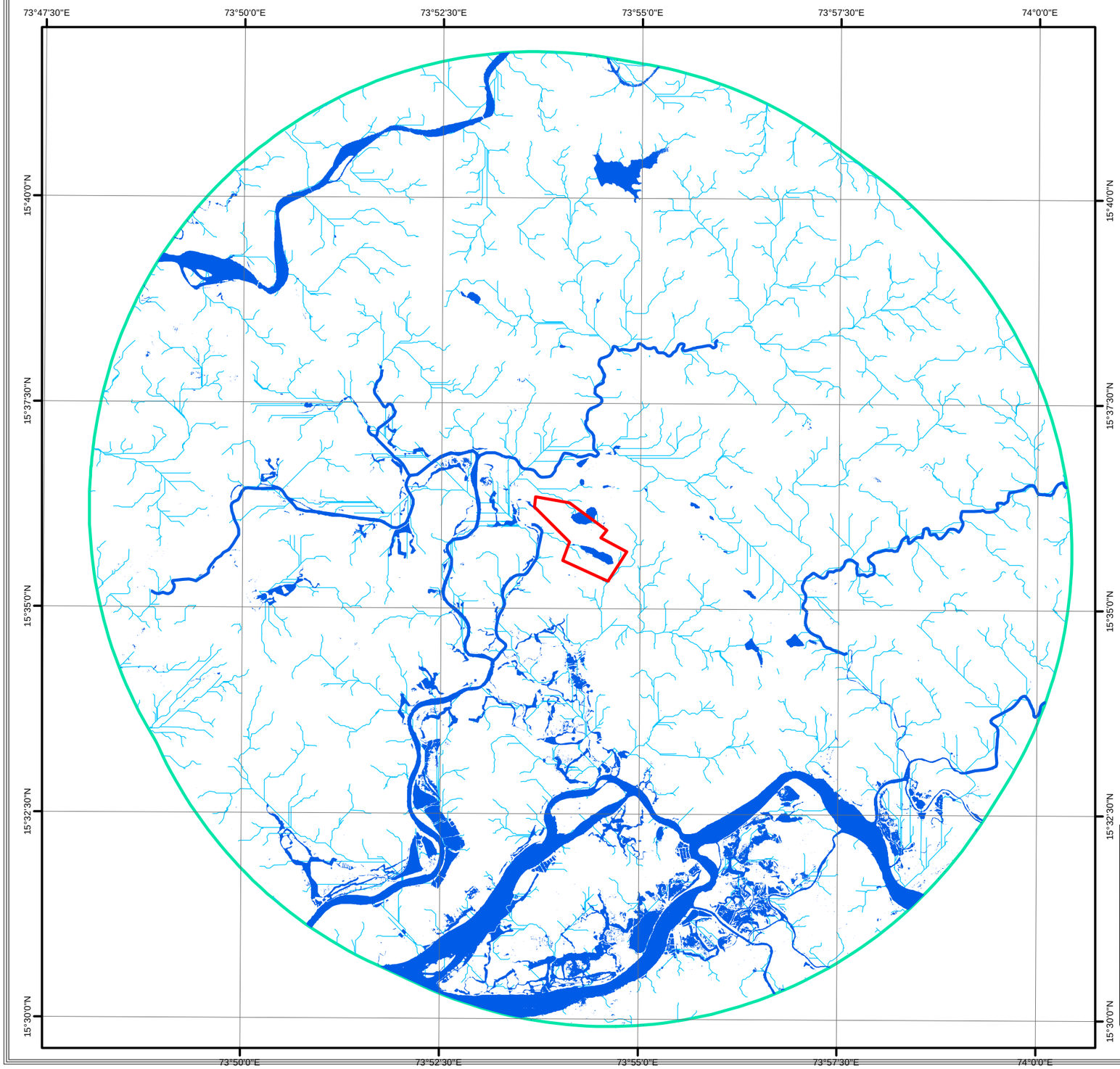
Block II – Sirigao-Mayem Mineral Block

Located at Sirigai & Mayem Villages, Bicholim Taluka
North Goa District, Goa

SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED

Title	DEM Data
Scale	1:100000
Map Prepared By	Mineral Engineering Services 25/XXV Club Road, Ballari -58103

Drainage Map



N
W E
S

Scale1:100,000

0 2.5 5 Km

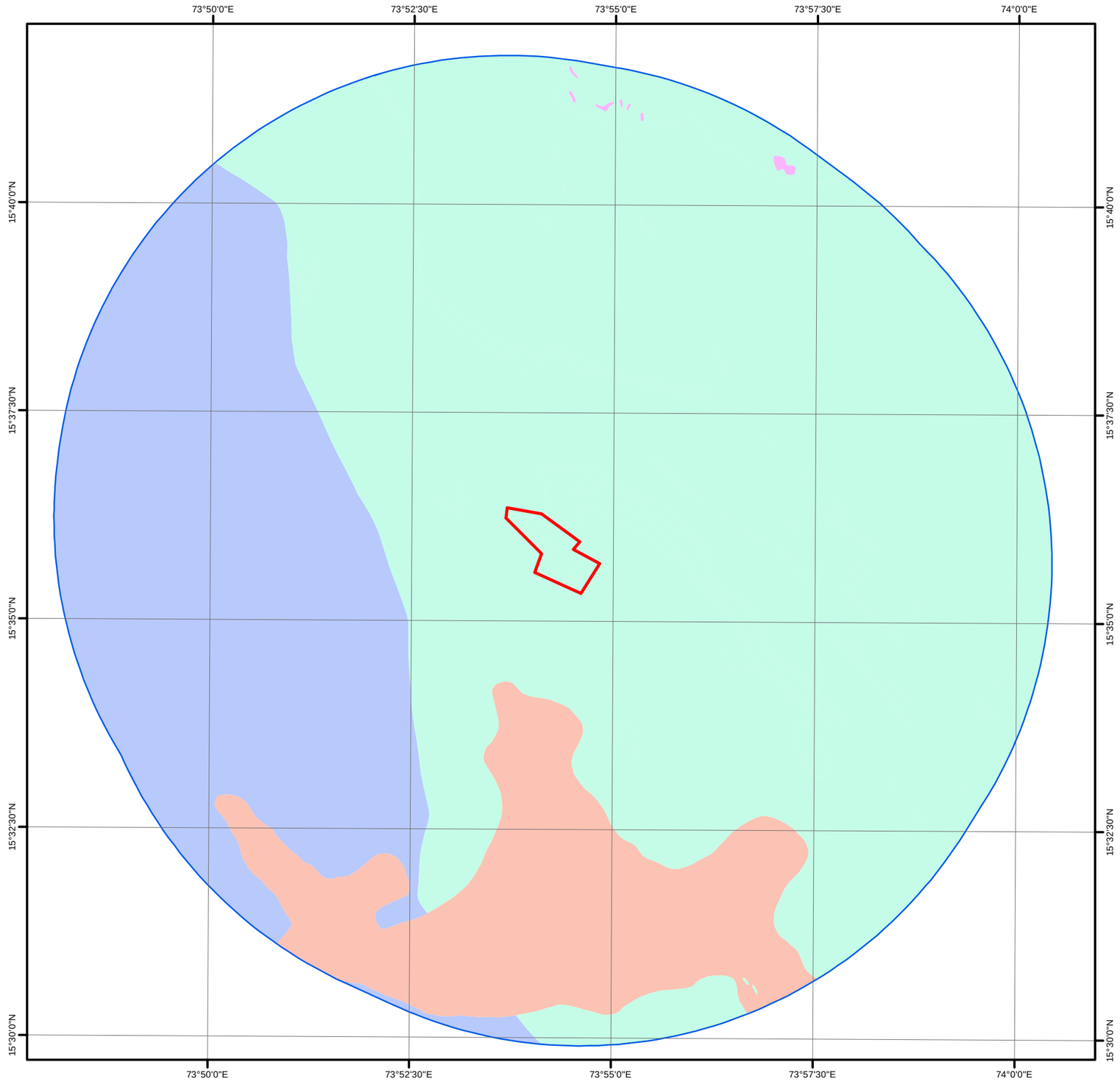
Legend

- Mining Lease Area
- 10km Bufferzone
- River
- Drainage pattern

Plate No-7

Block II – Sirigao-Mayem Mineral Block Located at Sirigao & Mayem Villages, Bichololim Taluka North Goa District, Goa	
SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED	
Title	Drainage Map of Study Area
Scale	1:100000
Map Prepared By	Mineral Engineering Services 25/XXV Club Road, Ballari -58103

Map showing Geological Formations of Study Area



Scale 1:100,000

0 2.5 5 Km

Legend

- Mining_Lease_Area
- 10km Bufferzone

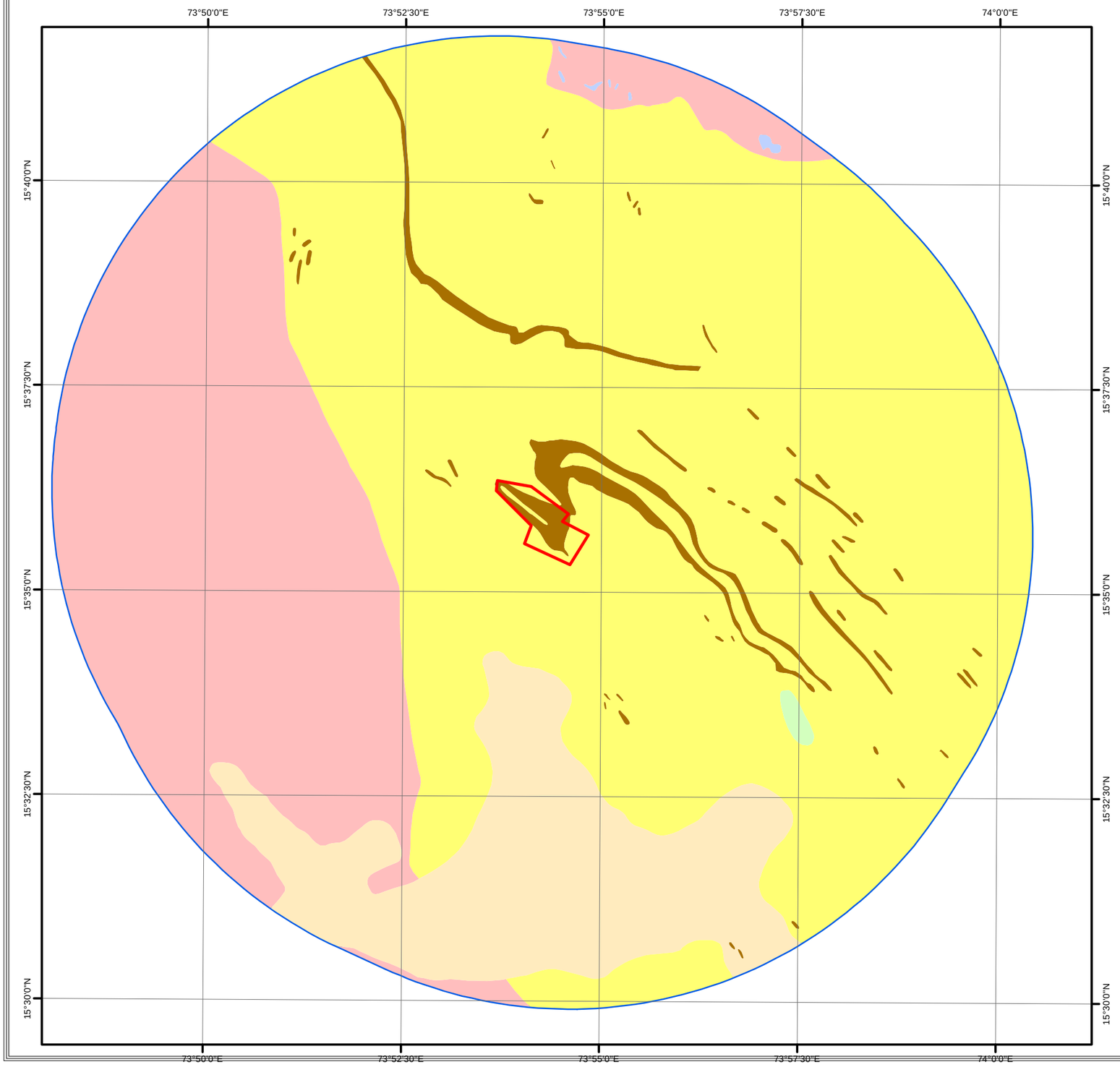
FORMATION

- VAGERI
- BICHOLIM
- SANVORDEM
- BARCEM

Plate No-8

Block II – Sirigao-Mayem Mineral Block Located at Sirigao & Mayem Villages, Bichololim Taluka North Goa District, Goa	
SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED	
Title	Geological Formations
Scale	1:100000
Map Prepared By	Mineral Engineering Services 25/XXV Club Road, Ballari -58103

Map showing Lithology of Study Area



N
W E
S

Scale1:100,000

0 2.5 5 Km

Legend

- Mining_Lease_Area
- 10km Bufferzone

LITHOLOGIC

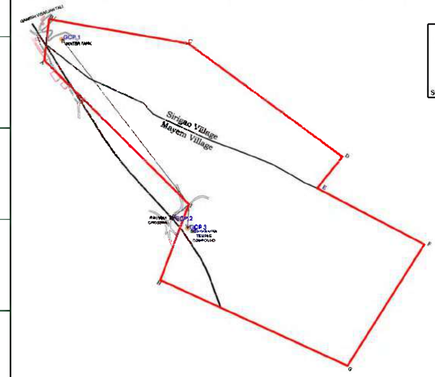
- ARGILLITE
- BANDED IRON FORMATION
- CHLORITE SCHIST
- CLAYEY SAND (ACTIVE FLOODPLAIN)
- GRAYWACKE
- META-GABBRO

Plate No-9

Block II – Sirigao-Mayem Mineral Block Located at Sirigao & Mayem Villages, Bichololim Taluka North Goa District, Goa	
SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED	
Title	Lithology
Scale	1:100000
Map Prepared By	Mineral Engineering Services 25/XXV Club Road, Ballari -58103

1170

KEY PLAN OF GROUND CONTROL POINTS THE MINING BLOCK-II



SCALE 1:10,000

SCALE 1:2,000

MONTE DE SHRIGAO MINERAL BLOCK-III OF RAJARAM BANDEKAR (SHRIGAO) MINES PVT. LTD.

S.No.6 S.No.7 S.No.4 S.No.47 S.No.5 S.No.3 S.No.2 S.No.1 S.No.98 S.No.48 S.No.95 S.No.97 S.No.96 S.No.94 S.No.93 S.No.56 S.No.58 S.No.57 S.No.59 S.No.60 S.No.48 S.No.80 S.No.84 S.No.47 S.No.42 S.No.61 S.No.79 S.No.62

PIT No.3 PIT No.1 PIT No.2

GCP 1 GCP 2 GCP 3

SRG 1

DUMP NO. 3 DUMP NO. 1

SEASONAL WATER COURSE

KONKAN RAILWAY

RAILWAY SAFETY ZONE

INDEX

- LEASE BOUNDARY
- CONTOURS
- MINES ROAD
- PUBLIC ROAD
- BORE HOLE
- FACES
- DUMPS
- HT POWER LINE
- BENCH MARK
- BUILDINGS
- CLD BOUNDARY PILLARS
- ARRESTER WALL
- KONKAN RAILWAY
- SEASONAL WATER COURSE
- HABITANT
- WATER PIPE LINE
- SILL
- 7.5M SAFETY ZONE
- 50M RAILWAY SAFETY ZONE
- 50M SAFETY ZONE FROM HABITANT
- 50M ZONE FROM PUBLIC ROAD
- 50M SEASONAL NALLAH
- TEMPORARY BACKFILLING AREA

GEOLOGICAL LEGEND

- LATERITE
- LUMPY (>60% Fe)
- OVERLYING FORMATION (Ferruginous Laterite)
- LOW GRADE ORE (>45% - 55% Fe)
- FRIABLE ORE (>55 - 57% Fe)
- POWDERY ORE (>60% Fe)
- INTERCALATED CLAY
- UNDERLYING FORMATION (Turtleback Laterite)
- DIP AND STRIKE
- ULTIMATE PIT LIMIT

UNFC CLASSIFICATION CODE FOR MINERAL RESERVES

- PROVED MINERAL RESERVES (111)
- PROBABLE MINERAL RESERVES (122)
- IMPLIED MINERAL RESOURCES (331)
- FEASIBILITY MINERAL RESOURCE (211)

YEARWISE PROPOSED BORE HOLE

- 1 - 15 (III rd YEAR)
- 16 - 31 (IV th YEAR)

TYPE OF LAND WITHIN LEASE AREA AS PER FORM No. I & XIV (AREA IN Ha.)

S.No.	Village	Khasara No. Block, Range/Falling Survey Nos.	Area (Ha.)	
1	Sirigao	1	0.33	PRIVATE LAND
2	Sirigao	2	0.1025	GOVT. LAND
3	Sirigao	3	2.01	PRIVATE LAND
4	Sirigao	4	1.2078	PRIVATE LAND
5	Sirigao	5	0.69	PRIVATE LAND
6	Sirigao	6	4.3687	PRIVATE LAND
7	Sirigao	7	1.3949	PRIVATE LAND
8	Sirigao	46	0.1422	PRIVATE LAND
9	Sirigao	47	0.7251	PRIVATE LAND
10	Sirigao	48	9.385	PRIVATE LAND
11	Sirigao	88	20.9381	PRIVATE LAND
12	Sirigao	90	0.2845	PRIVATE LAND
13	Sirigao	91	0.2903	PRIVATE LAND
14	Sirigao	92	0.6075	PRIVATE LAND
15	Sirigao	93	11.8	PRIVATE LAND
16	Sirigao	94	2.2225	PRIVATE LAND
17	Sirigao	95	0.8899	PRIVATE LAND
18	Sirigao	96	1.275	PRIVATE LAND
19	Sirigao	97	1.295	PRIVATE LAND
20	Sirigao	98	1.355	PRIVATE LAND
21	Sirigao	Road	0.7625	
22	Mayem	12	9.5522	GOVT. LAND
23	Mayem	47	5.0455	GOVT. LAND
24	Mayem	48	2.7856	GOVT. LAND
25	Mayem	56	3.9329	GOVT. LAND
26	Mayem	57	2.4044	GOVT. LAND
27	Mayem	58	3.4575	GOVT. LAND
28	Mayem	59	6.1656	GOVT. LAND
29	Mayem	60	41.316	GOVT. LAND
30	Mayem	61	14.7964	GOVT. LAND
31	Mayem	62	0.2983	GOVT. LAND
32	Mayem	79	19.4309	GOVT. LAND
33	Mayem	80	0.3145	GOVT. LAND
34	Mayem	84	8.4934	GOVT. LAND
35	Mayem	Road	0.3685	
Total			171.2472	

DGPS CO-ORDINATES OF MINERAL BLOCK CORNER PILLARS (MAP DATUM - WGS 84)

S.No.	Pillar ID	LATITUDE	LONGITUDE	NORTHING	EASTING
1	A	15° 36' 14.310" N	73° 53' 40.060" E	1725437.6814	381400.4352
2	B	15° 35' 23.421" N	73° 53' 40.938" E	1725662.2270	381507.4624
3	C	15° 35' 17.421" N	73° 54' 06.534" E	1725529.2214	382268.8199
4	D	15° 35' 57.405" N	73° 54' 34.906" E	1724909.9042	383110.9577
5	E	15° 35' 51.601" N	73° 54' 30.296" E	1724788.2894	382972.7604
6	F	15° 35' 41.907" N	73° 54' 58.014" E	1724431.2344	383558.4671
7	G	15° 35' 20.233" N	73° 54' 36.040" E	1723767.3122	383126.8781
8	H	15° 35' 25.335" N	73° 54' 01.582" E	1724236.0506	382114.9597
9	I	15° 35' 48.817" N	73° 54' 06.775" E	1724950.1993	382271.7646

GROUND CONTROL POINT (MAP DATUM WGS 84)

GROUND CONTROL POINT (GCP)	LATITUDE	LONGITUDE	R.L (M)	REMARKS	DISTANCE FROM BOUNDARY PILLAR	DIRECTION FROM THE BOUNDARY PILLAR
GCP - 1	15° 36' 18.066" N	73° 53' 41.362" E	21.00 M.	WATER TANK NEAR SIRGAO VILLAGE	1139.81 M.	N 36° W
GCP - 2	15° 35' 48.276" N	73° 54' 01.648" E	10.00 M.	RAILWAY CROSSING	116.28 M.	S 45° W
GCP - 3	15° 35' 44.326" N	73° 54' 05.528" E	9.00 M.	SHRI MAHAMAYA TEMPLE COMPOUND	126.19 M.	S 05° E
I	15° 35' 48.817" N	73° 54' 06.775" E	21.00 M.	CORNER BOUNDARY PILLAR		

SCALE 1:2000

Plate No-10

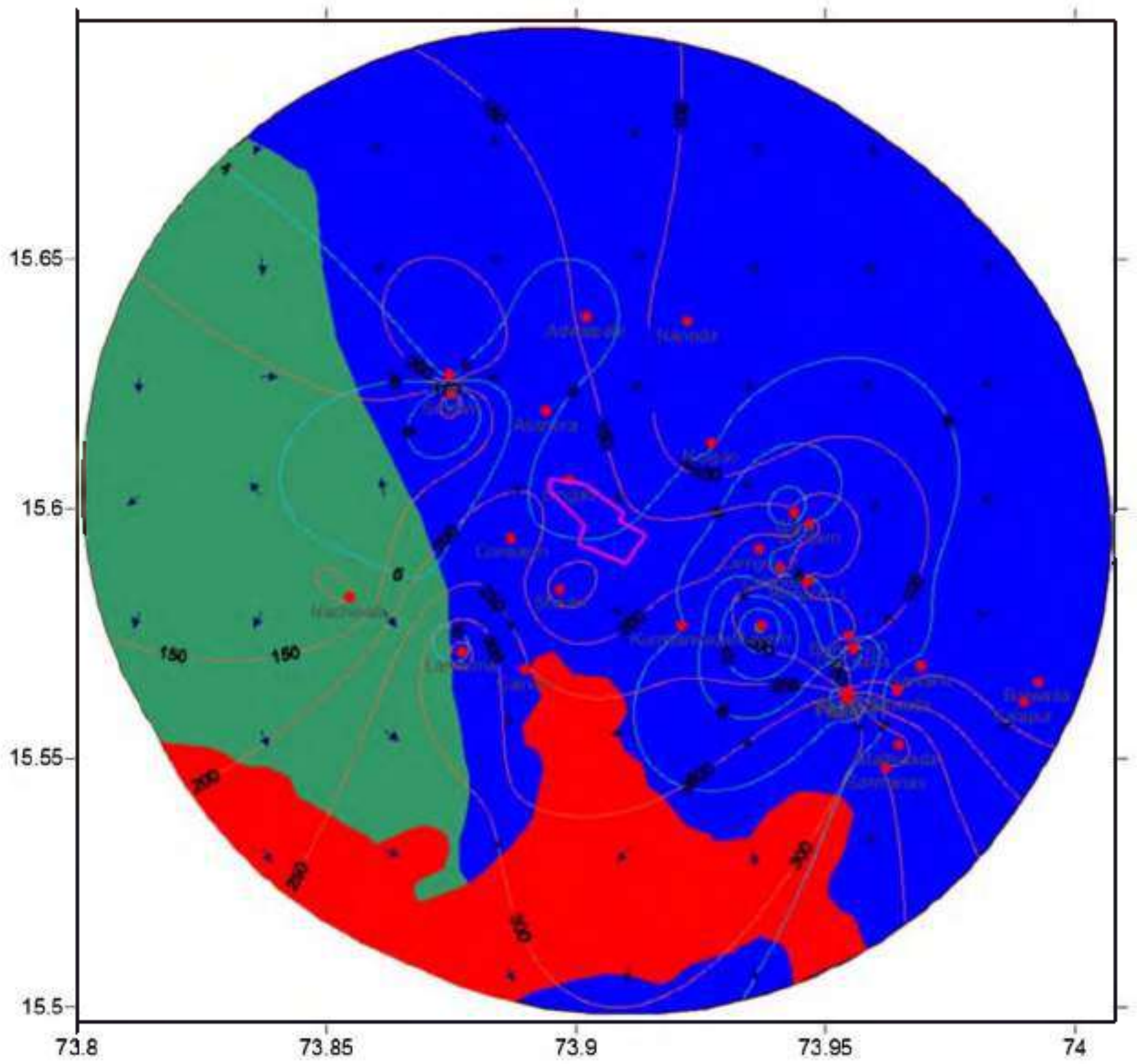
NAME OF THE LEASE:	BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK
LESSEE:	SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED ALTINHO, PANAJI - GOA
TITLE:	SURFACE GEOLOGICAL PLAN
SCALE - 1:2000	Area: 171.2472 — DATE OF SURVEY 01-10-2017 DATE OF Updation: 01-03-2023
PROJECT	BLOCK - II, SIRIGAO-MAYEM MINERAL BLOCK SIRIGAO & MAYEM VILLAGE, BICHOLIM TALUKA, NORTH GOA DISTRICT, GOA STATE
Purpose:	Mining Plan

THIS PLAN IS PREPARED BASED ON THE LEASE SKETCH DULY AUTHENTICATED BY THE DMG, STATE GOVERNMENT OF GOA AND CERTIFIED AS CORRECT.

M.S.RAJU
QUALIFIED PERSON

HYDROGEOLOGY IN AND AROUND SIRIGAO-MAYEM MINERAL BLOCK-II
IRON ORE MINE, MAYEM & SIRIGAO VILLAGES, BICHOLIM TALUKA, NORTH GOA DISTRICT, GAO

Plate No



TITLE:
HYDROGEOLOGY

Scale
0 1 2 3 4
Kilometers

LEGEND

- Village Location
- Electrical Conductivity (micromhos/cm at 25°C)
- Depth to Water Level Contour (mbgl) and Ground water flow direction
- Mine Lease Area

Geology / Formation

- VAGERI
- BICHOLIM
- SANVORDEM

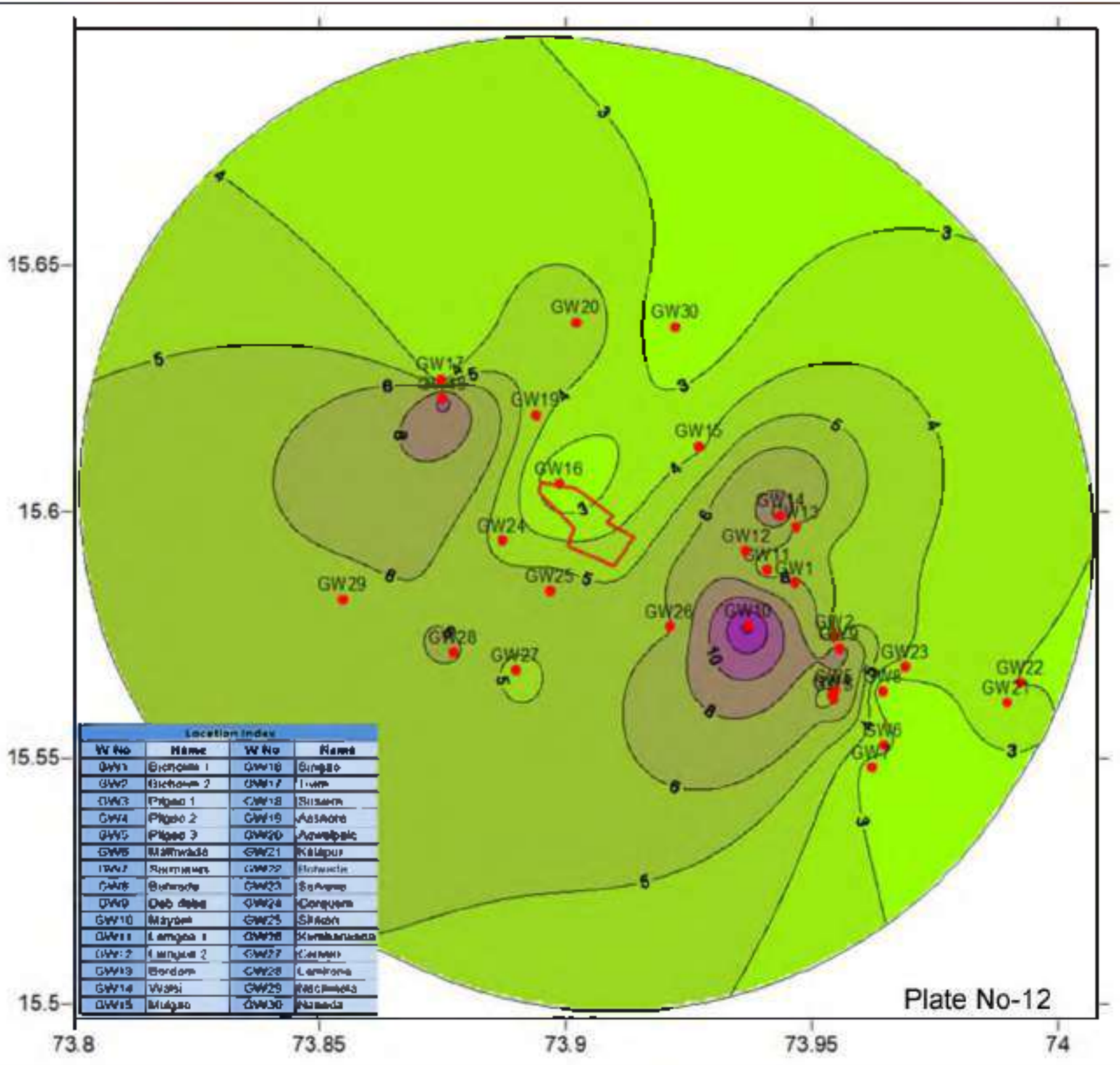
Plate No-11

PREPARED FOR:
M/S Salgaocar Shipping Company Private Limited

PREPARED BY:
M.C.REDDY 620
Former Regional Director,
Central Ground Water Board

HYDROGEOLOGY IN AND AROUND SIRIGAO-MAYEM MINERAL BLOCK-II
IRON ORE MINE, MAYEM & SIRIGAO VILLAGES, BICHOLIM TALUKA, NORTH GOA DISTRICT, GAO

Plate No



Location Index

W No	Name	W No	Name
GW1	Bicholim 1	GW16	Sirigao
GW2	Bicholim 2	GW17	Iwem
GW3	Pigao 1	GW18	Sirsaim
GW4	Pigao 2	GW19	Advalpal
GW5	Pigao 3	GW20	Ayvelpale
GW6	Mathwada	GW21	Kalapur
GW7	Surmenem	GW22	Holvarde
GW8	Bicholim	GW23	Sanquem
GW9	Deb dipg	GW24	Canguem
GW10	Mayem	GW25	Sirsem
GW11	Lamgao 1	GW26	Kumbarwada
GW12	Lamgao 2	GW27	Canem
GW13	Bordem	GW28	Lamkona
GW14	Vaysi	GW29	Kadamba
GW15	Mulgao	GW30	Nanada

TITLE:
DEPTH TO WATER LEVEL STUDY AREA

Scale
0 09 18 27 36
Kilometers

LEGEND

Mineral Block Area

Well Location

Depth to Water level Contour (mbgl)

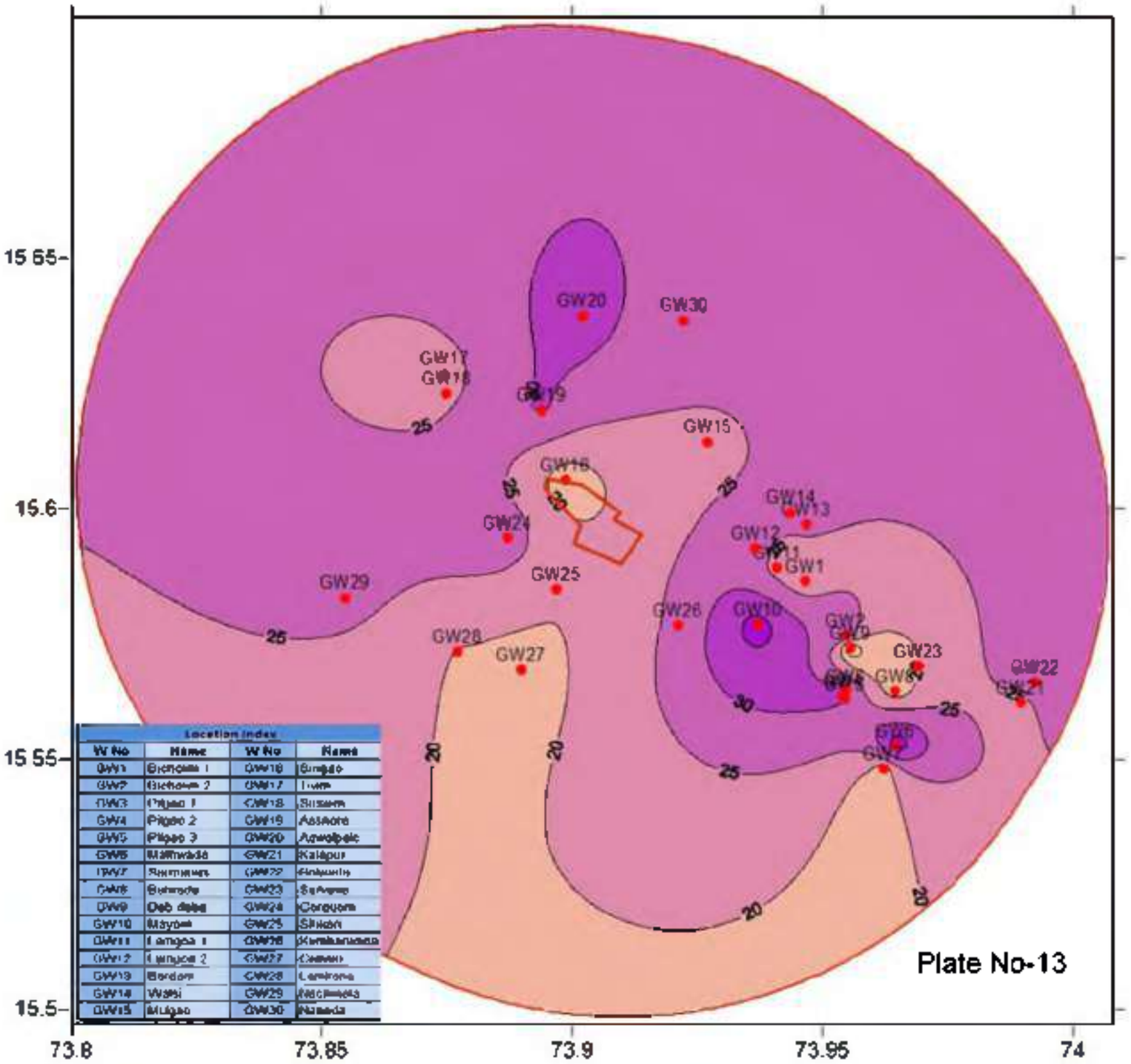
Water level (mbgl)
2 3 4 5 6 8 10 12 14

PREPARED FOR:
M/S Salgaocar Shipping Company Private Limited

PREPARED BY:
M.C.REDDY
Former Regional Director,
Central Ground Water Board

HYDROGEOLOGY IN AND AROUND SIRIGAO-MAYEM MINERAL BLOCK-II
IRON ORE MINE, MAYEM & SIRIGAO VILLAGES, BICHOLIM TALUKA, NORTH GOA DISTRICT, GAO

Plate No



Location Index

W No	Name	W No	Name
GW1	Bicholim 1	GW16	Sirigao
GW2	Bicholim 2	GW17	Ivem
GW3	Pilgao 1	GW18	Sirsem
GW4	Pilgao 2	GW19	Advalpal
GW5	Pilgao 3	GW20	Ayvalpale
GW6	Mathwada	GW21	Kalapur
GW7	Surmenem	GW22	Kirlpanem
GW8	Bairagdo	GW23	Sa Agnel
GW9	Deb dipg	GW24	Corgaum
GW10	Mayem	GW25	Sirsem
GW11	Lamgao 1	GW26	Kerbarvaddo
GW12	Lamgao 2	GW27	Cotnem
GW13	Bordem	GW28	Lamkona
GW14	Wagi	GW29	Mathwada
GW15	Mulgao	GW30	Nanada

TITLE:
WATER TABLE ELEVATION STUDY AREA

Scale
0 0.9 1.8 2.7 3.6
Kilometers

LEGEND

- Mineral Block Area
- Well Location
- Water Table Elevation Contour (amsl)

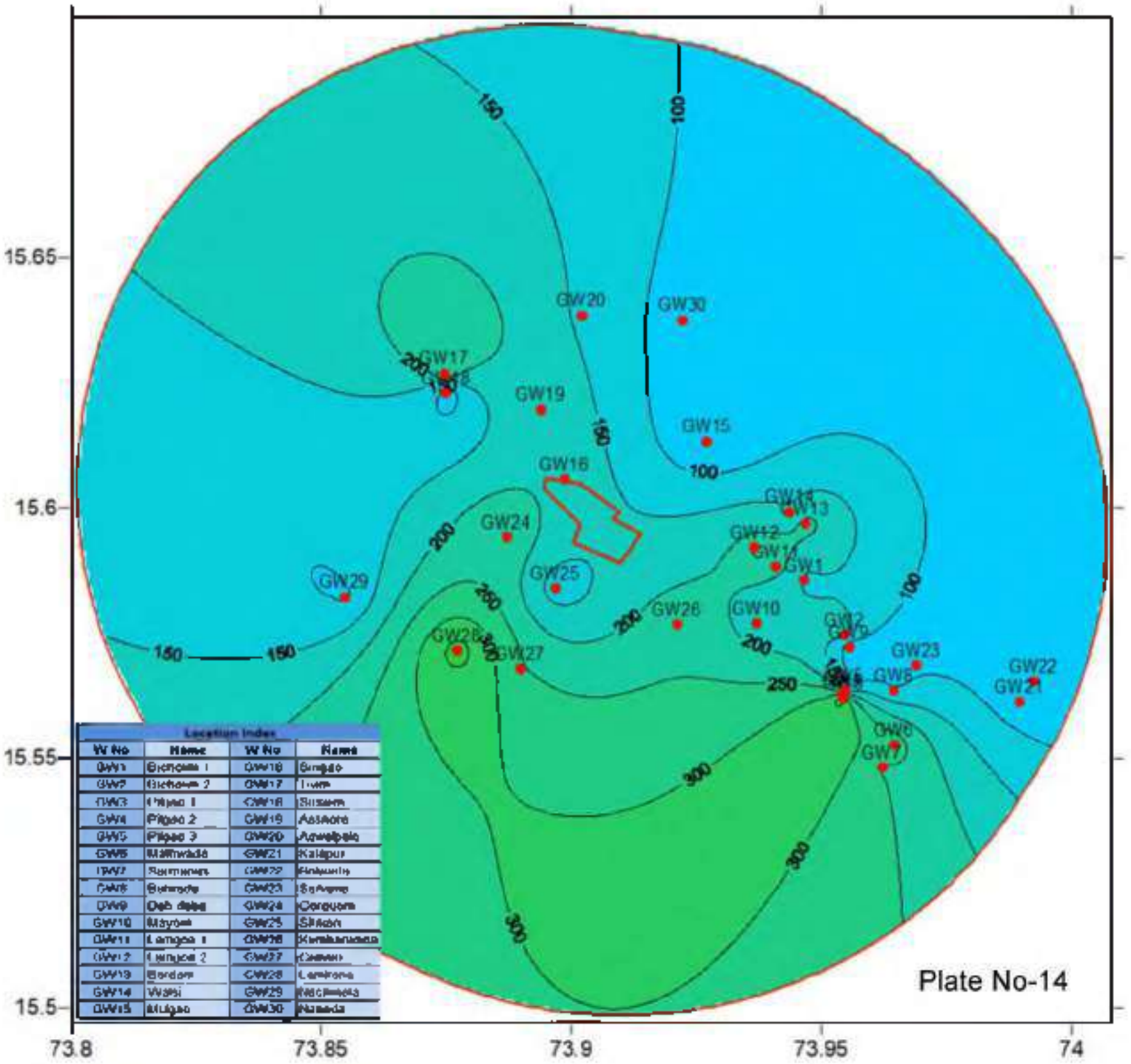
Water Table Elevation (mamsl)
10 15 20 25 30 35

