BEFORE THE HONOURABLE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE, CHENNAI

Original Application No. 74 of 2023

In the Matter of:
Padma Kumar, Kerala : Applicant

Vs.

State of Kerala,
Through its Chief Secretary
and others : Respondents

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This is to certify that the above documents are the true copies of the originals.

Dated at Ernakulam this the 6th of November, 2023

Counsel for the 6th Respondent

BEFORE THE HONOURABLE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE, CHENNAI

Original Application No 74 of 2023

In the Matter of:

Padma Kumar, Kerala	:	Applicant
Vs.		
The State of Kerala, Through its Chief Secretary and others	:	Respondents

REPLY AFFIDAVIT FILED BY THE SIXTH RESPONDENT

I, Chandrabose J., aged 56 years, S/o Janardhanan, residing at Villa No 4, Cassia Garden, Leed Homes, Thuthiyoor, Adarsh Nagar Road, Cochin Special Economic Zone, Ernakulam, PIN - 682037, the Managing Director, Kerala Minerals and Metals Limited, Chavara, Kollam, Kerala, do hereby solemnly affirm and state as follows:

1. I am the Managing Director of the 1st respondent, the Kerala Minerals and Metals Limited. I am conversant with the facts of the case and I am authorized and competent to swear to this affidavit on behalf of the 1st respondent.

2. At the outset, the allegations in the letter leading to the present original application are not correct. It is further submitted that findings in the joint committee and the KSPCB are denied by this respondent.

3. Without prejudice to the above, it is submitted that KMML has a fully functional effluent Treatment plant (ETP) consisting of Chemical treatment for neutralization of acidic effluents generated from unit process. Effluents from the entire process unit are pumped to the Primary Neutralization tank (PNT). pH is monitored in the PNT and is maintained around 4-5. Effluent from PNT is further neutralized in Secondary Neutralization Tank (SNT) and pH is maintained at 7- 8. Neutralized effluent is pumped to holding ponds above ground level

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(A GOVT. OF KERALA UNDERTAKING)
CHAVARA, KOLLAM - 691 583

CHANDRABOSE. J
Managing Director
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with a 7- liner system as per CPCB guidelines. After settling, the supernatant liquid from the pond is pumped into the sea. The monthly effluent monitoring reports are submitted to KSPCB periodically. It is seen that pH monitored values have been within the specified range without any deviation. A true copy of the effluent monitoring report forwarded dated 21.08.2023 along with the attachments is produced herewith and marked as **Annexure R1(a)**. A true copy of the effluent monitoring report forwarded dated 21.07.2023 along with the attachments is produced herewith and marked as **Annexure R1(b)**. A true copy of the effluent monitoring report forwarded dated 22.06.2023 along with the attachments is produced herewith and marked as **Annexure R1(c)**. As per the Quality Control Lab reports, the daily results of pH values are found satisfactory and within the range specified by KSPCB as per consent. A true copy of the QC samples report from 01.08.2023 to 27.09.2023 is produced herewith and marked as **Annexure R1(d).** It is to be noted that the joint committee had taken samples during October, 2022. Even during that period the parameters were within the specified limits. A true copy of the relevant pages of the QC Sample report (pertaining to tubewell water) from 01.04.2022 to 31.03.2023, showing the period from 28.10.2022 to 30.11.2022 is produced herewith and marked as **Annexure R1(e)**. It is further submitted that this respondent is complying with all the directions issued by the joint committee and the allegations of the applicant to the contrary are false. This respondent reserves liberty to file a detailed statement on the contents of the Report of the Joint Committee in appropriate proceedings.

4. it is submitted that this respondent has not violated any direction passed by this Honourable Tribunal in Original Application No 290 of 2013 and has been diligently pursuing and following the direction issued therein. The allegations of the applicant to the contrary are false. The allegation in paragraph 2 that due to the callous attitude of this respondent, the pollution has aggravated is totally false.

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5. It is submitted that based on the study report by M/s NEERI, this Honourable Tribunal had held that the iron oxide generated in KMML is of non-hazardous nature and that there is no need to transport the iron oxide residue to the common TSDF. This Honourable Tribunal had directed this respondent to prepare design on both short term and long term measures suggested by M/s NEERI through competent and expert developers/ contractors. In this regard, it is submitted that M/s KITCO was awarded the work for DPR preparation of short term measures suggested by NEERI and a report was submitted to KSPCB on 20.07.2018 for approval. The same was approved by the KSPCB in its meeting held on 10.12.2018 and communicated to KMML vide its letter dated 07.01.2019. .

6. The Action plan and current status details on various measures taken by this respondent as shown below:

   a. Construction of Garland drain around the iron oxide (IOP)/ ETP ponds: After an open e-tendering, the work order for the construction of Garland drain around new ETP/IOP and old ETP/IOP was issued to M/s Ravi Kumar & M/s Biohomes on 08.10.2019 and 08.04.2021 respectively. The period of contract was extended due to events viz. adverse climatic condition, restriction imposed as part of pandemic COVID-19 lock down, local labour issues, ETP sludge shifting process etc. The works are now progressing at site. Work is intermittently getting delayed due to incessant rain and elevated water table. Pumps have also been installed in the new garland collection pit constructed. Storm water drain cleaning inside KMML was done. Action taken for cleaning all the drain and natural drain within company premises and initated constructing delay pits for ensuring uncontaminated discharge. Garland drain construction around New ETP has been almost completed and 70 % around Old ETP/IOP have been completed. Installation of a garland pump in the new ETP pit has been done. The time frame given for garland drain completion is by

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the end of October 2023 (for NEW ETP) and January 2024 (for OLD ETP/ IOP).

b. Remediation of affected land near KMML premises: It is submitted that tender was invited for the Test patch for remediation of contaminated area inside KMML premises and its consultancy works on 09.07.2019. No parties quoted. Action for limited tender for consultancy work taken on 07.08.2019. Two parties quoted the tender. Work order was issued to M/s FEDO on 05.12.2019 for consultancy and supervision of the test patch area for contaminated land in KMML premises. M/s FEDO have submitted a detailed project report with schematic drawing and lay out of the contaminated land remediation work. It is submitted that tendering for test patch was done on three occasions i.e, 25.02.2020 (only single offer received), 24.06.2020 & 19.08.2020 (no party quoted). Due to non receipt of offers, action for doing the activity on trial basis has been initiated. Accordingly, land preparations for land remediation sample Test patch area development activities have been started on trial basis inside KMML. Since land remediation (In-Situ flushing) inside KMML premises involved huge investment and due to non availability of competent agency to execute the same, KMML is also exploring the possibility of remediating the test patch area by Bioremediation process. In this regard, it is submitted that we are exploring the service of M/s State Horticulture Society. They have done the analysis of samples and they forwarded a proposal to KMML which is under evaluation. It is submitted that a detailed EOI on bioremediation can be invited immediately after finalizing a suitable technology for in-situ bioremediation. It is submitted that the time frame for completion of the above is June 2024.

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c. Solid waste management in KMML (In-situ/Ex-situ storage): Considering the constraint for shifting the entire quantity of sludge to newly proposed containment system and limitation of vacant land availability,another technological option was identified by

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KMML through US based Titanium technology consultant. The new technology involves dewatering and storage of solid waste using Geotubes which was presented to KSPCB in the meeting held on 10.12.2018. In principle approval was received and directed to submit details of the proposal. A true copy of the Minutes of the meeting held on 10.12.2018 is produced herewith and marked as **Annexure R1(f)**. Further to this, tendering was done for the Geotube iron oxide containment from the new elevated iron oxide pond. Subsequently, Geotube suppliers had intimated KMML to get environmental clearance for the proposal. KMML submitted a request letter to KSPCB on 22.02.2022 for clearance approval to go ahead with the collection and containment of Iron oxide slurry in Geotubes from the elevated new iron oxide pond on a trial basis. Dewatered Iron oxide solids can safely be transferred to offsite after the containment. A presentation of solid waste management using Geotubes was conducted at the Chamber of Chairman, KSPCB on 16.05.2022 and 14.10.2022. KMML officials visited CPCB, New Delhi on 28.11.2022 and handed over the request letter for obtaining authorization for conducting trial Geotube filling and containment of iron oxide from the new elevated iron oxide pond. A VC meeting/ technical presentation was conducted on 03.01.2023 with CPCB officials and queries were addressed. A true copy of the communication dated 22.11.2022 issued to the CPCB is produced herewith and marked as **Annexure R1(g).** It is submitted that the work can be started only with the technical concurrence of CPCB/KSPCB. A further communication was issued to the CPCB in this regard on 07.06.2023, a true copy of which is produced herewith and marked as **Annexure R1(h).** It is submitted that the expected time frame is One year after getting approval from CPCB/ KSPCB and subsequent ordering. It is further submitted that the trials can be started upon receipts of required approvals from CPCB.