PREPARED FOR:
M/S Salgaocar Shipping Company Private Limited

PREPARED BY:
M.C.REDDY
Former Regional Director,
Central Ground Water Board

HYDROGEOLOGY IN AND AROUND SIRIGAO-MAYEM MINERAL BLOCK-II
IRON ORE MINE, MAYEM & SIRIGAO VILLAGES, BICHOLIM TALUKA, NORTH GOA DISTRICT, GAO

Plate No



Location Index			
W No	Name	W No	Name
GW1	Bicholim 1	GW16	Sirigao
GW2	Bicholim 2	GW17	Ivorn
GW3	Pilgao 1	GW18	Sirsaim
GW4	Pilgao 2	GW19	Advalpal
GW5	Pilgao 3	GW20	Ayvelpale
GW6	Mathwada	GW21	Kalapur
GW7	Sarmanas	GW22	Kinlaunim
GW8	Bhatwadi	GW23	Sa Agrap
GW9	Deb dipg	GW24	Corgaum
GW10	Mayem	GW25	Sirsaim
GW11	Lamgao 1	GW26	Kumbarwada
GW12	Lamgao 2	GW27	Cavern
GW13	Bordem	GW28	Lamkona
GW14	Wagi	GW29	Kadamba
GW15	Mulgao	GW30	Nanada

TITLE:
ELECTRICAL CONDUCTANCE IN STUDY AREA
(Micromhos/cm at 25°C)

Scale
0 09 18 27 36
Kilometers

LEGEND

Mineral Block Area

Well Location

EC Contour

EC Range
(micromhos/cm at 25°C)
0 50 100 150 200 250 300 350

PREPARED FOR:

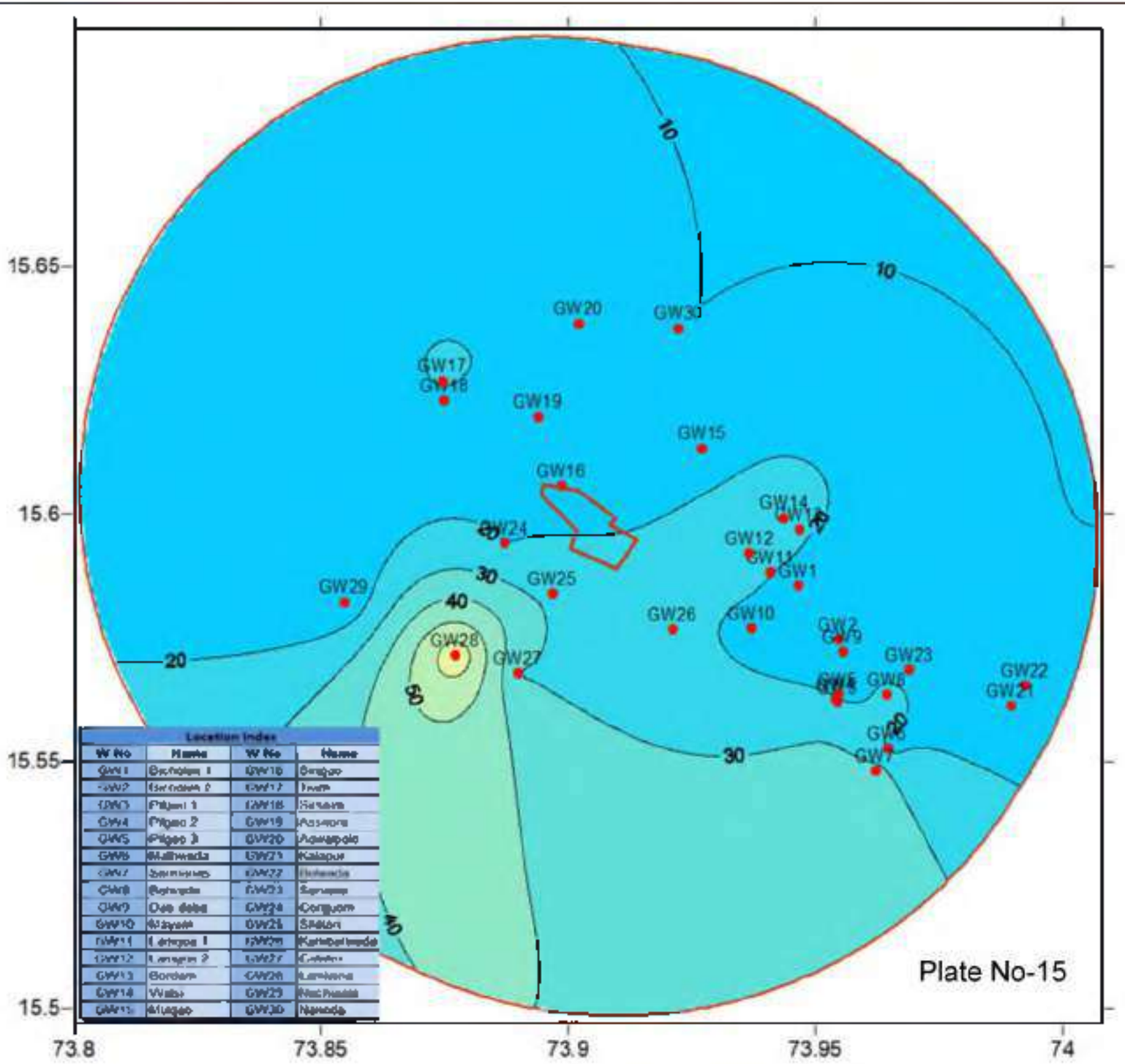
M/S Salgaocar Shipping Company Private Limited

PREPARED BY:

M.C.REDDY
Former Regional Director,
Central Ground Water Board

HYDROGEOLOGY IN AND AROUND SIRIGAO-MAYEM MINERAL BLOCK-II
IRON ORE MINE, MAYEM & SIRIGAO VILLAGES, BICHOLIM TALUKA, NORTH GOA DISTRICT, GAO

Plate No



Location Index			
W No	Name	W No	Name
GW1	Bethlem 1	GW16	Sirigao
GW2	Bethlem 2	GW17	Dadi
GW3	Pilgao 1	GW18	Salvara
GW4	Pilgao 2	GW19	Assonora
GW5	Pilgao 3	GW20	Agarpale
GW6	Mallwada	GW21	Kalapur
GW7	Sonarwada	GW22	Bethanda
GW8	Bethanda	GW23	Sanquem
GW9	Dev deba	GW24	Corjuem
GW10	Mayem	GW25	Shelori
GW11	Lamgao 1	GW26	Kamalwada
GW12	Lamgao 2	GW27	Gothan
GW13	Bordem	GW28	Lamkona
GW14	Wada	GW29	Khandola
GW15	Mulgao	GW30	Nanoda

TITLE:
DISTRIBUTION OF CHLORIDE (Mg/L) IN STUDY AREA

Scale
0 09 18 27 36
Kilometers

LEGEND

Mineral Block Area

Well Location

Chloride Contour

Chloride Range (Mg/l)

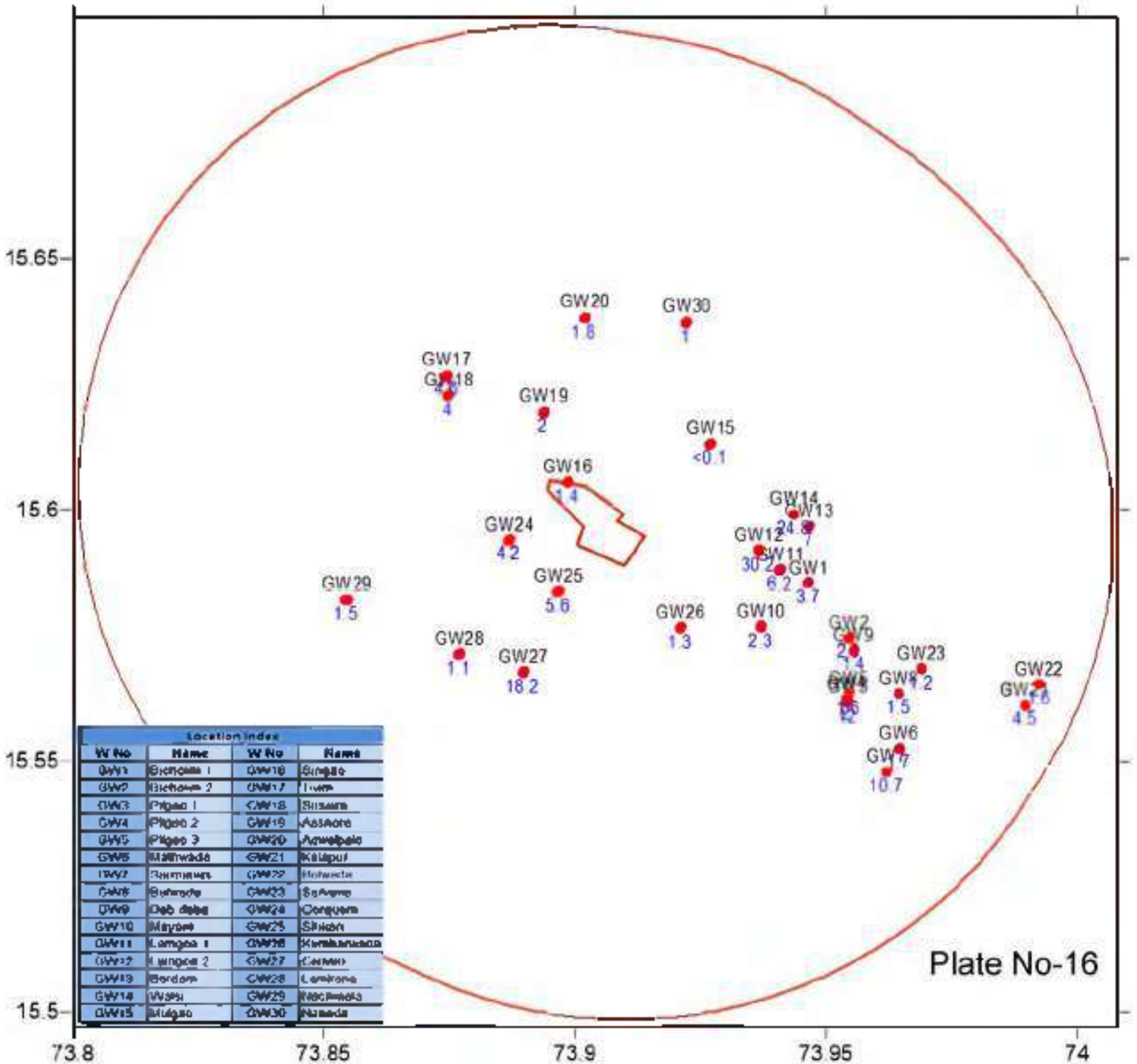
0 10 20 30 40 50 60

PREPARED FOR:
MS Salgaocar Shipping Company Private Limited

PREPARED BY:
M.C.REDDY
Former Regional Director,
Central Ground Water Board

HYDROGEOLOGY IN AND AROUND SIRIGAO-MAYEM MINERAL BLOCK-II
IRON ORE MINE, MAYEM & SIRIGAO VILLAGES, BICHOLIM TALUKA, NORTH GOA DISTRICT, GAO

Plate No



Location Index			
W No	Name	W No	Name
GW1	Bicholim 1	GW16	Sirigao
GW2	Bicholim 2	GW17	Tivim
GW3	Pilgao 1	GW18	Sirsaim
GW4	Pilgao 2	GW19	Advalpal
GW5	Pilgao 3	GW20	Aguadpale
GW6	Mallwada	GW21	Kalapur
GW7	Surmenem	GW22	Mulvarta
GW8	Bicholim	GW23	Sa Agnel
GW9	Deb dipg	GW24	Corjuem
GW10	Mayem	GW25	Siroda
GW11	Lamgao 1	GW26	Kumbarwada
GW12	Lamgao 2	GW27	Colvem
GW13	Bordem	GW28	Lamboria
GW14	Wadi	GW29	Kachwadi
GW15	Mulgao	GW30	Nanada

TITLE:

DISTRIBUTION OF NITRATE (Mg/L) IN GROUND WATER (NOV 2022)

Scale

0 09 18 27 36

Kilometers

LEGEND

Mineral Block Area

Well Location

Nitrate Range (Mg/l)

Well No.

Well

Nitrate Value

PREPARED FOR:

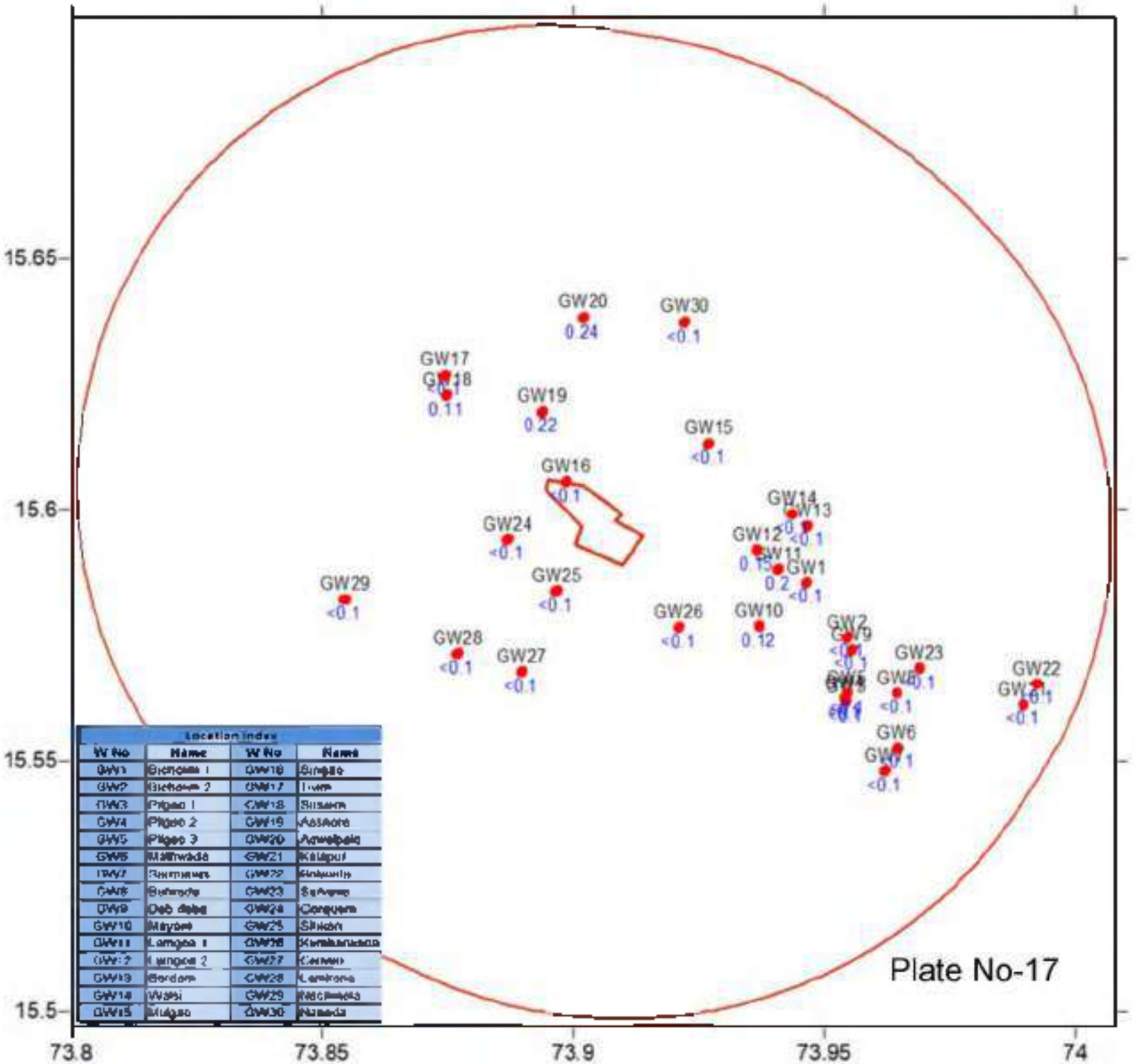
MS Salgaocar Shipping Company Private Limited

PREPARED BY:

M.C.REDDY
Former Regional Director,
Central Ground Water Board

HYDROGEOLOGY IN AND AROUND SIRIGAO-MAYEM MINERAL BLOCK-II
IRON ORE MINE, MAYEM & SIRIGAO VILLAGES, BICHOLIM TALUKA, NORTH GOA DISTRICT, GAO

Plate No



Location Index			
W No	Name	W No	Name
GW1	Bicholim 1	GW16	Sirigao
GW2	Bicholim 2	GW17	Ivorn
GW3	Pilgao 1	GW18	Sirsaim
GW4	Pilgao 2	GW19	Advalpal
GW5	Pilgao 3	GW20	Ayvelpaiq
GW6	Mallwada	GW21	Kalapur
GW7	Surmenem	GW22	Kinjuvlla
GW8	Bicholim	GW23	Sa Agnel
GW9	Deb dipg	GW24	Conquem
GW10	Mayem	GW25	Silvem
GW11	Lamgao 1	GW26	Kumbarwada
GW12	Lamgao 2	GW27	Colvem
GW13	Bordem	GW28	Lamkona
GW14	Wasi	GW29	Kadamba
GW15	Mulgao	GW30	Nanada

TITLE:

DISTRIBUTION OF FLUORIDE (Mg/L) IN GROUND WATER (NOV 2022)

Scale

0 09 18 27 36

Kilometers

LEGEND

Mineral Block Area

Well Location

Fluoride Range (Mg/l)

Well No.

Well

Fluoride Value

PREPARED FOR:

M/S Salgaocar Shipping Company Private Limited

PREPARED BY:

M.C.REDDY
Former Regional Director,
Central Ground Water Board

Andreza

IN THE HIGH COURT OF BOMBAY AT GOA

PUBLIC INTEREST LITIGATION WRIT PETITION NO. 6 OF 2024
WITH
MISC. CIVIL APPLICATION NO. 199 OF 2024
WITH
MISC. CIVIL APPLICATION NO. 215 OF 2024
IN
PUBLIC INTEREST LITIGATION WRIT PETITION NO. 6 OF 2024
WITH
MISC. CIVIL APPLICATION NO. 239 OF 2024
IN
PUBLIC INTEREST LITIGATION WRIT PETITION NO. 6 OF 2024
WITH
MISC. CIVIL APPLICATION NO. 1216 & 1217 OF 2024 (F)
IN
MISC. CIVIL APPLICATION NO. 239 OF 2024
AND
MISC. CIVIL APPLICATION NO. 1416 OF 2024 (F)
IN
PUBLIC INTEREST LITIGATION WRIT PETITION NO. 6 OF 2024

PUBLIC INTEREST LITIGATION WRIT PETITION NO. 6 OF 2024

1. The Mulakh Khajan Farmers Association, with office at Haldanwadi, Mayem, Bicholim, Goa – 403504, through its Secretary, Mr. Sakharam Anant Pednekar, age 58 years, H. No. 766, Gaonkarwada, Mayem, Bicholim, Goa – 403504, Approx. Annual Income – Rs. 1,20,000/-. Aadhar No. 439600055987, Mobile – 9767050503.

2. The Goa Foundation, through its Secretary Dr. Claude Alvares, age 75 years, having Regd. Office at Room No. 7, Above Mapusa Clinic, Mapusa, Goa – 403507, PAN No.AAAAG0249C, Income : Rs – 10 – 15,00,000/- p.a. (approx.) Registration No. - 23/Goa/86, Email id: goafoundation@gmail.com. ... Petitioners

WITH

MISC. CIVIL APPLICATION NO. 199 OF 2024
IN
PUBLIC INTEREST LITIGATION WP NO. 6 OF 2024

Surakshit Distributors Pvt. Ltd., a Company incorporated under the Companies Act, 1956, having its office at Unit No. 306, 3rd Floor, Gera Imperium Grand, EDC Complex, Patto Plaza, Panaji, Goa, and represented herein by its Authorised signatory, Mr. Sushil Khandelwal.

... Applicant

IN

1. The Mulakh Khajan Farmers Association, with office at Haldanwadi, Mayem, Bicholim, Goa – 403504, through its Secretary, Mr. Sakharam Anant Pednekar, age 58 years, H. No. 766, Gaonkarwada, Mayem, Bicholim, Goa – 403504, Approx. Annual Income – Rs. 1,20,000/-. Aadhar No. 439600055987, Mobile – 9767050503.

2. The Goa Foundation, through its Secretary Dr. Claude Alvares, age 75 years, having Regd. Office at Room No. 7, Above Mapusa Clinic, Mapusa, Goa – 403507, PAN No.AAAAG0249C, Income : Rs – 10 – 15,00,000/- p.a. (approx.) Registration No. - 23/Goa/86, Email id: goafoundation@gmail.com.

Versus

1. The Director of Mines and Geology, through its Director, Ground Floor of Institute Menezes Braganza, Panaji, Goa – 403 001.

2. The State of Goa, through its Chief Secretary, Secretariat, Porvorim, Goa, 403 521.

3. The Deputy Collector and SDO Bicholim, Bicholim, Goa – 403 504.

4. The Mamlatdar Bicholim, Office of the Mamlatdar, Bicholim, Goa – 403 504.

5. The Bicholim Police Station, through its Police Inspector, Bicholim, Goa – 403 504.

6. The Goa State Pollution Control Board, through its Member Secretary, near Pilerne Industrial Estate, Opposite Saligao Seminary, Saligao, Bardez, Goa, 403 511.

7. M/s. Blueglobe Exports Private Limited, B-3, F-1, Prudential Paradise, Peddem, Mapusa, Goa – 403 507. ... Respondents.

WITH

MISC. CIVIL APPLICATION NOS. 215 AND 239 OF 2024
IN
PUBLIC INTEREST LITIGATION WRIT PETITION NO. 6 OF 2024

Vedanta Limited, A public company duly incorporated under the provisions of the Indian Companies Act, 1956, having its registered office at 1st Floor, C wing, Unit 103, Corporate Avenue Atul Projects, Chakala, Andheri (East) NA Mumbai , Mumbai City MH 400093 IN. Having local office at Sesa Ghor, 20 EDC Complex, Patto, Panaji, Goa, 403 001, Represented in this petition through its authorised signatory, Mr. Benecio Menezes, 56 years of age, Indian National, Having residence at St. Roque Waddo, Colvale, Bardez, Goa.

IN

... Applicant

1. The Mulakh Khajan Farmers Association, through its Secretary Sakharam Anant Pednekar, H. No. 776, Gaonkarwada, Mayem, Bicholim, Goa – 403504.

2. The Goa Foundation, through its Secretary Dr. Claude Alvares, having Regd. Office at Room No. 7, Above Mapusa Clinic, Mapusa,

Goa – 403507.

Versus

1. The Director of Mines and Geology, through its Director, Ground Floor of Institute Menezes Braganza, Panaji, Goa – 403 001.

2. The State of Goa, through its Chief Secretary, having office at the Secretariat Complex, Porvorim, Bardez, Goa.

3. The Deputy Collector and SDO Bicholim, Office of the Deputy Collector and SDO, Bicholim, Bicholim, Goa.

4. The Mamlatdar, Office of the Mamlatdar, Bicholim, Goa.

5. The Bicholim Police Station, through its Police Inspector, Bicholim, Goa.

6. The Goa State Pollution Control Board, through its Member Secretary, near Pilerne Industrial Estate, Opposite Saligao Seminary, Saligao, Goa, 403 511.

7. Blueglobe Exports Private Limited, through its Director, B-3, F-1 Prudential Paradise, Peddem, Mapusa, North Goa, GA – 403 507 In.

8. The Union of India, through the Secretary, Ministry of Environment, Forests and Climate change, Government of India, Indira Paryavaran Bhavan, Jor Bagh Road, Aliganj, New Delhi, 110 003. ... Respondents.

WITH
MISC. CIVIL APPLICATION NO. 1216 OF 2024 (F)
IN

MISC. CIVIL APPLICATION NO. 239 OF 2024
IN
PUBLIC INTEREST LITIGATION WRIT PETITION NO. 6 OF 2024

Vedanta Limited, A public company duly incorporated under the provisions of the Indian Companies Act, 1956, having its registered office at 1st Floor, C wing, Unit 103, Corporate Avenue Atul Projects, Chakala, Andheri (East) NA Mumbai , Mumbai City MH 400093 IN. Having local office at Sesa Ghor, 20 EDC Complex, Patto, Panaji, Goa, 403 001, Represented in this petition through its authorised signatory, Mr. Benecio Menezes, 56 years of age, Indian National, Having residence at St. Roque Waddo, Colvale, Bardez, Goa.

IN

1. The Mulakh Khajan Farmers Association, through its Secretary Sakharam Anant Pednekar. ... Applicant

2. The Goa Foundation, through its Secretary Dr. Claude Alvares, having Regd. Office at Room No. 7, Above Mapusa Clinic, Mapusa, Goa – 403507.

Versus

1. The Director of Mines and Geology, through its Director, Ground Floor of Institute Menezes Braganza, Panaji, Goa – 403 001.

2. The State of Goa, through its Chief Secretary, having office at the Secretariat Complex, Porvorim, Bardez, Goa.

3. The Deputy Collector and SDO Bicholim, Office of the Deputy Collector and SDO, Bicholim, Bicholim, Goa.

4. The Mamlatdar, Office of the Mamlatdar, Bicholim, Goa.

5. The Bicholim Police Station, through its Police Inspector, Bicholim, Goa.

6. The Goa State Pollution Control Board, through its Member Secretary, near Pilerne Industrial Estate, Opposite Saligao Seminary, Saligao, Goa, 403 511.

7. Blueglobe Exports Private Limited, through its Director, B-3, F-1 Prudential Paradise, Peddem, Mapusa, North Goa, GA – 403 507 In.

8. The Union of India, through the Secretary, Ministry of Environment, Forests and Climate change, Government of India, Indira Paryavaran Bhavan, Jor Bagh Road, Aliganj, New Delhi, 110 003. ... Respondents.

AND

Shri Narendra Vinayak P. Gaoncar, aged about 50 years, Son of late Vinayak P. Gaoncar, R/o. Pilgao, Bicholim, Goa. ...Applicant/ Intervener

WITH
MISC. CIVIL APPLICATION NO. 1217 OF 2024 (F)
IN
MISC. CIVIL APPLICATION NO. 239 OF 2024
IN
PUBLIC INTEREST LITIGATION WRIT PETITION NO. 6 OF 2024

Vedanta Limited, A public company duly incorporated under the provisions of the Indian Companies Act, 1956, having its registered office at 1st Floor, C wing, Unit 103, Corporate Avenue Atul Projects, Chakala, Andheri (East) NA Mumbai , Mumbai City

MH 400093 IN. Having local office at Sesa Ghor, 20 EDC Complex, Patto, Panaji, Goa, 403 001, Represented in this petition through its authorised signatory, Mr. Benecio Menezes, 56 years of age, Indian National, Having residence at St. Roque Waddo, Colvale, Bardez, Goa.

IN

1. The Mulakh Khajan Farmers Association, through its Secretary Sakharam Anant Pednekar. ... Applicant

2. The Goa Foundation, through its Secretary Dr. Claude Alvares, having Regd. Office at Room No. 7, Above Mapusa Clinic, Mapusa, Goa – 403507.

Versus

1. The Director of Mines and Geology, through its Director, Ground Floor of Institute Menezes Braganza, Panaji, Goa – 403 001.

2. The State of Goa, through its Chief Secretary, having office at the Secretariat Complex, Porvorim, Bardez, Goa.

3. The Deputy Collector and SDO Bicholim, Office of the Deputy Collector and SDO, Bicholim, Bicholim, Goa.

4. The Mamlatdar, Office of the Mamlatdar, Bicholim, Goa.

5. The Bicholim Police Station, through its Police Inspector, Bicholim, Goa.

6. The Goa State Pollution Control Board, through its Member Secretary, near Pilerne Industrial Estate, Opposite Saligao Seminary, Saligao, Goa, 403 511.

7. Blueglobe Exports Private Limited, through its Director, B-3, F-1 Prudential Paradise, Peddem, Mapusa, North Goa, GA – 403 507 In.

8. The Union of India, through the Secretary, Ministry of Environment, Forests and Climate change, Government of India, Indira Paryavaran Bhavan, Jor Bagh Road, Aliganj, New Delhi, 110 003. ... Respondents.

AND

Shri Trivikram Govind Prabhu Gaunkar alias Prabhugaonkar, aged about 47 years, son of Govind Vasudev Prabhu Gaunkar, R/o. H. No. 76, Pilgao, Bicholim, Goa 403 504 ...Applicant/ Intervener

AND

MISC. CIVIL APPLICATION NO. 1416 OF 2024
IN
PUBLIC INTEREST LITIGATION WRIT PETITION NO. 6 OF 2024

Vedanta Limited, A public company duly incorporated under the provisions of the Indian Companies Act, 1956, having its registered office at 1st Floor, C wing, Unit 103, Corporate Avenue Atul Projects, Chakala, Andheri (East) NA Mumbai , Mumbai City MH 400093 IN. Having local office at Sesa Ghor, 20 EDC Complex, Patto, Panaji, Goa, 403 001, Represented in this petition through its authorised signatory, Mr. Benecio Menezes, 56 years of age, Indian National, Having residence at St. Roque Waddo, Colvale, Bardez, Goa.

IN

1. The Mulakh Khajan Farmers Association, through its Secretary Sakharam Anant ... Applicant

Pednekar.

2. The Goa Foundation, through its Secretary Dr. Claude Alvares, having Regd. Office at Room No. 7, Above Mapusa Clinic, Mapusa, Goa – 403507.

Versus

1. The Director of Mines and Geology, through its Director, Ground Floor of Institute Menezes Braganza, Panaji, Goa – 403 001.

2. The State of Goa, through its Chief Secretary, having office at the Secretariat Complex, Porvorim, Bardez, Goa.

3. The Deputy Collector and SDO Bicholim, Office of the Deputy Collector and SDO, Bicholim, Bicholim, Goa.

4. The Mamlatdar, Office of the Mamlatdar, Bicholim, Goa.

5. The Bicholim Police Station, through its Police Inspector, Bicholim, Goa.

6. The Goa State Pollution Control Board, through its Member Secretary, near Pilerne Industrial Estate, Opposite Saligao Seminary, Saligao, Goa, 403 511.

7. Blueglobe Exports Private Limited, through its Director, B-3, F-1 Prudential Paradise, Peddem, Mapusa, North Goa, GA – 403 507 In.

8. The Union of India, through the Secretary, Ministry of Environment, Forests and Climate change, Government of India, Indira Paryavaran Bhavan, Jor Bagh Road,

Aliganj, New Delhi, 110 003.

... Respondents.

AND

1. Shankar Chandrakant Jalmi, aged 25.

2. Savlo Raghu Kavlekar, aged 49, both major, residents of H. No. ...., Bagwada, Pilgao, Bicholim, Goa.

3. Sudhakar Vasudev Vaignkar, Age 43, major, resident of H. No. 65,Bagwadao, Bicholim, Goa.

4. Govind Shankar Kavlekar, age 62, major, resident of H. No. 23, Gaonkar Wada, Pilgao, Bicholim, Goa. ...Applicant/ Interveners

---

Ms. Norma Alvares, Advocate *with Mr. Om D'Costa, Advocate for the Petitioners.*

Mr Y. V. Nadkarni, Advocate *with Mr Nilay Naik and Ms. Simran S. Khadilkar, Advocate for the Applicant in MCA No. 199/2024.*

Mr. D. Pangam, Advocate General *with Mr. Deep Shirodkar, Additional Government Advocate for Respondent nos. 1 to 5.*

Mr. Manish Salkar, Government Advocate *for Respondent no.6-GSPCB.*

Mr. Raviraj Chodankar, Central Government Standing Counsel *for the Union of India-Respondent No.8.*

Mr. A. D. Bhobe, Advocate *with Ms. A. Fernandes Advocate for Respondent No. 9.*

Mr. Janak Dwarkadas, Senior Advocate *(Through V.C.) with Mr. Shivan Desai, Mr. A. Gosavi, Advocate with Ms. Krupa Naik and Mr. Guruprasad Naik, Advocates for the Interveners-Applicants in MCA No. 215/2024 and MCA No. 239/2024.*

Mr. H. D. Naik, Advocate *for the Applicant in MCA No. 1216/2024(F) and MCA No. 1217/2024(F).*

Mr. Nigel Da Costa Frias, Advocate *with Ms. Sonadevi Nishad and Mr. Shane Coutinho, Advocates for the Applicants-Interveners in MCA No.1416/2024(F)*

CORAM: M. S. KARNIK &
VALMIKI MENEZES, JJ.

RESERVED ON : 26th JUNE 2024
PROUNOUNCED ON : 29th JUNE 2024

JUDGMENT (*Per M. S. Karnik, J.)*

1. We have taken up this petition for final disposal in view of the earlier order passed and with the consent of all parties.

2. It is the case of the petitioner that the otherwise tranquil situation in the village will be jeopardised as a result of the large scale transportation of mineral ore. The safety of the villagers, and that of the school going children will be endangered with the sudden increase in the traffic of trucks/tippers carrying the ore. The resultant noise pollution as well as the environmental pollution resulting from such unwarranted intrusion in the serene and peaceful environs of the village is in complete conflict with the cherished principles of

fundamental right enshrined by Article 21 of the Constitution of India. The submission is that this massive invasion will completely disturb the equilibrium of the village which serves only the business interests of the project proponent to the detriment of the villagers. The villagers say that they do not deserve such intrusion.

3. The concern expressed by the villagers is genuine. On one hand are the fundamental rights of villagers and on the other are the economic interests of the State as well as the rights of the project proponent. These are competing interests in conflict with each other.

4. It goes without saying that it is the foremost duty of the State to work towards achieving and maintaining a fine balance between competing interests taking into account various myriad considerations. Present is a case where there is an apparent conflict between the fundamental rights of the villagers and that of the State. The State finds mining and as a consequence transportation necessary to further its economic interest for the development of the State. A conflict in the present case has arisen between the right to life under Article 21 of the Constitution of India on one hand and Article 19(1)(g) of the Constitution of India on the other. The villagers claim a right to a dignified existence in a safe pollution free environment. The State asserts its economic right necessitating such transportation which villagers submit amounts to bulldozing the otherwise peaceful life

which they are accustomed to for a long time. The task of achieving this fine balance is surely a difficult one as observed by His Lordship in **K. S. Puttaswamy (Aadhaar-5J) vs. Union of India**[1]**.** The observations which form a part of a dissenting opinion in **K. S. Puttaswamy** (supra) are significant. An ideal situation would be one which would preserve the core of the right for both sets of citizens whose entitlements to freedom appears to be in conflict. Realistically, drawing balances is not a simple task. Balances involve sacrifices and the foregoing of entitlements.

5. While forming an opinion, we have extensively sought guidance from the aforementioned decision of the Supreme Court and the observations in **Rajeev Suri vs. Delhi Development Authority & Ors.**[2], which we have referred to in the later part of our order.

6. Let us now consider the facts of the present case. Our attention is invited to the interim order dated 17.01.2024 and the subsequent orders passed during the pendency of the petition. This petition raises an important issue in the public interest about the transportation of mineral ore by road through the village of Mayem. The petition as filed was limited to the problems to be faced by village 'Mayem'

1 (2019) 1 SCC 1

2 (2022) 11 SCC 1

7. By subsequent orders, the scope of the petition was expanded to the transportation of ore through the villages in Goa. The State of Goa and the project proponents opposed restrictions in the transportation of ore through the village roads asserting their rights on the basis of valid permissions and right to carry on business. Examination of such conflicting interests is surely not an easy task. How do we achieve the right balance while considering competing interests in the present case; does such transportation pass the muster of the relevant legislations; what should be the safeguards; are the measures to mitigate the perils of transportation through village roads adequate, are questions which arise for our consideration. Please show compassion to those living in the villages is the fervent plea of Ms. Norma Alvares, learned counsel for the petitioner.

8. The petitioners contended that the permissions granted by the Goa State Pollution Control Board ('*GSPCB*', for short), and the Director of Mines and Geology ('*DMG*', for short), were without any application of mind to several relevant considerations, including, but not restricted to the conditions referred to in the Office Memorandum (OM) dated 29.10.2014, issued by the Ministry of Environment, Forests and Climate Change (Annexures to the petition at pages 40 and 42 of the paper book) and the ground conditions at the Mayem village. Pursuant to the filing of the petition, the GSPCB and DMG

have by way of SOPs, proposed several safeguards and measures for safe transport and as fairly submitted by Ms. Norma Alvares, these measures are positive. Such submission is made by the learned Counsel for the petitioners with a caveat that the concern of the villagers must be more adequately addressed in the best manner possible. She submits that though several safeguards are put in place, the environmental concerns affecting the safety and health of the villagers must be monitored effectively and addressed from time to time with the aid of real time monitoring of pollution with modern sophisticated equipment.

9. Learned Advocate General has serious objection to the course adopted by us in expanding the scope of the PIL as according to him there are no pleadings to justify such a course. We strongly feel that the concern of transportation through village roads needs to be addressed. We cannot ignore the larger issue of such large scale transportation through the village roads. Do we overlook the concerns of those residing in these villages through which roads the transporting operations are to take place only on some technical objections raised? We do appreciate the submission that the concerns may differ from village to village. It is the duty of the State and the statutory authorities to conduct a scientific exercise in evaluating what requirements are best suited on a village to village basis to ensure the

safety of the life and limb of its subjects. Howsoever small the population may be, the basic aspiration of their right to live should not be bulldozed on some technical considerations. The Court is not expected to shut its eyes and not even question the State as to what the measures proposed for the safety of the villagers are. There is not the slightest doubt in our mind that such a course is necessary. The petition was filed specific to village Mayem. During the course of hearing, learned Advocate General submits a decision is taken that there is to be no transportation through village 'Mayem'.

10. Let us examine what are the measures in place to regulate transportation through such villages in the first place. The problems cited of transportation of ore through the villages will have to be addressed in the context of two scenarios which are :-

(i) Transportation of the ore which was already extracted in the course of the decisions in **Goa Foundation vs. Union of India & Ors.**[3] (referred to as *Goa Foundation-I*) and **Goa Foundation vs. Sesa Sterlite Limited & Ors.**[4] (referred to as *Goa Foundation-II*), which we refer to as 'e-auction ore'; and

(ii) Transportation of ore by the project proponent i.e. Vedanta, who has intervened in the present case in whose favour there exists a 50-year lease having been granted Environmental Clearance (EC, for short) under the

3 (2014) 6 SCC 590

4 (2018) 4 SCC 218

Environment Protection Act. This aspect pertains to transportation pursuant to the EC granted as a result of fresh leases executed.

11. The second aspect i.e. in respect of EC granted to Vedanta, need not detain us much. This petition does not challenge the EC granted to Vedanta. We make it clear that though learned Senior Advocate Shri Janak Dwarkadas was at pains to point out that the EC has been granted pursuant to a detailed examination by an expert body constituted under the EP Act, we do not express any opinion on such submission in this petition. The limited issue that we are examining is transportation of ore through the villages which allegedly creates disharmony in the fundamental right to life of the villagers. We make it clear that it is open for the aggrieved persons to lay a challenge to the EC on its own merits and in accordance with law before the forum competent to entertain such a challenge. It must be noted that the measures and safeguards recommended and which are part of the EC are accepted by Vedanta.

12. The first aspect of transportation of 'e-auction ore" is something we need to examine in some detail. Ms. Alvares alleged that the conditions imposed by the GSPCB and DMG were not complied with by the transporters during the earlier regime. It was pointed out that there was incessant transportation of ore through trucks right from 4.30 a.m. in the morning till 6.30 p.m. in the evening. It is submitted

that such transportation is a source of pollution that has affected the entire village and the villagers.

13. On the basis of the submission of learned Counsel appearing for the petitioners and hearing the respondents, this Court was of the *prima facie* opinion that there was not much application of mind by either the GSPCB and DMG before the clearances or transit permits were issued in the context of the route now proposed by the project proponent, i.e. the seventh respondent. This Court *prima facie* observed that the authorities, without adverting to several relevant considerations, not to mention the Ministry's OM dated 29.10.2014, mechanically issued the clearance or the transit pass. It was noticed that there was confusion about the roles the GSPCB and the DMG was expected to play in such matters affecting the lives and properties of the villagers. After referring to the provisions of OM dated 29.10.2014, this Court was of the opinion that some measures had to be put in place which would safeguard the life and properties of the Villagers. The relevant directions issued from paragraph 26 onwards which form part of the interim Order dated 17.01.2024 read thus :

> "26. We direct the DMG and GSPCB to file detailed affidavits on the issue of grant of permissions, etc., for transportation of ore through villages in the State of Goa. The affidavits, as far as possible, should state the procedure that is

presently followed and the procedure that the authorities would like to follow in the future in case there are any shortcomings in the existing procedure. We think that the DMG and GSPCB should act in tandem and coordinate with each other so that proper procedures are evolved. For this, if possible, the authorities should hold a meeting. Other stakeholders, like the representatives of the mining industry, transportation industry, environmentalists, representatives of the Panchayat, etc., could also be invited to such meetings so that some policy which takes care of the interests of all stakeholders could be evolved.

27. The affidavits must also deal with an action plan for implementation or enforcement of the conditions included in the permissions. There is no point in imposing conditions to prevent pollution and hardships to villagers if there is no will or proper mechanism for effective implementation. It is not uncommon that considerable police forces are deployed when villagers raise their voices against ore transportation through villages. While it is improper for the villagers to take the law into their own hands, the Authorities must be vigilant in the enforcement of the conditions imposed for the benefit of such villagers. If the transporters disregard such conditions with impunity, strict action must be taken.

28. Since there is no clarity on the procedures for granting permissions for transportation or ores through villages, and at least prima facie, we get the

impression that DMG and GSPCB are passing the buck on each other without each of them assuming any responsibility, we direct that until the next date, no permissions shall be granted for transportation of ore by private parties through villages, without the leave of this Court. Such a direction is necessary to avoid a repetition of what has happened in the present case. Besides, we propose to dispose of this Petition at an early date.

29. We stand over this matter to 20.02.2024. The affidavits should be filed by 12.02.2024 by giving advance copies to the learned counsel for the petitioners. If the petitioners wish to file any rejoinder, they may do so on or before 20.02.2024 by giving advance copies to the learned counsel for the respondents. We also direct the Petitioners to implead and serve the Union of India through the Ministry of Environment, Forests and Climate Change.

30. The matter is posted for final disposal at the admission stage."

14. Learned Counsel for the petitioners submitted that having regard to the measures and safeguards provided and placed on record by the GSPCB and DMG pursuant to the filing of the petition so far as transportation of 'e-auction ore' is concerned, the spirit of the conditions which are set out in the OM of 2014 has been imbibed in the Standard Operating Procedure ('SOP' for short). At one stage, learned Advocate General did proceed to canvas that the OM of 2014

does not bind the GSPCB or the DMG as the said OM is only an executive instruction which does not pass muster of Section 3 of 'The Environment (Protection) Act, 1986, (herein after referred to as the *EP Act* for short). In view of the aforesaid submission of the learned Counsel for the petitioners, we refrain from expressing any opinion on such contention of learned Advocate General in this petition.

15. It needs to be considered whether there should be a complete ban on transport of the ore through village routes or providing safeguards and measures for mitigating the concerns of the villagers while permitting transportation can be a solution. For a better understanding, it would be apposite to refer to the decisions of the Supreme Court in **Goa Foundation vs. Union of India & Ors.**[5] (*supra*) and **Goa Foundation vs. Sesa Sterlite Limited & Ors.**[6] (*supra*). The facts related to mining in Goa is set out by Their Lordships in Goa Foundation-I, which reads thus :

> "2. Prior to 19-12-1961 when Goa was a Portuguese territory, its Portuguese Government had granted mining concessions in perpetuity to concessionaires. On 19-12-1961, Goa was liberated and became part of the Indian Union and on 1-10-1963, the Mines and Minerals (Development and Regulation) Act, 1957 (for short "the MMDR Act") was made applicable to the State of Goa. On 10-3-1975, the

5 (2014) 6 SCC 590

6 (2018) 4 SCC 218

Controller of Mining Leases issued a Notification calling upon every lessee and sub-lessee to file returns under Rule 5 of the Mining Leases (Modification of Terms) Rules, 1956 and sent copies of the notification to the concessionaires in Goa. Aggrieved, the concessionaires moved the Bombay High Court, Goa Bench, and by judgment dated 29-9-1983, in *Vassudeva Madeva Salgaocar* v. *Union of India*, the Bombay High Court restrained the Union of India from treating the concessions as mining leases and from enforcing the notification against the concessionaires.

3. Parliament thereafter passed the Goa, Daman and Diu Mining Concessions (Abolition and Declaration as Mining Leases) Act, 1987 (for short "the Abolition Act") which received the assent of the President on 23-5-1987. Section 4 of the Abolition Act abolished the mining concessions and declared that with effect from the 20th day of December, 1961, every mining concession will be deemed to be a mining lease granted under the MMDR Act and that the provisions of the MMDR Act will apply to such mining lease. Section 5 of the Abolition Act further provided that the concession holder shall be deemed to have become a holder of the mining lease under the MMDR Act in relation to the mines in which the concession relates and the period of such lease was to extend up to six months from the date when the Abolition Act received President's assent i.e. up to 22-11-1987. On 14-10-1987, sub-rules (8) and (9) were inserted in Rule 24-A of the Mineral Concession Rules, 1960 (for short "the MC Rules")

which deal with renewal of mining leases in Goa, Daman and Diu.

4. The Abolition Act was challenged by the lessees before the Bombay High Court in a writ petition. The High Court passed an interim order permitting the lessees to carry on mining operations and the mining business in the concessions for which renewal applications had been filed under Rule 24-A of the MC Rules. Subsequently, the High Court held in its judgment dated 20-6-1997 that the Abolition Act was valid but Section 22(1)(a) of the Abolition Act would operate prospectively and not retrospectively. The concessionaires filed special leave petition against the judgment dated 20-6-1997 before this Court. On 2-3-1998, this Court passed an interim order permitting the concessionaires to carry on mining operations and mining business in the mining areas for which renewal applications have been made on the condition that the lessee pays to the Government dead rent from the date of commencement of the Abolition Act. Subsequently, this Court granted leave in the special leave petition and continued the aforesaid interim order.

The Justice Shah Commission and its Report

5. As reports were received from various State Governments of widespread mining of iron ore and manganese ore in contravention of the provisions of the MMDR Act, the Forest (Conservation) Act, 1980, the Environment (Protection) Act, 1986 and other rules and guidelines issued thereunder, the Central Government appointed the Justice Shah Commission under Section 3 of the Commissions of

Inquiry Act, 1952 by Notification dated 22-11-2010. Paras 2 and 3 of the Notification, which are relevant, are extracted hereinbelow:

"2. The terms of reference of the Commission shall be-

(i) to inquire into and determine the nature and extent of mining and trade and transportation, done illegally or without lawful authority, of iron ore and manganese ore, and the losses therefrom; and to identify, as far as possible, the persons, firms, companies and others that are engaged in such mining, trade and transportation of iron ore and manganese ore, done illegally or without lawful authority;

(ii) to inquire into and determine the extent to which the management, regulatory and monitoring systems have failed to deter, prevent, detect and punish offences relating to mining, storage, transportation, trade and export of such ore, done illegally or without lawful authority, and the persons responsible for the same;

(iii) to inquire into the tampering of official records, including records relating to land and boundaries, to facilitate illegal mining and identify, as far as possible, the persons responsible for such tampering; and

(iv) to inquire into the overall impact of such mining, trade transportation and export done illegally or without lawful authority, in terms of destruction of forest wealth, damage

to the environment, prejudice to the livelihood and other rights of tribal people, forest dwellers and other persons in the mined areas, and the financial losses caused to the Central and State Governments.

3. The Commission shall also recommend remedial measures to prevent such mining, trade, transportation and export done illegally or without lawful authority."

6. The Justice Shah Commission visited Goa and issued notices under Section 4 of the Commissions of Inquiry Act, 1952 calling for information from the authorities concerned and the lessees and submitted its interim report on 15-3-2012 to the Ministry of Mines, Union of India. On 7-9-2012, the Justice Shah Commission Report on Goa was tabled in Parliament along with an Action Taken Report of the Ministry of Mines and on 10-9-2012 the State Government of Goa passed an Order suspending all mining operations in the State of Goa with effect from 11-9-2012. Pursuant to this Order of the State Government, on 11-9-2012 and 12-9-2012 the District Magistrates of the State of Goa banned transportation of iron ore in their respective districts and the Director of Mines and Geology ordered for verification of mineral ore which was already extracted. On 13-9-2012, the Director of Mines and Geology, Government of Goa issued show-cause notices to 40 mining leases. On 14-9-2012, the Ministry of Environment and Forests of the Union of India also directed that all

environmental clearances granted to mines in the State of Goa be kept in abeyance.

7. On the basis of findings in the Report of the Justice Shah Commission on illegal mining in the State of Goa, Goa Foundation has filed Writ Petition (C) No. 435 of 2012 as public interest litigation praying for directions to the Union of India and the State of Goa to take steps for termination of the mining leases of lessees involved in mining in violation of the Forest (Conservation) Act, 1980, the Mines and Minerals (Development and Regulation) Act, 1957, the Mineral Concessions Rules, 1960, the Environment (Protection) Act, 1986, the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 as well as the Wild Life (Protection) Act, 1972. Goa Foundation has prayed that a direction be issued to the respondents to prosecute all those who have committed offences under the different laws and are involved in the pilferage of State revenue through illegal mining activities in the State of Goa including the public servants who have aided and abetted the offences. Goa Foundation has also sought for appointment of an independent authority with full powers to take control, supervise and regulate mining operations in the State of Goa and to ensure the implementation of the laws. Besides, the aforesaid main reliefs, Goa Foundation has also prayed for some incidental and consequential reliefs.

8. On 5-10-2012, this Court issued notice in Goa Foundation v. Union of India to the respondents and

directed the Central Empowered Committee (for short "CEC") to submit its report on the writ petition and also directed that till further orders, all mining operations in the leases identified in the report of the Justice Shah Commission and transportation of iron ore and manganese ore from those leases, whether lying at the mine-head or stockyards, shall remain suspended, as recommended in the report of the Justice Shah Commission.

9. Different mining lessees of the State of Goa and the Goa Mining Association also filed writ petitions in the Bombay High Court, Goa Bench for a declaration that the report of the Shah Commission is illegal and for quashing the findings in the Report of the Justice Shah Commission and also for quashing the Order dated 10-9-2012 of the Government of Goa suspending mining operations in the State of Goa and the Order dated 14-9-2012 of the Ministry of Environment and Forests, Government of India, directing that the environmental clearances granted to the mines in the State of Goa be kept in abeyance. These writ petitions have been transferred to this Court for hearing along with the hearing of Writ Petition (Civil) No. 435 of 2012 filed by Goa Foundation.

10. The writ petitions and the transferred cases were heard during September, October and November 2013. On 11-11-2013 an order was passed by this Court directing that the inventory of the excavated mineral lying ores in different mines/stockyards/jetties/ports in the State of Goa made by the Department of Mines and Geology of

the Government of Goa be verified and thereafter the whole of the inventoried mineral ores be sold by e-auction and the sale proceeds (less taxes and royalty) be retained in separate fixed deposits (leasewise) by the State of Goa till the Court delivers the judgment in these matters on the legality of the leases from which the mineral ores were extracted. The Court has also directed that this entire process of verification of the inventory, e-auction and deposit of sale proceeds be monitored by a Monitoring Committee appointed by the Court. By the said order dated 11-11-2013, this Court also constituted an Expert Committee to conduct a macro-EIA study on what should be the ceiling of annual excavation of iron ore from the State of Goa considering its iron ore resources and its carrying capacity, keeping in mind the principles of sustainable development and intergenerational equity and all other relevant factors. On 11-11-2013 the case was also reserved for judgment."

16. Upon considering the submissions, Their Lordships in Goa Foundation-I held thus :

"87. In the result, we declare that:

87.1. The deemed mining leases of the lessees in Goa expired on 22-11-1987 and the maximum of 20 years renewal period of the deemed mining leases in Goa expired on 22-11-2007 and consequently mining by the lessees after 22-11-2007 was illegal and hence the impugned Order dated 10-9-2012 of Government of Goa and the impugned Order dated

14-9-2012 of MoEF, Government of India are not liable to be quashed.

87.2. Dumping of minerals outside the leased area of the mining lessees is not permissible under the MMDR Act and the Rules made thereunder.

87.3. Until the order dated 4-8-2006 of this Court is modified by this Court in IA No. 1000 in *T.N. Godavarman Thirumulpad v. Union of India*, there can be no mining activities within one kilometre from the boundaries of national parks and sanctuaries in Goa.

87.4. By the order dated 4-12-2006 in *Goa Foundation v. Union of India*, this Court has not prohibited mining activities within 10 kilometres' distance from the boundaries of the national parks or wildlife sanctuaries.

87.5. It is for the State Government to decide as a matter of policy in what manner mining leases are to be granted in future but the constitutionality or legality of the decision of the State Government can be examined by the Court in exercise of its power of judicial review."

17. After the declaration and directions in Goa Foundation-I, some controversy arose as the State of Goa granted second renewals to the mining lease holders. It was one of the contention of the petitioners in Goa Foundation-II that the State of Goa was obliged to grant fresh mining leases in accordance with law and not second renewals to the mining lease holders. The observations of Their Lordships in Goa

Foundation-II which also contains reference to the observations in Goa Foundation-I are significant, which read thus :

> "1. Rapacious and rampant exploitation of our natural resources is the hallmark of our iron ore mining sector coupled with a total lack of concern for the environment and the health and well-being of the denizens in the vicinity of the mines. The sole motive of mining leaseholders seems to be to make profits (no matter how) and the attitude seems to be that if the rule of law is required to be put on the backburner, so be it. Unfortunately, the State is unable to firmly stop violations of the law and other illegalities, perhaps with a view to maximise revenue, but without appreciating the long- term impact of this indifference. Another excuse generally put forth by the State is that of development, conveniently forgetting that development must be sustainable and equitable development and not otherwise.
>
> 2. Effective implementation and in some instances circumvention of the mining and environment related laws is a tragedy in itself. Laxity and sheer apathy to the rule of law gives mining leaseholders a field day, being the primary beneficiaries, with the State being left with some crumbs in the form of royalty. For the State to generate adequate revenue through the mining sector and yet have sustainable and equitable development, the implementation machinery needs a tremendous amount of strengthening while the law enforcement machinery needs strict vigilance.

Unless the two marry, we will continue to be mute witnesses to the plunder of our natural resources and left wondering how to retrieve an irretrievable situation.

3. The Government of India appears to have received information of large-scale illegal mining of iron ore and manganese ore in different States in contravention of the provisions of the Mines and Minerals (Development and Regulation) Act, 1957 (the MMDR Act); the Forest (Conservation) Act, 1980; the Environment (Protection) Act, 1986 and other rules and guidelines issued on the subject from time to time.

4. Acting on this information, the Government of India appointed Justice M. B. Shah, a former Judge of this Court as a Commission of Inquiry under Section 3 of the Commissions of Inquiry Act, 1952 by a Notification dated 22-11-2010. The terms of reference of the Commission for the State of Goa were as follows:

> "2. The terms of reference of the Commission shall be-
>
> (i) to inquire into and determine the nature and extent of mining and trade and transportation, done illegally or without lawful authority, of iron ore and manganese ore, and the losses therefrom; and to identify, as far as possible, the persons, firms, companies and others that are engaged in such mining, trade and transportation of iron ore and manganese ore, done illegally or without lawful authority;
>
> (ii) to inquire into and determine the extent to which the management, regulatory transportation, trade and export of such

ore, done illegally or without lawful authority, and the persons responsible for the same;

(iii) to inquire into the tampering of official records, including records relating to land and boundaries, to facilitate illegal mining and identify, as far as possible, the persons responsible for such tampering; and

(iv) to inquire into the overall impact of such mining, trade, transportation and export, done illegally or without lawful authority, in terms of destruction of forest wealth, damage to the environment, prejudice to the livelihood and other rights of tribal people, forest dwellers and other persons in the mined areas, and the financial losses caused to the Central and State Governments.

3. The Commission shall also recommend remedial measures to prevent such mining, trade, transportation and export done illegally or without lawful authority."

5. Justice Shah visited Goa and after calling for and receiving information from the authorities concerned as well as the mining leaseholders, he submitted a report on 15-3-2012 and another on 25-4-2012 to the Ministry of Mines in the Government of India. The reports were tabled in Parliament on 7-9-2012 along with an Action-Taken Report and as a result, the Government of Goa passed an order dated 10-9-2012 suspending all mining operations in the State with effect from 11-9-2012. The Ministry of Environment and Forests (MoEF) of the Government of India acted similarly and kept in abeyance the environmental clearances granted to 139 mines (actually 137 mines - there is some duplication) in the State of Goa by an order dated 14-9-2012.

6. Subsequent to the reports given by Justice Shah, a writ petition was filed by Goa Foundation in this Court being WP (C) No. 435 of 2012. The writ petition was a public interest litigation praying, inter alia, for directions to the Union of India and the State of Goa to take steps to terminate the mining leases where mining was carried out in violation of various statutes.

7. Similarly, several mining leaseholders preferred writ petitions in the Bombay High Court for a declaration that the reports given by Justice Shah are illegal and also for quashing the orders dated 10-9-2012 and 14-9-2012 whereby mining operations were suspended and environmental clearances were kept in abeyance. The writ petitions filed in the High Court were transferred to this Court for hearing along with WP (C) No.435 of 2012.

8. This Court heard all these matters and rendered its decision in Goa Foundation v. Union of India on 21-4-2014. Among other conclusions arrived at, it was held by the Court that all the iron ore and manganese ore leases had expired on 22-11-2007. Consequently, any mining operation carried out by the mining leaseholders after that date was illegal. It was also held that all the mining leaseholders had enjoyed a first deemed renewal of the mining lease and for a second renewal an express order was required to be passed in view of and in terms of Section 8(3) of the MMDR Act. For a second renewal of the mining lease, it was held that the State Government must apply its mind and record reasons for renewal being in the interest of mineral

development and the necessity to renew the mining lease. Any decision taken by the State Government should also be in conformity with the constitutional provisions. The decision taken by the State of Goa to grant a mining lease in a particular manner or to a particular party could be examined by way of judicial review. It was also held that the orders dated 10-9-2012 and 14-9-2012 are not liable to be quashed and that they would continue till decisions are taken to grant fresh leases and fresh environmental clearances for mining projects." (emphasis supplied)

18. The Supreme Court in Goa Foundation-II concluded thus :

"154 - In view of our discussion, we arrive at the following conclusions:

154.1. As a result of the decision, declaration and directions of this Court in Goa Foundation, the State of Goa was obliged to grant fresh mining leases in accordance with law and not second renewals to the mining lease holders.

154.2. The State of Goa was not under any constitutional obligation to grant fresh mining leases through the process of competitive bidding or auction.

154.3. The second renewal of the mining leases granted by the State of Goa was unduly hasty, without taking all relevant material into consideration and ignoring available relevant material and therefore not in the interests of mineral development. The decision was taken only to

augment the revenues of the State which is outside the purview of Section 8(3) of the MMDR Act. The second renewal of the mining leases granted by the State of Goa is liable to be set aside and is quashed.

154.4. The Ministry of Environment and Forest was obliged to grant fresh environmental clearances in respect of fresh grant of mining leases in accordance with law and the decision of this Court in Goa Foundation and not merely lift the abeyance order of 14th September, 2012.

154.5. The decision of the Bombay High Court in Lithoferro v. State of Goa (and batch) (2014 SCC Online Bom 997) giving directions different from those given by this Court in Goa Foundation is set aside.

154.6. The mining lease holders who have been granted the second renewal in violation of the decision and directions of this Court in Goa Foundation are given time to manage their affairs and may continue their mining operations till 15th March, 2018. However, they are directed to stop all mining operations with effect from 16th March, 2018 until fresh mining leases (not fresh renewals or other renewals) are granted and fresh environmental clearances are granted.

154.7. The State of Goa should take all necessary steps to grant fresh mining leases in accordance with the provisions of the Mines and Minerals(Development and Regulation) Act, 1957. The Ministry of Environment and Forest should also take all necessary steps to grant fresh environmental clearances to those who are successful in obtaining

fresh mining leases. The exercise should be completed by the State of Goa and the Ministry of Environment and Forest as early as reasonably practicable.

154.8. The State of Goa will take all necessary steps to ensure that the Special Investigating Team and the Team of Chartered Accountants constituted pursuant to the Goa Grant of Mining Leases Policy, 2014 give their reports at the earliest and the State of Goa should implement the reports at the earliest, unless there are very good reasons for rejecting them.

154.9. The State of Goa will take all necessary steps to expedite recovery of the amounts said to be due from the mining lease holders pursuant to the show cause notices issued to them and pursuant to other reports available with the State of Goa including the report of Special Investigating Team and the Team of Chartered Accountants.

155. The writ petitions and SLPs are disposed of in accordance with the above conclusions and directions."

19. The State of Goa, therefore, now had to proceed with the auction of the ore ('e-auction ore'), which was already extracted; and secondly, initiate the process of issuing fresh mining leases (allotment of blocks) in accordance with the directives of the Supreme Court as per law.

20. What is in issue in this PIL are the problems caused by bulk transport of minerals (iron ore) through mining villages in the mining zone of Goa that have plagued village communities in the past. The petitioner expects the Government to accept their rights to a clean, healthy and pollution free environment as the primary consideration which should guide them while granting transport permissions to the mining companies/transporters of the minerals, rather than the commercial interests of the project proponent/transporters. The grievance is that though statutory provisions are in place to regulate such operations, they are grossly inadequate and worse still poorly implemented. The submission is that poor implementation of norms lead to road deaths, insufferable dust pollution, destruction of roads and water delivery infrastructure, occupation of the road by heavy vehicles from dawn to dusk resulting in the degeneration of quality of life in the villages. It is submitted that with a fresh regime of mining now commencing, it was necessary that the transportation Rules ought to have been comprehensively re-examined especially in the context of findings of the two-year study of environmental impacts of mining done by the Dhanbad Institute of Mines, by the Ministry of Environment. According to the petitioners there is no scientific study of the village routes for sustainable transport before granting the permissions. Thus, it is vehemently urged that the transportation of the ore by means of trucks/tippers will not only disturb the peace and

tranquillity of the villages but seriously affect the safety of the villagers apart from increased pollution which will have an adverse effect on the health of the villagers.

21. As indicated earlier, learned Advocate General submitted that so far as village Mayem is concerned, the grievance is worked out as no transportation will be permitted from this village. It is further submitted that there are adequate safeguards in place in the form of rules, notifications, under the EP Act and also SOPs have been issued pursuant to the interim orders passed by this Court providing for adequate safety measures for safeguarding life and property of the villagers apart from addressing environmental concerns expressed.

22. We completely agree with learned Counsel for the petitioners, that there is bound to be heavy increase of transportation through the village roads as the materials on record indicate. However, in balancing the conflicting rights, we must bear in mind the observations of the Supreme Court in the matter in **Rajeev Suri vs. Delhi Development Authority & Ors.**(supra)**.** Their Lordships made significant observations for striking a just balance between two competing environmental and development concerns. Paragraph 519 to paragraph 528 reads thus :

"519. Indubitably, environment and development are not sworn enemies of each other. It would be an anomalous approach to consider environment as a hurdle in development and vice versa. The entities like EAC and NGT are created to strike a just balance between two competing interests and a time-tested principle of striking this balance is timely invocation of mitigating environmental measures amidst a development activity. True that mere application of certain mitigating measures may not alleviate environmental concerns in all matters and in some circumstances, the project is simply incomprehensible with the environment. But as long as a legitimate development activity can be carried on in harmony with the idea of environmental protection and preservation including sustainable development, the Courts as well as expert bodies should make their best endeavour to ensure that harmony is upheld and hurdles are minimised by resorting to active mitigating measures.

520. The principle of sustainable development and precautionary principle need to be understood in a proper context. The expression "sustainable development" incorporates a wide meaning within its fold. It contemplates that development ought to be sustainable with the idea of preservation of natural environment for present and future generations. It would not be without significance to note that sustainable development is indeed a principle of development, it posits controlled development. The primary requirement underlying this principle is to ensure that every development work is *sustainable*;

and this requirement of sustainability demands that the first attempt of every agency enforcing environmental rule of law in the country ought to be to alleviate environmental concerns by proper mitigating measures. The future generations have an equal stake in the environment and development. They are as much entitled to a developed society as they are to an environmentally secure society.

521. By the Declaration on the Right to Development, 1986, the United Nations has given express recognition to a right to development. Article 1 of the Declaration defines this right as:

> " i. The right to development is an inalienable human right by virtue of which every human person and all peoples are entitled to participate in, contribute to, and enjoy economic, social, cultural and political development, in which all human rights and fundamental freedoms can be fully realized."

522. The right to development, thus, is intrinsically connected to the preservance of a dignified life. It is not limited to the idea of infrastructural development, rather, it entails human development as the basis of all development. The jurisprudence in environmental matters must acknowledge that there is immense interdependence between the right to development and the right to natural environment.

523. In *International Law and Sustainable Development*, Arjun Sengupta in the chapter "*Implementing the Right to Development* [*International Law and Sustainable Development*

— *Principles and Practice* (Publisher : Martinus Nijhoff, Edn. 2004) p. 354.] " notes thus:

> "... Two rights are interdependent if the level of enjoyment of one is dependent on the level of enjoyment of the other..."
>
> The concern of the regulatory agencies is to weed out the unsustainable from the development plan and to parallelly ensure that the right to development is not trumping upon any other right. Sengupta further notes:
>
> "... There is an improvement in the right to development only if at least one of the constituent rights improves and no other right deteriorates or is violated, which means the right to development conforms to the principle of the indivisibility of human rights... [*International Law and Sustainable Development — Principles and Practice* "

524. The precautionary principle duly mandates that all agencies of the State, including Courts, must make their best endeavour to ensure that precaution is instilled in the process of development. The very requirement of prior EC is born out of this need for precaution. It is a manifestation of the precautionary principle in India and if development work is carried out in furtherance of prior EC and such EC is not vitiated by illegality, it would be a case of proper adherence with the precautionary principle.

525. In matters of balancing between competing environmental and development concerns, the Court has to be project-specific. In environmental matters, even one fact here or there may have the effect of attributing a totally distinct character to the project and accordingly, the scope of judicial review may vary. This sentiment is best reflected in the following words of Professor Schotland [D.C. Circuit Judicial

Conference, *Environmental Protection : Law and Policy*, 2nd Edn. (Cambridge : Cambridge University Press, 2007) p. 122.] who proposed ranking of standards of judicial review according to strictness:

> "3. ... I have always thought of scope of review as a spectrum, with de novo at one end, with unconstitutionality at the other end, and in between a number of what I will call "mood-points" or degrees of judicial aggressiveness or restraint, such as preponderance of the evidence, clearly erroneous, substantial evidence on the whole record, scintilla of evidence, abuse of discretion and last, right next to or even into unconstitutionality, arbitrary and capricious. And since these are only "mood-points", there is considerable room within each for difference."

526. The proper balance of judicial review in environmental matters in a constantly developing society is a matter of great debate across all jurisdictions. In *Ethyl Corpn.* v. *Environmental Protection Agency* [*Ethyl Corpn.* v. *Environmental Protection Agency*, 426 US 941 (1976). Ed. : Cert. denied in *Ethyl Corpn.* v. *Environmental Protection Agency*, 426 US 941 (1976) against *Ethyl Corpn.* v. *Environmental Protection Agency*, 541 F 2d 1 (DC Cir 1976).] , the observations of Wright, J. present a just balance. He observed thus:

> "There is no inconsistency between the deferential standard of review and the requirement that the reviewing court involve itself in even the most complex evidentiary matters; rather, the two indicia of arbitrary and capricious review stand in careful balance. The close scrutiny of the evidence is intended to educate the court. It must understand enough about the problem confronting the agency to comprehend the meaning of the evidence relied upon and the evidence discarded; the questions

> addressed by the agency and those bypassed; the choices open to the agency and those made. The more technical the case, the more intensive the court's effort to understand the evidence, for without an appropriate understanding of the case before it the court cannot properly perform its appellate function. ..."

527. Wright, J. in *Ethyl Corporation* [*Ethyl Corpn.* v. *Environmental Protection Agency*, 426 US 941 (1976). **Ed.** : Cert. denied in *Ethyl Corpn.* v. *Environmental Protection Agency*, 426 US 941 (1976) against *Ethyl Corpn.* v. *Environmental Protection Agency*, 541 F 2d 1 (DC Cir 1976).] then notes the need for realising the limits of judicial function thus:

> "*But the function must be performed with conscientious awareness of its limited nature. The enforced education into the intricacies of the problem before the agency is not designed to enable the court to become a superagency that can supplant the agency's expert decision-maker*. To the contrary, the court must give due deference to the agency's ability to rely on its own developed expertise. The immersion in the evidence is designed solely to enable the court to determine whether the agency decision was rational and based on consideration of the relevant factors. It is settled that we must affirm decisions with which we disagree so long as this test is met...." (emphasis supplied)

528. They must always look for a careful balance when two equally relevant interests compete with each other. The task may not be easy, but is the only reasonable recourse. For the proper application of these principles, the first and foremost thing to be kept in mind is the nature of the project. In the present case, the subject project is an independent building and construction project wherein one-time

> construction activity is to be carried out. It is not a perpetual or continuous activity like a running industry. It is absolutely incomprehensible to accept that a project of this nature would be unsustainable with the needs and aspirations of future generations. Furthermore, the increase in footprint is not shown to be substantial and the inclusion of new Members of Parliament after the delimitation exercise is anyway going to lead to an inevitable increase in footprint (floating though) that cannot be countenanced as a concern here."

23. We have therefore to look for a careful balance when two equally relevant interests compete with each other. At this juncture itself, we may refer to the MCA No. 239 of 2024 filed by Vedanta Limited. Shri Janak Dwarkadas submitted that Vedanta Limited has been granted Environmental Clearance (EC) to the project for Block – I, Bicholim Mineral Block and Block VII-Cudnem Mineral Block. It is submitted that the EC is granted after following a detailed procedure laid down under the EP Act and the Rules framed thereunder. Our attention is invited to the Notification dated 14.09.2012 published by the Ministry of Environment, Forest and Climate Change, which provides for requirements of prior environmental clearances for matters falling under category 'A' of the Schedule. Shri Dwarkadas submitted that the Expert Appraisal Committee comprises of domain experts. It is submitted that rigorous conditions are imposed in the EC. It is further submitted that transportation is a mechanism

provided under the Expert Appraisal Committee (EAC) regime. It is submitted that the EAC comprises of persons who are outstanding environmental policy experts with wide expertise in the relevant development sector. It consists of only professionals and experts fulfilling the qualifying criteria provided by the notification. It is submitted that a detailed procedure is prescribed for appraisal. A procedure is conducted for public hearing. It is thus submitted that before granting EC, it has to pass the muster of the stringent provisions of the EP Act and the Rules framed therein.

24. It is already indicated by us that we are not examining the challenge to the EC hence we refrain from expressing any opinion to the legality or otherwise of the EC. In appropriate proceedings, such challenge can be gone into. We also make it clear that what is being recorded by us are the assurances accepted by Vedanta in the matter of transportation. We may not be understood to mean that we have examined the legality and propriety of the conditions for transport in the EC and the Consent to Operate ('CTO' for short). The challenge to these conditions in the EC and the CTO regarding the transport and the measures incorporated is kept open for consideration in appropriate proceedings before the appropriate forum as and when a proper challenge to the EC as well as the CTO is made.

25. Shri Dwarkadas was at pains to point out that Vedanta's consent to operate incorporates all the safeguards necessary to ensure that the competing rights of the villagers regarding their safety and environmental concern are properly balanced with that of the right of the project proponent to carry mining operations pursuant to the valid EC. Shri Dwarkadas submitted that Vedanta's affidavit dated 17.06.2024 provides for measures of safeguards to prevent pollution under CTO. On instructions, Shri Dwarkadas submits that Vedanta shall be strictly complying with all conditions of transportation mentioned at serial nos. 13 to 24 of the CTO.

26. The CTO has been granted by the GSPCB under Section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization under Rule 6(i) of the Hazardous and Other Wastes (Management and Transboundry Movement) Rules 2016, as amended thereafter. In the EC granted to Vedanta Limited, we find that during the site inspection, certain observations were made by the sub-committee. The observations at item 4 and the reply of the project proponent thereon are relevant, reading thus :

> "4. The Project Proponent needs to bypass the public road and also to explore the possibility of increasing the capacity of the truck so as to reduce the no. of trips. The EAC opined that the Project

Proponent needs to revisit the traffic load by considering the cycle time and waiting time. The Project Proponent needs to submit the action plan for strengthening the road and for converting the unpaved road into concrete road.

The Project Proponent submitted the map showing the transportation route comprising of dedicated road corridor and public road. The total travel distance upto Jetty is 5.48 kms (4.54 km dedicated road and 0.94 km MDR-20 Public Road). Traffic load and effective distance between two trucks are as follows :-

S.No.	Transportation working days	Quantity (In TPA)	Tonnes/Day	Trips per day	Mode of trnasport
1	237	30,00,000	12658	1205	Road
	Total trips per day			1205	

The road witdth details for various segments are as follows :

Dedicated Road corridor	
3.31 km	1.23 km
12-15 mts wide Road	7 mts wide Road

Further, the Project Proponent submitted the following details :

i. Capacity of truck is 10.5 tons as per directives of Dept. Of Mines & Geology, Goa.

ii. Total Handling per day is 12658 tons/day

iii. Transportation timings are 6.00 a.m. to 7.00 am, 8.00 a.m. to 12.45 pm and 2.00 p,m to 5.45 pm. Therefore, the effective transportation time is 9.30 hrs.

iv. Per Hour Handling is : 1332 tons/hour

v. No. of vehicles per Hour (One Way): 127 vehicles

vi. No. of Vehicles per Hour (to and fro) : 254 vehicles

vii. The Speed of vehicle is 25 KMPH and the lead distance is 5.48 kms.

viii. The time taken for 5.48 km is 13.15 mins for each truck and loading time is 1 min, weighment time at both source location is 2 min, Tarpaulin typing and untying time is 2 min, unloading time 1 min and waiting time 10 min.

ix. Each truck length is 15'.5" (4.58 m)

x. Distance from truck to truck is 5 m both side – 10 m

xi. Each vehicle occupies a min. distance of 14.58 m =~ 15 m

xii. The length of road is 5.48 Km = 5480

xiii. No. of vehicle which can travel on this road for one side =5480/15=365, However we would be plying only 127 trucks hence effective distance between two vehicles is 43 m.