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d. Acid Regeneration Plant (ARP) technology modification to generate saleable iron oxide: Tender was invited and opened for technology modification of ARP in September 2019 and one party had quoted. Tender was closed in December 2019 and after evaluation of the proposal, the file was put up to the Board for approval. 243rd Board Meeting of the company held on 21.05.2020 had accorded approval for seeking final Government sanction. The file was put up to the Government on 01.06.2020, for getting final sanction. However as per the direction given by Government of Kerala, retendering was done in June 2021. It is submitted that a Global Tender was invited from technology providers for the process modification of the existing Acid Regeneration Plant on 10.06.2021. The offer submitted by M/s INDROX GLOBAL PVT LTD was evaluated, approved in the 250thBoard meeting held on 15.01.2022 and submitted for Government approval. A meeting was convened under the Chairmanship of Hon'ble Minister for Industries, Law & Coir on 09.06.2022 and in the meeting, it was decided to work out the cost reasonableness & submit a report to Government of Kerala. Accordingly, FEDO had done the cost analysis study & the report was submitted to the Government for approval to place the order. The file is under consideration of the Government of Kerala. It is submitted that work is expected to get commissioned in a target period of 18 months from placing of the work order.

e. Value addition of by-products (Iron oxide /ETP sludge): It is submitted that this respondent had identified M/s Renuka Equipments Pvt Ltd, Nagpur, with the help of M/s NEERI, as the competent technology provider for the management of iron oxide stored in the old pond, by converting the same in to usable product. 234th Board meeting held on 04.04.2018 had given permission in principle for receiving a detailed techno-commercial offer for setting up a pilot plant from M/s REPL. KMML has received offer from M/s REPL and it was evaluated. It is noticed that the proposed

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technology is not a field proven one and also involves investment around Rs. 400 Crores for a commercial scale installation. As the above proposal was not viable, in order to select potential agencies to carry out value addition of iron oxide & ETP sludge on a total responsibility basis with suitable technology, KMML has published a global Expression of Interest, pursuant to which, offers were received from parties. M/s CSIR- NIIST, Thiruvananthapuram was appointed as consultant to carry out the technical evaluation of the proposal and they have submitted their study report. Tender was invited, and Board approval was obtained for awarding order to the selected parties. The matter is now awaiting approval of the Government of Kerala for placement of the final order (ETP sludge). As far as Iron Oxide is concerned, alternatively techno economic feasibility of in-house development of sponge iron is getting explored with the preparation of a detailed project report.

f. Value addition of iron Oxide: With an intention to give value addition to the iron oxide and more specifically using this iron oxide as raw material for the iron industry, KMML has developed an in-house technique. R&D studies proved that it can be converted to iron sinters (Sponge Iron), which is expected to be used as feed material for the Iron TMT industry. Initially we have conducted a plant trial and produced 3.0 MT of sponge iron and analysis results are positive. Hence, we have conducted trials at two TMT manufacturing facilities at Palakkad and validated that it can be used as raw material for their induction furnaces. To proceed with the validation and stabilization of the utilization and to confirm the quality till the final TMT product, these companies require more quantity of sponge iron material. In view of this, we have conducted a second trial and produced around 10 to 15 MT of material with better quality and the separation process of the same is underway. This respondent is expecting further trials/commercial applications with this material at the TMT facilities shortly and looking for a positive outcome. As part of the above, a TMT manufacturer visited

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KMML on 25th August 2023 for technical discussion and for further plan. Subsequently for getting inputs on the process, a technical team from the committee visited M/s KIOCL, Mangalore and Rangaraj Steels, Erode, which are engaged in the green pellet and iron sponge production, respectively. With the input from the trials conducted and the visits conducted, the committee has prepared a scheme for the proposed plant for producing iron sponge. Also, a team has conducted a visit to M/s Fe Techno Engineering and Power Solutions (FTEPS), Bangalore, one of the consultant in the field, to enquire about the market demand for the KMML DRI and for validation of the process adopted. They are engaged in providing sustainable solutions for iron ore beneficiation, pelletization, sintering, iron & steel making and power solutions; with decades of extensive hands-on experience. In order to prepare scheme for a commercial plant at KMML for instance, with a capacity of 240 MTPD to consume the stock piled & online generated iron oxide, KMML is taking actions to prepare a DPR by appointing an appropriate consultant through tendering process. Time Frame for setting up an iron sponge plant in KMML is 2 to 3 years from finalization.

7. Apart from the above, this respondent has initiated the following actions:

   a. KMML invited e-tender for the sales of iron oxide residue for further process/value addition at end user on 19.12.2019. M/s Miracle sands and Chemicals, Tuticorin quoted for the tender and sales order was issued to the party on 09.06.2020, for shifting 10,000 MT to the end user end. Sales order of iron oxide sludge was extended for obtaining statutory approvals from TNPCB and KSPCB. M/s Miracle sands and Chemicals, Tuticorin has already submitted a detailed project proposal for manufacturing Iron oxide concrete bricks along with the consent order from TNPCB valid up to March 2025. In the meeting held on 19.09.2022, KMML

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requested KSPCB sanction to shift 10,000 MT of iron oxide to carry out trial runs. KSPCB informed KMML that a letter has been forwarded to CPCB on 24.09.2022 seeking their advice on conducting a trial. A true copy of the letter dated 24.09.2022 addressed by the KSPCB to CPCB is produced herewith and marked as **Annexure R1(i).** Subsequently, KMML officials visited CPCB on 28.11.2022 and made follow up for obtaining authorization for trial production of Iron Oxide bricks by M/s Miracle Sands and Chemicals, Tuticorin. CPCB officials informed that authorization requests from KMML will be included in the next committee meeting held in 2023. It is submitted that the targeted date is 12 months from the date of obtaining statutory clearances.

b. It is submitted that KMML had manufactured Iron oxide bricks using solid waste iron oxide from ARP along with cement, hydrated lime, sand and sodium silicate in a particular ratio for internal construction as per KSPCB advice. In 2009 due to high stock, space constraints, manpower shortage and machine maintenance the production of iron oxide bricks ceased. KMML planned to restart the Brick making plant and E-tender for the Brick making plant was invited on 01.05.2023 only single offer was received. The single offer received did not satisfy the pre-qualification criteria. Subsequently, retendering of the Brick making plant was done on 12.07.2023 with modified pre-qualification criteria and a single offer received, which is under evaluation prior to issuing work order.. The expected time-frame for commissioning of the machineries and manufacture of 8 lakhs iron oxide bricks is six months. The above project is expected to utilize 5000 MT of dry iron oxide.

c. EOI was invited for value addition of Iron oxide on DBFOO basis. M/s Tetrabic India, Hyderabad is the bidder. Board approved to seek GoK approval. 18-24 months from the date of Order/ statutory clearance is the time line. Awaiting approval from Government for

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engaging contract with M/s Tetrabic India, Hyderabad for value addition of ETP sludge and to be done based on TEFR feasibility of sponge iron proposal. Technical review meeting was held at KSPCB regional office on 18.10.2023.

d. Sale of ETP Sludge: E-tender was invited by KMML for shifting 10,000 MT of ETP sludge from ETP pond on 04.02.2020 and subsequently the quantity was enhanced from 10000 MT to 50000 MT on 17.02.2020 . Sales order was issued to M/s Miracle sands and Chemicals on 09.06.2020 for 10,000 MT. A new sales order was issued to M/s Miracle sands and Chemicals for 40,000 MT on 08.04.2022. Completed the shifting of 10000 MT of ETP sludge from KMML and started shifting of ETP sludge for 40000 MT as per the new sales order. Permission granted to M/s Miracle Sands & Chemicals from KSPCB for collection and transportation of ETP sludge from KMML is valid up to 31.03.2024. Shifting of 10000 MT has been completed and shifting started for 40000 MT (approx 3300 MT has been completed). The sanction is valid up to 31.03.2024. Hence the ETP sludge is getting successfully transferred with the approval of the KSPCB.

e. ETP Revamping/ Modernisation: It is submitted that E-tendering for preparation of DPR for ETP modernization was done on 10.02.2022. Pursuant to that e-tender, no offers were received. Contacted individual parties for price quote. The parties conveyed that they can proceed further only after signing an MOU. As such a course was not acceptable for a public sector undertaking like KMML, it was decided to go for retendering. E tendering done for DPR preparation of ETP modernization. Three offers were received and work order was awarded to M/s SBA Enviro System, Delhi. A draft report was submitted. Further DPR corrections/ comments already shared with the party on 01.09.2023 for finalizing the DPR. A revised report is awaited. Time frame set for final DPR submission is November 2023. After finalization of DPR, e - tendering will be done for ETP modernization with necessary

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approvals. Time frame for ETP modernization is 2-3 years. Budget allocation for Civil/ Mechanical work is in the stage of approval for the revamping of existing ETP system by the addition of a tertiary storage system to increase the retention time and settlement rate to make the system extra robust.

f. Capping of existing storage ponds: Capping of eastern side area (4400 M^2) of settling pond-I is completed. Purchase order was issued for procuring 15,000 square meters of LDPE film for temporary capping and the material was received in September 2023. The tendering activity for capping is in progress and the same is expected to be completed by May 2024.

g. It is further submitted that treatment in the existing yards and surface contaminated areas is going on as a temporary measure. In the ARP, a slurry preparation system is in operation for neutralizing iron oxide generated during operation of the plant. The slurry is neutralized at source before pumping to the new iron oxide pond. The iron oxide is deposited in the new IOP and the clear liquor is recycled to the slurry preparation unit.

8. It may kindly be recalled that this Honourable Tribunal, based on the report of the AERB had found that substance produced by KMML is not radioactive and there is no radio activity emanating therefrom. The sand tailings generated at the Mineral Separation unit are disposed strictly as per the direction of AERB. AERB's operational plant safety division is conducting Annual inspection in our facility to check and verify working operational standards. This respondent is also conducting Quarterly Health Physics study and its report is being submitted to AERB.

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9. It is further brought to the kind attention of this Honourable Court that the following services are rendered to the general public especially the people around the locality.

a. Conducting regular medical camps.

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b. Providing medical aid to ailing patients and providing palliative care.

c. Support to nearby Panchayats for providing street lights, drains and other public utility services.

d. This respondent had set up a Covid Second-line Treatment Centre (CSLTC) at Government Higher Secondary School, Sankaramangalam. This was a facility with 850 beds, with oxygen support from KMML. The said facility was maintained for more than a year, spending around 4.5 Crores.

e. Supplied liquid medical oxygen at reduced rate for pandemic treatment.

f. Providing support for the infrastructure upliftment of nearby schools.

g. Supporting welfare activities of mining area.

h. We are continuously supplying about 7 to 8 lakhs liters per day of drinking water of potable quality to the surrounding local residences.

i. Potable drinking water is supplied through pipe line (total pipe-line length of around 65 kms) for local residence and also in tankers.

j. KMML is paying 50% of water tax of the Jalanidhi scheme for local residences.