The Project Proponent submitted the following mitigation measures for transportation :

i. Public road is hot mixed and same will be maintained.

ii. Dedicated road is proposed to be hot mixed in phased manner.

iii. Entire Dedicated transportation route is surrounded by thick Green Belt

iv. Transportation vehicles shall be properly maintained to minimize the exhaust emission.

v. Regular tests shall be carried out to check exhaust emission and PUC certification of transportation vehicles at prescribed interval.

vi. Transportation trucks will be loaded with prescribed capacity and covered with tarpaulin before leaving mines premises.

vii. Overloading of the material will be avoided.

viii. Regular monitoring of the emission levels.

ix. Over speeding of Vehicle will not be allowed.

x. Traffic Marshalls shall be provided for regulating movement of vehicles as well as for safety of persons.

xi. Training will be given to all drivers about safe driving.

xii. Regular water sprinkling by means five hired water tanker of 10kL capacity on haul road and loading points will be carried out.

xiii. Used of fixed dust suppression system on haul roads

xiv. Installation of two wheel washed system (one each at the exit of the dedicated road and jetty exit respectively.

xv. Manual and mechanised machines for road sweeping.

xvi. Washing of mine exit points/Junctions (Mayem, Pilgao and Jetty exit area) after transportation hours/at night with water tanker having pipe arrangements

xvii. Underpass proposed at Mayem junction to prevent interface with public."

27. By way of a note submitted at the time of hearing, a summary of major compliances ensured by Vedanta are as under:

CTO CONDITION	COMPLIANCE	STATUS
13	The mining unit shall install online noise monitoring station approved by USEPA, TUV or CPCB, CSR or MCERTs at the transportation route near sarmanas in consultation with the Board and connect the same to thye Board server within one month of receipt of this Consent and submit compliance report to the Board.	24 x 7 real time online monitoring station connected with GSPCB has been set-up
14	The mining unit shall install CCTV Camera at exit gate from mine towards the jetty to monitor if the trucks are properly covered with tarpaulin before exit and should	Installed Camera shall give the status of compliance by Trucks to GSPCB

	be connected online to GSPCB, within one month of receipt of this Consent to Operate	
16	The trucks/tippers engaged in transportation of ore shall have with atleast six inches free board after filling the cargo box to avoid spillage	This shall be complied with
17	All trucks/tippers engaged in the transportation of ore shall be covered with tarpaulin and the tarpaulin shall be properly fastened to the cargo box ensure the ore does not get air borne or spill on the road.	
20	The mining unit shall provide wheel washing facility for the ore transport vehicles shall be provided at the	Wheel Washing System already set-up

	exit point of the mine	
23	The mining company should submit details regarding transportation of ore mentioning Source, Destination, Qty., No. Of trips (tipper trucks), Route (names of villages through which transportation takes place), Remarks	This shall be complied with

28. Shri Dwarkadas submitted, on instructions, that Vedanta is bound by the aforesaid conditions and the mitigating measures provided for transportation. Furthermore, even the CTO has provided for conditions for transportation mentioned at serial nos. 13 to 24. In the affidavit dated 17.06.2024 filed by Vedanta, it is assured that all the conditions pertaining therein will be strictly adhered to. Statements in the affidavit and the assurances aforementioned are accepted as an undertaking to this Court.

29. This Court by an Order dated 22.04.2024, directed the GSPCB to file an affidavit pursuant to the inspection carried out and place a status report on record. So far as Vedanta is concerned, the route applied for permission was NSP-1, Top-NBP Junction-NBP-Matwada Junction-Sarmanas jetty. As directed by DMG, the Board officials inspected the site along with unit representative on 03.05.2024. Following were the recommendations for pollution control safeguard:

> "**Recommendations for pollution control safeguard**
>
> • The truck/tippers engaged in transportation of ore shall have sufficient free board after filling the cargo box to avoid spillage.
>
> • All trucks/tippers engaged in the transportation of ore shall be covered with tarpaulin and the tarpaulin shall be properly fastened to the cargo box to ensure the ore does not get air borne or spill on the road.
>
> • In case of break down of loaded trucks/tippers unloading of ore at the road side shall be strictly avoided.
>
> • The roads within mining lease areas shall be sprinkled with water to suppress dust pollution.
>
> • Spillage of ore on the public roads shall be removed immediately on occurrence.
>
> • The mining company should make suitable arrangement for sweeping of roads affected due to transportation of iron ore.
>
> • The mining firm should manage the daily trips in staggered manner in consultation with DMG, so that traffic congestion is avoided at major junctions.
>
> • The Board shall carry out monitoring along the route through the Ministry of Environment, Forests and Climate

Change approved lab and monitoring charges shall be recovered from the transporters/mining firms as per actual. The Transportation/mining firms shall pay an advances of Rupees Three lakhs towards the monitoring charges.

- The Department of Mines to provide the transportation route for enabling the Board to identify suitable monitoring locations. The Department may also ensure power supply for the monitoring stations.
- Speed of ore carrying trucks should be controlled by online GPS monitoring done by DMG through its authorized agency.
- Road sweeping machines may be jointly/severally developed in hotspot areas/ stretches.
- The shoulders of the mining transport roads may be tarred whenever needed.
- DMG may ensure maintenance of public road in the mining area with respect to repair of potholes/widening of roads whenever necessary.
- The Operator is required to carry out manual wheel washing in order to clean the wheels of the trucks and subdue dust arising out of it whenever wheel washing stations are not installed.
- In case the air quality standards are breached the transport frequency should be reduced and the transporters to be levied polluter pays penalty.

Permission can be granted to above mentioned route."

30. Shri Dwarkadas submitted that the Project Proponent-Vedanta is accepting all these safeguards and assures this Court on instructions that the conditions will be strictly followed and implemented. The learned Advocate General as well as learned Counsel for the implementing agencies assures that the monitoring will be strict and

effective and not an eye wash. We accept these assurances as undertaking to this Court.

31. It is submitted by Shri Dwarkadas that in any case the transportation of Vedanta is through a dedicated corridor and not through village roads. The stretch of 0.9 kms though not a part of dedicated corridor is not a village road. Learned Senior Advocate submitted that they are even willing to provide for additional safeguards for this non-village/Major District Road of 0.9 kms by deployment of traffic marshals to avoid congestion and inconvenience to the public at large on arrival of the ferry. Whether to accept these additional safeguards is something which the DMG and transport authorities shall look into and take an informed decision depending on the ground conditions.

32. MCA No.1416/2024, is an intervention filed by Shri Shankar Chandrakant Jalmi and others in Vedanta's application. Upon hearing Mr. Frias, learned Counsel for the interveners, we are satisfied that the grievance about the road being illegally constructed through the lands of the interveners cannot be made a subject matter of this PIL Petition as and by way of an intervention application. It is for the Applicant-intervener to resort to appropriate remedies available in law. If any authority is required in support of this view, we may refer to the decision of the Supreme Court in **Saraswati Industrial Syndicate**

Ltd. vs. Commissioner of Income Tax, Haryana, Rohtak[7]. In paragraph 12, Their Lordships held that the only purpose of granting an intervention application is to entitle the intervener to address arguments in support of one or the other side. Keeping all contentions open with liberty to avail of appropriate remedies in accordance with law, the intervention application is disposed of.

33. Let us now examine the measures and safeguards provided for transportation of 'e-auction ore'. A meeting was convened by DMG along with the Officials of GSPCB, Transport Department, Police Department, Stakeholders, Transporters, Panchayat Representatives on 29.01.2024 at 3.30 p.m. It was decided that the DMG and GSPCB should mutually devise a Standard Operating Procedure (SOP) for grant of route approvals for transportation of ore through village roads. The Standard Operating Procedure (SOP) for grant of route approvals for transportation of ore through village roads, reads thus :

> "1. The transporter will first approach the Directorate of Mines and Geology for approval of the route of transportation. In their application they shall indicate the approximate width of the road and facts about number of houses along the route and availability of alternate route. The Directorate of Mines and Geology will examine the applications and decide upon the route to be allowed for transportation. Upon such approval, the transporter

7 (1999) 3 SCC 141

will apply to the GSPCB for setting up monitoring stations on the route. After the GSPCB sets up the stations, the transporter will then apply to the DMG for transit permits, which shall be accordingly decided by DMG.

2. The transporter upon receiving transit permit shall ensure that all conditions of transportation are adhered and complied. All trucks shall be registered with the Department and fitted with GPS.

3. GEL shall continuously monitor Vehicle speed and any Violation (above 40 km/hr) shall entail penalty i.e. Trucks shall be blocked for 3 days and further as per the Order dated 26/04/2016.

4. On the Bhumija Potal GEL through VTS System shall ensure that the total number of trips shall be restricted per Operator on the route to min 20 and maximum 40 per hour.

5. The road congestion shall be monitored by GEL on Bhumija Ore Monitoring System on a real time basis and accordingly trips shall be restricted.

6. Intimation about permitted transport shall be made to SP. North, SP. South and SP Traffic informing them that transporter has to strictly follow the Goa (Prevention of Illegal Mining, Storage and Transportation of Minerals) Rules, 2013, Order of the Directorate of Mines & Geology dated 26/04/2016, check whether the above conditions are followed by the Transporters and monitor the same.

7. The timing of the Ore Transportation along the designated route should be from 8.00 am to 1.00 pm

with a break from 1.00 pm to 2.00 pm and then transportation can continue from 2.00 pm to 5.45 pm from the source location.

8. GEL should ensure that no trip sheets are generated beyond the prescribed time so that transportation of Ore happens only within the specified time."

34. Apart from the aforesaid, there are in place "The Goa (Prevention of Illegal Mining Storage and Transportation of Minerals) Rules 2013, published in the Official Gazette, of the Government of Goa, dated 17.10.2013. Rule 17 under Chapter V deals with Regulation of Transport and Extraction. The Regulation provides for various stipulations regarding transporting the ore. These Rules shall be scrupulously followed and measures provided effectively monitored. Rule 23 provides for reasonable restrictions on transport reading thus :

"23. Reasonable Restriction on Transport.- The Government shall have power to impose reasonable restrictions, such as, restricting the number of carriers to be permitted for transport of mineral, fixing the maximum number of years for using carriers for mining transport, deciding a cut off date after which the carrier registered with Transport Department shall not be registered for transportation of the mining ore or any other similar restriction that may be necessary to ensure smooth

flow of traffic in the State, to counter congestion on State roads, for public safety, to regulate damage to ecology and environment of the State due to haphazard movement of trucks or vehicles or due to any other mode of transport authorized to carry ore including barges."

35. Our attention is also invited to the instructions containing route safety in the matters concerning transportation on road issued by the DMG on 26.04.2016. The instructions are for strict compliance by the truck owners, machinery owners, leaseholders, traders, end users, etc. These instructions are issued in exercise of powers under the Goa (Prevention of illegal Mining, Storage and Transportation of Minerals) Rules, 2013 and all other powers enabling in this behalf. The instructions are thus :

"INSTRUCTIONS CONCERNING ROAD SAFETY IN MATTERS CONCERNING TRANSPORTATION ON ROAD

Following instructions are issued to all Truck Owners, Machinery Owners, Leaseholders, Traders, Endusers, etc. for strict compliance in exercise of powers under the Goa (Prevention of Illegal Mining, Storage and Transportation of Minerals) Rules, 2013 and all other powers enabling in this behalf:

1. Since Hon'ble Supreme Court of India in Writ Petition No. 435/2012 in order dated 21/04/2014 directed the State Government to strictly enforce the Goa (Prevention of Illegal Mining, Storage and Transportation of Minerals) Rules, 2013, as such in exercise of power under Rule 17(10) of Goa (Prevention of Illegal Mining, Storage and

Transportation of Minerals) Rules, 2013, the speed limit for vehicles used for transportation of minerals is fixed at 40 km/hr.

2. The upper speed limit is applicable to the trucks registered with department irrespective of the facts whether it is involved in transportation of minerals or is driven for any other purpose. The speed limit shall be applicable to all such registered vehicles throughout the State of Goa and throughout the year so that confidence is reposed in the citizen that such vehicles shall not endanger the lives of other commuters on road.

3. The software with the help of VTS device fitted on transportation vehicles shall automatically debar all the trucks found to be exceeding the speed limit for the period mentioned as under:

(1) 1st Violation: Debarred upto 1 day
(2) 2nd Violation: Debarred upto 3 days
(3) 3rd Violation: Debarred upto 7 Days
(4) 4th Violation: Debarred upto 10 days
(5) 5th Violation: Debarred upto 15 days
(6) 6th Violation: Debarred upto 30 days
(7) 7th Violation: Debarred upto 60 days
(8) 8th Violation: Debarred upto full season

4. If in exigency situation if the truck exceeds limit beyond 40 km/hr. upto 50 km/hr., it shall not be treated as wilful violation of the speed limit. For this purpose any increase in speed of vehicle above 40 km/hr. up to 60 second at a time shall be presumed to be such exigency and shall not be treated as wilful violation of speed limit.

5. The list of violators shall be displayed on the website in the late evening of the same day or on next day.

6. It shall be the duty of the Leaseholder/Trader/end User, Transportation Contractors etc. not to employ such debarred vehicles' for any activities concerning Major Minerals like using such vehicles for internal movements within lease or jetty or storage points.

7. If the debarred vehicle is used for transportation of the minor minerals like sand, laterite stones, rubbles, murram etc. during when it was debarred, such vehicle may be made liable for exorbitant fines' so also person who employed such vehicles.

8. Since debarring of trucks is done by use of software, the Social Status, Political Status or Economical Status either of the truck owner or driver shall not influence either monitoring or process of debarring trucks.

9. The registration of vehicles with the department is voluntary, as such once registered with the department, the owner and driver of the truck or machinery shall be governed by provisions of the MMDR Act, 1957 and rules made therein, so also administrative instructions issued by Department from time to time.

10. Irrespective of financial arrangements or other commercial decision with regards to employing of vehicle between Lease Holders, traders and endusers etc. and owner of vehicles or machinery, the department shall fake serious note if any attempt by owner of vehicle or through others' to illegal stop the transport. The department reserves the right to take stern action against such person if they are found to have stopped or abated legal transportation in accordance with law which is authorised by this department.

11. The department shall monitor all the vehicles registered with it throughout the year, as such VTS device of all the vehicles registered with department shall be active throughout the year irrespective of the fact whether it is mining season or otherwise.

12. The choice of vehicles to be used for transportation concerning the particular lease holder, traders or end users shall be exclusively left to the choice of lease holders, traders or end users. As such mere registration of vehicle with department shall not give any rights to any of the vehicle owner

to get business of transportation as a matter of right from the department/lease holder, end user etc.

13. The vehicle engaged for one lease hold area/end user shall be expressively barred for undertaking transportation or other allied activities for other lease holder/end user on the same day.

14. The time for transportation of minerals though starts from 6 a.m. to 10 p.m. the same may be modified from time to time at different locations' taking into accounts the usage of infrastructure facilities by members of public, so also all school going children etc.

15. To decongest the roads it is hereby ordered that there shall be equal way bridges at loading and unloading points.

16. Proper care shall be taken by the owner and driver of the vehicle to cover the minerals with turpentine etc. so that no wastage of mineral takes place at the same time dust pollution is avoided.

17. The Lease Holders or transportation contractors, end users shall ensure that before vehicles leaves their premises, the tyres of the vehicles are washed properly so that dust pollution on the road due to tyres 'can be avoided.

18. The trucks owners shall ensure that speedometer of vehicles are in good condition so as to enable the driver to control the speed of the vehicle and drive within the speed limit.

19. When any violation shall be noticed, the message of debarring of the truck shall be sent to all the owners/drivers on mobile numbers provided by them to department for over speeding. The duration for which they are debarred shall be intimated by auto generated SMS and when such message is received, it shall be the duty of such owner/driver not to use vehicle for any mining related activity during such period, any wilful defines of such instruction shall be solely attributed to such owner/driver and

employing of such debarred vehicle shall be liable for further grievous action both monitory and otherwise.

20. In case when vehicle registered with the department meets with an accident, it shall be presumed to be at fault and strict action shall be initiated against such vehicle. It shall be the duty of the vehicle owner to prove his innocence.

21. It is hereby clarified that whenever the old vehicles shall be replaced, they shall be replaced with new vehicles of capacity of at least 15 tons.

The above instructions are issued not only for implementation of the Goa (Prevention of illegal Mining, Storage and Transportation of Minerals) Rules, 2013 but also for honouring directions of the Hon'ble Supreme Court of India. The said action is initiated so that confidence is reposed in the minds of general public that the transportation of ore is not only in compliance with legal requirements but also keeping in mind safety of the general public, which is of paramount importance.

Since actions are initiated by the help of software with electronics monitoring devices there is no scope of human intervention for favouring any person or against any person as such should be taken into right spirit so that necessary corrective majors are taken.

Place: Panaji sd/-
(Prasanna A. Acharya)
Dated: 26th April, 2016. Director of Mines & Geology

(emphasis supplied)

36. The underlined portion of the instructions is significant. DMG is conscious of the directions of the Supreme Court. It also has in mind safety of the general public. As far as back as in 2016, the need

was felt to use software to do away with the scope for any human intervention. As experts concerned with the safety of citizens, adopting modern technology, upgrading software should be routine. To this end, we expect the DMG and GSPCB to be proactive. The suggestions of learned Counsel for the petitioners which we have dealt with in the later part of this judgment assumes relevance and need to be seriously looked into. As an expert body, we expect the DMG and GSPCB to examine these suggestions and depending on the scientific study enforce them if found useful.

37. In respect of transportation of 'e-auction ore', vide Corrigendum dated 06.06.2023, the DMG has imposed the following restrictions on traffic movement on different transportation routes. Such restrictions read thus:

> **CORRIGENDUM**
>
> **Subject: Transportation of Ore**
>
> This Department vide Memorandum No.03/66/2023/Major/Mines/194 dated 05/04/2023 had put restriction on number of trips per hour to avoid traffic congestion on village roads. This restriction stands amended to the extent given below:
>
> The traffic movement on different transportation routes will be monitored by Goa Electronics Limited on real time basis and the number of trips will be staggered between

20 trips to 40 trips per hour depending on the traffic congestion on the roads.

Sd/-
(Dr. S. Shanbhogue)
Director & Ex-officio Joint Secretary

38. Now we come to OM dated 29.10.2014 issued by the Ministry of Environment, Forests and Climate Change, as regards the impact of mining activities on habitations-issues related to the mining Projects wherein habitations and villages are the part of mine lease areas or habitations and villages are surrounded by the mine lease area. The said OM provides thus :

OFFICE MEMORANDUM

Subject: Impact of mining activities on Habitations-Issues related to the mining Projects wherein Habitations and villages are the part of mine lease areas or Habitations and villages are surrounded by the mine lease area- Regarding.

The Ministry has been receiving mining proposals wherein the habitations and villages are part of mine lease areas or habitations and villages are surrounded by the mine lease area.

2. To discuss the impact of mining activities on habitations and to develop a code of practice on these issues, a meeting was held under the Chairmanship of Shri M.S. Nagar, Chairman EAC (Non Coal Mining Sector) on 23.06.2014. After detailed deliberations by the Experts, the following suggestions were made as part of mitigation

measures to avoid adverse impact of mining operations in the case of such habitations/villages:-

a) The Project Authority shall adopt Best Mining Practice for the given mining conditions. In the mining area, adequate number of check dams, retaining walls/structures, garland drains and settling ponds should be provided to arrest the wash-off with rain water in catchment area.

b) The natural water bodies and or streams which are flowing in and around the village should not be disturbed. The Water Table should be nurtured so as not to go down below the pre-mining period. In case of any water scarcity in the area, the Project Authorities have to provide water to the villagers for their use. A provision for regular monitoring of water table in open dug well located in village should be incorporated to ascertain the impact of mining over ground water table.

c) The illumination and sound at night at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Habitations have a right for darkness and minimal noise levels at night. The Project Proponents (PPs) must ensure that the

biological clock of the villagers is not disturbed by orienting the floodlights/ masks away from the villages and keeping the noise levels well within the prescribed limits for day/night hours.

d) The Project Authority shall make necessary alternative arrangements, where required, in consultation with the State Government to provide alternate arrangements for livestock grazing. In this context, Project Authority should implement the directions areas for the Hon'ble Supreme Court with regard to acquiring grazing land. The sparse trees on such grazing ground, which provide mid-day shelter from the scorching sun should be scrupulously guarded against felling, lest the cattle abandon the grazing ground or return home by noon.

e) Where ever blasting is undertaken as part of mining activity, the Project Authority shall carry out vibration studies well before approaching any such habitats or other buildings to evaluate the zone of influence and impact of blasting on the neighbourhood. Within 500 meters of such sites vulnerable to blasting vibrations, avoidance of use of explosives and adoption of alternative means of mineral extraction, such as ripper/dozer combination/rock breakers/surface miners etc. should be seriously considered and practiced

wherever practicable. A provision for monitoring of each blast should be made so that the impact of blasting on nearby habitation and dwelling units could be ascertained. The covenant of lease deed under Rule 31 of MCR 1960 provides that no mining operations shall be carried out within 50 meters of public works such as public roads and buildings or inhabited sites except with the prior permission from the Competent Authority.

f) Main haulage road in the mine should be provided with permanent water sprinklers and other roads should be regularly wetted with water tankers fitted with sprinklers. Crusher and material transfer points should invariably be provided with Bag filters and or dry fogging system. Belt- conveyors should be fully covered to avoid air borne dust.

g) The Project Authority shall ensure that the productivity of agricultural crops is not affected due to mining operations. Crop Liability Insurance Policy has to be taken by the PP as a precaution to compensate for any crop loss. The impact zone shall be 5km from the boundary of mine lease area for such insurance policy. In case, several mines are located in a cluster, the Associations of owners of the cluster mines, formed inter-alia, to sub-serve such an

objective, shall take responsibility for securing such Crop Liability Policy.

h) In case any village is located within the mining leasehold which is not likely to be affected due to mining activities during the life of mine, the Expert Appraisal Committee (EAC) should consider the proposal of Environmental Clearance (EC) for reduced mining area. The Mining lease may be executed for the area for which EC is accorded. The mining plan may also be accordingly revised and required stipulations under the MMDR Act, 1957 and MCR, 1960 met.

i) Transportation of the minerals by road passing through the village shall not be allowed. A 'bypass' road should be constructed (say, leaving a gap of at least 200 meters) for the purpose of transportation of the minerals so that the impact of sound, dust and accidents could be mitigated. The PP shall bear the cost towards the widening and strengthening of existing public road network in case the same is proposed to be used for the Project. No road movement should be allowed on existing village road network without appropriately increasing the carrying capacity of such roads.

j) Likewise, alteration or re-routing of foot paths, pagdandies, cart roads, and village infrastructure/public utilities or

roads (for purposes of land acquisition for mining) shall be avoided to the extent possible and in case such acquisition is inevitable, alternative arrangements shall be made first and then only the area acquired. In these types of cases, Inspection Reports by site visit by experts may be insisted upon which should be done through reputed Institutes.

k) As CSR activities by Companies including the Mining Establishments has become mandatory up to 2% of their financial turn-over, Socio Economic Development of the neighborhood Habitats could also be planned and executed by the PPs more systematically based on the 'Need based door to door survey' by established Social Institutes/Workers on the lines as required under TOR. "R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs/STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the

> village located in the mine lease area will be shifted or not. The issues relating to shifting of Village including their R&R and socio-economic aspects should be discussed in the EIA report."
>
> 3. The matter was examined in the Ministry and accordingly, it has been decided that the above mentioned conditions at para-2 (a-k) may be included as a condition of Environmental Clearance letter to mitigate the adverse impact of mining operations in the case of such habitations/villages.
>
> 4. This issues with the approval of Competent Authority." (emphasis supplied)

39. It is therefore not as if transportation of the ore through village roads is completely prohibited as fairly submitted by the learned Counsel for the petitioner. Moreover, the aforesaid SOPs/measures are put in place to mitigate the adverse impact of mining operations in the case of such habitations/villages. Learned Counsel for the petitioners fairly submitted that the spirit of the OM dated 29.10.2014 is imbibed in the SOPs issued by the authorities from time to time. The safeguards imposed by way of SOPs, instructions, Rules and Regulations before and after filing of the PIL accords with the spirit of the OM dated 29.10.2014. These measures be strictly implemented.

40. Learned Counsel for the petitioners made a fervent plea that the number of trips per hour be reduced and that there should be real time monitoring about the impact of pollution caused as a result of such transport. Learned counsel submitted that so far as transport is concerned, as a result of this Court's intervention, the SOP was evolved jointly by the DMG and the GSPCB. Learned Counsel submitted that the timing of ore transportation should be from 9.00 a.m. instead of 8.00 a.m. to 1.00 p.m. as per the SOP condition no.7. It is submitted that time period of 8.00 a.m. to 9.00 a.m. is the peak time for people travelling, large number of children going to school, etc. It is submitted that heavy truck movement is dangerous for human safety and it would seriously impede and inconvenience the day to day travel of a large number of people during this period from 8.00 a.m. to 9.00 a.m. It is then submitted that the total number of trips be restricted to the minimum or less than 20 trucks per hour and not the upper cap of 40 trucks per hour. It is submitted that no technical study has been carried out for the capacity of village roads and the figure proposed in the SOP is an adhoc figure not backed by data. The constant movement of the trucks would be hazardous for the locals. It is requested that the total number of trips ought not to be higher than 20 (load) trips per hour.

41. So far as monitoring of ore transportation operation by GSPCB and DMG is concerned, learned Counsel for the petitioners submitted that the monitoring of ore transportation is proposed to be done under the new regime i.e. installation of monitoring stations along the ore transportation route, readings of air quality taken twice a week and averaged out for 24 hours and results obtained after six days. She submits that the use of 24-hour ambient air quality monitoring data for truck transport of ore is wholly inappropriate since the truck transport does not happen over a 24-hour period as is the case with an industrial unit working three shifts. Thus, while the actual transportation period in which air pollution levels are higher are approximately 8 hours only, these air pollution readings are merged into the readings captured over the period of 24 hours, which results in the air pollution levels being averaged out and almost always being within permissible limits on account of no major activity taking place in the balance 16 hours (i.e. of non transportation). According to learned Counsel, the average pollution level readings are thus deemed to be within the norms (Ambient Air Quality for Residential Areas). Learned Counsel for the petitioners suggested that, (a) the monitoring of air pollution needs to be done daily and exclusively within the ore transportation timings and (b) monitoring should be in the nature of real time, online monitoring, with the equipment linked with the PCB servers and Panchayat. Learned Counsel submitted that at present the

monitoring system neither indicates the true picture of dust pollution levels during ore transportation nor does it enable the Board to respond quickly by reducing the transport or shutting it down temporarily and more focused method is required to achieve proof of air pollution and most importantly, enable the Board to conduct what is actually "point source" monitoring. It is further submitted that while the movement and timing of trucks is already subject to real time monitoring online by the DMG, the measurement of pollution levels (in terms of PM10 and PM2.5) is available only six days after the actual events, due to outdated technology. Learned Counsel submitted that with the outdated system, the chance of policy intervention and quick action being taken against excessive pollution is ruled out.

42. Learned Counsel for the petitioners urged that the need of the hour is to ensure the updation of pollution monitoring technology to keep up with scientific advancements. According to her, Real Time monitoring of air pollution levels will enable the Pollution Control Board to swiftly take action in the event air pollution levels are breached on a particular day. The petitioner wants this Court to recommend to the Board to invest in and use low-cost air quality monitoring for dust pollution in village settlements and crowded roads in the forthcoming season itself, commencing September 2024. It is

submitted that the costs may be recovered from the transporter. It is submitted that the transportation of 'e-auction ore, which is actually never ending process will always be an ongoing phenomenon. Learned Counsel urged that the Board must take a proactive approach while entering a new phase of mining. It is submitted that trials of the new, low-cost electronic sensor-based air quality technologies (also used by Govt. Pollution Control Boards in Rajasthan, Maharashtra and - Karnataka) should be started during the monsoon itself, so that the difference between pure air and polluted air will be obvious, if pollution is generated by this activity. The low-cost systems suggested (or any other sensible equivalent) would enable the person at the monitoring station /P.C.B. officer to immediately shut down the activity or warn the transporter (and connected leaseholder), if the PM standards (100 for PM10 and 60 for PM 2.5) are breached. This according to the learned Counsel would be similar to the real time action that the D.M.G. states it will take if the number of trucks deployed is in violation of the number permitted, or if stipulated speed levels are exceeded. The petitioners have provided details about some of the low cost air quality monitoring device which has been deployed in various cities. Learned Counsel suggested that 'ATMOS' real time Air Quality Monitoring Device, developed by the research team at IIT Kanpur is useful. The features of this device are :

- It enables real time monitoring of PM 1, PM 2.5 and PM 10 levels.

- The average cost per unit is Rs,30,000/-

- It has an inbuilt GPRS module and does not require additional WIFI/network setups.

- Monitoring data is transmitted real time and is accessible on an online dashboard.

- On a full charge, the device can monitor air levels for a period of 8 hours.

43. Pursuant to the orders passed by this Court, we find that the DMG and the GSPCB have suggested measures and put SOPs in place which are mitigating measures. We have no manner of doubt that the GSPCB and DMG will adopt a proactive approach in embracing modern technology which will go a long way in striking a just balance between two competing interests as the time tested principle of striking this balance is primary invocation of mitigating measures amidst such activity. We have no manner of doubt that the suggestions made by the learned Counsel for the petitioners which we find worth considering will be given due weightage. The GSPCB as an expert body should make best possible endeavor to ensure that harmony is upheld and hurdles for the citizens are minimised by resorting to active mitigating measures. The suggestions of the learned Counsel for the petitioners be given serious consideration by

the authorities. It is the primary duty of the expert agencies to ensure a right balance and we expect that a proactive approach be adopted in the best interest of the villagers.

44. The DMG and GSPCB to ensure that the measures aforesaid are strictly monitored and implemented in its true letter and spirit. Any violation be dealt with firmly.

45. We thus find from the materials that the expert bodies like GSPCB and the DMG have issued the SOPs and imposed necessary safeguards in the transportation of the 'e-auction ore'. It is not possible for us to substitute our opinion for that of the expert body like the GSPCB and DMG. The recommendations and decision of the DMG and GSPCB cannot be undermined in a light manner and due deference must be accorded to expert agencies when the decisions do not attract the taint of legal unjustness/infirmity. We, however, feel the need to record that the mitigating measures must be strictly observed by the project proponent/transport operators in letter and spirit during the transportation of the ore. They shall ensure regular monitoring. Any infraction be dealt with seriously. The suggestions made by the petitioners be given due weightage by the GSPCB and DMG. The GSPCB and the DMG should make every possible endeavour to strike a just balance in the conflict of competing interests by resorting to modern techniques amidst the transportation activity.

46. We find it necessary to direct that a proper study be carried out by preparing a report specific to each route permitted by DMG and GSPCB for transportation of ore through the villages on the basis of carrying capacity of each road. The DMG and GSPCB undoubtedly will have to consider the length of the route, number of houses/hamlets, situated on the route with the study of the population enroute, the details of schools or other such activities that may exist along the route apart from other factors while taking a decision on granting transport permission based on the carrying capacity set down for each route. This will accord with the spirit of the OM issued by the Ministry of Environment. The DMG and GSPCB shall, as far as possible, monitor the trucks on each route on Real Time basis, install CCTV cameras connected to DVR devices at Panchayat Ghars and/or public schools and/or the office of the GSPCB and DMG to enable the DMG/GSPCB and/or Panchayat officials or other designated officials to monitor and observe the movement of trucks carrying such ore along the route.

47. The DMG and GSPCB shall as far as possible install pollution monitoring devices of the nature that may upload information/data to the server of the DMG and GSPCB in Real Time to enable the Departments to monitor the air quality along the designated routes in Real Time and to arrest the movement of trucks, if required to bring air pollution to within permissible norms.

48. We reserve the liberty of the petitioners/any of the affected person or in public interest to approach this Court in case of difficulty in the implementation of the aforesaid measures, breach of any conditions or for any other genuine cause concerning the transport activity at any stage when necessary.

49. The PIL Writ Petition is disposed of in the above terms. No order as to costs.

VALMIKI MENEZES, J. **M. S. KARNIK, J.**

Signed by: ANDREZA RODRIGUES EPEREIRA
Designation: Private Secretary
Date: 03/07/2024 10:17:49

By e-mail

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES
OFFICE OF THE REGIONAL CONTROLLER OF MINES, GOA

No. MCDR-MPC0FE/3/2023-GOA-IBM_RO_GOA Dt : 07/08/2023

Shri/M/s. SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED ,
plot no. 15, Salgaocar Bhavan Altinho Tiswadi

Sirigao mayem Mineral Block-II (PB73)

Sub : Approval of Mining Plan in respect of your BLOCK II – SIRIGAO MAYEM MINERAL BLOCK over an area of 171.2472 Ha. situated in Sirigao Village, Bicholim Taluka, North Goa District of Goa State submitted under Rule 16(1) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016.

Ref : (i) Online submission/receipt of draft Mining Plan in respect of your aforesaid Block in the MPAS portal on 21.04.2023.

(ii) This office scrutiny comments on the examination of draft Mining Plan in respect of your aforesaid Block was sent through MPAS Portal on 06.06.2023.

(iii) Online submission/receipt of modified Mining Plan in respect of your aforesaid Block in the MPAS portal on 20.06.2023, 07.07.2023, and 02.08.2023.

Sir,

In exercise of the powers conferred by clause (b) of sub-section (2) of section 5 of the Mines & Minerals (Development & Regulation) Act, 1957 read with Government of India Order No. S.O. 1857(E) dated 18.05.2016; and in the exercise of the powers conferred under sub-rule (3) of Rule 16 of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016, I hereby **approve** the Mining Plan with Progressive Mine Closure Plan in respect of your Block No. II – Sirigao Mayem Mineral Block over an extent of 171.2472 Ha. situated in Sirigao Village, Bicholim Taluka, North Goa District of Goa State submitted under Rule 16(1) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules 2016. This approval is subject to the following conditions: -

1. That the Mining Plan is approved without prejudice to any other Law applicable to the mine area from time to time whether made by the Central Government, State Government, or any other authority, and without prejudice to any order or direction from any court of competent jurisdiction.
2. The proposals shown on the plates and/or given in the document are based on the auctioned Mineral Block/lease map/sketch submitted by the applicant/lessee and are applicable from the date of approval.
3. It is clarified that the approval of the aforesaid Mining Plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines & Minerals (Development & Regulation) Act, 1957 or the Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016 and any other laws including Forest (Conservation) Act, 1980, Environment (Protection) Act, 1986 or the rules made there under, Mines Act, 1952 and Rules and Regulations made thereunder.
4. Indian Bureau of Mines has not undertaken verification of the auctioned Mineral Block / Mining Lease Boundary on the ground and does not undertake any responsibility regarding the correctness of the boundaries of the Mineral Block/leasehold shown on the ground with reference to the lease map & other plans furnished by the applicant.
5. At any stage, if it is observed that the information furnished, or data incorporated in the document is incorrect or misrepresents facts, the approval of the document shall be revoked with immediate effect.
6. If the approval conflicts with any other law or court order/direction under any statute, it shall be revoked immediately.
7. Terms and conditions of the Mine Development and Production Agreement (MDPA), whenever signed with State Govt; shall be complied with. The preferred bidder shall submit a copy of the Mine Development & Production Agreement & Mining Lease deed executed with the State Govt. to this office within 15 days of their execution along with a copy of Performance Security furnished.
8. The preferred bidder has to comply with the terms & conditions laid down in the LOI issued by the State Govt. If any comments are received from the State Govt. then the necessary action as per comments shall be taken immediately.
9. It shall be mandatory for the project proponent, abstracting groundwater to obtain a No Objection Certificate from Central Ground Water Authority or the Goa State Ground Water Authority.
10. The preferred bidder of the auctioned block shall complete detailed exploration (G1 level exploration) over the potential mineralized area in accordance with Rule 12(4) of MCDR Amendment Rules 2021 (notified dated 03.11.2021) and prepare a detailed feasibility study report conforming to Part IV and V of the Mineral (Evidence of Mineral Contents) Rules, 2015 over the entire area, within five years from the date of commencement of such mining lease.

Approved

Yours faithfully,

(Naresh Kumar Katariya)

Deputy Controller of Mines & OIC

Copy forwarded for kind information to: -

1. The Controller of Mines (SZ), Indian Bureau of Mines, Bangalore.
2. The Director, Directorate of Mines & Geology, Government of Goa, Institute of Menezes Braganza Building, Panaji – Goa, 403001.
3. The Director, Directorate of Mines Safety, Goa Region, Agali, Fatorda – Goa, 403602.
4. M.S.Raju, Plot No. 15, Salgaocar Bhawan, Altinho – Tiswadi, Goa

(Naresh Kumar Katariya)

Deputy Controller of Mines & OIC

Sirigao mayem Mineral Block-II (PB73)

Approved

Chapter 1 : General Information

1.1 : Lease Details

IBM Registration Number :	IBM/45356/2023
Lease Code :	PB73
Mine Code :	Nil
Name of Lessee :	SALGAOCAR SHIPPING COMPANY PRIVATE LIMITED
Address of Lessee :	Plot No. 15, Salgaocar Bhavan Altinho Tiswadi
Type of Lessee :	Private
Name of Mining Lease :	Sirigao Mayem Mineral Block-II
State :	GOA
District :	NORTH GOA
Tehsil/ Taluk/ Mandal :	Bicholim
Village :	Sirigao
Lease Area (Ha) :	171.2472
Forest Area (Ha) :	0.0000
Name of Minerals :	IRON ORE
Name of associated minerals :	

Approved

1260

Type :	Fresh Grant
Period of the proposal (FY) from :	Nil
Period of the proposal (FY) to :	Nil
Type of working :	Opencast
Nature of Use :	Non Captive
Category of Mine :	Category A

1.1.1 : Initial/subsequent Lease grant details

Grant	From	To	Lease deed execution date	Lease registration date
Nil	Nil	Nil	Nil	Nil

1.1.2 : Mining Plan Submission Criteria Details

Type of Document :	Mining Plan Under Rule 16(1) Of MCR 2016
LOI Number :	DMG/25/Auction cell/LOI-function/2023/2802
Date :	13/01/2023

1.2 : Land Ownership Details

View Land Ownership Details Excel	Land_Ownership_Details (2).xlsx

1.3 : Existing Lease

Date of Execution :	Nil

Approved

1.3.1 : Approval of earlier Mining Plan & Its Subsequent Review in Chronological Order

S.N.	Letter Number	Date	Period		Type Of Approved Document	Remark
			From	To		
1	Nil	Nil	Nil	Nil	Nil	Nil

1.3.2 : Partial Surrenderd Area During Stages of Operations in Chronological Order

Not Applicable

1.3.3 : Transfer of Lease Area Subsequent to Grant

Not Applicable

1.3.4 : Statutory Compliances

1.3.4.1 : Environment Clearance

Applicable :	No
Letter No :	Nil
Date :	Nil
Validity :	Nil
ROM Mineral :	Nil

Approved

1.3.4.2 : SPCB Approvals

Letter No :	Nil
Approval of :	Nil
Date :	Nil
Validity :	Nil
ROM Mineral :	Nil

1.3.4.3 : Forest Clearance

Applicable :	No
Letter No :	Nil
Date :	Nil
Validity :	Nil
Area (Ha) :	Nil

1.3.4.4 : Land Acquisition Details

Total Area Acquired in hectare:	0.0000
Total Amount Paid (INR) :	0.0000

1.3.5 : Mine Location Details

Toposheet Number :	48E/14

Approved

1.3.5.1 : Location of Boundary Pillars

View Location of Boundary Pillars Excel	location_boundary_pillar (3).xlsx

1.3.6 : Owner/Nominated Owner Details

Name	PAN of owner / Nominated Owner	Address of owner/ Nominated Owner	Mobile Number	Email	Please attach Minutes of Board Resolution in case of Nominated Owner
Sandeep M Naik	AECPN5317F	Plot No 15 Salgaocar BhavanAltinhoTiswadi	9423320259	finance@smilindia.com	Resolution_&_List_of_Directors.pdf

1.3.7 : Qualified Person Details as per M(OAHCEM)CR, 2016

S.N.	Prefix	Name	PAN of QP	Address	Mobile no.	Qualification	Exp in years as prescribed under the rule	Email
1	Mr	MS Raju	ACBPR9146B	Plot No 15 Salgaocar BhavanAltinhoTiswadi	9448367421	B E Mining MTech Mineral EngineeringDhanbad	51	smil.mining@gmail.com

Approved

Chapter 2A : Geology & Exploration

2A.1 : Geology

2A.1.1 : Topography

Terrain :	Undulating
Highest Level (m) from MSL :	120.0000
Lowest Level (m) from MSL :	0.0000
Average Level (m) from MSL :	55.0000
Drainage Pattern :	Dendritic
Order of Stream :	Order 1
Min Dist of Stream from Lease Area(m) :	50.0000

2A.1.2 : Details of Physiographic features and Infrastructures avaiable in and around the lease/ block area

Description	Location if existing Within the lease/block area	Distance from boundary periphery in kms, if existing outside the lease/block area. (within 5.00Kms)	Remark if any
River/Nallah/Reservoir	No	50	1st order nallah adjacent to lease area
Public roads (Tar road, cart road)	yes N1724012 to N 1724546, E 382232 to E 382604, N1725357 to N1725484 E 381456 to E 381561, N 1725634 to N1725659 E 381504 to E 381527	0	Village Sirigao & village Poira roads are partly passing within the lease area towards northern & southern Lease boundary.
Railway track	yes N1725281 to N1725518 E381490 to E381637, N1724085 to N1724522 E382223 to E382445	0	Konkan Railway is passing within the lease area towards southern boundary

Approved

Human settlements	yes N1725314 to N1725645 E381585 to E382440	0	Part of Sirigao village is coming within the lease area towards northeastern side.
Archaeological monuments/ places of worships/public utilities etc	No	0	Nil
Wild life sanctuaries/ national parks	No	0	Nil
Coastal Regulation Zone (CRZ)	No	0	Nil
Powertransmision lines/telephone lines	yes N1725367 to 1725660 E382183 to E381520	0	Electricity connection for Sirigao village towards northern lease boundary
Firing range	No	0	Nil
Ordinance factory	No	0	Nil
grazing land/ burial ground or cremation ground	No	50	Cremation ground is at a distance of 50m from lease boundary towards southern side.
Any other specify	No	0	Nil

Particulars	Distance from lease boundary in kms
Near by village	0.00
Nearest Railway station	6.00
Nearest Port	69.00
Distance of SH/NH from lease area	2.40

Approved

2A.1.3 : Regional Geology

Regional Geology
The major part of goa is covered by the rocks of Pre-Cambrian age. The iron ore deposits are generally confined to pink phyllite horizon, iron ore is formed by replacement of phyllites by iron ore due to laterizations and also by leaching of silica from BHQ. The iron ore deposits trend along NW-SE direction over a length of 95 kms, more than 30 iron ore deposits have been identified along the length. The said mining block comes under Bicholim-Sirigao deposit. The deposit occurs on a N500-600W trending anticlinal fold, overturned to the south-west and its nose portion refolded in shape of “S” with a plunge towards NW. Iron ore deposits consists essentially of Hematite, limonite and goethite.

2A.1.4 : Local Geology & Structure

2A.1.4.1 : Local Geological Set-up

The mining lease area comprises of a major ridge running northwest-southeast direction. The ridge separates the two villages, Sirigao in northeast and Poira (Mayem) in the south west. Geologically the auction block comprises of the rocks the Bicholim Group of rocks formation belonging to Dharwar Supergroup. The ore deposits of Block-II - Sirigao-Mayem Mineral Block is a part of the Sirigao Bicholim deposits. Northern or Sirigao band shows shallow to medium dips towards NE whereas southern or Poira band shows north-easterly shallow to steep dips. The ore body extends over a strike length of 2065M with a variable width of 30-35M dipping on either side with varying angles of dip. The ore occurs at shallow depths from the surface at the crustal part of the anticline, the ore body dips on either side of the ridge and is deep seated at the foot of the ridge on either side. The total mineralised area in the block comes to around 55.456 Ha, unexplored area of 64.9973 Ha and non mineralised area of 50.7939 Ha.

2A.1.4.2 : Structure

The ore body is a north-westerly plunging overturned anticline. The axis of the anticline follows the NW-SE trending Sirigao ridge. General strike of the deposit is N60W S60E. Both north-easterly and south-westerly dips are observed.

2A.1.4.3 : Lithology, Petrographic & Mineralogical Description for Major, Associated & Indicator Minerals

The ores are hard but porous in nature nearer surface. They grade to friable and powdery in depth and are mostly powdery towards further depth. Mineralogically the ores are mostly haematitic and partly limonitic. There are four types of iron ore formations namely Lumpy ore, friable ore, powdery ore and low grade ore. 1 Lumpy ore: The ore exposed at the surface or occurs below the laterite zone and is hard, compact, massive bouldery type and colour varies from red to cherry red. The Fe content ranges from 55% to 58% Fe and insitu bulk density is 3.0 Tonnes/M3. Being resistant to weathering they occur as blocks broken up along joint planes. Since the mine is fully opened up greater part of lumpy ore zone has been mined out. 2 Friable ore: Between the top hard lumpy ore zone and the powdery ore zone at depth there is an intermediate thin zone of laminated ore about 2m to 5m thick. The ore is result of either leaching away of silica and inadequate concentration and cementation of iron or the presence of thin laminae of phyllitic matter. Owing to its friable nature it crumbles while handling and resulting in a mixture of lumps, fines and powdery ore. The iron ore content in the ore ranges from 55% to 59% Fe and the insitu bulk density is 2.6 Tonnes/M3. 3 Powdery ore: Fine grains of haematite and magnetite ranging in size upto 10mm and varying in colour from blue to bluish black, loosely packed with considerable amount of voids and pore spaces between them, are present generally at depth below the hard compact ore and the laminated ore. The iron content in the ore is above 60 percent and the insitu bulk density is 2.6 Tonnes/M3. 4 Low grade ore Between the laterite zone at the surface and the ore zone, similarly below the ore zone in contact with ferruginous phyllite zone, there is an intermediate zone classified as low grade ore, which mainly consists of aluminous and siliceous clays. Iron percent in the ore ranges from 45-54% and the insitu bulk density 2.3T/m3

2A.1.4.4 : Mode of Occurance & Controls of Mineralization

Iron ore is formed as a result of residual concentration in the banded haematite quartzite by leaching of silica and concentration of iron and by replacement of phyllites by iron ore due to lateririsation

Approved

2A.1.4.5 : Extent of Weathering/ Alteration

Enrichment of iron ore occurred due to intense weathering effect of Banded haematite quartzite. The Iron ore is formed as a result of residual concentartion in the banded haematite quartizite by leaching of silica and concentartion of iron and also by replacement of phyllite by iron ore due to laterization.

2A.1.4.6 : Nature/Form of Mineral	Powdery
Specify If any other	Lumpy : Fines ratio, 20: 80

2A.1.4.7 : Extent of Mineralization

The ore body extends over a strike length of 2065m with a variable width of 30-35m dipping on either side with varying angles of dips. The ore occurs at shallow depths from the surface at the crustal part of the anticline, the ore body dips on either side of the ridge and is deep seated at the foot of the ridge on either side. The total mineralised area in the block comes to around 55.456 Ha, unexplored area of 64.9973 Ha and non mineralised area of 50.7939 Ha.

2A.1.4.8 : Deposit Type (as per MEMC Rule)

Bedded, Stratiform and tabular deposits of regular habit

Strike / Trend of the Ore Body						
N	60	W	to	S	60	E

Amount of Dip of the Ore Body (degree)	Amount of Dip of the Ore Body (degree)
45	55
(from)	(to)

Dip Direction of the Ore Body			Plunge of Mineral Body (degree) (if any)	Direction of Plunge		
N	35	E	0	W	Nil	W

Approved

2A.2: Exploration

2A.2.1: Summary of The Previous Exploration (for fresh grant) / During Last Plan Period (for existing leases)

Name of The Agency
Mining Division of Chowgule & Company private limited.

2A.2.1.1: Geological Mapping

SI.No.	Year		Scale	Area Covered (Ha)
	From	To		
1	01/04/1987	31/03/2018	1:2000	171.2472

2A.2.1.2: Airborne Geophysical Survey

SI.No.	Type of Survey	Spacing (m)	Total line (km)	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
					Form	To	Form	To
1	NIL	Nil	Nil	Nil	Nil	Nil	Nil	Nil

2A.2.1.3: Ground Geophysical Survey

SI.No.	Type of Survey	Spacing (m)	Total line (km)	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
					Form	To	Form	To
1	Nil	0	0	0.0000	Nil	Nil	Nil	Nil

2A.2.1.4: Geochemical Survey

SI.No.	Type of Sample	No of Samples	Aanlysis report	Area Covered (Ha)
1	Nil	0	Nil	Nil

Approved

2A.2.1.5: Pitting

Number of Pits
0

SI.No.	Year		Pit ID	Length of Pit (m)	Width of Pit (m)	Depth of Pit (m)	Depth (from)	Depth(to)	Running mtr	Litho units exposed	Name of the radical	Av Grade(in %)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
	From	To											From	To	From	To
1	Nil	Nil	Nil	0.00	0.00	0.00	0.00	0.00	0.00	Nil	Nil	0.00	Nil	Nil	Nil	Nil

2A.2.1.6: Trenching

Number of Trenches
0

2A.2.1.6.1: Spacing

Min (m)	Max (m)	Avg (m)
0.00	0.00	0.00

SI.No.	Year		Trench ID	Length of Trench (m)	Width of Trench (m)	Depth of Trench(m)	Depth (from)	Depth(to)	Running mtr	Litho units exposed	Name of the radical	Av. Grade	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
	From	To											From	To	From	To
1	Nil	Nil	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0	0	0.0000	Nil	Nil	Nil	Nil

2A.2.1.7 Exploratory Drilling(Core/non Core)

SI.No.	Year	Exploration agency	Core holes	Non-core (RC/DTH)	Grand total	Attach log sheet of each borehole in

Approved

	From	To		Number of boreholes drilled	Total mtrs	Number of boreholes drilled	Total mtrs	Number of boreholes drilled	Total mtrs	csv/excel format
1	01/04/1987	31/03/2018	Mining Division, Chowgule & Company	461	15314.40	0	0.00	461	15314.40	Nil

2A.2.1.8: Exploratory Mining

SI.No.	Pit/Adit ID	Length in Mtr	Width in Mtr	Depth in mtrs	Volume (m^3)
1	Nil	0.00	0.00	0.00	0.00

2A.2.1.9: Sampling

SI.No.	Type of sample	No of samples collected	Number of samples analyzed	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Remark if any
				From	To	From	To	
1	Random	10	10	Nil	Nil	Nil	Nil	Nil

2A.2.1.10: Chemical Analysis

SI.No.	Sample ID	Minerals	Radical with garde in %	Name of Agency	Type of agency	Attachment
1	0	Nil	Nil	Nil	Nil	Nil

* Chemical analysis of core /non vore samples may be uploaded in CSV file which shall normally include Five files namely collar file, survey file and Geology log file, Assay file & RQD File.

2A.2.1.11: Petrology & Mineralogical Studies

SI.No.	Type of Sample	Number of Sample Drawn	Number of Sample Analyzed	Petrographic Study Report
1	Nil	Nil	Nil	Nil

Approved

2A.2.1.12: Beneficiation Studies

SI.No.	Type of Beneficiation	Number of Samples	Attach
1	Nil	Nil	Nil

2A.2.1.13: Bulk Density Study as per M(EMC) Rules, 2015 and SOP of CGPB

Method adopted for calculating bulk density of ore and waste
The 'insitu' bulk density tests of waste and ores were conducted in the past as per IS 5842-1986 standard and procedure adopted has been described below : • Overburden/waste and ore formations exposed on mine benches identified and surface has been cleared for debris. • Pits of 0.5M x 0.5M x 0.5M size were dug in different formation exposed in the pit. Excavated material from the pits stacked separately as formation/pitwise. • Pit wise excavated material from the stack weighed without loss of an

SI.No.	Nature of Ore/OB	Mineral	Number of samples	Bulk Density Established (t/m^3)
1	Lumpy Ore	Hametite	1	3.00
2	Friable ore	Hametite	1	2.60
3	Powdery ore	Hametite	1	2.60
4	Low grade	Hametite	1	2.30

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2A.2.1.14: Area Covered under Exploration

Level of exploration	Area in Ha.		Total Area in Ha.
	Forest	Non Forest	
G-1	0.000000	26.983500	26.983500
G-2	0.000000	8.727300	8.727300
G-3	0.000000	70.539100	70.539100
G-4	0.000000	0.000000	0.000000
Area proved as Non-mineralized	0.000000	50.793900	50.793900
Area to be explored	0.000000	64.997300	64.997300
Total	0.000000	171.247200	171.247200

2A.2.2: Summary of The Previous Exploration (Before Last Plan Period)

Name of The Agency
Nil

2A.2.2.1: Geological Mapping

SI.No.	Year		Scale	Area Covered (Ha)
	From	To		
1	Nil	Nil	Nil	Nil

2A.2.2.2: Airborne Geophysical Survey

SI.No.	Type of Survey	Spacing (m)	Total line (km)	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
					From	To	From	To
1	NIL	0.00	0.000000	0.00	Nil	Nil	Nil	Nil

2A.2.2.3: Ground Geophysical Survey

SI.No.	Type of Survey	Spacing (m)	Total line (km)	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
					From	To	From	To
1	Nil	0	0	0.0000	Nil	Nil	Nil	Nil

2A.2.2.4: Geochemical Survey

SI.No.	Type of Sample	No of Samples
1	Nil	0

2A.2.2.5: Pitting

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SI.No.	Pit ID	Length of Pit (m)	Width of Pit (m)	Depth of Pit (m)	Litho units exposed	Litho Unit From (m)	Litho Unit To (m)	Average Grade(%)	Running Metres (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
										Form	To	Form	To
1	Nil	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	Nil	Nil	Nil	Nil

2A.2.2.6: Trenching

Number of Trenches
0

Spacing

Min (m)	Max (m)	Avg (m)
0.00	0.00	0.00

Area Covered Under Trenching

Co-ordinates

Latitude

North	Nil
North	Nil
North	Nil
North	Nil

Longitude

East	Nil
East	Nil
East	Nil

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East	Nil

SI.No.	Trench ID	Length of Trench (m)	Width of Trench (m)	Depth of Trench (m)	Litho Units Exposed	Average Grade	Running mtr	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
								From	To	From	To
1	0	0.0000	0.0000	0.0000	0	0	0.0000	Nil	Nil	Nil	Nil

2A.2.2.7: Exploratory Drilling

2A.2.2.7.1:Core/Non-core Drilling

SI.No.	Year		Exploration agency	Core holes		Non-core (RC/DTH)		Grand total		Attach log sheet of each borehole in csv/excel format
	From	To		Number of boreholes drilled	Total mtrs	Number of boreholes drilled	Total mtrs	Total boreholes	Total mtrs	
1	Nil	Nil	Nil	0	0.00	0	0.00	0	0.00	Nil

2A.2.2.8: Exploratory Mining

SI.No.	Pit / Adit ID	Volume (m^3)
1	Nil	0.00

2A.2.2.9: Sampling

SI.No.	Type of sample	Number of Samples	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
				From	To	From	To
1	Nil	0	0.00	Nil	Nil	Nil	Nil

2A.2.2.10: Chemical Analysis

SI.No.	Sample ID	Minerals	Radical Analysis	Attachment

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1	0	Nil	Nil	Nil

2A.2.2.11:Petrology & Mineralogical Studies

SI.No.	Type of Sample	Number of Sample Drawn	Number of Sample Analyzed	Petrographic Study Report
1	Nil	0	0	Nil

2A.2.2.12: Beneficiation Test

SI.No.	Type of Beneficiation	Number of Samples	Attachment
1	Nil	0	Nil

2A.2.2.13: Bulk Density

SI.No.	Rock Type	Number of Samples	Minerals	Bulk Density Established (t/m^3)
1	Nil	0	Nil	0.00

2A.2.2.14: Area Covered under Exploration

Level of exploration	Area in Ha.		Total Area in Ha.
	Forest	Non Forest	
G-1	0.0000	0.0000	0.0000
G-2	0.0000	0.0000	0.0000
G-3	0.0000	0.0000	0.0000
G-4	0.0000	0.0000	0.0000
Area proved as Non-mineralized	0.0000	0.0000	0.0000
Area to be explored	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000

Approved

SI.No.	Year		Area converted to G1 from G2, G3 & G4	% increase in G-1 Area	Remaining Area % in G2	Remaining Area % in G3	Remaining Area % in G4	Remaining Area in G2	Remaining Area in G3	Remaining Area in G4
	From	To								
1	Nil	Nil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potentially Mineralised area (Ha)										0.00

2A.2.3 Ore Body Geometry & Grade

SI.No.	Name of the ore band	General Strike / Trend	Dip Of Mineral Body	Average Strike Length (m)	Average Width (m)	Chemical parameters				
						Average Depth (m)	Name of the radical	Min Grade (%)	Max Grade (%)	Avg Grade (%)
1	Sirigao Side	NW-SE	NE	1250.00	30.00	100.00	Fe	45.00	60.00	54.12
2	Poira side	NW-SE	NE	1150.00	30.00	100.00	Fe	45.00	60.00	54.12

2A.2.4: Reserve / Resource Estimation Method

2A.2.4.1: Methodology

Resource / Reserve Estimation Method
Sectional Area Method
Methodology
The reserves and resources are given as per the geological report provided by DMG, Govt of Goa. Geological Cross sections are provided along with the Geological Report. Sectional area of the respective litho unit is multiplied with sectional influence and with respective bulk density to get tonnage (Bulk density considered is as given in the geological report.) Recovery percentage of 95% has been considered.

2A.2.4.2: Resource Calculation

SI.No.	Cross Section/Block	Section Area/ Block Area(sq mt)	Influence(m)	Depth in mtr	Volume (m^3)	Bulk Density (t/m^3)	Resource Quantity (t)	Level of Exploration	Type of Land	Name of the radical	Grade (%)	Method used for resource estimation
1	Section 9	790	50.00	0.00	39500.00	3.00	112575.0000	333	NON-	Fe	56.00%	cross

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							0		FOREST LAND			sectional
2	Section 10	48	50.00	0.00	2400.00	3.00	6840.00000	333	NON-FOREST LAND	Fe	56.00%	cross sectional
3	Section 11	52	50.00	0.00	2600.00	3.00	7410.00000	333	NON-FOREST LAND	Fe	56.00%	cross sectional
4	Section 13	30	50.00	0.00	1500.00	3.00	4275.00000	333	NON-FOREST LAND	Fe	56.00%	cross sectional
5	Section 14	162	50.00	0.00	8100.00	3.00	23085.00000	333	NON-FOREST LAND	Fe	56.00%	cross sectional
6	Section 19	289	50.00	0.00	14450.00	3.00	41183.00000	333	NON-FOREST LAND	Fe	56.00%	cross sectional
7	Section 20	61	50.00	0.00	3050.00	3.00	8693.00000	333	NON-FOREST LAND	Fe	56.00%	cross sectional
8	Section 21	17	50.00	0.00	850.00	3.00	2423.00000	333	NON-FOREST LAND	Fe	56.00%	cross sectional
9	Section 22	17	50.00	0.00	850.00	3.00	2423.00000	333	NON-FOREST LAND	Fe	56.00%	cross sectional
10	Section 24	29	50.00	0.00	1450.00	3.00	4133.00000	333	NON-FOREST LAND	Fe	56.00%	cross sectional
11	Section 26	61	50.00	0.00	3050.00	3.00	8693.00000	333	NON-FOREST LAND	Fe	56.00%	cross sectional
12	Section 28	188	50.00	0.00	9400.00	3.00	26790.00000	333	NON-FOREST LAND	Fe	56.00%	cross sectional

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13	Section 30	70	50.00	0.00	3500.00	3.00	9975.00000	333	NON-FOREST LAND	Fe	56.00%	cross sectional
14	Section 31	311	50.00	0.00	15550.00	3.00	44318.00000	333	NON-FOREST LAND	Fe	56.00%	cross sectional
15	Section 32	20	50.00	0.00	1000.00	3.00	2850.00000	333	NON-FOREST LAND	Fe	56.00%	cross sectional
16	Section 33	81	50.00	0.00	4050.00	3.00	11543.00000	333	NON-FOREST LAND	Fe	56.00%	cross sectional
17	Section 35	64	50.00	0.00	3200.00	3.00	9120.00000	333	NON-FOREST LAND	Fe	56.00%	cross sectional
18	Section 36	120	50.00	0.00	6000.00	3.00	17100.00000	333	NON-FOREST LAND	Fe	56.00%	cross sectional
19	Section 37	16	50.00	0.00	800.00	3.00	2280.00000	333	NON-FOREST LAND	Fe	56.00%	cross sectional
20	Section 1	292	25.00	0.00	7300.00	2.60	18031.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
21	Section 2	295	50.00	0.00	14750.00	2.60	36433.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
22	Section 3	419	50.00	0.00	20950.00	2.60	51747.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
23	Section 4	421	50.00	0.00	21050.00	2.60	51994.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
24	Section 5	228	50.00	0.00	11400.00	2.60	28159.00000	333	NON-FOREST	Fe	58.64%	cross sectional

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									LAND			
25	Section 6	201	50.00	0.00	10050.00	2.60	24824.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
26	Section 7	324	50.00	0.00	16200.00	2.60	40014.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
27	Section 9	323	50.00	0.00	16150.00	2.60	39891.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
28	Section 10	997	50.00	0.00	49850.00	2.60	123130.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
29	Section 11	698	50.00	0.00	34900.00	2.60	86204.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
30	Section 12	503	50.00	0.00	25150.00	2.60	62121.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
31	Section 13	462	50.00	0.00	23100.00	2.60	57057.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
32	Section 14	1305	50.00	0.00	65250.00	2.60	161168.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
33	Section 15	175	50.00	0.00	8750.00	2.60	21613.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
34	Section 16	1136	50.00	0.00	56800.00	2.60	140297.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
35	Section 17	1300	50.00	0.00	65000.00	2.60	160550.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional

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36	Section 18	1041	50.00	0.00	52050.00	2.60	128564.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
37	Section 19	506	50.00	0.00	25300.00	2.60	62491.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
38	Section 20	718	50.00	0.00	35900.00	2.60	88673.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
39	Section 21	420	50.00	0.00	21000.00	2.60	51870.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
40	Section 22	1235	50.00	0.00	61750.00	2.60	152523.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
41	Section 23	293	50.00	0.00	14650.00	2.60	36186.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
42	Section 24	717	50.00	0.00	35850.00	2.60	88550.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
43	Section 25	950	50.00	0.00	47500.00	2.60	117325.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
44	Section 26	388	50.00	0.00	19400.00	2.60	47919.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
45	Section 27	700	50.00	0.00	35000.00	2.60	86450.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
46	Section 28	738	50.00	0.00	36900.00	2.60	91143.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
47	Section 29	586	50.00	0.00	29300.00	2.60	72371.00000	333	NON-FOREST	Fe	58.64%	cross sectional

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									LAND			
48	Section 30	950	50.00	0.00	47500.00	2.60	117325.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
49	Section 31	792	50.00	0.00	39600.00	2.60	97812.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
50	Section 32	900	50.00	0.00	45000.00	2.60	111150.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
51	Section 33	734	50.00	0.00	36700.00	2.60	90649.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
52	Section 34	738	50.00	0.00	36900.00	2.60	91143.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
53	Section 35	276	50.00	0.00	13800.00	2.60	34086.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
54	Section 36	850	50.00	0.00	42500.00	2.60	104975.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
55	Section 37	651	50.00	0.00	32550.00	2.60	80399.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
56	Section 38	600	50.00	0.00	30000.00	2.60	74100.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
57	Section 39	264	25.00	0.00	6600.00	2.60	16302.00000	333	NON-FOREST LAND	Fe	58.64%	cross sectional
58	Section 1	348	25.00	0.00	8700.00	2.30	19010.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional

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59	Section 2	224	50.00	0.00	11200.00	2.30	24472.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
60	Section 3	139	50.00	0.00	6950.00	2.30	15186.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
61	Section 4	153	50.00	0.00	7650.00	2.30	16715.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
62	Section 5	105	50.00	0.00	5250.00	2.30	11471.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
63	Section 6	286	50.00	0.00	14300.00	2.30	31246.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
64	Section 7	92	50.00	0.00	4600.00	2.30	10051.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
65	Section 9	104	50.00	0.00	5200.00	2.30	11362.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
66	Section 10	396	50.00	0.00	19800.00	2.30	43263.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
67	Section 11	494	50.00	0.00	24700.00	2.30	53970.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
68	Section 12	296	50.00	0.00	14800.00	2.30	32338.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
69	Section 13	569	50.00	0.00	28450.00	2.30	62163.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
70	Section 14	600	50.00	0.00	30000.00	2.30	65550.00000	333	NON-FOREST	Fe	49.00%	cross sectional

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									LAND			
71	Section 15	600	50.00	0.00	30000.00	2.30	65550.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
72	Section 16	600	50.00	0.00	30000.00	2.30	65550.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
73	Section 17	600	50.00	0.00	30000.00	2.30	65550.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
74	Section 18	600	50.00	0.00	30000.00	2.30	65550.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
75	Section 19	600	50.00	0.00	30000.00	2.30	65550.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
76	Section 20	362	50.00	0.00	18100.00	2.30	39549.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
77	Section 21	400	50.00	0.00	20000.00	2.30	43700.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
78	Section 22	400	50.00	0.00	20000.00	2.30	43700.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
79	Section 23	400	50.00	0.00	20000.00	2.30	43700.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
80	Section 24	400	50.00	0.00	20000.00	2.30	43700.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
81	Section 25	400	50.00	0.00	20000.00	2.30	43700.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional

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82	Section 26	400	50.00	0.00	20000.00	2.30	43700.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
83	Section 27	400	50.00	0.00	20000.00	2.30	43700.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
84	Section 28	400	50.00	0.00	20000.00	2.30	43700.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
85	Section 29	486	50.00	0.00	24300.00	2.30	53096.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
86	Section 30	600	50.00	0.00	30000.00	2.30	65550.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
87	Section 31	500	50.00	0.00	25000.00	2.30	54625.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
88	Section 32	500	50.00	0.00	25000.00	2.30	54625.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
89	Section 33	500	50.00	0.00	25000.00	2.30	54625.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
90	Section 34	500	50.00	0.00	25000.00	2.30	54625.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
91	Section 35	500	50.00	0.00	25000.00	2.30	54625.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
92	Section 36	500	50.00	0.00	25000.00	2.30	54625.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
93	Section 37	500	50.00	0.00	25000.00	2.30	54625.00000	333	NON-FOREST	Fe	49.00%	cross sectional

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								LAND			
94	Section 38	600	50.00	0.00	30000.00	2.30	65550.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
95	Section 39	600	25.00	0.00	15000.00	2.30	32775.00000	333	NON-FOREST LAND	Fe	49.00%	cross sectional
96	Section 26	87	50.00	0.00	4350.00	2.30	9505.00000	332	NON-FOREST LAND	Fe	49.00%	cross sectional
97	Section 28	32	50.00	0.00	1600.00	2.30	3496.00000	332	NON-FOREST LAND	Fe	49.00%	cross sectional
98	Section 28	196	50.00	0.00	9800.00	2.60	24206.00000	332	NON-FOREST LAND	Fe	49.00%	cross sectional
Total					2113450.00		5041197.00000					

2A.2.4.3: Mineral Resource Estimate for Conversion to Mineral Reserve

The reserve and resources are given as per the geological report provided by DMG, Govt. of Goa. As per geological report the reserves/resources are estimated based on 461 boreholes drilled with a meterage of 15314.40m. The total of geological insitu resource in the e-auctioned mineral block is 23.58 million tonnes.

2A.2.4.4: Threshold value & Cut off Parameters

Reserves and Resources are estimated as per the threshold value notified by IBM, for Hematitic ore-45% Fe (Min). The cutoff grade for production & dispatch has been considered as per the threshold value.

2A.2.4.5: Mining Factors or Assumptions

It is proposed to carryout mining operations by “A” category fully mechanized method without drilling and blasting. An overall pit slope of 28o to 32o will be maintained and roads will be maintained in 1 : 16 gradient. ROM recovery for mining operations has been considered as 100%. Actual recovery tests to be carried out after resumption of mining operations. The lumps: fines ration is

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considered as 20:80. as per Geological report provided by DMG, Govt. of Goa.

2A.2.4.6: Metallurgical Factors or Assumptions

Nil

2A.2.4.7: Cost & Revenue Factors

The lease is a new auction block, The preferred bidder intends to operate the mine with maximum yearly production of 1.0mtpa, in the year 2027-28. Based on the present exploration data provided by DMG, the proved mineral reserves of 14.53MT, which can sustain the production levels up to next 14 years. The above reserves have been arrived based on UNFC classification, and threshold values fixed by IBM. The mineable portion of the reserves were estimated considering mining factors such as Pit Limit, bench height & width, UPL, Ore to OB. Ratio, mineral ore blocked at 7.5m safety zone, railway safety zone and human settlements safety zone. The cost and Revenue factors, considered for calculations are in the feasibility report enclosed as Annexure 10.

2A.2.4.8: Market Assessment

Mining will be done with threshold value fixed by IBM, The lower grade ore will be suitable blended with higher grade ore as per the market demand. The average grade of ore produced in the mine +53.32% Fe. Hence all the ore produced from the mine will be saleable/marketable. The Economic evaluation details are given in the feasibility report. enclosed as Annexure10.

2A.2.4.9: Other Modifying Factors

Statutory clearance such as approval of Mining plan from IBM, Environmental clearance, Consent to operate and others (if any) will be obtained before commencement of mining operations.

2A.2.4.10: Classification

During classification of reserves /resources as per UNFC, mineralized area covered under exploration, ore blocked due to benches, safety barriers, roads etc., have been considered. Accordingly Reserves and Resources have been classified under proved Mineral reserve (111), Probable Mineral Reserve (122), Feasibility mineral resource (211), Indicated Mineral Resources (332), and Inferred Mineral Resources (333).

2A.2.4.11: Calculation of blocked resources

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SI.No.	Reserves blocked due to	Cross section/Block	Sectional area/ block area (in Sq mtr)	Influence (m)	Depth (m)	Volume (m^3)	Bulk Density (t/m^3)	Resource Quantity (t)	UNFC code	Type of Land	Name of the radical	Grade (%)	Method used for resource estimation
1	Other	Section 9	323.00	50.00	0.00	16150.00	3.00	46027.50000	211	Non Forest	Fe	56.00%	Cross sectional
2	Other	Section 11	55.00	50.00	0.00	2750.00	3.00	7837.50000	211	Non Forest	Fe	56.00%	Cross sectional
3	Other	Section 13	131.00	50.00	0.00	6550.00	3.00	18667.50000	211	Non Forest	Fe	56.00%	Cross sectional
4	Railway track	Section 36	454.00	50.00	0.00	22700.00	2.60	56070.00000	211	Non Forest	Fe	59.43%	Cross sectional
5	Railway track	Section 37	1196.00	50.00	0.00	59800.00	2.60	147707.00000	211	Non Forest	Fe	59.43%	Cross sectional
6	Railway track	Section 38	956.00	50.00	0.00	47800.00	2.60	118066.00000	211	Non Forest	Fe	59.43%	Cross sectional
7	Railway track	Section 39	1501.00	50.00	0.00	75050.00	2.60	185374.00000	211	Non Forest	Fe	59.43%	Cross sectional
8	Railway track	Section 36	275.00	50.00	0.00	13750.00	2.30	30044.00000	211	Non Forest	Fe	49.00%	Cross sectional
9	Railway track	Section 38	104.00	50.00	0.00	5200.00	2.30	11362.00000	211	Non Forest	Fe	49.00%	Cross sectional
10	Railway track	Section 39	459.00	50.00	0.00	22950.00	2.30	50146.00000	211	Non Forest	Fe	49.00%	Cross sectional
11	Human settlements	Section 31	124.00	50.00	0.00	6200.00	3.00	17670.00000	211	Non Forest	Fe	56.00%	Cross sectional
12	Human settlements	Section 26	40.00	50.00	0.00	2000.00	2.60	4940.00000	211	Non Forest	Fe	59.43%	Cross sectional
13	Human settlements	Section 27	248.00	50.00	0.00	12400.00	2.60	30628.00000	211	Non Forest	Fe	59.43%	Cross sectional
14	Human settlements	Section 28	668.00	50.00	0.00	33400.00	2.60	82498.00000	211	Non Forest	Fe	59.43%	Cross sectional

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15	Human settlements	Section 29	708.00	50.00	0.00	35400.00	2.60	87438.00000	211	Non Forest	Fe	59.43%	Cross sectional
16	Human settlements	Section 30	95.00	50.00	0.00	4750.00	2.60	11733.00000	211	Non Forest	Fe	59.43%	Cross sectional
17	Human settlements	Section 31	1623.00	50.00	0.00	81150.00	2.60	200441.00000	211	Non Forest	Fe	59.43%	Cross sectional
18	Human settlements	Section 32	1197.00	50.00	0.00	59850.00	2.60	147830.00000	211	Non Forest	Fe	59.43%	Cross sectional
19	Human settlements	Section 33	1026.00	50.00	0.00	51300.00	2.60	126711.00000	211	Non Forest	Fe	59.43%	Cross sectional
20	Human settlements	Section 34	1822.00	50.00	0.00	91100.00	2.60	225017.00000	211	Non Forest	Fe	59.43%	Cross sectional
21	Human settlements	Section 35	164.00	50.00	0.00	8200.00	2.60	20254.00000	211	Non Forest	Fe	59.43%	Cross sectional
22	Human settlements	Section 36	276.00	50.00	0.00	13800.00	2.60	34086.00000	211	Non Forest	Fe	59.43%	Cross sectional
23	Human settlements	Section 37	1158.00	50.00	0.00	57900.00	2.60	143013.00000	211	Non Forest	Fe	59.43%	Cross sectional
24	Human settlements	Section 39	96.00	50.00	0.00	4800.00	2.60	11856.00000	211	Non Forest	Fe	59.43%	Cross sectional
25	Human settlements	Section 27	764.00	50.00	0.00	38200.00	2.30	83467.00000	211	Non Forest	Fe	49.00%	Cross sectional
26	Human settlements	Section 28	497.00	50.00	0.00	24850.00	2.30	54297.00000	211	Non Forest	Fe	49.00%	Cross sectional
27	Human settlements	Section 29	474.00	50.00	0.00	23700.00	2.30	51785.00000	211	Non Forest	Fe	49.00%	Cross sectional
28	Human settlements	Section 30	275.00	50.00	0.00	13750.00	2.30	30044.00000	211	Non Forest	Fe	49.00%	Cross sectional
29	Human settlements	Section 31	519.00	50.00	0.00	25950.00	2.30	56701.00000	211	Non Forest	Fe	49.00%	Cross sectional
30	Human settlements	Section 32	341.00	50.00	0.00	17050.00	2.30	37254.00000	211	Non Forest	Fe	49.00%	Cross sectional

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31	Human settlements	Section 33	443.00	50.00	0.00	22150.00	2.30	48398.00000	211	Non Forest	Fe	49.00%	Cross sectional
32	Human settlements	Section 34	316.00	50.00	0.00	15800.00	2.30	34523.00000	211	Non Forest	Fe	49.00%	Cross sectional
33	Human settlements	Section 36	1048.00	50.00	0.00	52400.00	2.30	114494.00000	211	Non Forest	Fe	49.00%	Cross sectional
34	Human settlements	Section 37	608.00	50.00	0.00	30400.00	2.30	66424.00000	211	Non Forest	Fe	49.00%	Cross sectional
35	Human settlements	Section 38	1490.00	50.00	0.00	74500.00	2.30	162783.00000	211	Non Forest	Fe	49.00%	Cross sectional
36	Human settlements	Section 39	2647.00	50.00	0.00	132350.00	2.30	289185.00000	211	Non Forest	Fe	49.00%	Cross sectional
37	Ultimate Pit Limit	Section 23	1743.00	50.00	0.00	87150.00	2.60	215260.00000	211	Non Forest	Fe	59.43%	Cross sectional
38	Ultimate Pit Limit	Section 24	913.00	50.00	0.00	45650.00	2.60	112755.00000	211	Non Forest	Fe	59.43%	Cross sectional
39	Ultimate Pit Limit	Section 25	1214.00	50.00	0.00	60700.00	2.60	149929.00000	211	Non Forest	Fe	59.43%	Cross sectional
40	Ultimate Pit Limit	Section 26	733.00	50.00	0.00	36650.00	2.60	90526.00000	211	Non Forest	Fe	59.43%	Cross sectional
41	Ultimate Pit Limit	Section 27	351.00	50.00	0.00	17550.00	2.60	43349.00000	211	Non Forest	Fe	59.43%	Cross sectional
42	Ultimate Pit Limit	Section 28	673.00	50.00	0.00	33650.00	2.60	83115.00000	211	Non Forest	Fe	59.43%	Cross sectional
43	Ultimate Pit Limit	Section 29	406.00	50.00	0.00	20300.00	2.60	50141.00000	211	Non Forest	Fe	59.43%	Cross sectional
44	Ultimate Pit Limit	Section 31	368.00	50.00	0.00	18400.00	2.60	45448.00000	211	Non Forest	Fe	59.43%	Cross sectional
45	Ultimate Pit Limit	Section 32	390.00	50.00	0.00	19500.00	2.60	48165.00000	211	Non Forest	Fe	59.43%	Cross sectional
46	Ultimate Pit Limit	Section 35	451.00	50.00	0.00	22550.00	2.60	55699.00000	211	Non Forest	Fe	59.43%	Cross sectional