10. It is further submitted that this respondent had utilized around 10 acres of barren land for agricultural activities and made the land productive. For the above activity, this respondent had bagged the "Kerala State Level Agricultural Award 2022 - Best Public Sector Unit engaging in vegetable cultivation". The harvest from the said land was utilized to serve food for more than 1500 people daily. The beneficiaries of the said activity include people under palliative care and others in need.

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11. It is brought to the notice of this Honorable Tribunal that as part of ecological enhancement and green initiative, this respondent had planted various types of tree saplings inside KMML premises to restore and rebuild the structure and function of the ecosystem, thereby protecting and restoring the degraded lands. Also as a green initiative, this respondent had purchased 2000 plant saplings and distributed them to employees on "World Environment Day, 2022". On World Environment Day 2023, KMML purchased plants and planted them at various places inside its premises. On a trial basis KMML developed the land area at Railway gate Area (3 acres approx.) inside KMML and planted various kinds of fruit bearing plants, coconut trees and tubers. From the planted crops KMML is obtaining a good harvest. Protection of environment and social welfare are just two of the numerous social initiatives undertaken by this respondent. With the aim of tackling food shortage, organic farming was started by the company in 7.5 acres of fallow land. Fish farming is also being carried out. As part of the pre-monsoon cleaning operations, the drains in nearby areas have been cleared.

12. In the light of the contents of this reply affidavit, it is most respectfully submitted that this Original Application is liable to be closed. This respondent seeks liberty to file additional replies and documents as and when found necessary.

For the reasons stated above, it is therefore humbly prayed that this Hon'ble Tribunal may be pleased to dismiss the Application with costs and pass such order or other orders as this Hon'ble Tribunal may deem fit and necessary in the circumstances of the case and thus render justice

Dated this the 11nd day of November, 2023

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Deponent

CHANDRABOSE. J
Managing Director
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VERIFICATION

I, Chandrabose J., aged 56 years, S/o Janardhanan, residing at Villa No 4, Cassia Garden, Leed Homes, Thuthiyoor, Adarsh Nagar Road, Cochin Special Economic Zone, Ernakulam, PIN - 682037, the Managing Director, Kerala Minerals and Metals Limited, Chavara, Kollam, Kerala, do hereby submit that the contents of paragraphs 1 to 12 are true to the best of my knowledge and belief derived from the relevant files and records. I have not suppressed any material facts.

Date: 02/11/2023

Place:

Ext,Respondent

THE KERALA MINERALS & METALS LTD. (A GOVT. OF KERALA UNDERTAKING) CHAVARA, KOLLAM - 691 583

CHANDRABOSE. J
Managing Director
The Kerala Minerals and Metals Ltd.
(A Govt. of Kerala Undertaking)
Chavara, Kollam - 691583

Solemnly affirmed and signed before me by the deponent on this the 2nd day of November 2023 in my office at Chavara, Karunagappally.

SEDHUMADHAVAN M.A., LL.M
ADVOCATE & NOTARY
KARUNAGAPPALLY
KERALA, INDIA

NOTARY
SEDHU MADHAVAN
Karuna ppally Taluk
Reg No 997
Expiry Date : 03.09.2028
SPECIAL ADHESIVE
GOVT. OF IN

NOTARIAL REGISTER
Vol. No. 2 Page No. 132
Sl. No. 1191 Date. 2/11/2023

5220 Annexure-I HOD (Env) 5220

The Kerala Minerals and Metals Ltd.
(A Govt. Of Kerala Undertaking)
(An ISO 9001, ISO 14001, OHSAS 18001 & SA 8000 Certified Company)
SANKARAMANGALAM, CHAVARA-691 583
KOLLAM, KERALA, INDIA.
Phone : +91- 476-2651215 to 2651217
Fax : +91- 0476-2680101, 2686721
E-mail : contact@kmml.com, URL : www.kmml.com
CIN-U14109KL1972SGC002399

RICE)

TS/PCB/14-A
21.08.2023

REGD POST

The Member Secretary,
Kerala State Pollution Control Board,
Plamoodu Junction
Pattom. P.O.
Thiruvananthapuram-695004

RECEIVED
Date 25/08/23

Dear Sir,

Sub: Effluent Monitoring Report.

Please find enclosed the effluent Monitoring report for the month of JULY -2023.

Thanking You,

Yours faithfully,

For The Kerala Minerals and Metals Limited.

HOD (TS/ENV) 24/08/23

CC: (1) The Environmental Engineer
Kerala State Pollution Control Board,
District Office,
Ushas Building, Big Bazar, Kollam -691001.

(2) The Chief Environmental Engineer
Kerala State Pollution Control Board Pattom P.O.
Thiruvananthapuram - 695 004

EFFLUENT PUMPING DETAILS	
July-23	
DATE	Quantity pumped (M^3)
1	880.00
2	1200.00
3	1920.00
4	1920.00
5	1760.00
6	1200.00
7	480.00
8	1920.00
9	320.00
10	800.00
11	800.00
12	960.00
13	560.00
14	640.00
15	1120.00
16	0.00
17	400.00
18	1200.00
19	1200.00
20	880.00
21	800.00
22	880.00
23	960.00
24	1200.00
25	1200.00
26	720.00
27	1200.00
28	960.00
29	800.00
30	880.00
31	960.00
TOTAL	**30720.00**

HOD (TS/ENV),
The Kerala Minerals and Metals Ltd,
Chavara , Kollam.

ANNEXURE TO FORM – I

Report of analysis of treated effluent showing performance of the treated plant for the month of **JULY** – 2023.
Sample collected on: Every week
Sample tested on: Every week
By the Laboratories of M/s. The Kerala Minerals & Metals Ltd, Kollam

Sl. No	Polluting parameters as mentioned in the conditions imposed under consent granted under section 25/26 of the water (Prevention and control of pollution) Act, 1974	Max. Permissible limits or ranges allowed as per constant condition	Concentration of range of parameters as per report	Date on which	
				There was break down and failure of the plant	Under performance was noticed
1	2	3	4	5	6
1	PH	5.5-9			
2	Suspended solids	100 mg/max.	Refer analysis report furnished		NA
3	Oil and Grease	20.0 "			
4	Total residual chlorine	- 1.0 "			
5	Total Chromium	2.0 "			
6	Zinc	15.0 "			
7	Titanium	5 .0 "			
8	Lead	2.0 "			
9	Vanadium	0.2 "			
10	Manganese	2.0 "			
11	Iron	3.0 "			
12	Total Heavy Metals	7.0 "			

Encl: Original analysis report of laboratory

Signature:

Date:

HOD (TS/ENV) 21/08/23
The Kerala Minerals and Metals Ltd, Chavara,
Kollam.

HOD (ENV) & AGM (PB)
No. 170/23 Date. 03/08/23

TP/QC/PCB/1173
03/082023

HOD (PB/ENV) Thru' M(Lab)/HOD(TS&RD/QC)

Sub: EFFLUENT WATER ANALYSIS-MONTHLY REPORT

The weekly analysis results of effluent water for the month JULY– 2023 are as given below.

Date		Std value	03/07/2023	10/07/2023	17/07/2023	24/07/2023	31/07/2023
pH		5.5-9.0	7.0	9.0	6.8	9.0	7.1
Sus.solids	mg/L	Max 100	70	90	60	90	70
Res.Cl2	mg/L	Max 1	ND	ND	ND	ND	ND
Oil&grease	mg/L	Max 20	ND	ND	ND	ND	ND
Zn	mg/L	Max 15	ND	ND	ND	ND	ND
Cr	mg/L	Max 2	ND	ND	ND	ND	ND
Ti	mg/L	Max 5	ND	ND	ND	ND	ND
Fe	mg/L	Max 3	0.3	0.7	0.3	0.7	2.0
Mn	mg/L	Max 2	2.4	0.2	2.3	0.2	1.3
V	mg/L	Max 0.2	ND	ND	ND	ND	ND
Pb	mg/L	Max 2	ND	ND	ND	ND	ND
Heavy metals	mg/L	Max 7	<7	<7	<7	<7	<7

ND-Not Detected

ScO 3/8/23

TP/QC/PCB/1173
03/08/2023

03/08/23 03/8/23

HOD (PB/ENV) Thru' M(Lab)/HOD(TS/RD/QC)

Sub: MS Plant wet mill overflow sample analysis-monthly report.

The weekly analysis result of wet mill overflow samples for the month JULU Y-2023 are as given below.

Period-From		Std value	11-07-2023	25-07-2023
Period-To			17-07-2023	31-07-2023
pH		5.5-9.0	7.2	7.2
Sus.solids	mg/L	Max 100	70	70
/Res.Cl2	mg/L	Max 1	ND	ND
Oil&grease	mg/L	Max 20	ND	ND
Zn	mg/L	Max 15	ND	ND
Cr	mg/L	Max 2	ND	ND
Ti	mg/L	Max 5	ND	ND
Fe	mg/L	Max 3	0.2	0.2
Mn	mg/L	Max 2	ND	ND
V	mg/L	Max 0.2	ND	ND
Pb	mg/L	Max 2	ND	ND
Heavy metals	mg/L	Max 7	<7	<7

ND- Not Detected

ScO 3/8/23

EFFLUENT MONITORING REPORT FOR THE PERIOD FROM
01.07.2023 TO 31.07.2023

A. ANALYSIS

Ref: Consent No. **PCB/HO/KLM/ICO-R/04/2021** dtd 13.09.2021 valid up to 2025

Sl. No	Characteristics	Tolerance	Unit	Results	Reason for non conformity with conditions No.4	Action taken / proposed to comply with condition No.4 and expected data achievement.
1.	PH	5.5-9		As per the analysis report attached		
2.	Suspended solids	100. 00	mg/l			
3	Total residual Chlorine	1. 00	"			
4	Oil & Grease	20. 00	"			
5	Total Chromium	2. 00	"			
6	Zinc	15. 00	"			
7	Titanium	5. 00	"			
8	Iron	3. 00	"			
9	Manganese	2. 00	"			
10	Vanadium	0. 20	"			
11	Lead	2. 00	"			
12.	Total heavy metals	7. 00	"			

B. Flow

Date	Limit M^3 per day	Measurement M^3 per day	Mode of measurement	Reason for non conformity with condition No.6	Action taken / proposed to comply with condition No.6 and expected date achievement
	4800	Details attached	Pump running hrs and Rota meter	NA	NA

C. Any other matter that is to be reported.

Note: 1. Attach copy of the lab reports of analysis
2. State 'Not applicable' if any column is not relevant

Signature:

Name & Designation of occupier /authorised agent:

HOD (TS/ ENV) 21/08/23
Kerala Minerals and Metals Ltd, Chavara.
Kollam.