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47	Ultimate Pit Limit	Section 23	199.00	50.00	0.00	9950.00	2.30	21741.00000	211	Non Forest	Fe	49.00%	Cross sectional
48	Ultimate Pit Limit	Section 24	23.00	50.00	0.00	1150.00	2.30	2513.00000	211	Non Forest	Fe	49.00%	Cross sectional
49	Ultimate Pit Limit	Section 25	205.00	50.00	0.00	10250.00	2.30	22396.00000	211	Non Forest	Fe	49.00%	Cross sectional
50	Ultimate Pit Limit	Section 26	662.00	50.00	0.00	33100.00	2.30	72323.00000	211	Non Forest	Fe	49.00%	Cross sectional
51	Ultimate Pit Limit	Section 27	52.00	50.00	0.00	2600.00	2.30	5681.00000	211	Non Forest	Fe	49.00%	Cross sectional
52	Ultimate Pit Limit	Section 28	33.00	50.00	0.00	1650.00	2.30	3605.00000	211	Non Forest	Fe	49.00%	Cross sectional
53	Ultimate Pit Limit	Section 29	167.00	50.00	0.00	8350.00	2.30	18245.00000	211	Non Forest	Fe	49.00%	Cross sectional
54	Ultimate Pit Limit	Section 31	201.00	50.00	0.00	10050.00	2.30	21959.00000	211	Non Forest	Fe	49.00%	Cross sectional
55	Ultimate Pit Limit	Section 33	207.00	50.00	0.00	10350.00	2.30	22615.00000	211	Non Forest	Fe	49.00%	Cross sectional
56	Ultimate Pit Limit	Section 35	79.00	50.00	0.00	3950.00	2.30	8631.00000	211	Non Forest	Fe	49.00%	Cross sectional
57	Other	Section 16	19.00	50.00	0.00	950.00	2.60	2346.50000	211	Non Forest	Fe	59.43%	Cross sectional
58	Other	Section 11	207.00	50.00	0.00	10350.00	2.30	22614.75000	211	Non Forest	Fe	49.00%	Cross sectional
59	Other	Section 13	273.00	50.00	0.00	13650.00	2.30	29825.25000	211	Non Forest	Fe	49.00%	Cross sectional
60	Other	Section 15	29.00	50.00	0.00	1450.00	2.30	3168.25000	211	Non Forest	Fe	49.00%	Cross sectional
61	Other	Section 16	71.00	50.00	0.00	3550.00	2.30	7756.75000	211	Non Forest	Fe	49.00%	Cross sectional
Total						1689500.00		4004579.00					

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2A.2.4.12: Calulation of Reserves - I

SI.No.	Cross section/Block	Sectional area/ block area (in Sq mtr)	Influence (m)	Depth (m)	Volume (m^3)	Bulk Density (t/m^3)	Resource Quantity (t)	UNFC code	Type of Land	Name of the radical	Grade (%)	Method used for resource estimation
1	Section 13	400	50.00	0.00	20000.00	3.00	57000.00	111	Non Forest	Fe	56.0	Cross Sectional
2	Section 14	160	50.00	0.00	8000.00	3.00	22800.00	111	Non Forest	Fe	56.0	Cross Sectional
3	Section 16	170	50.00	0.00	8500.00	3.00	24225.00	111	Non Forest	Fe	56.0	Cross Sectional
4	Section 17	50	50.00	0.00	2500.00	3.00	7125.00	111	Non Forest	Fe	56.0	Cross Sectional
5	Section 18	200	50.00	0.00	10000.00	3.00	28500.00	111	Non Forest	Fe	56.0	Cross Sectional
6	Section 19	715	50.00	0.00	35750.00	3.00	101888.00	111	Non Forest	Fe	56.0	Cross Sectional
7	Section 20	230	50.00	0.00	11500.00	3.00	32775.00	111	Non Forest	Fe	56.0	Cross Sectional
8	Section 21	280	50.00	0.00	14000.00	3.00	39900.00	111	Non Forest	Fe	56.0	Cross Sectional
9	Section 22	305	50.00	0.00	15250.00	3.00	43463.00	111	Non Forest	Fe	56.0	Cross Sectional
10	Section 23	105	50.00	0.00	5250.00	3.00	14963.00	111	Non Forest	Fe	56.0	Cross Sectional
11	Section 24	150	50.00	0.00	7500.00	3.00	21375.00	111	Non Forest	Fe	56.0	Cross Sectional
12	Section 25	74	50.00	0.00	3700.00	3.00	10545.00	111	Non Forest	Fe	56.0	Cross Sectional
13	Section 26	175	50.00	0.00	8750.00	3.00	24938.00	111	Non Forest	Fe	56.0	Cross Sectional

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14	Section 27	130	50.00	0.00	6500.00	3.00	18525.00	111	Non Forest	Fe	56.0	Cross Sectional
15	Section 29	180	50.00	0.00	9000.00	3.00	25650.00	111	Non Forest	Fe	56.0	Cross Sectional
16	Section 31	200	50.00	0.00	10000.00	3.00	28500.00	111	Non Forest	Fe	56.0	Cross Sectional
17	Section 32	175	50.00	0.00	8750.00	3.00	24938.00	111	Non Forest	Fe	56.0	Cross Sectional
18	Section 33	82	50.00	0.00	4100.00	3.00	11685.00	111	Non Forest	Fe	56.0	Cross Sectional
19	Section 34	100	50.00	0.00	5000.00	3.00	14250.00	111	Non Forest	Fe	56.0	Cross Sectional
20	Section 35	150	50.00	0.00	7500.00	3.00	21375.00	111	Non Forest	Fe	56.0	Cross Sectional
21	Section 36	9	50.00	0.00	450.00	3.00	1283.00	111	Non Forest	Fe	56.0	Cross Sectional
22	Section 37	50	50.00	0.00	2500.00	3.00	7125.00	111	Non Forest	Fe	56.0	Cross Sectional
23	Section 38	40	50.00	0.00	2000.00	3.00	5700.00	111	Non Forest	Fe	56.0	Cross Sectional
24	Section 39	90	50.00	0.00	2250.00	3.00	6413.00	111	Non Forest	Fe	56.0	Cross Sectional
25	Section 1	238	25.00	0.00	5950.00	2.60	14697.00	111	Non Forest	Fe	57.77	Cross Sectional
26	Section 7	226	50.00	0.00	11300.00	2.60	27911.00	111	Non Forest	Fe	57.77	Cross Sectional
27	Section 9	571	50.00	0.00	28550.00	2.60	70519.00	111	Non Forest	Fe	57.77	Cross Sectional
28	Section 13	779	50.00	0.00	38950.00	2.60	96207.00	111	Non Forest	Fe	57.77	Cross Sectional
29	Section 14	61	50.00	0.00	3050.00	2.60	7534.00	111	Non Forest	Fe	57.77	Cross Sectional

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30	Section 15	1671	50.00	0.00	83550.00	2.60	206369.00	111	Non Forest	Fe	57.77	Cross Sectional
31	Section 16	479	50.00	0.00	23950.00	2.60	59157.00	111	Non Forest	Fe	57.77	Cross Sectional
32	Section 17	2012	50.00	0.00	100600.00	2.60	248483.00	111	Non Forest	Fe	57.77	Cross Sectional
33	Section 18	2024	50.00	0.00	101200.00	2.60	249964.00	111	Non Forest	Fe	57.77	Cross Sectional
34	Section 19	2110	50.00	0.00	105500.00	2.60	260585.00	111	Non Forest	Fe	57.77	Cross Sectional
35	Section 20	3738	50.00	0.00	186900.00	2.60	461643.00	111	Non Forest	Fe	57.77	Cross Sectional
36	Section 21	2133	50.00	0.00	106650.00	2.60	263426.00	111	Non Forest	Fe	57.77	Cross Sectional
37	Section 22	1889	50.00	0.00	94450.00	2.60	233292.00	111	Non Forest	Fe	57.77	Cross Sectional
38	Section 23	2285	50.00	0.00	114250.00	2.60	282198.00	111	Non Forest	Fe	57.77	Cross Sectional
39	Section 24	1640	50.00	0.00	82000.00	2.60	202541.00	111	Non Forest	Fe	57.77	Cross Sectional
40	Section 25	2740	50.00	0.00	137000.00	2.60	338390.00	111	Non Forest	Fe	57.77	Cross Sectional
41	Section 26	2993	50.00	0.00	149650.00	2.60	369636.00	111	Non Forest	Fe	57.77	Cross Sectional
42	Section 27	3716	50.00	0.00	185800.00	2.60	458926.00	111	Non Forest	Fe	57.77	Cross Sectional
43	Section 29	1991	50.00	0.00	99550.00	2.60	245889.00	111	Non Forest	Fe	57.77	Cross Sectional
44	Section 31	1380	50.00	0.00	69000.00	2.60	170430.00	111	Non Forest	Fe	57.77	Cross Sectional
45	Section 32	569	50.00	0.00	28450.00	2.60	70272.00	111	Non Forest	Fe	57.77	Cross Sectional

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46	Section 33	1488	50.00	0.00	74400.00	2.60	183769.00	111	Non Forest	Fe	57.77	Cross Sectional
47	Section 34	920	50.00	0.00	46000.00	2.60	113620.00	111	Non Forest	Fe	57.77	Cross Sectional
48	Section 35	2111	50.00	0.00	105550.00	2.60	260709.00	111	Non Forest	Fe	57.77	Cross Sectional
49	Section 36	180	50.00	0.00	9000.00	2.60	22231.00	111	Non Forest	Fe	57.77	Cross Sectional
50	Section 37	476	50.00	0.00	23800.00	2.60	58786.00	111	Non Forest	Fe	57.77	Cross Sectional
51	Section 38	1014	50.00	0.00	50700.00	2.60	125229.00	111	Non Forest	Fe	57.77	Cross Sectional
52	Section 39	254	25.00	0.00	6350.00	2.60	15685.00	111	Non Forest	Fe	57.77	Cross Sectional
53	Section 1	238	25.00	0.00	5950.00	2.30	13001.00	111	Non Forest	Fe	49.0	Cross Sectional
54	Section 7	116	50.00	0.00	5800.00	2.30	12673.00	111	Non Forest	Fe	49.0	Cross Sectional
55	Section 9	224	50.00	0.00	11200.00	2.30	24472.00	111	Non Forest	Fe	49.0	Cross Sectional
56	Section 13	331	50.00	0.00	16550.00	2.30	36162.00	111	Non Forest	Fe	49.0	Cross Sectional
57	Section 14	2133	50.00	0.00	106650.00	2.30	233030.00	111	Non Forest	Fe	49.0	Cross Sectional
58	Section 15	3595	50.00	0.00	179750.00	2.30	392754.00	111	Non Forest	Fe	49.0	Cross Sectional
59	Section 16	1507	50.00	0.00	75350.00	2.30	164640.00	111	Non Forest	Fe	49.0	Cross Sectional
60	Section 17	655	50.00	0.00	32750.00	2.30	71559.00	111	Non Forest	Fe	49.0	Cross Sectional
61	Section 18	1867	50.00	0.00	93350.00	2.30	203970.00	111	Non Forest	Fe	49.0	Cross Sectional

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62	Section 19	1123	50.00	0.00	56150.00	2.30	122688.00	111	Non Forest	Fe	49.0	Cross Sectional
63	Section 20	3203	50.00	0.00	160150.00	2.30	349928.00	111	Non Forest	Fe	49.0	Cross Sectional
64	Section 21	2786	50.00	0.00	139300.00	2.30	304371.00	111	Non Forest	Fe	49.0	Cross Sectional
65	Section 22	2252	50.00	0.00	112600.00	2.30	246031.00	111	Non Forest	Fe	49.0	Cross Sectional
66	Section 23	2854	50.00	0.00	142700.00	2.30	311800.00	111	Non Forest	Fe	49.0	Cross Sectional
67	Section 24	3411	50.00	0.00	170550.00	2.30	372652.00	111	Non Forest	Fe	49.0	Cross Sectional
68	Section 25	3323	50.00	0.00	166150.00	2.30	363038.00	111	Non Forest	Fe	49.0	Cross Sectional
69	Section 26	2831	50.00	0.00	141550.00	2.30	309287.00	111	Non Forest	Fe	49.0	Cross Sectional
70	Section 27	3141	50.00	0.00	157050.00	2.30	343154.00	111	Non Forest	Fe	49.0	Cross Sectional
71	Section 29	2750	50.00	0.00	137500.00	2.30	300438.00	111	Non Forest	Fe	49.0	Cross Sectional
72	Section 30	343	50.00	0.00	17150.00	2.30	37473.00	111	Non Forest	Fe	49.0	Cross Sectional
73	Section 31	3160	50.00	0.00	158000.00	2.30	345230.00	111	Non Forest	Fe	49.0	Cross Sectional
74	Section 32	1434	50.00	0.00	71700.00	2.30	156665.00	111	Non Forest	Fe	49.0	Cross Sectional
75	Section 33	1906	50.00	0.00	95300.00	2.30	208231.00	111	Non Forest	Fe	49.0	Cross Sectional
76	Section 34	643	50.00	0.00	32150.00	2.30	70248.00	111	Non Forest	Fe	49.0	Cross Sectional
77	Section 35	1980	50.00	0.00	99000.00	2.30	216315.00	111	Non Forest	Fe	49.0	Cross Sectional

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78	Section 36	712	50.00	0.00	35600.00	2.30	77786.00	111	Non Forest	Fe	49.0	Cross Sectional
79	Section 37	681	50.00	0.00	34050.00	2.30	74400.00	111	Non Forest	Fe	49.0	Cross Sectional
80	Section 38	2447	50.00	0.00	122350.00	2.30	267335.00	111	Non Forest	Fe	49.0	Cross Sectional
81	Section 39	1121	25.00	0.00	28025.00	2.30	61235.00	111	Non Forest	Fe	49.0	Cross Sectional
82	Section 16	35	50.00	0.00	1750.00	3.00	4988.00	122	Non Forest	Fe	56.0	Cross Sectional
83	Section 17	160	50.00	0.00	8000.00	3.00	22800.00	122	Non Forest	Fe	56.0	Cross Sectional
84	Section 18	32	50.00	0.00	1600.00	3.00	4560.00	122	Non Forest	Fe	56.0	Cross Sectional
85	Section 21	62	50.00	0.00	3100.00	3.00	8835.00	122	Non Forest	Fe	56.0	Cross Sectional
86	Section 22	23	50.00	0.00	1150.00	3.00	3278.00	122	Non Forest	Fe	56.0	Cross Sectional
87	Section 23	27	50.00	0.00	1350.00	3.00	3848.00	122	Non Forest	Fe	56.0	Cross Sectional
88	Section 28	229	50.00	0.00	11450.00	3.00	32633.00	122	Non Forest	Fe	56.0	Cross Sectional
89	Section 8	549	50.00	0.00	27450.00	2.60	67802.00	122	Non Forest	Fe	57.64	Cross Sectional
90	Section 16	235	50.00	0.00	11750.00	2.60	29023.00	122	Non Forest	Fe	57.64	Cross Sectional
91	Section 17	1057	50.00	0.00	52850.00	2.60	130540.00	122	Non Forest	Fe	57.64	Cross Sectional
92	Section 18	826	50.00	0.00	41300.00	2.60	102011.00	122	Non Forest	Fe	57.64	Cross Sectional
93	Section 19	820	50.00	0.00	41000.00	2.60	101270.00	122	Non Forest	Fe	57.64	Cross Sectional

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94	Section 20	762	50.00	0.00	38100.00	2.60	94107.00	122	Non Forest	Fe	57.64	Cross Sectional
95	Section 21	419	50.00	0.00	20950.00	2.60	51747.00	122	Non Forest	Fe	57.64	Cross Sectional
96	Section 22	690	50.00	0.00	34500.00	2.60	85215.00	122	Non Forest	Fe	57.64	Cross Sectional
97	Section 23	593	50.00	0.00	29650.00	2.60	73236.00	122	Non Forest	Fe	57.64	Cross Sectional
98	Section 26	707	50.00	0.00	35350.00	2.60	87315.00	122	Non Forest	Fe	57.64	Cross Sectional
99	Section 28	4020	50.00	0.00	201000.00	2.60	496470.00	122	Non Forest	Fe	57.64	Cross Sectional
100	Section 29	144	50.00	0.00	7200.00	2.60	17784.00	122	Non Forest	Fe	57.64	Cross Sectional
101	Section 31	1544	50.00	0.00	77200.00	2.60	190685.00	122	Non Forest	Fe	57.64	Cross Sectional
102	Section 8	229	50.00	0.00	11450.00	2.30	25018.00	122	Non Forest	Fe	49.0	Cross Sectional
103	Section 15	916	50.00	0.00	45800.00	2.30	100073.00	122	Non Forest	Fe	49.0	Cross Sectional
104	Section 16	563	50.00	0.00	28150.00	2.30	61508.00	122	Non Forest	Fe	49.0	Cross Sectional
105	Section 17	1667	50.00	0.00	83350.00	2.30	182120.00	122	Non Forest	Fe	49.0	Cross Sectional
106	Section 18	1830	50.00	0.00	91500.00	2.30	199928.00	122	Non Forest	Fe	49.0	Cross Sectional
107	Section 19	658	50.00	0.00	32900.00	2.30	71887.00	122	Non Forest	Fe	49.0	Cross Sectional
108	Section 20	597	50.00	0.00	29850.00	2.30	65222.00	122	Non Forest	Fe	49.0	Cross Sectional
109	Section 21	967	50.00	0.00	48350.00	2.30	105645.00	122	Non Forest	Fe	49.0	Cross Sectional

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110	Section 22	421	50.00	0.00	21050.00	2.30	45994.00	122	Non Forest	Fe	49.0	Cross Sectional
111	Section 23	1904	50.00	0.00	95200.00	2.30	208012.00	122	Non Forest	Fe	49.0	Cross Sectional
112	Section 26	285	50.00	0.00	14250.00	2.30	31136.00	122	Non Forest	Fe	49.0	Cross Sectional
113	Section 28	3458	50.00	0.00	172900.00	2.30	377787.00	122	Non Forest	Fe	49.0	Cross Sectional
114	Section 29	3	50.00	0.00	150.00	2.30	328.00	122	Non Forest	Fe	49.0	Cross Sectional
115	Section 31	502	50.00	0.00	25100.00	2.30	54844.00	122	Non Forest	Fe	49.0	Cross Sectional
Total					6231925.00		14541254.00					

2A.2.4.13: Calculation of Reserves -II

Mineral	IRON ORE
Reserves/ Resources estimated as on	01/04/2023
UNIT of estimation	tonnes

A. Mineral Reserve

Classification	Code	Quantity			Grade		Remark
		Forest	Non Forest	Total	Forest	Non Forest	
1. Proved Mineral Reserve (A)	111	0.00	11403605.00	11403605.00	0	53.30	Nil
2. Probable Mineral Reserve (A)	121	0.00	0.00	0.00	0	0	Nil
3. Probable Mineral Reserve (A)	122	0.00	3137649.00	3137649.00	0	53.39	Nil

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B. Remaining Resources

Classification	Code	Quantity			Grade		Remark
		Forest	Non Forest	Total	Forest	Non Forest	
1. Feasibility Mineral Resource (B)	211	0.00	4004579.00	4004579.00	0	55.75	Nil
2. Prefeasibility Mineral Resource (B)	221	0.00	0.00	0.00	0	0	Nil
3. Prefeasibility Mineral Resource (B)	222	0.00	0.00	0.00	0	0	Nil
4. Measured Mineral Resource (B)	331	0.00	0.00	0.00	0	0	Nil
5. Indicated Mineral Resource (B)	332	0.00	37207.00	37207.00	0	55.65	Nil
6. Inferred Mineral Resource (B)	333	0.00	5003990.00	5003990.00	0	55.16	Nil
7. Reconnaissance Mineral Resource (B)	334	0.00	0.00	0.00	0	0	Nil

Total Mineral Resources (A+B) :	23587030.00

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2A.2.4.13: Calculation of Reserves -III

No associate minerals are available!

2A.2.5: Future Exploration Proposal

2A.2.5.1: Geological Mapping

SI.N.	Year	Scale	Area Covered (Ha)
1	Year1	1:2000	171.25
2	Year2	1:2000	171.25

3	Year3	1:2000	171.25
4	Year4	1:2000	171.25
5	Year5	1:2000	171.25

2A.2.5.2: Ground Geophysical Survey

SI.No.	Year	Type of Survey	Spacing (m)	Total line (km)	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
						From	To	From	To
1	Nil	NIL	0	0	0.0000	Nil	Nil	Nil	Nil

2A.2.5.3: Pitting

Number of Pits
0

SI.No.	Year	Land Type	Pit ID	Length of Pit (m)	Width of Pit (m)	Depth of Pit (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
							From	To	From	To
1	Nil	Nil	Nil	0.00	0.00	0.00	Nil	Nil	Nil	Nil

2A.2.5.4: Trenching

Number of Trenches
0

2A.2.5.4.1: SPACING

Min (m)	Max (m)	Avg (m)
0.00	0.00	0.00

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2A.2.5.4.2: Area Covered Under Trenching

Co-ordinates

SI.No.	Year	Land Type	Trench ID	Length of Trench (m)	Width of Trench (m)	Depth of Trench(m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
							From	To	From	To
1	Nil	Nil	0	0.0000	0.0000	0.0000	Nil	Nil	Nil	Nil

2A.2.5.5: Exploratory Drilling

2A.2.5.5.1: Core Drilling & Non-Core Drilling

SI.No.	Year	In Forest Area				In Non Forest Area				Total Borehole	Total Meter
		No. of Borehole	Total Mtr	Type Borehole	Grid Interval	No. of Borehole	Total Mtr	Type Borehole	Grid Interval		
1	Year3	0	0.00	Nil	0.00	15	750.00	Core	100.00	15	750.00
2	Year4	0	0.00	Nil	0.00	16	800.00	Core	100.00	16	800.00

2A.2.5.6: Exploratory Mining

SI.No.	Year	Pit ID	Length in meter	Width in meter	Depth in meter	Volume (m^3)
1	Nil	Nil	0.00	0.00	0.00	0.00

2A.2.5.7: Sampling

SI.No.	Year	Type of Sample	Number of Samples Proposed	Area Covered(Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
					From	To	From	To
1	Year3	Drill Core	750	26.00	15:35:29.76	15:35:51.15	73:54:19.78	73:54:41.80
2	Year4	Drill Core	800	19.00	15:35:38.59	15:36:36.00	73:54:06.58	73:54:56.81

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2A.2.5.8 Petrographic & Mineralgraphic Studies

SI.No.	Year	Type of Sample	Number of Samples Proposed
1	Year3	Mineral	2

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1303

Chapter 2B : Geology & Exploration UG : NA

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Chapter 3: Mineral Beneficiation / Processing

Name of The Ore/Mineral	Iron Ore

3.1: Mineralogy of the ROM ore/ Mineral

SI.No	Valuable Mineral Name	Approx. Mineral %	Gangue Mineral/s name	Approx. Mineral Gangue %
1	Iron Ore	57.9400	Not provided	0.0000
2	Iron Ore	53.0600	Not provided	0.0000
3	Iron Ore	56.4600	Not provided	0.0000
4	Iron Ore	57.9400	Not provided	0.0000
5	Iron Ore	57.5400	Not provided	0.0000
6	Iron Ore	59.6900	Not provided	0.0000
7	Iron Ore	52.6000	Not provided	0.0000
8	Iron Ore	57.8200	Not provided	0.0000
9	Iron Ore	59.1300	Not provided	0.0000
10	Iron Ore	52.0400	Not provided	0.0000

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3.2: Complete Chemical Analysis of the ROM Ore/Mineral

SI.No	Radical	Wt%
1	Fe	57.9400
2	Fe	53.0600
3	Fe	56.4600
4	Fe	57.9400

5	Fe	57.5400
6	Fe	59.6900
7	Fe	52.6000
8	Fe	57.8200
9	Fe	59.1300
10	Fe	52.0400

3.3: Crushing Section

3.3.1: Primary Crushing

SI.No	Type of Crusher	Make	Capacity of Crusher(tph)	Feed Size(mm)	Product Size(mm)
1	Jaw Crusher	Sandvik 340 S5	200	-400.0000	40.0000

3.3.2: Secondary Crushing

Not Applicable

3.3.3: Tertiary Crushing

Not Applicable

3.4: Grinding Section

3.4.1: Dry Grinding

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Not Applicable

3.4.2: Wet Grinding

Not Applicable

3.5: Dry Processing

3.5.1: Screening and Classification

SI.No	Type of Screen/Classifer	Stages	Make	Capacity(tph)	Aperture Size of Screen/Classifier (mm), if applicable	Feed Size(mm)	Product (mm)	Product Quality(if applicable)
1	Mobile Screen	Multiple	Sandvik 340 S5	200.0000	40.0000	-40.0000	-10.0000	Nil

3.5.2: Other Operations

Not Applicable

3.5.3: Product Quality

Products	Wt%	In Tonnes	Size (Range) mm	Complete chemical analysis
Concentrate	100.0000	1000000.0000	-40 to +10 & -10	Fe, SiO2, Al2O3, SiO2, P, S, Mn, LOI
Sub-grade	0.0000	0.0000	0	0
Rejects	0.0000	0.0000	0	0

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3.6: Wet Processing

3.6.1: Scrubbing / Washing

SI.No	Type of Scrubbers / washers	Stages, if applicable	Make	Capacity(tph)	Feed Size(mm)	Product Size (mm)	Product Quality, if available	Water Requirement(l/h)	Fresh Water Requirement (l/h)	Recirculated Water (l/h)
1	Nil	Not applicable	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

3.6.2: Screening and Classification

SI.No	Type of screen / classifiers	Stages, if applicable	Make	Capacity(tph)	Aperture Size of Screen/Classifier (mm), if applicable	Feed Size(mm)	Product Size (mm)	Product Quality, if available	Water Requirement(l/h)	Fresh Water Requirement (l/h)	Recirculated Water (l/h)
1	Nil	Not applicable	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

3.6.3: Gravity Separation

SI.No	Type of separators (jig, table, spiral, etc.)	Stages, if applicable	Make	Capacity(tph)	Feed Size(mm)	Product (Conc) (tph)	Product-Mid (tph), if available	Product-Tail (tph)	Water Requirement(l/h)	Fresh Water Requirement (l/h)	Recirculated Water (l/h)
1	NIL	Nil	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.6.4: Magnetic Separation

SI.No	Type of magnetic separators	Stages, if applicable	Make	Capacity(tph)	Feed Size(mm)	Product-Mag (tph)	Product-Mid (tph), if available	Product non-Mag (tph)	Water Requirement(l/h)	Fresh Water Requirement (l/h)	Recirculated Water (l/h)

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	(magnetic intensity)										
1	NIL	Nil	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.6.5: Flotation

SI.No	Type of flotation equipment (froth/ column)	Stages (rougher/ cleaner, etc), if applicable	Make	Capacity(tph)	Feed Size(mm)	Product-Float (tph)	Product non-Float (tph)	Water Requirement(l/h)	Fresh Water Requirement (l/h)	Recirculated Water (l/h)
1	Nil	Nil	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.6.6: Other Operations

SI.No	Type of equipment / operation	Stages, if applicable	Make	Capacity(tph)	Feed Size(mm)	Product-Conc (tph)	Product-Mid (tph), if available	Product-Tail (tph)	Water Requirement(l/h)	Fresh Water Requirement (l/h)	Recirculated Water (l/h)
1	Nil	Not applicable	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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3.6.7: Product Quality (wet processing)

Products	Wt%	In Tonnes	Size (Range) mm	Complete chemical analysis
Concentrate	0.0000	0.0000	0	0
Sub-grade	0.0000	0.0000	0	0
Rejects	0.0000	0.0000	0	0

3.7: Overall Product Quality (Dry cum Wet Processing)

Products	Wt%	In Tonnes	Size (Range) mm	Complete chemical analysis
Concentrate	100.0000	1000000.0000	-40 to +10 and -10	0

Sub-grade	0.0000	0.0000	0	0
Rejects	0.0000	0.0000	0	0

3.8: Disposal Method for tailing/ rejects

a) Explain the disposal method for tailing or reject from processing plant with detail chemical / mineral analysis of tailing	Nil
b) Size and capacity of tailing pond, toxic effect of such tailings, process adopted to neutralise its effect (if any)	Nil
c) Any other data (if available)	Nil

3.9: Overall water requirement of mining and mineral processing

Indicate quantity, source of supply, disposal of water and extent of recycling and chemical analysis of water	Water_requirement.pdf

3.10: Flow sheets and charts

Material balance chart of mineral processing plant(s) (each stage of process)	Nil
Attach flow sheet of beneficiation of plant(s)	Nil
Any other data (if applicable)	Rain_water_&_drainage_plan.pdf

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Chapter 4A: Mining Operations

4A.1.1: Existing Method of Mining	Mechanized

Choose one or more	Surface Miner	HEMM without deephole drilling	Combination of loaders and tippers	None

4A.1.2: Proposed Method of Mining	Mechanized

Choose one or more	Surface Miner	HEMM without deephole drilling	Combination of loaders and tippers	None

Reasons for Proposed Changes	The mine will be operated as opencast category A fully mechanized mine without drilling and blasting The mine will be worked in general shift from 8am to 5pm whenever required the mine workings will be carried out till day light hours The average bench height will be 6m and width more than height the overall pit slope of 28 degrees will be maintained The road gradient of 1 in 16 will be maintained The hard laterite will be loosened by using ripper dozer Hydraulic excavators and dumper combina

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4A.2: Operational Parameters

4A.2.1: Inventory of Existing Pits & Dumps

4A.2.1.1: Pits

SI.No.	Pit ID	Pit Status	Area Covered by Pit(Ha)	Pit Dimensions(L*W*D)
1	Pit No. 1	Active	29.53	730X400X80
2	Pit No. 2	Active	34.68	1070X450X115
3	Pit No. 3	Reclaimed And Rehabilitated	17.31	240X810X39

4A.2.1.2: Dumps and Stacks

4A.2.1.2.1: Dump Details

SI.No.	Dump ID	Dump Status	Type of Dump	Total of Dump Quantity(t)	Area Covered by Dump(Ha)	Height(m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
							From	To	From	To
1	Dump-1	Stabilised	Waste	5500000.00	13.20	66.00	15:35:29.50	15:35:43.16	73:54:15.30	73:54:35.89
2	Dump-3	Stabilised	Waste	1590000.00	8.99	20.00	15:35:39.48	15:35:58.83	73:54:32.89	73:54:46.49

4A.2.1.2.2: Stack Details

SI.No.	Stack ID	Type of Stack	Total Stack of Quantity(t)	Area Covered by Stack(Ha)	Height(m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
						From	To	From	To
1	Proposed for e-auction by DMG	Stack for mineral	0	1.55	5	15:35:49.74	15:35:53.56	73:54:11.44	73:54:15.65

4A.2.1.3: Details of stabilised dumps

SI.No.	Dump ID	Number of Terraces	Average Height of Terraces(m)	Lenght of Toe Wall(m)	Lenght of Garland Drain(m)	Area Stablized(Ha)	Method of Stablization
1	Dump-1	4	15.00	1100.00	1350.00	13.20	Afforestation
2	Dump-3	2	10.00	355.00	365.00	8.99	Afforestation
3	Backfilling (Pit No. 1)	Nil	Nil	Nil	Nil	5.11	Area Reclaimed
4	Backfilling (Pit No. 3)	Nil	Nil	Nil	Nil	5.20	Area Reclaimed
5	T.B. 1 (Temporary Backfilling Pit)	Nil	Nil	Nil	Nil	2.28	Temporary
6	T.B. 2 (Temporary Backfilling Pit)	Nil	Nil	Nil	Nil	36.00	Temporary
7	T.B. 3 (Temporary	Nil	Nil	Nil	Nil	1.29	Temporary

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	Backfilling Pit)						
8	T.B. 4 (Temporary Backfilling Pit)	Nil	Nil	Nil	Nil	9.86	Temporary

4A.2.2: Opencast Mining

4A.2.2.1: Bench Parameters

Pit ID	Year	Max Height of the Benches in Over Burden (m)	Min Width of the Benches in Over Burden (m)	Slope of the Bench in Over Burden (degree)	Max Height of the Benches in Mineral (m)	Minimum Width of the Benches in Mineral (m)	Slope of the Bench in Mineral (degree)	Overall Slope of Pit (degree)	Number of Benches in Top Soil	Number of Benches in Over Burden	Number of Benches in Mineral	Max Depth of Workings (m)	Depth of Water Table (mRL)	Max Slope Angle of Haul Roads (1xx in)
Pit No. 1	Year1	6.00	9.00	65.00	6.00	9.00	65.00	28.00	0	2	2	72.00	0.00	16
Pit No. 1 & 2	Year2	6.00	9.00	65.00	6.00	9.00	65.00	28.00	0	1	2	66.00	0.00	16
Pit No. 2	Year3	6.00	9.00	65.00	6.00	9.00	65.00	28.00	0	9	6	-24.00	7.00	16
Pit No. 1 & 2	Year4	6.00	9.00	65.00	6.00	9.00	65.00	28.00	0	14	8	-33.00	7.00	16
Pit No. 1 & 2	Year5	6.00	9.00	65.00	6.00	9.00	65.00	28.00	0	11	14	-33.00	7.00	16

4A.2.2.2: Yearwise Opencast Development - I Continue

SI.No.	Year	Pit ID	Bench	Direction	Bulk Density of Overburden (BD1) (ton/m^3)	Bulk Density of Mineral (BD2) (tonn/m^3)	Top Soil Volume (Length x Width x Height) (m^3)	Over Burden Volume (Length x Width x Height) (m^3)	Over Burden Quantity (t)	ROM Volume (Length x Width x Height) (m^3)	ROM Quantity (t)	Recovery	Mineral Reject (t)	Production Main (t)	Production Associated (t)	OB Ratio to Ore (m^3/ton)

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1	Year1	Pit No.1	4	Eastern	2.00	2.36	0.00	145680.00	291360.00	203389.83	480000.00	1.00	0.00	480000.00	Nil	0.3035
2	Year2	Pit No. 1 & 2	2	Eastern	2.00	2.42	0.00	106300.00	212600.00	239669.42	580000.00	1.00	0.00	580000.00	Nil	0.1833
3	Year3	Pit No.2	27	Advanced below up to -33 Level	2.00	2.49	0.00	731550.00	1463100.00	281124.50	700000.00	1.00	0.00	700000.00	Nil	1.0451
4	Year4	Pit No. 1 & 2	27	Advanced below up to -33 Level	2.00	2.42	0.00	234250.00	468500.00	342975.21	830000.00	1.00	0.00	830000.00	Nil	0.2822
5	Year5	Pit No. 1 & 2	27	Advanced below up to -33 Level	2.00	2.44	0.00	244900.00	489800.00	409836.07	1000000.00	1.00	0.00	1000000.00	0.00	0.2449
Total									2925360.00		3590000.00		0.00	3590000.00	0.00	

4A.2.2.2 Yearwise Opencast Development - I End

SI.No.	Year	Pit ID	Total Topsoil Volume (m^3)	Total Over Burden Volume (m^3)	Total Over Burden Quantity (t)	Total ROM Volume (m^3)	Total ROM Quantity (t)
1	Year1	Pit No. 1	0.00	145680.00	291360.00	203389.83	480000.00
2	Year2	Pit No. 1 & 2	0.00	106300.00	212600.00	239669.42	580000.00
3	Year3	Pit No.2	0.00	731550.00	1463100.00	281124.50	700000.00
4	Year4	Pit No. 1 & 2	0.00	234250.00	468500.00	342975.21	830000.00
5	Year5	Pit No. 1 & 2	0.00	244900.00	489800.00	409836.10	1000000.00
		Total	0.00	1462680.00	2925360.00	1476995.06	3590000.00

4A.2.2.3: Transportation & Hauling Equipment

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SI.No.	Type	Make	Capacity (m^3)	No. of Equipments
1	Dumper	Tata	20.00	34
2	Water Tanker	Tata	10000.00	3

4A.3: Material Handling Summary

4A.3.1: Studies Undertaken

Title	Study Undertaken	Attachment (only pdf allowed)
Blast Vibration Study Report	No	Nil
Slope Stability Study Report	Yes	Slope_Stability_study.pdf
Recovery Study Report	Yes	Recovery_study.pdf
Hydrological Study Report	Yes	Hydrological_study.pdf
Mineral Beneficiation Study Report	No	Nil
Subsidence Study Report	No	Nil
Geotechical Study Report	Yes	Geotechnical_study_undertaking.pdf
Any Other Study Report	No	Nil
Bulk Density Study Report	Yes	Bulk_density_study.pdf

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4A.3.2: Insitu Mining

SI.No.	Year	Waste Quantity(t)	ROM Quantity(t)	Total Handling (t)	ROM Quantity Saleable Mineral (t)	ROM Quantity Mineral Reject (t)	OB Ratio to Ore (Waste Quantity / ROM Quantity)	Grade Range (%)
1	Year1	291360.00	480000.00	771360.00	480000.00	0.00	0.61	50.68
2	Year2	212600.00	580000.00	792600.00	580000.00	0.00	0.37	51.84
3	Year3	1463100.00	700000.00	2163100.00	700000.00	0.00	2.09	55.72
4	Year4	468500.00	830000.00	1298500.00	830000.00	0.00	0.56	52.18

5	Year5	489800.00	1000000.00	1489800.00	1000000.00	0.00	0.49	52.82
	Total	2925360.00	3590000.00	6515360.00	3590000.00	0.00		

4A.3.3: Dump workings

SI.No.	Year	Dump ID	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Area (m2)	Avg Height of Dump (m)	Volume (m^3)	Total Dump Quantity (t)	Proposed Dump Handling Quantity (t) (A)	Proposed Recovery of Saleable Mineral (t)(B)	Proposed Waste Quantity (t) (A-B)	Grade Range (%)	Justification
			From	To	From	To									
1	Nil	0	Nil	Nil	Nil	Nil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0

4A.3.4: Calculation Summary

Year	Year1	Year2	Year3	Year4	Year5	Total
(A) Total ROM quantity (t)	480000.00	580000.00	700000.00	830000.00	1000000.00	3590000.00
(B) Saleable ore from ROM (t)	480000.00	580000.00	700000.00	830000.00	1000000.00	3590000.00
(C) Proposed Dump Handling Quantity (t)	0.00	0.00	0.00	0.00	0.00	0.00
(D) Saleable Ore recovered from dump workings (t)	0.00	0.00	0.00	0.00	0.00	0.00
(E) Total Saleable Ore (t)(=B+D)	480000.00	580000.00	700000.00	830000.00	1000000.00	3590000.00
(F) Total Quantity Handled (t)(=A+C)	480000.00	580000.00	700000.00	830000.00	1000000.00	3590000.00

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4A.4: Machine Calculation

4A.4.1: Machine Requirement Summary

Number of Average Working Days in One Year (A)	251
Number of Shifts per Day (B)	1
Material Handling Required per Day (t) ((D)=Largest of (Q1,Q5)/(A))	8617.93
Material to be Handled per Shift (t) ((E)=(D)/(B))	8617
Handling Required per Hour (t) ((F)=(E)/8 hours)	1436.17
Effective Shift Time	6 hrs 00 mins

4A.4.2: Shovel / Excavator Requirement

Effective Shift Time	6 hrs	00 mins

SI.No.	Type	Bucket Capacity (m^3)(A)	Bucket Fill Factor (B)	Swell Factor (C)	Tonnage Factor (t/m^3) (D)	Machine Utilization Factor (%) (U)	Efficiency (%) (E)	Cycle time (sec) (F)	(G) TPH =TPH (G) =((3600 x A x B x C x D x E x U) / F)	Total Hours (H) =Number of working days x Number of shifts/day x Effective shift hours	Yearly handling by one Excavator (t) (I)=(G x H)	Maximum handling of the material by this machine during the block period (t) (J)	Number of excavator machines required (K) = (J / I)	Standby excavator (L)
1	Ex300	1.70	0.9	0.85	2.50	0.85	0.85	60	140.94	1506	212255.64	700000.00	3.30	1
2	Ex300	1.70	0.9	0.85	2.00	0.85	0.85	30	225.51	1506	339618.06	1463100.00	4.31	1

4A.4.3: Dumper Requirement

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Effective Shift Time	6 hrs	00 mins

SI.No.	Total Hours=Number of working days (W)x Number of shifts/day x Effective shift hours (Machine Requirement Summary) (A)	Capacity of Dumpers (t) (B)	Speed of the dumper (KMPH) (i)	Lead Distance (KM) (ii)	Time taken to cover distance in minutes(iii) =(ii/i) x 60	Queuing, Loading Time at Shovel (min) (iv)	Queuing, Unloading Time during unloading (min) (v)	Total Time to complete one trip(vi) = (iii + iv + v)	No. of Trips / hr = (60 / vi)	Total transportation per hour =(B X vii)	Yearly handling by one dumper (ix) = A x TPH	Maximum handling of the material by this machine during the block period (t) (x)	Number of dumpers will be (xi) =(x / ix)	Plus Standby dumper (xii)
1	1506	20.00	10.00	3.00	18.00	3.00	3.00	24.00	2	50	75300.00	2163100.00	29	5

Approved

4A.4.4: Drill Machine Requirement

Effective Shift Time	6 hrs	00 mins

SI.No.	Type of Drill	Depth of Hole(including Sub-grade Drilling (m)	Spacing (m)	Burden (m)	Bulk Density of Waste (t/m^3)	Bulk Density of Mineral (t/m^3)	Yield per Hole (t)	Yield per Meter (t/m) = Yield per Hole (t)/Depth of Hole(including Sub-grade Drilling (m))	Annual Target Known (t)	Drilling Requirement per Day (m) = (Annual Target Known (t) / Yield per Meter (t/m))/Number of Average Working Days in	Drilling Requirement per Shift(m)	Rate of Drilling per Hours (m/hr) = Drilling Requirement per Shift(m)/Effective Shift Time	Required No. of drills (m/c) = Required rate of drilling in meters per hr./ Actual rate of drilling in meters per hr of the machine deployed	Stand by Drill

										One Year (A)				
1	Nil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0

4A.4.5: Machine Deployment Details

4A.4.5.1: Excavator & Loading Equipment

SI.No.	Type	Make	Capacity (m^3)	No. of Equipments
1	Excavator	Cabelco	1.70	11
2	Wheel Loader	Volvo	1.70	7

4A.4.5.2: Dozers Details

SI.No.	Type	Make	Capacity (hp)	No. of Equipments
1	Hydraulic	Cat	325.00	5

4A.4.5.3: Drilling Details

SI.No.	Type	Make	Capacity (t)	Diameter of Hole(mm)
1	0	0	0.00	Nil

4A.5 Blasting Requirement

4A.5.1: Blasting & Explosive Requirement in Waste/Development

SI.No.	Drill Pattern / Spacing of Holes (m)	Burden of Holes (m)	Number of Rows / Rings	Yield per Holes in Waste (m^3)	Frequency of Blasting in a Week	Maximum Number of Holes Blasted in a Round	Charge per Hole (kg)	Charge per Round (kg)	Explosive Requirement Per Month in Development (kg)	Powder Factor in Development / Waste (t/kg)	Depth Of Hole

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1	0	0	0	0	0	0	00	0	0	0	0

4A.5.2: Blasting & Explosive Requirement in Mineral / Ore

Type of Explosive	Type of Explosives used / to be Used
NIL	Aluminised Slurry Explosives (Large Diameter)

SI.No.	Total ROM proposed to be handled in CUM/annum	Total ROM proposed to be handled in CUM/day	Spacing of Holes (m)	Burden of Holes (m)	Number of Rows	Yield per Holes in ROM Zone (m^3)	Frequency of Blasting in a Week	Maximum Number of Holes Blasted in a Round	No of Holes Required to be Blasted per Round	Charge per Hole (kg)	Charge per Round (kg)	Explosive Requirement Per Month for ROM Zone Blasting (kg)	Powder Factor in Ore (t/kg)	Pop Shooting (no of Boulders)	Plaster Shooting (no of Boulders)	Use of Rockbreaker	Capacity	Secondary Blasting Requirements	Depth Of Hole
1	0	0	0	0	Nil	0	0	0	0	0	0	0	0	0	0	Nil	0	0	0

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4A.6: Man Power Deployment

4A.6.1: Managerial

SI.No.	Particular	Number of Persons in Shift 1	Number of Persons in Shift 2	Number of Persons in Shift 3	Number of Persons in General Shift	Total No. of Persons per day
1	1st Class	0	0	0	1	1
2	Mining Engineer	0	0	0	5	5
3	Geologist	0	0	0	2	2
4	other	0	0	0	2	2

4A.6.2: Supervisory

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SI.No.	Particular	Number of Persons in Shift 1	Number of Persons in Shift 2	Number of Persons in Shift 3	Number of Persons in General Shift	Total No. of Persons per day
1	Foreman	0	0	0	8	8
2	Mine-mate	0	0	0	4	4
3	other	0	0	0	1	1
4	other	0	0	0	1	1

4A.6.3: Skilled Workers / Operators

SI.No.	Particular	Number of Persons in Shift 1	Number of Persons in Shift 2	Number of Persons in Shift 3	Number of Persons in General Shift	Total No. of Persons per day
1	Dozer/Grader Operator	0	0	0	8	8
2	Dumper Operator	0	0	0	30	30
3	Operator	0	0	0	21	21
4	Technician	0	0	0	7	7
5	Other	0	0	0	2	2

4A.6.4: Semi-skilled Workers

SI.No.	Number of Persons in Shift 1	Number of Persons in Shift 2	Number of Persons in Shift 3	Number of Persons in General Shift	Total No. of Persons per day
1	0	0	0	10	10

4A.6.5: Unskilled Workers

SI.No.	Number of Persons in Shift 1	Number of Persons in Shift 2	Number of Persons in Shift 3	Number of Persons in General Shift	Total No. of Persons per day
1	0	0	0	30	30

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4A.6.6: Others Specify

SI.No.	Particular	Number of Persons in Shift 1	Number of Persons in Shift 2	Number of Persons in Shift 3	Number of Persons in General Shift	Total No. of Persons per day
1	Nil	0	0	0	0	0

4A.6.7: No of Persons Engaged Per Day

SI.No.	Number of Persons in Shift 1	Number of Persons in Shift 2	Number of Persons in Shift 3	Number of Persons in General Shift	Total No. of Persons per day
1	0	0	0	132	132

No of Shifts per Day ((A) = Machine Requirement Summary (B))	1
Average Daily Employment per Shift ((B) = (Total Number of Person per Day) / (A))	132
Material to be Handled per Shift ((C) = Machine Requirement Summary (E))	8617

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4A.6.8: Supervision

SI.No.	Particular	Qualification	Requirement / Proposed	In Position / Existing Strength	(Requirement / Proposed) - (In Position / Existing Strength) = (-) Shortage / (+) Excess	Remarks
1	Mines Manager	B E Mining	1	0	1	1st Class
2	Assistant Manager	B E Mining	5	0	5	2nd Class
3	Geologist	M.Sc Geology	2	0	2	Nil
4	Mine Foreman	Foreman Certificate	8	0	8	Nil
5	Mining Mate	Mines Mate Certificate	4	0	4	Nil
6	Others Specify	Electrical Engineer	1	0	1	Nil
7	Others Specify	Mechanical Engineer	1	0	1	Nil

4A.7: Waste Management

4A.7.1: Existing Dump

SI.No.	Year	Dump Id	Type of Dump	Proposed Area (ha)	Height (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Total Dump Quantity (m^3)	Existing Dump Location
						From	To	From	To		
1	Nil	Nil	Nil	0.00	0.00	Nil	Nil	Nil	Nil	0.00	0

4A.7.2: New Dump

SI.No.	Year	Dump Id	Type of Dump	Proposed Area (ha)	Height (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Total Dump Quantity (m^3)	New Dump Location
						From	To	From	To		
1	Year1	Backfilling (Pit No.1)	Waste	3.36	40.00	15:35:58.39	15:36:05.24	73:54:17.00	73:54:30.15	145680.00	0
2	Year2	Backfilling (Pit No.1)	Waste	1.77	10.00	15:35:58.22	15:36:02.22	73:54:19.48	73:54:27.49	106300.00	Nil
3	Year3	Backfilling (Pit No.1)	Waste	6.58	30.00	15:36:03.78	15:36:10.11	73:54:08.46	73:54:23.74	731550.00	Nil
4	Year4	Backfilling (Pit No.1)	Waste	3.50	10.00	15:36:03.00	15:36:10.16	73:54:11.58	73:54:18.03	234250.00	Nil
5	Year5	Backfilling (Pit No.1)	Waste	5.73	10.00	15:36:03.10	15:36:10.37	73:54:10.89	73:54:22.95	244900.00	Nil

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4A.7.3: Existing Stack

SI.No.	Year	Stack ID	Type of Stack	Proposed Area (ha)	Height (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Total Stack Quantity (m^3)	Existing Stack Location
						From	To	From	To		
1	Year1	Stack-1	Stack for mineral	1.55	12.00	15:35:49.74	15:35:53.56	73:54:15.65	73:54:11.44	153389.83	Nil
2	Year2	Stack-1	Stack for mineral	1.55	12.00	15:35:49.74	15:35:53.56	73:54:15.65	73:54:11.44	189669.42	Nil

3	Year3	Stack-1	Stack for mineral	1.55	12.00	15:35:49.74	15:35:53.56	73:54:15.65	73:54:11.44	181124.50	Nil
4	Year4	Stack-1	Stack for mineral	1.55	12.00	15:35:49.74	15:35:53.56	73:54:15.65	73:54:11.44	242975.21	Nil
5	Year5	Stack-1	Stack for mineral	1.55	12.00	15:35:49.74	15:35:53.56	73:54:15.65	73:54:11.44	309836.10	Nil

4A.7.4: New Stack

SI.No.	Year	Stack ID	Type of Stack	Proposed Area (ha)	Height (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Total Stack Quantity (m^3)	New Stack Location
						From	To	From	To		
1	Year1	Stack-2	Stack for mineral	0.55	5.00	15:35:56.25	15:35:58.71	73:54:05.80	73:54:10.36	50000.00	Nil
2	Year2	Stack-2	Stack for mineral	0.55	5.00	15:35:56.25	15:35:58.71	73:54:05.80	73:54:10.36	50000.00	Nil
3	Year3	Stack-2	Stack for mineral	0.55	5.00	15:35:56.25	15:35:58.71	73:54:05.80	73:54:10.36	50000.00	Nil
4	Year3	Stack-3	Stack for mineral	0.65	5.00	15:35:33.13	15:35:35.89	73:54:09.86	73:54:06.33	50000.00	Nil
5	Year4	Stack-2	Stack for mineral	0.55	5.00	15:35:56.25	15:35:58.71	73:54:05.80	73:54:10.36	50000.00	Nil
6	Year4	Stack-3	Stack for mineral	0.65	5.00	15:35:33.13	15:35:35.89	73:54:09.86	73:54:06.33	50000.00	Nil
7	Year5	Stack-2	Stack for mineral	0.55	5.00	15:35:56.25	15:35:58.71	73:54:05.80	73:54:10.36	50000.00	Nil
8	Year5	Stack-3	Stack for mineral	0.65	5.00	15:35:33.13	15:35:35.89	73:54:09.86	73:54:06.33	50000.00	Nil

4A.8: Mineral Waste Handling To Utilize As Minor Mineral

SI.No.	Year	Dump ID	Type of Dump	Proposed Area (ha)	Quantity Handled (t)	Quantity Recovered (t)	Name Of Minor Mineral	Alternative Waste Utilization (m^3)

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1	Nil	Nil	Nil	0.00	0.00	0.00	nil	0.00

4A.9: Use of Minerals

SI.No.	Proposed Use Of Mineral	Name Of Mineral	Relevant Use Of Mineral	Physical Specifications	Chemical Specifications
1	Direct Selling	IRON ORE	Domestic Steel Industry	+40 to-10 Lumps -10mm Fines	Fe: 52.4, SiO2: 8.4, Al2O3: 4.85, P: 0.03, S: 0.02, Mn: 0.87
2	Direct Selling	IRON ORE	Export	+40 to-10 Lumps -10mm Fines	Fe: 52.4, SiO2: 8.4, Al2O3: 4.85, P: 0.03, S: 0.02, Mn: 0.87

* Choose among these:

1. Captive use in own industry

2. Direct Selling

3. Selling Post-Beneficiation /Up-gradation

*Select more than one, if applicable

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Chapter 4 B : Mining Operations UG : NA

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Chapter 5: Sustainable Mining

5.1: Sustainable Mining and SDF Implementations in Compliance of Rule 35 of MCDR'2017

Sustainable Mining and SDF implementation will be carried out in accordance with Rule 35 of MCDR'2017. SDU unit will be formed at mine level after stating of the mining operations. Efforts will be made to fully comply with implementation of environmental protection, CSR & welfare activities in the peripheral area of the mineral block area. On starting of the mining operations, The self-assessment report will be regularly submitted online.

(Total 200 characters)

Compliance of Vishakha Committee Guidelines for prevention of women harassment at workplace	Not Applicable

5.2: CSR INITIATIVES

5.2.1: Year1

Details of Work Proposed during the Year / Measures Planned for the Affected Segment	Cumulative Work done / Measures Taken
5.2.1.1: Area to be Developed for Recreation	
Area (Ha)	Area (Ha)
0.00	Nil

5.2.1.2: Area for Water Storage & Recharge Facility	
Area (Ha)	Area (Ha)
0.59	Nil

5.2.1.3: Efforts Made towards Housing for Local Communities	
Number of Houses	Number of Houses
0	Nil

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5.2.1.4: Efforts Made towards Providing Transport to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
0	Nil

5.2.1.5: Efforts Made towards Providing Healthcare to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
15	Nil

5.2.1.6: Efforts Made towards Providing Hygiene & Sanitation to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
15	Nil

5.2.1.7: Efforts Made towards Skill Development Programs to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
15	Nil

5.2.1.8: Efforts Made to Promote Education & Knowledge Based Initiatives	
Number of Beneficiaries	Number of Beneficiaries
15	Nil

5.2.1.9: Communication Facilities Provided to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
0	Nil

5.2.1.10: Any Other Steps Taken for Improving the Socio-Economic Standard of Local Communities	
Number of Beneficiaries	Number of Beneficiaries
0	Nil

5.2.1.11: Adoption of ODF		
Number of Toilets Built inside the Lease Area	Number of Toilets Built outside the Lease Area:	Number of Beneficiaries
4	Nil	132

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5.2.1.12: Awareness Program among Mine Workers for Swatchata	
Number of Swatchata Programmes Proposed	Number of Swatchata Programmes Held
2	Nil

5.2.1.13: Efforts for green energy	
Total energy consumption (KWh)	Green energy consumption (% of total)
15.00	10.00

5.2.1.14: Water & recycled use	
Total water consumption (KLD)	Water recycled (% of total)
220.00	0.00

5.2.2: Year2

Details of Work Proposed during the Year / Measures Planned for the Affected Segment	Cumulative Work done / Measures Taken
5.2.2.1: Area to be Developed for Recreation	
Area (Ha)	Area (Ha)
0.00	0.00

5.2.2.2: Area for Water Storage & Recharge Facility	
Area (Ha)	Area (Ha)
0.59	0.59

5.2.2.3: Efforts Made towards Housing for Local Communities	
Number of Houses	Number of Houses
0	0

5.2.2.4: Efforts Made towards Providing Transport to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
0	0

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5.2.2.5: Efforts Made towards Providing Healthcare to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
15	15

5.2.2.6: Efforts Made towards Providing Hygiene & Sanitation to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
15	15

5.2.2.7: Efforts Made towards Skill Development Programs to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
15	15

5.2.2.8: Efforts Made to Promote Education & Knowledge Based Initiatives	
Number of Beneficiaries	Number of Beneficiaries
15	15

5.2.2.9: Communication Facilities Provided to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
0	0

5.2.2.10: Any Other Steps Taken for Improving the Socio-Economic Standard of Local Communities	
Number of Beneficiaries	Number of Beneficiaries
0	0

5.2.2.11: Adoption of ODF		
Number of Toilets Built inside the Lease Area	Number of Toilets Built outside the Lease Area:	Number of Beneficiaries
4	0	132

5.2.2.12: Awareness Program among Mine Workers for Swatchata	
Number of Swatchata Programmes Proposed	Number of Swatchata Programmes Held
2	2

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5.2.2.13: Efforts for green energy	
Total energy consumption (KWh)	Green energy consumption (% of total)
15.00	10.00

5.2.2.14: Water & recycled use	
Total water consumption (KLD)	Water recycled (% of total)
220.00	0.00

5.2.3: Year3

Details of Work Proposed during the Year / Measures Planned for the Affected Segment	Cumulative Work done / Measures Taken
5.2.3.1: Area to be Developed for Recreation	
Area (Ha)	Area (Ha)
0.00	0.00

5.2.3.2: Area for Water Storage & Recharge Facility	
Area (Ha)	Area (Ha)
0.59	1.18

5.2.3.3: Efforts Made towards Housing for Local Communities	
Number of Houses	Number of Houses
0	0

5.2.3.4: Efforts Made towards Providing Transport to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
0	0

5.2.3.5: Efforts Made towards Providing Healthcare to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
15	30

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5.2.3.6: Efforts Made towards Providing Hygiene & Sanitation to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
15	30

5.2.3.7: Efforts Made towards Skill Development Programs to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
15	30

5.2.3.8: Efforts Made to Promote Education & Knowledge Based Initiatives	
Number of Beneficiaries	Number of Beneficiaries
15	30

5.2.3.9: Communication Facilities Provided to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
0	0

5.2.3.10: Any Other Steps Taken for Improving the Socio-Economic Standard of Local Communities	
Number of Beneficiaries	Number of Beneficiaries
0	0

5.2.3.11: Adoption of ODF		
Number of Toilets Built inside the Lease Area	Number of Toilets Built outside the Lease Area:	Number of Beneficiaries
4	0	132

5.2.3.12: Awareness Program among Mine Workers for Swatchata	
Number of Swatchata Programmes Proposed	Number of Swatchata Programmes Held
2	4

5.2.3.13: Efforts for green energy	
Total energy consumption (KWh)	Green energy consumption (% of total)
15.00	10.00

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5.2.3.14: Water & recycled use	
Total water consumption (KLD)	Water recycled (% of total)
220.00	0.00

5.2.4: Year4

Details of Work Proposed during the Year / Measures Planned for the Affected Segment	Cumulative Work done / Measures Taken
5.2.4.1: Area to be Developed for Recreation	
Area (Ha)	Area (Ha)
0.00	0.00

5.2.4.2: Area for Water Storage & Recharge Facility	
Area (Ha)	Area (Ha)
0.59	1.76

5.2.4.3: Efforts Made towards Housing for Local Communities	
Number of Houses	Number of Houses
0	0

5.2.4.4: Efforts Made towards Providing Transport to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
0	0

5.2.4.5: Efforts Made towards Providing Healthcare to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
15	45

5.2.4.6: Efforts Made towards Providing Hygiene & Sanitation to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
15	45

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5.2.4.7: Efforts Made towards Skill Development Programs to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
15	45

5.2.4.8: Efforts Made to Promote Education & Knowledge Based Initiatives	
Number of Beneficiaries	Number of Beneficiaries
15	45

5.2.4.9: Communication Facilities Provided to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
0	0

5.2.4.10: Any Other Steps Taken for Improving the Socio-Economic Standard of Local Communities	
Number of Beneficiaries	Number of Beneficiaries
0	0

5.2.4.11: Adoption of ODF		
Number of Toilets Built inside the Lease Area	Number of Toilets Built outside the Lease Area:	Number of Beneficiaries
4	0	132

5.2.4.12: Awareness Program among Mine Workers for Swatchata	
Number of Swatchata Programmes Proposed	Number of Swatchata Programmes Held
2	6

5.2.4.13: Efforts for green energy	
Total energy consumption (KWh)	Green energy consumption (% of total)
15.00	10.00

5.2.4.14: Water & recycled use	
Total water consumption (KLD)	Water recycled (% of total)
220.00	0.00

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5.2.5: Year5

Details of Work Proposed during the Year / Measures Planned for the Affected Segment	Cumulative Work done / Measures Taken
5.2.5.1: Area to be Developed for Recreation	
Area (Ha)	Area (Ha)
0.00	0.00

5.2.5.2: Area for Water Storage & Recharge Facility	
Area (Ha)	Area (Ha)
0.59	2.35

5.2.5.3: Efforts Made towards Housing for Local Communities	
Number of Houses	Number of Houses
0	0

5.2.5.4: Efforts Made towards Providing Transport to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
0	0

5.2.5.5: Efforts Made towards Providing Healthcare to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
15	60

5.2.5.6: Efforts Made towards Providing Hygiene & Sanitation to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
15	60

5.2.5.7: Efforts Made towards Skill Development Programs to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
15	60

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5.2.5.8: Efforts Made to Promote Education & Knowledge Based Initiatives	
Number of Beneficiaries	Number of Beneficiaries
15	60

5.2.5.9: Communication Facilities Provided to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
0	0

5.2.5.10: Any Other Steps Taken for Improving the Socio-Economic Standard of Local Communities	
Number of Beneficiaries	Number of Beneficiaries
0	0

5.2.5.11: Adoption of ODF		
Number of Toilets Built inside the Lease Area	Number of Toilets Built outside the Lease Area:	Number of Beneficiaries
4	0	132

5.2.5.12: Awareness Program among Mine Workers for Swatchata	
Number of Swatchata Programmes Proposed	Number of Swatchata Programmes Held
2	8

5.2.5.13: Efforts for green energy	
Total energy consumption (KWh)	Green energy consumption (% of total)
15.00	10.00

5.2.5.14: Water & recycled use	
Total water consumption (KLD)	Water recycled (% of total)
220.00	0.00

5.3: Rehabilitation & Resettlement of Affected Persons

Particular	Year1	Year2	Year3	Year4	Year5

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Proposed Number of Project Affected Persons(PAP)	0	0	0	0	0
Proposed Number of Person for Alternate Arrangement for Sustainable Livelihood	0	0	0	0	0
Proposed Number of Person for Skill Training	0	0	0	0	0
Proposed Number of Person Likely to get Direct Employment	0	0	0	0	0
Proposed Number of Person Likely to get Indirect Employment	0	0	0	0	0
Proposed Project Affected Families Skilled and Absorbed	0	0	0	0	0
Proposed Number of Project Affected Families	0	0	0	0	0

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Chapter 6: Progressive Mine Closure Plan

6.1: Status of Land

Total Area Degraded					Total mined out area Reclaimed and Rehabilitated			Other Areas Reclaimed and Rehabilitated	
Total area under excavation in the lease		Area under Dumps(in hect)	Area under utility services(in hect)	Area under Stack yards(in hect)	Mined out Area Reclaimed but not rehabilitated(in hect)	Mined outArea fully Rehabilitated from Reclaimed area(in hect)	Area under Water Reservoir considered Rehabilitated (in hect)	Stabililized Waste dump Rehabilitated (in hect)	Virgin area under Green Belt (in hect)
Area under mining operation	Mined Out area in the lease								
81.70	0.00	22.19	21.91	1.55	17.31	0.00	0.00	0.00	25.19

6.2: Progressive Reclamation and Rehabilitation Plan

6.2.1: Backfilling

Quantity of Waste / Fill Material Available at Site (m^3)	1462680.00
Availability of Top Soil for Spreading (m^3)	0.00
Proposed Spread Area (m^2)	117100.00

6.2.1.1: Year Wise Proposal

SI.No	Year	Pit ID	Area (m^2)	Top RL	Bottom RL	Estimated Expenditure (₹ INR)
1	Year1	Pit No 1	33600.00	45	5	2016000.00
2	Year2	Pit No 1	17700.00	45	35	1062000.00
3	Year3	Pit No 1	65800.00	-3	-33	3948000.00

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4	Year4	Pit No 1	35000.00	-3	-13	2100000.00
5	Year5	Pit No 1	57300.00	7	-3	3438000.00

6.2.2: Water Reservoir

Average Rainfall of The Area (mm)	3500.00
Proposed Area under Water Storage	0

6.2.2.1: Preparations For Ground Water Recharging

6.2.2.1.1: Drilling Holes	
Year	Proposed no of Holes to be Drilled
Year1	0.00
Year2	0.00
Year3	0.00
Year4	0.00
Year5	0.00

6.2.2.1.2:Preparation of Course Gravel Bed	
Year	Proposed Area of Bed (LxW)
Year1	0.00
Year2	0.00
Year3	0.00
Year4	0.00
Year5	0.00

Please specify, if others
Nil

Approved

6.2.2.2: Protective measures (Please specify running meter)

6.2.2.2.1: Fencing

Year	Proposed Fencing Length (m)	Latitude(dd:mm:ss.ss)		Longitude(dd:mm:ss.ss)	
		From	To	From	To
Year1	457	15:36:07.14	15:36:11.93	73:54:02.02	73:54:14.32
Year2	0	Nil	Nil	Nil	Nil
Year3	0	Nil	Nil	Nil	Nil
Year4	0	Nil	Nil	Nil	Nil
Year5	0	Nil	Nil	Nil	Nil

6.2.2.2.2: Retaining Wall

Year	Proposed Wall Length (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
		From	To	From	To
Year1	195	15:35:36.67	15:35:42.34	73:54:15.28	73:54:15.46
Year2	0	Nil	Nil	Nil	Nil
Year3	0	Nil	Nil	Nil	Nil
Year4	0	Nil	Nil	Nil	Nil
Year5	0	Nil	Nil	Nil	Nil

6.2.2.2.3: Garland Drains

Year	Proposed Bund Length (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
		From	To	From	To
Year1	585	15:36:00.36	15:36:01.39	73:54:16.97	73:54:25.16
Year2	585	15:35:59.95	15:36:02.19	73:54:17.77	73:54:27.19
Year3	415	15:35:59.25	15:36:00.39	73:54:17.91	73:54:30.24
Year4	0	Nil	Nil	Nil	Nil

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Year5	0	Nil	Nil	Nil	Nil

6.2.3: Green Belt Development

6.2.3.1: Cumulative work done (upto end of previous block of five years)

SI.No	Total Expenditure Incurred up to Last Year (INR)	Area Covered (Ha)	Number of Plants	Survival Rate (%)
1	0.00	0.00	Nil	0.00

6.2.3.2: Year Wise Proposal

SI.No	Year	Green Belt Location (s)	Area Proposed to be Covered (Ha)	Number of Plants Proposed	Expected Survival Rate (%)	Estimated Expenditure (₹ INR)
1	Year1	No proposals	0.00	Nil	0	0
2	Year2	Backfilling	1.41	2100	70	210000
3	Year3	Backfilling	2.00	3000	70	300000
4	Year4	Backfilling	1.00	1500	70	150000
5	Year5	Backfilling	1.00	1500	70	150000

Approved

6.2.4: Use of Shallow Pits

6.2.4.1: Cumulative Work Done (upto end of previous block of five years)

SI.No	Pit ID	Work Done	Area covered (m^2)	Total Expenditure Incurred (up to last five year block) (₹ INR)
1	Nil	Nil	0.00	0.00

6.2.4.2: Year Wise Proposal

SI.No	Year	Pit ID	Total Area(Ha)	Area Proposed for Crops (Ha)	Suitable Crops	Area Proposed for Grass (Ha)	Total Proposed Expenditure (₹ INR)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Remarks
								From	To	From	To	
1	Nil	Nil	0.00	0.00	0	0.00	0.00	Nil	Nil	Nil	Nil	0

6.2.5: Pisciculture

6.2.5.1: Total Expenditure incurred as on Date (INR)	0

6.2.5.2: Cumulative work done as on Date

SI.No	Pit ID	Area (m^2)	Expenditure (₹ INR)
1	Nil	0.00	0.00

6.2.5.3: Year Wise Proposal

SI.No	Year	Pit ID	Area (m^2)	Estimated Expenditure (₹ INR)
1	Nil	Nil	0.00	0.00

6.2.5.4: Source of Water for Pisciculture	Nil

6.2.5.5: Whether the quality of water has been assessed & found to be suitable for Pisciculture	No

6.2.6: Recreational Facility

6.2.6.1: Total Expenditure Incurred (up to last five year block) (INR)	0.00

6.2.6.2: Cumulative work done as on Date

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SI.No	Pit ID	Area (m^2)	Expenditure (₹ INR)
1	Nil	0.00	0.00

6.2.6.3: Year Wise Proposal

SI.No	Year	Type of Recreational Facility	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Estimated Expenditure (INR)
				From	To	From	To	
1	Year1	Nil	0.00	Nil	Nil	Nil	Nil	Nil
2	Year2	Nil	0.00	Nil	Nil	Nil	Nil	Nil
3	Year3	Nil	0.00	Nil	Nil	Nil	Nil	Nil
4	Year4	Nil	0.00	Nil	Nil	Nil	Nil	Nil
5	Year5	Nil	0.00	Nil	Nil	Nil	Nil	Nil

6.2.7: Dump Area Stabilization & Development

SI.No	Year	Dump ID	No of Terraces	Average Height of Terraces (m)	Length of Toe Wall (m)	Length of Garland Drain (m)	Area Stabilized (Ha)	Method of Stabilization	Estimated Expenditure (₹ INR)	No of Check Dams
1	Nil	Nil	0	0.00	0.00	0.00	0.00	0	0.00	Nil

6.2.8: Other Form of Reclaiming the Area

6.2.8.1: Cumulative work done as on Date

SI.No	Total Expenditure incurred as on Date (INR)	Work Done
1	0.00	Nil

6.2.8.2: Year Wise Proposal

Approved

SI.No	Year	Work Proposals	Estimated Expenditure (INR)
1	Year1	Nil	0.00
2	Year2	Nil	0.00
3	Year3	Nil	0.00
4	Year4	Nil	0.00
5	Year5	Nil	0.00

6.2.9: TopSoil Management

6.2.9.1: Cummulative Work Done as on Date

SI.No	Top Soil Generated (m^3)	Top Soil Utilized (m^3)	Topsoil Stored (m^3)	Total expenditure incurred as on date (₹)
1	0.00	0.00	0.00	0.00

Approved

6.2.9.2: Year Wise Proposal

SI.No	Year	Topsoil Generated (m^3) (A)	Topsoil Utilized (m^3) (B)	Topsoil Stored (m^3) (A-B)	Estimated Expenditure (INR)
1	Year1	0.00	0.00	0.00	0.00
2	Year2	0.00	0.00	0.00	0.00
3	Year3	0.00	0.00	0.00	0.00
4	Year4	0.00	0.00	0.00	0.00
5	Year5	0.00	0.00	0.00	0.00

6.2.10: Tailings Dam Management

SI.No	Year	Yearly generation	Total capacity of	Measures Proposed	Yearly Utilization	Disposal of Tailing	Tailing Dam Design	Structural Stability

		of Tailing (m^3) (A)	Tailing Pond (m^3)	for Periodic Desilting	of Tailing (m^3) (B)	to Tailing Pond (m^3) (A-B)		Studies
1	Year1	0.00	0.00	0	0.00	0.00	Nil	Nil
2	Year2	0.00	0.00	0	0.00	0.00	Nil	Nil
3	Year3	0.00	0.00	0	0.00	0.00	Nil	Nil
4	Year4	0.00	0.00	0	0.00	0.00	Nil	Nil
5	Year5	0.00	0.00	0	0.00	0.00	Nil	Nil

6.2.11: Land Use of Lease Area at the Expiry of Lease Period

Total Area Degraded				Non Degraded area	Total mined out area Reclaimed and Rehabilitated			Other Areas Reclaimed and Rehabilitated			
Mined Out area in the lease	Area under Dumps(in hect)	Area under the Tailing Dam	Area under utility services(in hect)	Area undistur bed/virgin	Mined out Area Reclaimed but not rehabilitated(in hect)	Mined outArea fully Rehabilitated from Reclaimed area(in hect)	Area under Water Reservoir considered Rehabilitated (in hect)	Stabililized Waste dump Rehabilitated (in hect)	Virgin area under Green Belt (in hect)	Rehabilitated Area under utility services(in hect)	Rehabilitated Area under Tailing dam (in hect)
106.65	21.78	0.00	2.35	21.15	0.00	92.10	14.55	21.78	21.15	0.86	0.00

Approved

Chapter 7: Financial Assurance/ Performance Surety (AREA PUT TO USE)

Year1

Consolidated View of Financial Assurance

SI.No	Particular	Area put to use at Start of Year (ha) (A)	Additional Requirement (ha) (B)	Total (ha) (C = A + B)
1	Area under Mining	81.70	0.00	81.70
2	Topsoil stacking	0.00	0.00	0.00
3	Overburden/Waste Dumping	22.19	0.00	22.19
4	Mineral Storage	1.55	0.55	2.10
5	Infrastructure (Workshop, Administrative Building etc.)	0.27	0.00	0.27
6	Roads	4.55	0.00	4.55
7	Railway	0.00	0.00	0.00
8	Tailing Pond	0.00	0.00	0.00
9	Effluent Treatment Plant	0.00	0.00	0.00
10	Mineral Separation Plant	0.00	0.00	0.00
11	Township Area	0.00	0.00	0.00
12	Others to specify	17.09	0.00	17.09
	Total	127.35	0.55	127.90

Approved

Year2

Consolidated View of Financial Assurance

SI.No	Particular	Area put to use at Start of Year (ha) (A)	Additional Requirement (ha) (B)	Total (ha) (C = A + B)
1	Area under Mining	81.70	0.00	81.70
2	Topsoil stacking	0.00	0.00	0.00
3	Overburden/Waste Dumping	22.19	0.00	22.19
4	Mineral Storage	2.10	0.00	2.10
5	Infrastructure (Workshop, Administrative Building etc.)	0.27	0.00	0.27
6	Roads	4.55	0.00	4.55
7	Railway	0.00	0.00	0.00
8	Tailing Pond	0.00	0.00	0.00
9	Effluent Treatment Plant	0.00	0.00	0.00
10	Mineral Separation Plant	0.00	0.00	0.00
11	Township Area	0.00	0.00	0.00
12	Others to specify	17.09	0.00	17.09
	Total	127.90	0.00	127.90

Approved

Year3

Consolidated View of Financial Assurance

SI.No	Particular	Area put to use at Start of Year (ha) (A)	Additional Requirement (ha) (B)	Total (ha) (C = A + B)
1	Area under Mining	81.70	0.44	82.14
2	Topsoil stacking	0.00	0.00	0.00
3	Overburden/Waste Dumping	22.19	-0.21	21.98
4	Mineral Storage	2.10	0.00	2.10
5	Infrastructure (Workshop, Administrative Building etc.)	0.27	0.00	0.27

6	Roads	4.55	0.00	4.55
7	Railway	0.00	0.00	0.00
8	Tailing Pond	0.00	0.00	0.00
9	Effluent Treatment Plant	0.00	0.00	0.00
10	Mineral Separation Plant	0.00	0.00	0.00
11	Township Area	0.00	0.00	0.00
12	Others to specify	17.09	-0.23	16.86
	Total	127.90	0.00	127.90

Year4

Consolidated View of Financial Assurance

SI.No	Particular	Area put to use at Start of Year (ha) (A)	Additional Requirement (ha) (B)	Total (ha) (C = A + B)
1	Area under Mining	82.14	0.26	82.40
2	Topsoil stacking	0.00	0.00	0.00
3	Overburden/Waste Dumping	21.98	-0.09	21.89
4	Mineral Storage	2.10	0.00	2.10
5	Infrastructure (Workshop, Administrative Building etc.)	0.27	0.00	0.27
6	Roads	4.55	0.00	4.55
7	Railway	0.00	0.00	0.00
8	Tailing Pond	0.00	0.00	0.00
9	Effluent Treatment Plant	0.00	0.00	0.00
10	Mineral Separation Plant	0.00	0.00	0.00
11	Township Area	0.00	0.00	0.00
12	Others to specify	16.86	-0.17	16.69
	Total	127.90	0.00	127.90

Approved

Year5

Consolidated View of Financial Assurance

SI.No	Particular	Area put to use at Start of Year (ha) (A)	Additional Requirement (ha) (B)	Total (ha) (C = A + B)
1	Area under Mining	82.40	0.58	82.98
2	Topsoil stacking	0.00	0.00	0.00
3	Overburden/Waste Dumping	21.89	-0.10	21.79
4	Mineral Storage	2.10	0.00	2.10
5	Infrastructure (Workshop, Administrative Building etc.)	0.27	0.00	0.27
6	Roads	4.55	0.00	4.55
7	Railway	0.00	0.00	0.00
8	Tailing Pond	0.00	0.00	0.00
9	Effluent Treatment Plant	0.00	0.00	0.00
10	Mineral Separation Plant	0.00	0.00	0.00
11	Township Area	0.00	0.00	0.00
12	Others to specify	16.69	-0.06	16.63
	Total	127.90	0.42	128.32
	Grand Total			128.32

Performance Surety

(b) Performance Surety

Lease Category (A/B)	Total Resources in Tonnes For Calculations of Performnce Surety	Existing Performnce Surety in Rs	Valid Till (dd/mm/yyyy)	Upload Copy Of Existing Performance Surety as Attachment
Category A	24828397	75444823.00	Nil	Upfront_Amount_Payment_slip.pdf

Approved

1349

Approved

Chapter 8 : Review of previous proposals during the last plan period (NA)

Approved

Chapter 9: Impact Assessment(for fresh grant)

9.1 : Baseline Information

Whether Area falls under Forest	No
Whether Area falls under Wildlife Sanctuary	No
Whether Area falls under Coastal Regulation Zone (CRZ)	No
Whether Area falls under Defence Land	No
Any Other Clearance (specify)	No

Any Significant Objections from any Agency Involved in Stakeholder's Consultation.