HOD (ENV) & AGM (PB)
No. 140/23 Date. 03/08/23

TP/QC/PCB/1173
03/082023

03/08/23

03/8/23

HOD (PB/ENV) Thru' M(Lab)/HOD(TS&RD/QC)

Sub: EFFLUENT WATER ANALYSIS-MONTHLY REPORT

The weekly analysis results of effluent water for the month JULY– 2023 are as given below.

Date		Std value	03/07/2023	10/07/2023	17/07/2023	24/07/2023	31/07/2023
pH		5.5-9.0	7.0	9.0	6.8	9.0	7.1
Sus.solids	mg/L	Max 100	70	90	60	90	70
Res.Cl2	mg/L	Max 1	ND	ND	ND	ND	ND
Oil&grease	mg/L	Max 20	ND	ND	ND	ND	ND
Zn	mg/L	Max 15	ND	ND	ND	ND	ND
Cr	mg/L	Max 2	ND	ND	ND	ND	ND
Ti	mg/L	Max 5	ND	ND	ND	ND	ND
Fe	mg/L	Max 3	0.3	0.7	0.3	0.7	2.0
Mn	mg/L	Max 2	2.4	0.2	2.3	0.2	1.3
V	mg/L	Max 0.2	ND	ND	ND	ND	ND
Pb	mg/L	Max 2	ND	ND	ND	ND	ND
Heavy metals	mg/L	Max 7	<7	<7	<7	<7	<7

ND-Not Detected

ScO 31/8/23

TP/QC/PCB/1173
03/08/2023

03/08/23 03/8/23

HOD (PB/ENV) Thru' M(Lab)/HOD(TS/RD/QC)

Sub: MS Plant wet mill overflow sample analysis-monthly report.

The weekly analysis result of wet mill overflow samples for the month JULU Y-2023 are as given below.

Period-From		Std value	11-07-2023	25-07-2023
Period-To			17-07-2023	31-07-2023
pH		5.5-9.0	7.2	7.2
Sus.solids	mg/L	Max 100	70	70
/Res.Cl2	mg/L	Max 1	ND	ND
Oil&grease	mg/L	Max 20	ND	ND
Zn	mg/L	Max 15	ND	ND
Cr	mg/L	Max 2	ND	ND
Ti	mg/L	Max 5	ND	ND
Fe	mg/L	Max 3	0.2	0.2
Mn	mg/L	Max 2	ND	ND
V	mg/L	Max 0.2	ND	ND
Pb	mg/L	Max 2	ND	ND
Heavy metals	mg/L	Max 7	<7	<7

ND- Not Detected

ScO 3/8/23

O/C HOD(ENV)

2702

The Kerala Minerals and Metals Ltd.
(A Govt. Of Kerala Undertaking)
(An ISO 9001, ISO 14001, OHSAS 18001 & SA 8000 Certified Company)
SANKARAMANGALAM, CHAVARA-691 583
KOLLAM, KERALA, INDIA.
Phone : +91- 476-2651215 to 2651217
Fax : +91- 0476-2680101, 2686721
E-mail : contact@kmml.com, URL : www.kmml.com
CIN-U14109KL1972SGC002399

RIGHT

REGD POST

TS/PCB/14-A
21.07.2023

31/07/23

The Member Secretary,
Kerala State Pollution Control Board,
Plamoodu Junction
Pattom. P.O.
Thiruvananthapuram-695004

Dear Sir,

Sub: Effluent Monitoring Report.

Please find enclosed the effluent Monitoring report for the month of JUNE -2023.

Thanking You,

Yours faithfully,

For The Kerala Minerals and Metals Limited.

HOD (ENV) 21/07/23

CC: (1) The Environmental Engineer
Kerala State Pollution Control Board,
District Office,
Ushas Building, Big Bazar, Kollam -691001.

(2) The Chief Environmental Engineer
Kerala State Pollution Control Board Pattom P.O.
Thiruvananthapuram - 695 004

EFFLUENT PUMPING DETAILS	
June-23	
DATE	Quantity pumped (M^3)
1	1200.00
2	1120.00
3	1200.00
4	1200.00
5	1200.00
6	1200.00
7	1120.00
8	1120.00
9	880.00
10	1200.00
11	480.00
12	720.00
13	640.00
14	1200.00
15	1120.00
16	1120.00
17	1120.00
18	1200.00
19	1200.00
20	640.00
21	640.00
22	1120.00
23	1120.00
24	880.00
25	1200.00
26	480.00
27	960.00
28	720.00
29	480.00
30	0.00
TOTAL	28480.00

HOD (ENV)
The Kerala Minerals and Metals Ltd,
Chavara , Kollam.

ANNEXURE TO FORM – I

Report of analysis of treated effluent showing performance of the treated plant for the month of **JUNE** – 2023.
Sample collected on: Every week
Sample tested on: Every week
By the Laboratories of M/s. The Kerala Minerals & Metals Ltd, Kollam

Sl. No	Polluting parameters as mentioned in the conditions imposed under consent granted under section 25/26 of the water (Prevention and control of pollution) Act, 1974	Max. Permissible limits or ranges allowed as per constant condition	Concentration of range of parameters as per report	Date on which	
				There was break down and failure of the plant	Under performance was noticed
1	2	3	4	5	6
1	PH	5.5-9	Refer analysis report furnished		NA
2	Suspended solids	100 mg/max.			
3	Oil and Grease	20.0 "			
4	Total residual chlorine	1.0 "			
5	Total Chromium	2.0 "			
6	Zinc	15.0 "			
7	Titanium	5 .0 "			
8	Lead	2.0 "			
9	Vanadium	0.2 "			
10	Manganese	2.0 "			
11	Iron	3.0 "			
12	Total Heavy Metals	7.0 "			

Encl: Original analysis report of laboratory

Signature:

Date:

HOD (ENV)
The Kerala Minerals and Metals Ltd, Chavara,
Kollam.

TP/QC/PCB/1173
05/07/2023

HOD (PB/ENV) Thru' M(Lab)/HOD(TS&RD/QC)

Sub: EFFLUENT WATER ANALYSIS-MONTHLY REPORT

The weekly analysis results of effluent water for the month JUNE– 2023 are as given below.

Date		Std value	05/06/2023	12/06/2023	19/06/2023	26/06/2023
pH		5.5-9.0	5.8	6.4	6.4	6.5
Sus.solids	mg/L	Max 100	60	60	60	65
Res.Cl2	mg/L	Max 1	ND	ND	ND	ND
Oil&grease	mg/L	Max 20	ND	ND	ND	ND
Zn	mg/L	Max 15	ND	ND	ND	ND
Cr	mg/L	Max 2	ND	ND	ND	ND
Ti	mg/L	Max 5	ND	ND	ND	ND
Fe	mg/L	Max 3	2.0	1.4	2.8	2.9
Mn	mg/L	Max 2	1.1	0.5	1.5	1.2
V	mg/L	Max 0.2	ND	ND	ND	ND
Pb	mg/L	Max 2	ND	ND	ND	ND
Heavy metals	mg/L	Max 7	<7	<7	<7	<7

ND-Not Detected

ScO 5/7/23

TP/QC/PCB/1173
05/07/2023

HOD (PE/ENV) Thru' M(Lab)/HOD(TS&RD/QC)

Sub: MS Plant wet mill overflow sample analysis-monthly report.

The weekly analysis result of wet mill overflow sample for the month JUNE-2023 are as given below.

Period-From		Std value	30-05-2023	13-06-2023	27-06-2023
Period-To			05-06-2023	19-06-2023	03-07-2023
pH		5.5-9.0	7.2	7.4	7.8
Sus.solids	mg/L	Max 100	70	70	75
Res.Cl2	mg/L	Max 1	ND	ND	ND
Oil&grease	mg/L	Max 20	ND	ND	ND
Zn	mg/L	Max 15	ND	ND	ND
Cr	mg/L	Max 2	ND	ND	ND
Ti	mg/L	Max 5	ND	ND	ND
Fe	mg/L	Max 3	0.2	0.4	0.8
Mn	mg/L	Max 2	0.2	0.2	0.4
V	mg/L	Max 0.2	ND	ND	ND
Pb	mg/L	Max 2	ND	ND	ND
Heavy metals	mg/L	Max 7	<7	<7	<7

ND- Not Detected

ScO

EFFLUENT MONITORING REPORT FOR THE PERIOD FROM
01.06.2023 TO 30.06.2023

A. ANALYSIS

Ref: Consent No. **PCB/HO/KLM/ICO-R/04/2021** dtd 13.09.2021 valid up to 2025

Sl. No	Characteristics	Tolerance	Unit	Results	Reason for non conformity with conditions No.4	Action taken / proposed to comply with condition No.4 and expected data achievement.
1.	PH	5.5-9				
2.	Suspended solids	100. 00	mg/I			
3	Total residual Chlorine	1. 00	"	As per the		
4	Oil & Grease	20. 00	"	analysis		
5	Total Chromium	2. 00	"	report		
6	Zinc	15. 00	"	attached		
7	Titanium	5. 00	"			
8	Iron	3. 00	"			
9	Manganese	2. 00	"			
10	Vanadium	0. 20	"			
11	Lead	2. 00	"			
12.	Total heavy metals	7. 00	"			

B. Flow

Date	Limit M^3 per day	Measurement M^3 per day	Mode of measurement	Reason for non conformity with condition No.6	Action taken / proposed to comply with condition No.6 and expected date achievement
	4800	Details attached	Pump running hrs and Rota meter	NA	NA

C. Any other matter that is to be reported.

Note: 1. Attach copy of the lab reports of analysis
2. State 'Not applicable' if any column is not relevant

Signature:

Name & Designation of occupier /authorised agent:

HOD (ENV)
Kerala Minerals and Metals Ltd, Chavara.
Kollam.

21/08/23

TP/QC/PCB/1173
05/07/2023

HOD (PB/ENV) Thru' M(Lab)/HOD(TS&RD/QC)

Sub: EFFLUENT WATER ANALYSIS-MONTHLY REPORT

The weekly analysis results of effluent water for the month JUNE– 2023 are as given below.

Date		Std value	05/06/2023	12/06/2023	19/06/2023	26/06/2023
pH		5.5-9.0	5.8	6.4	6.4	6.5
Sus.solids	mg/L	Max 100	60	60	60	65
Res.Cl2	mg/L	Max 1	ND	ND	ND	ND
Oil&grease	mg/L	Max 20	ND	ND	ND	ND
Zn	mg/L	Max 15	ND	ND	ND	ND
Cr	mg/L	Max 2	ND	ND	ND	ND
Ti	mg/L	Max 5	ND	ND	ND	ND
Fe	mg/L	Max 3	2.0	1.4	2.8	2.9
Mn	mg/L	Max 2	1.1	0.5	1.5	1.2
V	mg/L	Max 0.2	ND	ND	ND	ND
Pb	mg/L	Max 2	ND	ND	ND	ND
Heavy metals	mg/L	Max 7	<7	<7	<7	<7

ND-Not Detected

ScO 5/7/23

TP/QC/PCB/1173
05/07/2023

HOD (PE/ENV) Thru' M(Lab)/HOD(TS&RD/QC)

Sub: MS Plant wet mill overflow sample analysis-monthly report.

The weekly analysis result of wet mill overflow sample for the month JUNE-2023 are as given below.

Period-From		Std value	30-05-2023	13-06-2023	27-06-2023
Period-To			05-06-2023	19-06-2023	03-07-2023
pH		5.5-9.0	7.2	7.4	7.8
Sus.solids	mg/L	Max 100	70	70	75
Res.Cl2	mg/L	Max 1	ND	ND	ND
Oil&grease	mg/L	Max 20	ND	ND	ND
Zn	mg/L	Max 15	ND	ND	ND
Cr	mg/L	Max 2	ND	ND	ND
Ti	mg/L	Max 5	ND	ND	ND
Fe	mg/L	Max 3	0.2	0.4	0.8
Mn	mg/L	Max 2	0.2	0.2	0.4
V	mg/L	Max 0.2	ND	ND	ND
Pb	mg/L	Max 2	ND	ND	ND
Heavy metals	mg/L	Max 7	<7	<7	<7

ND- Not Detected

ScO

The Kerala Minerals and Metals Ltd.
(A Govt. Of Kerala Undertaking)
(An ISO 9001, ISO 14001, OHSAS 18001 & SA 8000 Certified Company)
SANKARAMANGALAM, CHAVARA-691 583
KOLLAM, KERALA, INDIA.
Phone : +91- 476-2651215 to 2651217
Fax : +91- 0476-2680101, 2686721
E-mail : contact@kmml.com, URL : www.kmml.com

CIN-U14109KL1972SGC002399

R1(9).

TS/PCB/14-A
22.06.2023

REGD POST

The Member Secretary,
Kerala State Pollution Control Board,
Plamoodu Junction
Pattom. P.O.
Thiruvananthapuram-695004

Dear Sir,

Sub: Effluent Monitoring Report.

Please find enclosed the effluent Monitoring report for the month of MAY -2023.

Thanking You,

Yours faithfully,

For The Kerala Minerals and Metals Limited.

HOD (ENV) 22/06/23

CC: (1) The Environmental Engineer
Kerala State Pollution Control Board,
District Office,
Ushas Building, Big Bazar, Kollam -691001.

(2) The Chief Environmental Engineer
Kerala State Pollution Control Board Pattom P.O.
Thiruvananthapuram - 695 004

EFFLUENT PUMPING DETAILS	
May-23	
DATE	Quantity pumped (M^3)
1	640.00
2	1200.00
3	960.00
4	640.00
5	720.00
6	800.00
7	1200.00
8	720.00
9	1200.00
10	1200.00
11	1120.00
12	960.00
13	1120.00
14	1120.00
15	640.00
16	1040.00
17	1040.00
18	1200.00
19	1120.00
20	1120.00
21	1040.00
22	1200.00
23	1200.00
24	480.00
25	0.00
26	560.00
27	1200.00
28	1200.00
29	1200.00
30	1200.00
31	1200.00
TOTAL	**30240.00**

HOD (ENV),
The Kerala Minerals and Metals Ltd,
Chavara , Kollam.

ANNEXURE TO FORM – I

Report of analysis of treated effluent showing performance of the treated plant for the month of **MAY** – 2023.
Sample collected on: Every week
Sample tested on: Every week
By the Laboratories of M/s. The Kerala Minerals & Metals Ltd, Kollam

Sl. No	Polluting parameters as mentioned in the conditions imposed under consent granted under section 25/26 of the water (Prevention and control of pollution) Act, 1974	Max. Permissible limits or ranges allowed as per constant condition	Concentration of range of parameters as per report	Date on which	
				There was break down and failure of the plant	Under performance was noticed
1	2	3	4	5	6
1	PH	5.5-9	Refer analysis report furnished		NA
2	Suspended solids	100 mg/max.			
3	Oil and Grease	20.0 "			
4	Total residual chlorine	1.0 "			
5	Total Chromium	2.0 "			
6	Zinc	15.0 "			
7	Titanium	5 .0 "			
8	Lead	2.0 "			
9	Vanadium	0.2 "			
10	Manganese	2.0 "			
11	Iron	3.0 "			
12	Total Heavy Metals	7.0 "			

Encl: Original analysis report of laboratory

Signature:

Date:

HOD (ENV)
The Kerala Minerals and Metals Ltd, Chavara,
Kollam.

TP/QC/PCB/1173
03/06/2023

HOD (PB/ENV) Thru' M(Lab)/HOD(TS&RD/QC)

Sub: EFFLUENT WATER ANALYSIS-MONTHLY REPORT

The weekly analysis results of effluent water for the month MAY– 2023 are as given below.

Date		Std value	01/05/2023	08/05/2023	15/05/2023	22/05/2023	29-05-2023
pH		5.5-9.0	6.6	8.6	6.7	7.8	7.2
Sus.solids	mg/L	Max 100	60	80	60	70	70
Res.Cl2	mg/L	Max 1	ND	ND	ND	ND	ND
Oil&grease	mg/L	Max 20	ND	ND	ND	ND	ND
Zn	mg/L	Max 15	ND	ND	ND	ND	ND
Cr	mg/L	Max 2	ND	ND	ND	ND	ND
Ti	mg/L	Max 5	ND	ND	ND	ND	ND
Fe	mg/L	Max 3	1.0	2.6	2.9	2.3	2.8
Mn	mg/L	Max 2	1.2	0.5	1.4	0.9	1.8
V	mg/L	Max 0.2	ND	ND	ND	ND	ND
Pb	mg/L	Max 2	ND	ND	ND	ND	ND
Heavy metals	mg/L	Max 7	<7	<7	<7	<7	<7

ND-Not Detected

ScO

TP/QC/PCB/1173
03/06/2023

HOD (PB/ENV) Thru' M(Lab)/HOD(TS&RD/QC)

Sub: MS Plant wet mill overflow sample analysis-monthly report.

The weekly analysis result of wet mill overflow sample for the month MAY-2023 are as given below.

Period-From		Std value	02-05-2023	09-05-2023	23-05-2023
Period-To			08-05-2023	15-05-2023	29-05-2023
pH		5.5-9.0	7.0	7.1	7.4
Sus.solids	mg/L	Max 100	70	70	75
Res.Cl2	mg/L	Max 1	ND	ND	ND
Oil&grease	mg/L	Max 20	ND	ND	ND
Zn	mg/L	Max 15	ND	ND	ND
Cr	mg/L	Max 2	ND	ND	ND
Ti	mg/L	Max 5	ND	ND	ND
Fe	mg/L	Max 3	0.2	0.8	0.3
Mn	mg/L	Max 2	ND	ND	ND
V	mg/L	Max 0.2	ND	ND	ND
Pb	mg/L	Max 2	ND	ND	ND
Heavy metals	mg/L	Max 7	<7	<7	<7

ND- Not Detected

ScO

EFFLUENT MONITORING REPORT FOR THE PERIOD FROM
01.05.2023 TO 31.05.2023

A. ANALYSIS

Ref: Consent No. **PCB/HO/KLM/ICO-R/04/2021** dtd 13.09.2021 valid up to 2025

Sl. No	Characteristics	Tolerance	Unit	Results	Reason for non conformity with conditions No.4	Action taken / proposed to comply with condition No.4 and expected data achievement.
1.	PH	5.5-9				
2.	Suspended solids	100. 00	mg/l			
3	Total residual Chlorine	1. 00	"	As per the		
4	Oil & Grease	20. 00	"	analysis		
5	Total Chromium	2. 00	"	report		
6	Zinc	15. 00	"	attached		
7	Titanium	5. 00	"			
8	Iron	3. 00	"			
9	Manganese	2. 00	"			
10	Vanadium	0. 20	"			
11	Lead	2. 00	"			
12.	Total heavy metals	7. 00	"			

B. Flow

Date	Limit M^3 per day	Measurement M^3 per day	Mode of measurement	Reason for non conformity with condition No.6	Action taken./ proposed to comply with condition No.6 and expected date achievement
	4800	Details attached	Pump running hrs and Rota meter	NA	NA

C. Any other matter that is to be reported.

Note: 1. Attach copy of the lab reports of analysis
2. State 'Not applicable' if any column is not relevant

Signature:

Name & Designation of occupier /authorised agent:

HOD (ENV)
Kerala Minerals and Metals Ltd, Chavara.
Kollam.