No

(Total 500 characters)

Approved

9.2: Environment Parameters

9.2.1: Environment Monitoring

Monitoring Activity

9.2.1.1: Ambient Air Quality

Core Zone (Quarterly Monitoring Planned)	Yes

Buffer Zone (Quarterly Monitoring Planned)	Yes

9.2.1.2: Water Quality

Core Zone (Quarterly Monitoring Planned)	Yes
Buffer Zone (Quarterly Monitoring Planned)	Yes

9.2.1.3: Noise Level

Core Zone (Quarterly Monitoring Planned)	Yes
Buffer Zone (Quarterly Monitoring Planned)	Yes

Approved

9.3: Impact Assessment

9.3.2: Land Environment

9.3.2.1: BASE / PRESENT STATUS

Pre Mining Use	AREA (Ha)
Barren / Waste land with small bushes & shrubs	0.0000
Land under Agriculture / Crops	0.0000
Land covered with Plants	0.0000
Land under Grass Cover	0.0000
Land under Public Infrastructure / Utilities (water bodies, roads, railways, electric lines, telephone lines etc.)	11.8600

Land under Habitation	11.4000
Land under Monuments & places of Historical Importance	0.0000
Degraded by Pits & Excavation	81.7000
Degraded by Dumps & Material Staking	40.5000
Covered under Mine Infrastructure (plants, shades, buildings etc.)	0.2700
Land under Forest	0.0000
Historically, Culturally & Ecologically Important Places	0.0000
Any Other, please specify below	25.5200
Date of Observation	01/04/2023

Approved

9.3.2.2: ANTICIPATED IMPACT

Post Mining Use	AREA (Ha)
Degradation by Excavation	106.6544
Degradation by Dumps & Material Staking	21.7815
Covered under Plants, Shades & Buildings	11.3961
Covered by Roads & Approaches	0.8586
Any Other, please specify below	30.5566

9.3.2.3: MITIGATION MEASURES

9.3.2.3.1: Backfilling

The waste generated during the mining operations will be backfilled within the Sirigao mine pit

(Total 1000 characters)

9.3.2.3.2: Area proposed to be covered by Plantation in Backfilled Area

Plantation over the permanent backfilled area and along the Eastern boundary within the statutory barrier of 7.5m of the Mineral Block will be carried out. Every year about 1500 sampling will be planted

(Total 1000 characters)

9.3.2.3.3: Proposed Area under Agriculture

No Proposal

(Total 1000 characters)

9.3.2.3.4: Proposed Area to be converted to Grazing Land

No Proposal

(Total 1000 characters)

9.3.2.3.5: Ground Water Recharging

Rainwater from the mine face and broken-up area will be channelized into the mine pit during monsoon season. Mining pit developed during mining operations will act as a major storage pit where rainwater will be collected, which will act as a water recharging site also. Number of settling ponds at strategic locations will also facilitate in groundwater recharging. Detailed hydrogeological study is in process. Recommendation with respect to groundwater recharging will be followed.

(Total 1000 characters)

9.3.2.3.6: Green Belt Development

Green belt development will be carried out by way of plantation over the permanent backfilled area and gap filling in the stabilized dump within the statutory barrier of 7.5m of the Mineral Block. Every year about 1700 sampling will be planted covering a minimum area of about 1.0Ha. Per year. Care and maintenance will be done for maximum survival of saplings. The expected survival rate is about 80% per year.

(Total 1000 characters)

9.3.2.3.7: Agriculture

No Proposal

(Total 1000 characters)

Approved

9.3.3: Air Environment

9.3.3.1: Climate & Meteorology (Please provide average of 10 years)

Temperature (°C)	
Maximum	35.00
Minimum	25.00

Relative Humidity (%)	
85.00	

Average Rainfall (mm)	
99.99	

9.3.3.2: Air Quality Details for Base line Information / Present Status

S.N.	Station Name	Season	PM10 (µg/m3)	PM10 Excess (µg/m3)2	PM2.5 (µg/m3)	PM2.5 Excess (µg/m3)2	SO2 Value (µg/m3)	SO2 Excess (µg/m3)	NOX Value (µg/m3)	NOX Excess (µg/m3)	Date of Observation	Action
1	A1 Sirigao villageA1 Sirigao village	Autumn	55.0000	0.0000	27.0000	0.0000	10.0000	0.0000	11.0000	0.0000	04/11/2020	Within limits
2	A2 Maem village	Autumn	38.0000	0.0000	13.0000	0.0000	8.0000	0.0000	12.0000	0.0000	04/11/2020	Within limits
3	A3 Mulgao village	Autumn	45.0000	0.0000	29.0000	0.0000	11.0000	0.0000	12.0000	0.0000	04/11/2020	Within limits

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4	A4 Sircaim village	Autumn	49.0000	0.0000	31.0000	0.0000	13.0000	0.0000	15.0000	0.0000	04/11/2020	Within limits
5	A5 Calvim village	Autumn	63.0000	0.0000	39.0000	0.0000	14.0000	0.0000	19.0000	0.0000	04/11/2020	Within limits
6	A6, Sinquirem wada	Autumn	37.0000	0.0000	20.0000	0.0000	10.0000	0.0000	11.0000	0.0000	04/11/2020	Within limits
7	A7 Advalpal Village	Autumn	44.0000	0.0000	24.0000	0.0000	10.0000	0.0000	14.0000	0.0000	04/11/2020	Within limits
8	A8 Lamgao Village	Autumn	32.0000	0.0000	15.0000	0.0000	10.0000	0.0000	13.0000	0.0000	04/11/2020	Within limits

Approved

9.3.3.3: Impact Assessment & Mitigation Measures

9.3.3.3.1: Anticipated Impact

Give details on Prediction of fugitive dust emissions due to mining activities, crushing & cleaning plants, loading & unloading, transportation by rail, road or conveyor

Activities involved during mining operation will include ground preparation wherein ripping of hard laterite terrain by Ripper-Dozer followed by excavation of Ore/waste by Excavators. Further, Excavators will load such excavated ROM (Iron Ore) and waste in the dumpers. Dumpers will haul the ROM and waste by road within the Mineral Block to a predetermined stacking area. ROM will be transported out of the mineral block by road. The activities in the mining operations as explained above will generate fugitive dust during ripping and dozing, excavation, loading and unloading, and during transportation/ hauling of ore and waste.

(Total 1000 characters)

9.3.3.3.2: Mitigation Measure

Give details on measures to reduce the emissions of pollutants during mining, loading, unloading, transportation, drilling, blasting, crushing etc. to maintain the air quality

Drilling and blasting activities will not be carried out. Taking into consideration the major sources of fugitive dust generation, the following mitigating measures will be undertaken during the mining operations & will be continued until the conceptual period, to control fugitive dust emission:- 1) Water sprinkling on active working benches & also on transport haul roads. 2) Carriers of tipper carrying ROM out of the Mineral Block will be covered with tarpaulin to prevent dust from getting airborne. 3) Overloading of trucks will be avoided to prevent spillage of ore on the transport /haul route. 4) Regular maintenance of mining machineries will be done to keep a control over vehicular exhaust emissions. 5) Well maintained trucks will be engaged for transportation

of ore. 6) Trucks/ Dumpers used for transportation of ore having valid 'Pollution Under Control' certificate and having necessary permits under Central Motor Rule, 1989 and its further amendments, will be engaged. 7) A system will be maintained wherein the ore and waste hauling trucks within the mineral block will be allowed to ply only via designated routes and at controlled speed limits. 8) Development of green belt along the eastern block boundary, on the inactive waste dumps, around the infrastructure, wherever feasible, will be carried out. 9) Regular ambient air quality monitoring will be carried out in core and buffer zone to keep a check on the conformity of air quality to the norms laid down by CPCB. 10) Wheel washing system will be installed to clean the transport truck tyres before exiting the Mineral block.

(Total 1000 characters)

9.3.4: Water Environment

9.3.4.1: RAIN WATER

9.3.4.1.1: Base / Present Status

(Details of Rivers, Springs, Lakes, Reservoirs & Drains up to First Order in Study Area)

Activities involved during mining operation will include ground preparation wherein ripping of hard laterite terrain by Ripper Dozer followed by excavation of Ore waste by Excavators Further Excavators will load such excavated ROM Iron Ore and waste in the dumpers Dumpers will haul the ROM and waste by road within the Mineral Block to a predetermined stacking area ROM will be transported out of the mineral block by road The activities in the mining operations as explained above will generate fugitive dust during ripping and dozing excavation loading and unloading and during transportation hauling of ore and waste

(Total 1000 characters)

9.3.4.1.2: Anticipated Impact

(Impact on Surface Water Bodies / Groundwater Table Regime / Streams / Lake / Springs due to Mining, to be Assessed from Hydro-geological StudyGive details about impact on vegetation)

Drilling and blasting activities will not be carried out Taking into consideration the major sources of fugitive dust generation the following mitigating measures will be undertaken during the mining operations will be continued until the conceptual period to control fugitive dust emission 1 Water sprinkling on active working benches also on transport haul roads 2 Carriers of tipper carrying ROM out of the Mineral Block will be covered with tarpaulin to prevent dust from getting airborne 3 Overloading of trucks will be avoided to prevent spillage of ore on the transport haul route 4 Regular maintenance of mining machineries will be done to keep a control over vehicular exhaust emissions 5 Well maintained trucks will be engaged for transportation of ore 6 Trucks Dumpers used for transportation of ore having valid Pollution Under Control certificate and having necessary permits under Central Motor Rule 1989 and its further amendments will be engaged 7 A system will be maintained wherein the ore and waste hauling trucks within the mineral block will be allowed to ply only via designated routes and at controlled speed limits 8 Development of green belt along the eastern block boundary on the inactive waste dumps around the infrastructure wherever feasible will be carried out 9 Regular ambient air quality monitoring will be carried out in core and buffer zone to keep a check on the conformity of air quality to the norms laid down by CPCB 10 Wheel washing system will be installed to clean the transport truck tyres before exiting the Mineral block

(Total 1000 characters)

Approved

9.3.4.1.3: Mitigation Measure

(Possibilities of Rain Water Harvesting & Artificial Recharge with in the Mining Lease)

Annual average rainfall received in the area where Sirigao Mayem Mineral Block is located is about 3500 mm Rainwater from the face of the mine pit and from the broken up area within the Mineral Block will be channelized into the mining pit Sirigao Mayem Mineral Block is an Iron Ore mine granted through e auction process under the Mineral Auction Rule 2015 There exists two water logged mining pits within the mineral block and a one seasonal nallah that flows from the South East to North West of the Mineral Block is of first order Assonara River exists on the North side boundary of the Mineral Block at distance of 048 km and flows in the North to south direction its joins Madhai River

(Total 1000 characters)

9.3.4.2: WATER BODY

9.3.4.2.1: Base / Present Status

(Water Bodies Existing & Water Bodies likely to be created due to Mining Activities & their Water Holding Capacity)

There are no perennial water courses within the lease area. Minor seasonal water courses originate during monsoon, towards western and southern part of the lease area. These nallas flow further towards west outside the lease area, and join the corjuem creek. There are 2 old worked out pits within the Mineral Block which are waterlogged. During mining operations approximately 200 m3 per day for Dust suppression Green belt 10m3 per day Domestic 1m3 per day wheel washing system 10m3 per day will be utilized which will be sourced from the harvested rainwater in the mine pit Water for domestic purpose will be sourced through nearby well within the mineral block In order to carry out mining operation dewatering of mine pit will be carried out at a rate of 10000 m3 per day Waste water will not be generated from the mining operations The generated domestic waste water will be treated through septic tank and soak pit system.

(Total 1000 characters)

9.3.4.2.2: Anticipated Impact

(Ingress of Sea Water, Particularly for Mining Projects in Coastal Areas)

There are 2 old worked out pits within the Mineral Block mine which are waterlogged In order to carry out mining operations the mine pit needs to be dewatered. Dewatering at a rate of 10000 m3 per day will be carried out Detailed hydrogeological study is in progress

(Total 1000 characters)

9.3.4.2.3: Mitigation Measure

(Steps to Minimize Impact on Water Table if Mining Intercepts Groundwater Regime)

Construction of Check Dams Settling Tanks Retaining Walls etc with Design Site Features for Control of runoff Water pumped from the mine pit will be passed through a series of setting ponds to allow sedimentation of any silt before discharging from the Mineral Block Wherever necessary water will be treated to expedite the silt sedimentation rate Clean water will be discharged from the Mineral Block Water used in workshop and for wheel washing system will be recycled As there is no wet beneficiation plant within the Mineral Block tailings will not be generated

Approved

(Total 1000 characters)

9.3.4.3: Water Balance

9.3.4.3.1: Base / Present Status

(Water Balance (Withdrawal of Surface Water & Release of Mine Drainage Water) Water Requirement & Waste Water Generation from various Activities of Mine, Including Beneficiation)

Natural Perennial surface water bodies do not exist within the Mineral Block There are 2 old worked out pits within the Mineral Block which are waterlogged During mining operations approximately 200 m3 per day for Dust suppression Green belt 10m3 per day Domestic 1m3 per day wheel washing system 10m3 per day will be utilized which will be sourced from the harvested rainwater in the mine pit Water for domestic purpose will be sourced through nearby well within the mineral block In order to carry out mining operation dewatering of mine pit will be carried out at a rate of 10000 m3 per day Waste water will not be generated from the mining operations The generated domestic waste water will be treated through septic tank and soak pit system

(Total 1000 characters)

9.3.4.3.2: Anticipated Impact

(Impact of Water Drawl on Surface & Groundwater Resources Impact on Surface & Groundwater Quality due to Discharges from Mining, Tailings Pond, Workshop, Township, & Leach ate from Solid Waste Dumps etc)

There are 2 old worked out pits within the Mineral Block mine which are waterlogged In order to carry out mining operations the mine pit needs to be dewatered Dewatering at a rate of 10000 m3 per day will be carried out Detailed hydrogeological study is in progress

(Total 1000 characters)

9.3.4.3.3: Mitigation Measure

(Construction of Check Dams, Sedimentation Ponds, Settling Tanks, Retaining Walls etc. with Design & Site Features for Control of run-off Mine Water Treatment for Meeting the Prescribed Standard Waste Water Treatment for Township Sewage, Workshop(s), Tailing Pond Overflow etc)

Construction of Check Dams Settling Tanks Retaining Walls etc with Design Site Features for Control of runoff Water pumped from the mine pit will be passed through a series of setting ponds to allow sedimentation of any silt before discharging from the Mineral Block Wherever necessary water will be treated to expedite the silt sedimentation rate Clean water will be discharged from the Mineral Block Water used in workshop and for wheel washing system will be recycled As there is no wet beneficiation plant within the Mineral Block tailings will not be generated

(Total 1000 characters)

9.3.5: Noise

9.3.5.1: Critical Locations Identified within Lease Area

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The noise level monitored as per IS 9989 in the core and buffer zone. Following detail of Nosie level observed during day and night taken in the month of November 2020. Prediction of Noise Level by using Mathematical Modeling at different locations will be carried out before commencing the mining operations

(Total 1000 characters)

9.3.5.2: Give Detail About Prediction of Noise Level by using Mathematical Modeling at Different Locations Identified

All the measures as explained and laid down as per ILO guidelines in DGMS technical circu lar 18 of 1975 will be undertaken to maintain the noise levels below 85 dB(A), in the work environment. The following mitigation measures will be undertaken to keep noise pollution under control, 1. State of the art Heavy Earth Moving Machinery (HEMM) which are ergonomically designed, air conditioned cabins, which provide acoustic insulators for the operator. Such HEMM generate low noise levels within the cabins, which are well below the permissible limits. 2. Well maintained trucks which are in good condition will be engaged for transportation of Ore. 3. Regular maintenance of Mining machinery and trucks will be undertaken. 4. Noise levels will be monitored in the core and buffer zone regularly during day and night time. 5. Workers engaged in the mining operation will be provided with ear plugs/muffs. 6. A 7.5 m safety barrier with vegetation wherever feasible will be maintained around the inner periphery of the Mineral Block, which will act as a noise barrier.

(Total 1000 characters)

9.3.5.3: Measures to Minimize the Impact on Receiving Environment

Noise will be monitored quaterly both core zone and buffer zone as per CPCB guidelines

(Total 1000 characters)

9.3.5.4: Noise Details for Base / Present Status

Noise Standards			
Area Code	Category of Area	Limits in dB(A)Leq	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commerical Area	65	55
C	Residential Area	55	45
D	Silence Area	40	50

Note :

1. Day time reckoned in between 6.00 am to 9.00p.m

2. Night time reckoned in between 9.00p.m.to 6:00am

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3. Silence zone is defined as areas up to 100 meter around such premises as Hospitals, Educational institutes and Courts. The Silence zones are to be declared by the competent Authority

4. Mixed categories of areas should be declared as "one of the four above mentioned categories" by the Competent Authority and the corresponding standards shall be applied.

S.N.	Station Name	Season	Type of Area	Noise At Day Time	Excess Noise At Day	Noise At Night Time	Excess Noise at Night	Date of Observation
1	Sirigao village	Autumn	Residential	71.2	0	69.3	0	04/11/2020
2	Mayem village	Autumn	Residential	73.6	0	64.7	0	04/11/2020
3	Mulgao village	Autumn	Residential	69.1	0	65.5	0	04/11/2020
4	Sircaim village	Autumn	Residential	66.5	0	60.7	0	04/11/2020
5	Calvim village	Autumn	Residential	65.4	0	63.5	0	04/11/2020
6	Sinquirem wada	Autumn	Residential	64.5	0	69.4	0	04/11/2020
7	Assonara Village	Autumn	Residential	62.7	0	64.9	0	04/11/2020
8	Lamgao Village	Autumn	Residential	68.7	0	64.1	0	04/11/2020
9	Khorje Village	Autumn	Residential	66.7	0	61.0	0	04/11/2020

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9.3.5.5: Impact Assessment & Mitigation Measures

9.3.5.5.1: Anticipated Impact

Give details on impact on ambient noise level due to rock excavation, transportation, processing equipment's & ancillaries

Fully mechanized Open cast mining method will be followed The process will involve ripping of hard ground by ripper dozer avoiding the conventional drilling and blasting methods Excavators will then load the ROM Iron Ore and waste overburden into dumpers Dumpers will haul ROM and waste overburden from the excavation site to their predetermined stacking area ROM will be transported from the Mineral Block by road Noise will be generated during ground preparation wherein the hard rock surface will be ripped by Ripper Dozer further the boulders will be broken by the rock breaker producing the loose material which will be made accessible for its haul Excavation is carried out by excavators and the loose material will be loaded into the transport dumpers Source of noise pollution may also be attributed during haulage of ore and waste overburden High noise levels pose a health risk to the mine workers Depending on the magnitude of noise extent of exposure and the age of the person mine workers may experience from discomfort when noise levels exceeds the tolerance limits and in extreme cases to loss of hearing

(Total 1000 characters)

9.3.5.5.2: Mitigation Measure

Give details on measures for noise abatement including point source & line source

All the measures as explained and laid down as per ILO guidelines in DGMS technical circular 18 of 1975 will be undertaken to maintain the noise levels below 85 dBA in the work environment The following mitigation measures will be undertaken to keep noise pollution under control 1 State of the art Heavy Earth Moving Machinery HEMM which are ergonomically designed air conditioned cabins which provide acoustic insulators for the operator Such HEMM generate low noise levels within the cabins which are well below the permissible limits 2 Well maintained trucks which are in good condition will be engaged for transportation of Ore 3 Regular maintenance of Mining machinery and trucks will be undertaken 4 Noise levels will be monitored in the core and buffer zone regularly during day and night time 5 Workers engaged in the mining operation will be provided with ear plugsmuffs 6 A 75 m safety barrier with vegetation wherever feasible will be maintained around the inner periphery of the Mineral Block which will act as a noise barrier

(Total 1000 characters)

9.3.6: VIBRATION

9.3.6.1: Vibration Details for Base / Present Status

S.N.	Station Name	Season	Distance from the Blasting Site (m)	Peak Particle Velocity (mm/s)	Air Over Pressure (DB)	Frequency (Hz)	Date of Observation
1	NA	Nil	0.00	0.00	0.00	0.00	Nil

9.3.6.2: Impact Assessment & Mitigation Measures

9.3.6.2.1: Anticipated Impact

(Give details on impact of vibrations including damage to materials/structures due to blasting)

Not applicable

(Total 1000 characters)

9.3.6.2.2: Mitigation Measure

Give details on measures for noise abatement including point source & line source

Not applicable

(Total 1000 characters)

Approved

9.3.7: Socio-Economic Environment

9.3.7.1: Demographic Profile

S.N.	Type of Area	Name of Village	Total Population	Male to Female Ratio	Literacy Rate (%)	Employment Rate (%)
1	Non-scheduled	Alorna	2651.00	1039	79.00	40.30
2	Non-scheduled	Cansarvornem	1382.00	1194	74.60	40.70
3	Non-scheduled	Ozorim	1669.00	1148	75.90	38.70
4	Non-scheduled	Dargalim	5696.00	1017	79.50	40.20
5	Non-scheduled	Tuem	2751.00	1070	79.50	40.20
6	Non-scheduled	Oxel	2794.00	907	85.10	31.90
7	Non-scheduled	Nadora	1257.00	1064	83.20	39.50
8	Non-scheduled	Pirna	2568.00	974	79.60	37.20
9	Non-scheduled	Assonora	4367.00	1030	85.00	41.40
10	Non-scheduled	Paliem	1377.00	1299	82.70	39.10
11	Non-scheduled	Punola	864.00	1062	82.40	39.50
12	Non-scheduled	Ucassaim	1077.00	896	81.90	35.20
13	Non-scheduled	Nachinola	2725.00	996	80.40	42.70
14	Non-scheduled	Corjuem	2725.00	916	82.40	33.70
15	Non-scheduled	Calvim	403.00	807	76.70	32.80
16	Non-scheduled	Olaulim	659.00	877	91.50	53.00
17	Non-scheduled	Pomburpa	3095.00	1008	85.90	38.80
18	Non-scheduled	Salvador do	6763.00	1026	83.80	41.50
19	Non-scheduled	Aldona CT	6270.00	874	83.90	35.10
20	Non-scheduled	Caraim	202.00	1040	89.60	33.70
21	Non-scheduled	Navelim	1133.00	854	80.20	34.20
22	Non-scheduled	Goltim	1634.00	859	85.10	35.10

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23	Non-scheduled	Malar	1630.00	995	85.70	40.10
24	Non-scheduled	Ella	5372.00	1012	79.50	38.60
25	Non-scheduled	Bainguinim	1501.00	1009	80.70	45.60
26	Non-scheduled	Jua CT	4134.00	911	84.30	35.20
27	Non-scheduled	Bicholim	97955.00	1040	80.30	38.40
28	Non-scheduled	Mencurem	1381.00	953	77.20	41.20
29	Non-scheduled	Dumacem	296.00	987	82.80	41.20
30	Non-scheduled	Salem	3427.00	1012	78.80	34.10
31	Non-scheduled	Adwalpale	1412.00	945	78.60	42.60
32	Non-scheduled	Sirigao	1617.00	1029	82.30	32.80
33	Non-scheduled	Mulgao	3892.00	1055	83.00	36.90
34	Non-scheduled	Ona	685.00	963	77.50	36.80
35	Non-scheduled	Maulinguem	1457.00	1029	71.20	34.70
36	Non-scheduled	Sarvona	3586.00	1084	79.30	37.80
37	Non-scheduled	Maem	7544.00	995	81.20	38.10
38	Non-scheduled	Vainguinim	706.00	967	86.80	33.90
39	Non-scheduled	Aturli	467.00	1004	77.50	39.80
40	Non-scheduled	Naroa	1897.00	1007	79.80	39.80
41	Non-scheduled	Piligao	2643.00	961	80.30	37.50
42	Non-scheduled	Amone	2963.00	1001	82.20	33.90
43	Non-scheduled	Podocem	966.00	984	75.90	46.90
44	Non-scheduled	Poriem	4190.00	1076	77.10	38.40
45	Non-scheduled	Tivrem	4190.00	1046	81.30	41.50
46	Non-scheduled	Candola CT	5354.00	1050	81.30	41.50
47	Non-scheduled	Vazare	1393.00	1004	66.00	47.90
48	Non-scheduled	Ambadgaon	1117.00	977	67.10	39.70

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49	Non-scheduled	Matane	1994.00	1165	63.80	43.00
50	Non-scheduled	Ayee	1653.00	1059	69.20	40.50
51	Non-scheduled	NonscheduledKasai	3811.00	1063	81.00	34.10

9.3.7.1.1: Anticipated Impact

(Give details about impact on the cropping pattern & crop productivity in the core zone)

There are no crops produced in the core zone.

(Total 1000 characters)

9.3.7.1.2: Mitigation Measure

(Give details about compensation for loss of land & crops)

Not applicable as such no crop loss recorded in the area

(Total 1000 characters)

9.3.7.2: Traditional Skills & Source of Livelihood

9.3.7.2.1: Base / Present Status

(Give details about present status on traditional skills & source of livelihood)

Major source of livelihood in the area is mining. Other sources of livelihood is from Agriculture and through employment in other industries existing in the area. There are no significant traditional skills observed in villages in the vicinity of the mine

(Total 1000 characters)

9.3.7.2.2: Anticipated Impact

(Give details about positive & negative impacts on present status of livelihood in the area)

No such negative impacts found. Local people area highly benefited by the facilties developed by mining. Local villages are benefitted by direct and indirect employment opportunity. It is envisaged that about 332 persons will be Employed of which around 132 persons will be directly employed while about 200 persons will be indirectly employed

(Total 1000 characters)

Approved

9.3.7.2.3: Mitigation Measure

(Give details about training to locals for employment in the project training for making them self-employable or elsewhere)

The proposed project will provide training facilities to the villagers for skill development in area s of driving, computer education, in-house training regarding working methods, facilitating self-help groups for women empowerment, etc., to make the people in the self-reliant

(Total 1000 characters)

9.3.7.3: Economic Profile of the Population in Core & Buffer Zone

9.3.7.3.1: Base / Present Status

(Give details about economic profile of the population in core & buffer zone)

The Economic conditions of the majority of population of core and buffer zone in good condition A few houses exists within the Mineral block Buffer zone comprises of seven talukas two district and two states details regarding the economic profile survey report per Census 2011 Economic activity details in 10km buffer zone are Cultivators are 7216 Agriculture laborers are 5785 Household industries are 3084 Other are 92111 and Total is 108196

(Total 1000 characters)

9.3.7.3.2: Anticipated Impact

(Give details about impact on community resources such as grazing land)

No such community resources and grazing lands affected in the area

(Total 1000 characters)

9.3.7.3.3: Mitigation Measure

(Give details about employment opportunities & access to other amenities such as education, health care facilities to be extended to locals, addressing local unemployment, tourism or recreation opportunities, efforts for sustainable development of the local community)

It is envisaged that about 332 persons will be Employed of which around 132 persons will be directly employed while about 200 persons will be indirectly employed Training facilities will be extended to the villagers for skill development in areas of driving computer education inhouse training regarding working methods facilitating self help groups for women empowerment etc The project will also extend facilities to school children in their education Provision of drinking water improvement in medical facilities improvement in infrastructure by carrying out repair maintenance of village roads etc will also be an area of focus

Approved

(Total 1000 characters)

9.3.7.4: Human Settlement in Core & Buffer Zone

9.3.7.4.1: Base / Present Status

(Give details about human settlement in core & buffer zone)

The part of Sirigao and mayem villges fall in the mining lease The details of human settlement falling with in buffer zone are discussed in the para 9371 under demography profile

(Total 1000 characters)

9.3.7.4.2: Anticipated Impact

(Give details about any displacement of human settlements during the life of the mine)

No Displacement of human settlements during the life of the mine

(Total 1000 characters)

9.3.7.4.3: Mitigation Measure

(Give details about rehabilitation & resettlement of land ousters & displaced people)

No Displacement of human settlements during the life of the mine

(Total 1000 characters)

9.3.7.5: Health Profile of Population in Core & Buffer Zone

9.3.7.5.1: Base / Present Status

(Give details about health profile of population in core & buffer zone)

Morbidity data has been collected from the health centre and local medical practitioners in and around the project area Many diseases like Cholera Leprosy Tetanus Encephalitis STD AIDS Pleurisy Poliomyelitis Disease of ENT Malnutrition Food poisoning Gout and Burns have not been reported in the last three months Rarely reported diseases are Dengue Malaria Filariasis Typhoidparatyphoid Dysentery Gastroenteritis Cancer Whooping cough Epilepsy Throat infection Goitre Disease of thyroid gland Disease of Kidney Pneumonia Jaundice and Mental disorder Often reported diseases are Heart disease Piles Anemia Blood Pressure Arthritis Rheumatismpain Diabetes Asthma Bronchitis Skin diseases Gout or any joint problems accompanied by fever and Cough cold without fever Very often reported diseases are Disease of eye Cough cold with fever Fever not classified elsewhere Cough and fever Vomiting and Disease of mouth teeth and gums

Approved

(Total 1000 characters)

9.3.7.5.2: Anticipated Impact

(Give details about any adverse impact on the general health condition of the population in core & buffer zone)

Iron ore and overburden waste do not contain any toxic elements Hence the possibility of health hazards due to toxic elements does not arise No negative impacts are anticipated to the people staying within the core zone In the buffer zone the following impacts are anticipated to a small extent and are limited to the area involved in ore transportation activity 1 The houses falling along the transportation routes will face dust pollution due to plying of transportation trucks carrying ore 2 Noise pollution caused by the transportation trucks carrying ore Mining operations carried out within the core zone will not have any adverse impact on the general health condition of the population in the buffer zone

(Total 1000 characters)

9.3.7.5.3: Mitigation Measure

(Give details about avenues like dispensaries, hospitals, maternity homes if any to be created)

following mitigation measures will be undertaken to keep dust and noise pollution under control 1 Well maintained trucks which are in good condition and which are PUC certified will be engaged for transportation of Ore 2 Overloading of Trucks with iron ore will be avoided as to prevent spillages on the transportation route 3 Carriers of the ore carrying trucks will covered with tarpaulin to prevent the dust from getting airborne during transportation 4 Vehicular traffic with respect to ore transportation trucks will be dispatched from the mine in a staggered manner 5 Transportation will be carried out during daytime only 6 Dust suppression measures will be taken up by cleaning of roads and further by sprinkling water 7 Periodical air quality and noise levels will be monitored in the core as well as buffer zone 8 Regular health check camps in vicinity

(Total 1000 characters)

9.3.7.6: Historically, Culturally & Ecologically Important Places in Core & Buffer Zone

9.3.7.6.1: Base / Present Status

(Give details about historically, culturally & ecologically important places in core & buffer zone)

There are no historically culturally ecologically important places in the core zone In the buffer zone a Shri Lahari Temple exists within the lease area Konkan railway passes through mining block No mining activity is proposed close to this railway track and a safety buffer zone of 50m shall be maintained

(Total 1000 characters)

9.3.7.6.2: Anticipated Impact

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(Give details about risk profiling)

Mining activity will not have any adverse impact on the historically culturally ecologically Important Places

(Total 1000 characters)

9.3.7.6.3: Mitigation Measure

(Give details about public health benefits (e.g. clean water to an aboriginal community), measure for safeguard against damage etc.)

The project will also extend facilities to school children in their education Provision of drinking water improvement in medical facilities improvement in infrastructure by carrying out repair maintenance of village roads etc will also be an area of focus Safeguard measures against damage within the core and buffer zone along the transportation route is explained above in the sections pertaining to mitigations measures

(Total 1000 characters)

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Chapter 10: Annexures

1. Upload Document

1.1 Upload Document

SI.No.	Title	Is Upload	Document (only pdf allowed)
1	Letter of Intent /Letter of lease grant	Nil	Letter_of_intent.pdf
2	Copy of lease deed executed	Nil	Nil
3	Copy of Declaration of Owner/Nominated Owner in case of Company/partnership firm	Nil	Resolution_&_List_of_Directors.pdf
4	ID & Address Proof of Owner/ Nominated Owner	Nil	Aadhar-Sandeep.pdf
5	Copy of Environment and Forest Clearence, Consent to Establish, Consent to Operate	Nil	Nil
6	Copy of Registration of Company (RoC)/Partnership firm (Registration) & Deed	Nil	Certificate_of_registration.pdf
7	Consent letter for Qualified Person	Nil	Consent_letter_for_QP.pdf
8	Experience & Qualification Details of Qualified Person	Nil	Qualification_and_experience_certificate.pdf
9	Certificate from QP	Nil	Certificate_&_undertaking_from_QP.pdf
10	Copy of Bank Guarantee	Nil	Nil
11	Copy of Performance Surety	Nil	Upfront_Amount_Payment_slip.pdf
12	Copy of MDPA (as applicable)	Nil	Nil
13	Exploration details	Nil	Geological_report_-_new.pdf
14	Copy of feasibility Report	Nil	Feasibility_report.pdf
15	Copy of Study reports conducted as per Para	Nil	Undertakings.pdf

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	4.3.1		
16	Chemical and Mineralogical analysis report	Nil	Chemical_Analysis.pdf
17	Any other Report or Certification as required in the submitted Document.	Nil	Nil
18	Copy of Scale relaxation approval granted(if applicable)	Nil	Nil
19	Mineral processing flowsheet with stage wise recovery	Nil	Nil
20	Any Other	Yes	Annexure_20.pdf

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Chapter 11: Plates (OC)

1. Upload Document

1.1 Upload Document

S.N.	Title	Is Upload	Document
1	Lease sketch plan;	Nil	Nil
2	Surface Plan (.KMZ format)(Georeferenced); A statutory plan as per MCDR, 2017. The Plan should be submitted showing different color codes for:(1) Active Pits & Excavation area(2) Excavated area reclaimed & rehabilitated (3)Active dumps (4) Stabilized & rehabilitated dump area , (5) Green belt (6) Mineral Stacks (7) Utilities such as plant, buildings etc (8) Lease boundary along with other details.)	Nil	Surface_Plan.kmz
3	Surface Geological Plan of the lease (.KMZ format)(Georeferenced); The Plan should be submitted showing different color codes for : (1) Lithological/Geological Occurance (2) Area under G1,G2,G3 & G4 (3) Active pits & Excavation area (4) Dump Area (5) Mineral Stacks (6) Lease boundary along with other details.)	Nil	Surface_geological_plan.kmz
4	Surface Geological sections (in Pdf format); Geological sections with different color coding depicting all the features shown in Surface Geological Plan.)	Nil	Geological_Sections.pdf
5	Five year Production and Development plan (.KMZ format)(Georeferenced); The Plan should be submitted showing different color coding for: (1) Active Pit and Excavation area ,	Nil	Production_&_development_plan.kmz

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	(2) Year wise excavation proposal for year I to V ((3) Active dump and yearwise dump proposal for year I to V (4) Year wise Dump working proposal for year I to V (6) Lease boundary (with reference to chapter 4) along with other details.)		
6	Five year Production and Development sections (in pdf fromat); Year wise excavation and dumping proposals with different color coding depicting all the features as shown in the Five year Production and development plan.)	Nil	Production_&_Development_sections.pdf
7	Progressive Mine Closure Plan (.KMZ format)(Georeferenced); The Plan should be submitted showing different color coding for : (1) Yearwise excavated area Reclaimed & rehabilitated for year I to V (2) Year wise dump area to be stabilized and dump area to be rehabilitatd for year I to V (3) Year wise Green area proposed from year I to V.(4) Any other reclamation and rehabilitation measures proposed (5) Lease boundary (with reference to chapter 6) along with other details.)	Nil	PMCP.kmz
8	Progressive mine Closure sections (in pdf format); Year wise Progressive mine clouser sections showing all the yearwise reclamation, rehabilitaion proposals as depicted in the Progessive mine clouser plan.)	Nil	PMCP_sections.pdf
9	Conceptual Plan (.KMZ format)(Georeferenced); The Plan should depict the staus of lease area as envisaged at the end of life of Mine showing all the details. Status of land use shall be depicted by different color coding.)	Nil	conceptal_plan.kmz
10	Conceptual Sections (pdf) format;	Nil	Conceptual_sections.pdf
11	Geo referenced Cadastral Plan; Duly certified by the State Government)	Nil	DGPS_MAP_OF_BLOCK-II_(SSCPL).pdf
12	Financial Assurance Plan (KMZ);	Nil	Finical_Assurance_Plan.kmz

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13	Environmental Plan (.KMZ format)(Georeferenced); As per MCDR, 2017 indicating all the details.)	Nil	Environmental_Plan.kmz
14	Any other plan/section as deemed necessary by approving authority;	Nil	Nil
15	Five Year Production and Development sections (in pdf format);	Nil	Nil
16	LEVEL WISE SLICE PLAN; LEVEL WISE SLICE PLAN (PDF FORMAT IN VISIBLE SCALE))	Nil	Nil

Approved

Chapter 11 : Plates(UG) : NA

Approved

Esigned by: NARESH
Date: 07/08/2023 05:56:11 PM