22/06/23

TP/QC/PCB/1173
03/06/2023

HOD (PB/ENV) Thru' M(Lab)/HOD(TS&RD/QC)

Sub: EFFLUENT WATER ANALYSIS-MONTHLY REPORT

The weekly analysis results of effluent water for the month MAY– 2023 are as given below.

Date		Std value	01/05/2023	08/05/2023	15/05/2023	22/05/2023	29-05-2023
pH		5.5-9.0	6.6	8.6	6.7	7.8	7.2
Sus.solids	mg/L	Max 100	60	80	60	70	70
Res.Cl2	mg/L	Max 1	ND	ND	ND	ND	ND
Oil&grease	mg/L	Max 20	ND	ND	ND	ND	ND
Zn	mg/L	Max 15	ND	ND	ND	ND	ND
Cr	mg/L	Max 2	ND	ND	ND	ND	ND
Ti	mg/L	Max 5	ND	ND	ND	ND	ND
Fe	mg/L	Max 3	1.0	2.6	2.9	2.3	2.8
Mn	mg/L	Max 2	1.2	0.5	1.4	0.9	1.8
V	mg/L	Max 0.2	ND	ND	ND	ND	ND
Pb	mg/L	Max 2	ND	ND	ND	ND	ND
Heavy metals	mg/L	Max 7	<7	<7	<7	<7	<7

ND-Not Detected

ScO 3/6/23

TP/QC/PCB/1173
03/06/2023

HOD (PB/ENV) Thru' M(Lab)/HOD(TS&RD/QC)

Sub: MS Plant wet mill overflow sample analysis-monthly report.

The weekly analysis result of wet mill overflow sample for the month MAY-2023 are as given below.

Period-From		Std value	02-05-2023	09-05-2023	23-05-2023
Period-To			08-05-2023	15-05-2023	29-05-2023
pH		5.5-9.0	7.0	7.1	7.4
Sus.solids	mg/L	Max 100	70	70	75
Res.Cl2	mg/L	Max 1	ND	ND	ND
Oil&grease	mg/L	Max 20	ND	ND	ND
Zn	mg/L	Max 15	ND	ND	ND
Cr	mg/L	Max 2	ND	ND	ND
Ti	mg/L	Max 5	ND	ND	ND
Fe	mg/L	Max 3	0.2	0.8	0.3
Mn	mg/L	Max 2	ND	ND	ND
V	mg/L	Max 0.2	ND	ND	ND
Pb	mg/L	Max 2	ND	ND	ND
Heavy metals	mg/L	Max 7	<7	<7	<7

ND- Not Detected

ScO

Annexure-(2)

QUALITY CONTROL LABORATORY

SAMPLE/DATE WISE REPORT OF QC SAMPLES FROM : 01/08/2023 TO: 27/09/2023

Sl.No.	Date	Time	Shift	Sample Characteristics	Sample Value
SAMPLE : PNT/SNT/POND					
1	01/08/2023	10.00	A	1.PNT - pH	1.7
2	01/08/2023	10.00	A	2.SNT - pH	10.3
3	01/08/2023	10.00	A	3.POND - pH	6.4
4	01/08/2023	10.00	A	4.POND - SOLIDS ppm	60
5	02/08/2023	10.00	A	1.PNT - pH	3.2
6	02/08/2023	10.00	A	2.SNT - pH	8.4
7	02/08/2023	10.00	A	3.POND - pH	8.6
8	02/08/2023	10.00	A	4.POND - SOLIDS ppm	80
9	03/08/2023	10.00	A	1.PNT - pH	1.3
10	03/08/2023	10.00	A	2.SNT - pH	11.7
11	03/08/2023	10.00	A	3.POND - pH	9.0
12	03/08/2023	10.00	A	4.POND - SOLIDS ppm	90
13	04/08/2023	10.00	A	1.PNT - pH	<0.5
14	04/08/2023	10.00	A	2.SNT - pH	9.4
15	04/08/2023	10.00	A	3.POND - pH	6.5
16	04/08/2023	10.00	A	4.POND - SOLIDS ppm	60
17	05/08/2023	10.00	A	1.PNT - pH	0.6
18	05/08/2023	10.00	A	2.SNT - pH	7.8
19	05/08/2023	10.00	A	3.POND - pH	8.9
20	05/08/2023	10.00	A	4.POND - SOLIDS ppm	90
21	06/08/2023	10.00	A	1.PNT - pH	0.6
22	06/08/2023	10.00	A	2.SNT - pH	7.4
23	06/08/2023	10.00	A	3.POND - pH	6.7
24	06/08/2023	10.00	A	4.POND - SOLIDS ppm	70
25	07/08/2023	10.00	A	1.PNT - pH	0.9
26	07/08/2023	10.00	A	2.SNT - pH	7.5
27	07/08/2023	10.00	A	3.POND - pH	8.8
28	07/08/2023	10.00	A	4.POND - SOLIDS ppm	90
29	08/08/2023	10.00	A	1.PNT - pH	1.5
30	08/08/2023	10.00	A	2.SNT - pH	7.0
31	08/08/2023	10.00	A	3.POND - pH	8.2
32	08/08/2023	10.00	A	4.POND - SOLIDS ppm	80
33	09/08/2023	10.00	A	1.PNT - pH	5.3
34	09/08/2023	10.00	A	2.SNT - pH	7.3
35	09/08/2023	10.00	A	3.POND - pH	8.4
36	09/08/2023	10.00	A	4.POND - SOLIDS ppm	80
37	10/08/2023	10.00	A	1.PNT - pH	<0.5
38	10/08/2023	10.00	A	2.SNT - pH	9.0
39	10/08/2023	10.00	A	3.POND - pH	7.5
40	10/08/2023	10.00	A	4.POND - SOLIDS ppm	70
41	11/08/2023	10.00	A	1.PNT - pH	<0.5
42	11/08/2023	10.00	A	2.SNT - pH	11.7
43	11/08/2023	10.00	A	3.POND - pH	8.4
44	11/08/2023	10.00	A	4.POND - SOLIDS ppm	80

RICH)

QUALITY CONTROL LABORATORY

SAMPLE/DATE WISE REPORT OF QC SAMPLES FROM : 01/08/2023 TO: 27/09/2023

Sl.No.	Date	Time	Shift	Sample Characteristics	Sample Value
SAMPLE : PNT/SNT/POND					
45	12/08/2023	10.00	A	1.PNT - pH	0.8
46	12/08/2023	10.00	A	2.SNT - pH	6.4
47	12/08/2023	10.00	A	3.POND - pH	7.9
48	12/08/2023	10.00	A	4.POND - SOLIDS ppm	80
49	13/08/2023	10.00	A	1.PNT - pH	0.5
50	13/08/2023	10.00	A	2.SNT - pH	11.5
51	13/08/2023	10.00	A	3.POND - pH	6.8
52	13/08/2023	10.00	A	4.POND - SOLIDS ppm	70
53	14/08/2023	10.00	A	1.PNT - pH	0.6
54	14/08/2023	10.00	A	2.SNT - pH	9.9
55	14/08/2023	10.00	A	3.POND - pH	6.9
56	14/08/2023	10.00	A	4.POND - SOLIDS ppm	70
57	15/08/2023	10.00	A	1.PNT - pH	0.7
58	15/08/2023	10.00	A	2.SNT - pH	7.8
59	15/08/2023	10.00	A	3.POND - pH	8.0
60	15/08/2023	10.00	A	4.POND - SOLIDS ppm	80
61	16/08/2023	10.00	A	1.PNT - pH	1.7
62	16/08/2023	10.00	A	2.SNT - pH	7.8
63	16/08/2023	10.00	A	3.POND - pH	7.7
64	16/08/2023	10.00	A	4.POND - SOLIDS ppm	80
65	17/08/2023	10.00	A	1.PNT - pH	<0.5
66	17/08/2023	10.00	A	2.SNT - pH	8.7
67	17/08/2023	10.00	A	3.POND - pH	8.7
68	17/08/2023	10.00	A	4.POND - SOLIDS ppm	85
69	18/08/2023	10.00	A	1.PNT - pH	0.5
70	18/08/2023	10.00	A	2.SNT - pH	8.8
71	18/08/2023	10.00	A	3.POND - pH	7.5
72	18/08/2023	10.00	A	4.POND - SOLIDS ppm	70
73	19/08/2023	9.30	A	1.PNT - pH	<0.5
74	19/08/2023	9.30	A	2.SNT - pH	10.3
75	19/08/2023	9.30	A	3.POND - pH	8.7
76	19/08/2023	9.30	A	4.POND - SOLIDS ppm	80
77	20/08/2023	10.00	A	1.PNT - pH	0.6
78	20/08/2023	10.00	A	2.SNT - pH	6.8
79	20/08/2023	10.00	A	3.POND - pH	6.9
80	20/08/2023	10.00	A	4.POND - SOLIDS ppm	70
81	21/08/2023	10.00	A	1.PNT - pH	0.8
82	21/08/2023	10.00	A	2.SNT - pH	10.9
83	21/08/2023	10.00	A	3.POND - pH	8.9
84	21/08/2023	10.00	A	4.POND - SOLIDS ppm	90
85	22/08/2023	10.00	A	1.PNT - pH	0.7
86	22/08/2023	10.00	A	2.SNT - pH	8.7
87	22/08/2023	10.00	A	3.POND - pH	8.9
88	22/08/2023	10.00	A	4.POND - SOLIDS ppm	90

QUALITY CONTROL LABORATORY

SAMPLE/DATE WISE REPORT OF QC SAMPLES FROM : 01/08/2023 TO: 27/09/2023

Sl.No.	Date	Time	Shift	Sample Characteristics	Sample Value
SAMPLE : PNT/SNT/POND					
89	24/08/2023	10.00	A	1.PNT - pH	1.4
90	24/08/2023	10.00	A	2.SNT - pH	8.4
91	24/08/2023	10.00	A	3.POND - pH	6.2
92	24/08/2023	10.00	A	4.POND - SOLIDS ppm	60
93	25/08/2023	10.00	A	1.PNT - pH	0.9
94	25/08/2023	10.00	A	2.SNT - pH	6.2
95	25/08/2023	10.00	A	3.POND - pH	8.2
96	25/08/2023	10.00	A	4.POND - SOLIDS ppm	80
97	26/08/2023	10.00	A	1.PNT - pH	<0.5
98	26/08/2023	10.00	A	2.SNT - pH	7.7
99	26/08/2023	10.00	A	3.POND - pH	6.8
100	26/08/2023	10.00	A	4.POND - SOLIDS ppm	70
101	27/08/2023	10.00	A	1.PNT - pH	0.5
1[illegible]	27/08/2023	10.00	A	2.SNT - pH	10.1
103	27/08/2023	10.00	A	3.POND - pH	7.3
104	27/08/2023	10.00	A	4.POND - SOLIDS ppm	70
105	28/08/2023	10.00	A	1.PNT - pH	<0.5
106	28/08/2023	10.00	A	2.SNT - pH	8.9
107	28/08/2023	10.00	A	3.POND - pH	5.9
108	28/08/2023	10.00	A	4.POND - SOLIDS ppm	60
109	29/08/2023	10.00	A	1.PNT - pH	<0.5
110	29/08/2023	10.00	A	2.SNT - pH	7.4
111	29/08/2023	10.00	A	3.POND - pH	7.0
112	29/08/2023	10.00	A	4.POND - SOLIDS ppm	70
113	30/08/2023	10.00	A	1.PNT - pH	2.5
114	30/08/2023	10.00	A	2.SNT - pH	6.5
115	30/08/2023	10.00	A	3.POND - pH	5.9
11[illegible]	30/08/2023	10.00	A	4.POND - SOLIDS ppm	60
11[illegible]	31/08/2023	10.00	A	1.PNT - pH	3.5
118	31/08/2023	10.00	A	2.SNT - pH	7.9
119	31/08/2023	10.00	A	3.POND - pH	8.1
120	31/08/2023	10.00	A	4.POND - SOLIDS ppm	80
121	01/09/2023	10.00	A	1.PNT - pH	1.1
122	01/09/2023	10.00	A	2.SNT - pH	7.6
123	01/09/2023	10.00	A	3.POND - pH	7.6
124	01/09/2023	10.00	A	4.POND - SOLIDS ppm	70
125	02/09/2023	10.00	A	1.PNT - pH	1.4
126	02/09/2023	10.00	A	2.SNT - pH	7.1
127	02/09/2023	10.00	A	3.POND - pH	7.7
128	02/09/2023	10.00	A	4.POND - SOLIDS ppm	80
129	03/09/2023	10.00	A	1.PNT - pH	3.0
130	03/09/2023	10.00	A	2.SNT - pH	10.9
131	03/09/2023	10.00	A	3.POND - pH	8.0
132	03/09/2023	10.00	A	4.POND - SOLIDS ppm	80

QUALITY CONTROL LABORATORY

SAMPLE/DATE WISE REPORT OF QC SAMPLES FROM : 01/08/2023 TO: 27/09/2023

Sl.No.	Date	Time	Shift	Sample Characteristics	Sample Value
SAMPLE : PNT/SNT/POND					
133	04/09/2023	10.00	A	1.PNT - pH	1.2
134	04/09/2023	10.00	A	2.SNT - pH	7.5
135	04/09/2023	10.00	A	3.POND - pH	8.3
136	04/09/2023	10.00	A	4.POND - SOLIDS ppm	80
137	05/09/2023	10.00	A	1.PNT - pH	0.5
138	05/09/2023	10.00	A	2.SNT - pH	6.6
139	05/09/2023	10.00	A	3.POND - pH	8.9
140	05/09/2023	10.00	A	4.POND - SOLIDS ppm	90
141	06/09/2023	10.00	A	1.PNT - pH	1.7
142	06/09/2023	10.00	A	2.SNT - pH	6.8
143	06/09/2023	10.00	A	3.POND - pH	7.4
144	06/09/2023	10.00	A	4.POND - SOLIDS ppm	70
145	07/09/2023	10.00	A	1.PNT - pH	0.6
146	07/09/2023	10.00	A	2.SNT - pH	9.4
147	07/09/2023	10.00	A	3.POND - pH	6.9
148	07/09/2023	10.00	A	4.POND - SOLIDS ppm	70
149	08/09/2023	10.00	A	1.PNT - pH	1.2
150	08/09/2023	10.00	A	2.SNT - pH	6.2
151	08/09/2023	10.00	A	3.POND - pH	6.0
152	08/09/2023	10.00	A	4.POND - SOLIDS ppm	60
153	09/09/2023	10.00	A	1.PNT - pH	3.4
154	09/09/2023	10.00	A	2.SNT - pH	10.2
155	09/09/2023	10.00	A	3.POND - pH	7.3
156	09/09/2023	10.00	A	4.POND - SOLIDS ppm	70
157	10/09/2023	10.00	A	1.PNT - pH	0.7
158	10/09/2023	10.00	A	2.SNT - pH	7.2
159	10/09/2023	10.00	A	3.POND - pH	6.2
160	10/09/2023	10.00	A	4.POND - SOLIDS ppm	60
161	11/09/2023	10.00	A	1.PNT - pH	<0.5
162	11/09/2023	10.00	A	2.SNT - pH	8.1
163	11/09/2023	10.00	A	3.POND - pH	7.0
164	11/09/2023	10.00	A	4.POND - SOLIDS ppm	70
165	12/09/2023	10.00	A	1.PNT - pH	0.8
166	12/09/2023	10.00	A	2.SNT - pH	8.5
167	12/09/2023	10.00	A	3.POND - pH	5.8
168	12/09/2023	10.00	A	4.POND - SOLIDS ppm	60
169	13/09/2023	10.00	A	1.PNT - pH	1.2
170	13/09/2023	10.00	A	2.SNT - pH	10.8
171	13/09/2023	10.00	A	3.POND - pH	7.9
172	13/09/2023	10.00	A	4.POND - SOLIDS ppm	80
173	14/09/2023	10.00	A	1.PNT - pH	0.9
174	14/09/2023	10.00	A	2.SNT - pH	7.5
175	14/09/2023	10.00	A	3.POND - pH	8.4
176	14/09/2023	10.00	A	4.POND - SOLIDS ppm	80

QUALITY CONTROL LABORATORY

SAMPLE/DATE WISE REPORT OF QC SAMPLES FROM : 01/08/2023 TO: 27/09/2023

Sl.No.	Date	Time	Shift	Sample Characteristics	Sample Value
SAMPLE : PNT/SNT/POND					
177	15/09/2023	10.00	A	1.PNT - pH	3.5
178	15/09/2023	10.00	A	2.SNT - pH	8.2
179	15/09/2023	10.00	A	3.POND - pH	8.2
180	15/09/2023	10.00	A	4.POND - SOLIDS ppm	80
181	16/09/2023	10.00	A	1.PNT - pH	0.6
182	16/09/2023	10.00	A	2.SNT - pH	11.6
183	16/09/2023	10.00	A	3.POND - pH	6.7
184	16/09/2023	10.00	A	4.POND - SOLIDS ppm	70
185	17/09/2023	10.00	A	1.PNT - pH	0.5
186	17/09/2023	10.00	A	2.SNT - pH	6.5
187	17/09/2023	10.00	A	3.POND - pH	6.9
188	17/09/2023	10.00	A	4.POND - SOLIDS ppm	70
189	18/09/2023	10.00	A	1.PNT - pH	1.2
190	18/09/2023	10.00	A	2.SNT - pH	9.6
191	18/09/2023	10.00	A	3.POND - pH	7.5
192	18/09/2023	10.00	A	4.POND - SOLIDS ppm	75
193	19/09/2023	10.00	A	1.PNT - pH	0.6
194	19/09/2023	10.00	A	2.SNT - pH	6.7
195	19/09/2023	10.00	A	3.POND - pH	5.9
196	19/09/2023	10.00	A	4.POND - SOLIDS ppm	60
197	20/09/2023	10.00	A	1.PNT - pH	5.1
198	20/09/2023	10.00	A	2.SNT - pH	8.5
199	20/09/2023	10.00	A	3.POND - pH	9.0
200	20/09/2023	10.00	A	4.POND - SOLIDS ppm	90
201	21/09/2023	10.00	A	1.PNT - pH	3.2
202	21/09/2023	10.00	A	2.SNT - pH	9.0
203	21/09/2023	10.00	A	3.POND - pH	8.1
204	21/09/2023	10.00	A	4.POND - SOLIDS ppm	80
205	22/09/2023	10.00	A	1.PNT - pH	0.5
206	22/09/2023	10.00	A	2.SNT - pH	7.8
207	22/09/2023	10.00	A	3.POND - pH	6.6
208	22/09/2023	10.00	A	4.POND - SOLIDS ppm	60
209	23/09/2023	10.00	A	1.PNT - pH	<0.5
210	23/09/2023	10.00	A	2.SNT - pH	9.3
211	23/09/2023	10.00	A	3.POND - pH	8.8
212	23/09/2023	10.00	A	4.POND - SOLIDS ppm	90
213	24/09/2023	10.00	A	1.PNT - pH	0.5
214	24/09/2023	10.00	A	2.SNT - pH	6.4
215	24/09/2023	10.00	A	3.POND - pH	7.7
216	24/09/2023	10.00	A	4.POND - SOLIDS ppm	70
217	25/09/2023	10.00	A	1.PNT - pH	3.0
218	25/09/2023	10.00	A	2.SNT - pH	9.2
219	25/09/2023	10.00	A	3.POND - pH	8.9
220	25/09/2023	10.00	A	4.POND - SOLIDS ppm	90

QUALITY CONTROL LABORATORY

SAMPLE/DATE WISE REPORT OF QC SAMPLES FROM : 01/08/2023 TO: 27/09/2023

Sl.No.	Date	Time	Shift	Sample Characteristics	Sample Value
SAMPLE : PNT/SNT/POND					
221	26/09/2023	10.00	A	1.PNT - pH	1.4
222	26/09/2023	10.00	A	2.SNT - pH	6.8
223	26/09/2023	10.00	A	3.POND - pH	6.9
224	26/09/2023	10.00	A	4.POND - SOLIDS ppm	70
225	27/09/2023	10.00	A	1.PNT - pH	<0.5
226	27/09/2023	10.00	A	2.SNT - pH	10.9
227	27/09/2023	10.00	A	3.POND - pH	9.0
228	27/09/2023	10.00	A	4.POND - SOLIDS ppm	90

Annexure-3

QUALITY CONTROL LABORATORY

SAMPLE/DATE WISE REPORT OF QC SAMPLES FROM : 01/04/2022 TO: 31/03/2023

Sl.No.	Date	Time	Shift	Sample Characteristics	Sample Value
SAMPLE : TUBE WELL WATER					
45	28/10/2022	10.00	A	1. SAMPLE DETAILS	NO. 8
46	28/10/2022	10.00	A	2.0 pH	6.0
47	28/10/2022	10.00	A	2.0 pH	6.3
48	28/10/2022	10.00	A	2.0 pH	6.2
49	28/10/2022	10.00	A	2.0 pH	6.2
50	28/10/2022	10.00	A	2.0 pH	6.0
51	28/10/2022	10.00	A	3.0 CONDUCTIVITY umhos	114
52	28/10/2022	10.00	A	3.0 CONDUCTIVITY umhos	143
53	28/10/2022	10.00	A	3.0 CONDUCTIVITY umhos	117
54	28/10/2022	10.00	A	3.0 CONDUCTIVITY umhos	134
55	28/10/2022	10.00	A	3.0 CONDUCTIVITY umhos	137
56	28/10/2022	10.00	A	4.0 TDS mg/L	82
57	28/10/2022	10.00	A	4.0 TDS mg/L	81
58	28/10/2022	10.00	A	4.0 TDS mg/L	87
59	28/10/2022	10.00	A	4.0 TDS mg/L	86
60	28/10/2022	10.00	A	4.0 TDS mg/L	70
61	28/10/2022	10.00	A	5.0 CHLORIDE ppm	10
62	28/10/2022	10.00	A	5.0 CHLORIDE ppm	18
63	28/10/2022	10.00	A	5.0 CHLORIDE ppm	15
64	28/10/2022	10.00	A	5.0 CHLORIDE ppm	16
65	28/10/2022	10.00	A	5.0 CHLORIDE ppm	11
66	28/10/2022	10.00	A	6.0 Fe ppm	1.2
67	28/10/2022	10.00	A	6.0 Fe ppm	2.1
68	28/10/2022	10.00	A	6.0 Fe ppm	1.5
69	28/10/2022	10.00	A	6.0 Fe ppm	1.6
70	28/10/2022	10.00	A	6.0 Fe ppm	2.4
71	28/10/2022	10.00	A	7.0 SiO2 ppm	13
72	28/10/2022	10.00	A	7.0 SiO2 ppm	13
73	28/10/2022	10.00	A	7.0 SiO2 ppm	12
74	28/10/2022	10.00	A	7.0 SiO2 ppm	14
75	28/10/2022	10.00	A	7.0 SiO2 ppm	13
76	28/10/2022	10.00	A	8.0 Turbidity NTU	3
77	28/10/2022	10.00	A	8.0 Turbidity NTU	2
78	28/10/2022	10.00	A	8.0 Turbidity NTU	4
79	28/10/2022	10.00	A	8.0 Turbidity NTU	2
80	28/10/2022	10.00	A	8.0 Turbidity NTU	2
81	18/11/2022	12.00	A	1. SAMPLE DETAILS	TUBEWELL -2
82	18/11/2022	12.00	A	1. SAMPLE DETAILS	TUBE WELL -8
83	18/11/2022	12.00	A	1. SAMPLE DETAILS	TUBE WELL-4
84	18/11/2022	12.00	A	2.0 pH	6.1
85	18/11/2022	12.00	A	2.0 pH	6.4
86	18/11/2022	12.00	A	2.0 pH	6.0
87	25/11/2022	15.00	B	1. SAMPLE DETAILS	TUBEWELL 2
88	25/11/2022	15.00	B	1. SAMPLE DETAILS	TUBEWELL 8

R1(i)

QUALITY CONTROL LABORATORY

SAMPLE/DATE WISE REPORT OF QC SAMPLES FROM : 01/04/2022 TO: 31/03/2023

Sl.No.	Date	Time	Shift	Sample Characteristics	Sample Value
SAMPLE : TUBE WELL WATER					
89	25/11/2022	15.00	B	1. SAMPLE DETAILS	TUBEWELL 4
90	25/11/2022	15.00	B	2.0 pH	5.9
91	25/11/2022	15.00	B	2.0 pH	6.1
92	25/11/2022	15.00	B	2.0 pH	6.2
93	30/11/2022	13.30	A	1. SAMPLE DETAILS	NO.8
94	30/11/2022	13.30	A	1. SAMPLE DETAILS	NO. 4
95	30/11/2022	13.30	A	1. SAMPLE DETAILS	NO.2
96	30/11/2022	13.30	A	2.0 pH	5.9
97	30/11/2022	13.30	A	2.0 pH	6.1
98	30/11/2022	13.30	A	2.0 pH	6.1

MEETING CONDUCTED ON 10/12/2018 IN THE CHAMBER OF CHAIRMAN, KERALA STATE POLLUTION CONTROL BOARD, TO EVALUATE THE FINAL DPR SUBMITTED BY KMML, CHAVARA.

The meeting started at 11.30 am. Meeting was presided by the Chairman, Member Secretary was also present. The following officers attended the meeting.

1. Sri. Raghavan. K (Managing Director, KMML)
2. Sri. Santhosh. P[(HOD (TD), KMML]
3. Sri. M. U. Vijayakumar [HOD (Material), KMML]
4. Sri. P. K. Manikuttan [HOD, Env, KMML]
5. Sri. Suraj. J. Fernandaz
6. Smt. Sreekala. S (Chief Environmental Engineer, Regional Office, Trivandrum)
7. Smt. Simi. P (Environmental Engineer, District Office, Kollam)
8. Smt. Ramya. G (Environmental Engineer -1, Head Office)
9. Smt. Saritha. R (Assistant Environmental Engineer, Head Office)
10. Smt. Sruthi (Assistant Engineer, Head Office, Thiruvananthapuram)

The Kerala Minerals and Metals Limited had prepared a detailed project report (DPR) and submitted the same before the Board for getting approval, as directed by Hon'ble NGT, in order to implement the short term and long term measures suggested by NEERI. DPR is prepared for the following projects.

1) Construction of Garland drain around the Iron Oxide/ ETP ponds.
2) Remediation of the affected lands near KMML premises.
3) Facilities for insitu/ exsitu storage of Iron Oxide.

For discussing on the above DPR the meeting was convened. The Kerala Minerals and Metals Limited official Sri. Manikuttan has carried out a presentation on the salient points in the DPR, which are as follows:

1) **CONSTRUCTION OF GARLAND DRAIN AROUND THE IRON OXIDE/ ETP PONDS.**

Chairman asked the officials of the company to explain the merits of the above project. Sri. Manikuttan explained that seepage overflow from the old pond can be eliminated after construction of garland drain. Since the seepage will pass only through the garland drain, the contamination caused to the nearby water bodies and further ground water contamination can be completely eliminated.

Total project cost will be 5.7 crores excluding operation and maintenance cost. It will take 12 months to complete the work from the date of award of the work.

2) **REMEDIATION OF AFFECTED LAND NEAR KMML PREMISES.**

Remediation is proposed to be carried out in 515 acres of land in and around Kerala Minerals and Metals Limited. It is proposed to provide test patches with 6 extraction wells first. One such Remediation Unit, will take 23 years for the remediation. It is proposed to provide 10 Remediation Units, so that the remediation can be completed within 2-3 years. The test patch of one RU unit having size 75 x 50 m is proposed to be implemented inside KMML.

3) **FACILITIES FOR INSITU/EXSITU STORAGE OF IRON OXIDE.**

- **Exsitu Method:** In this method Solid state sludge transfer and Slurry state sludge transfer are proposed. After disposal of sludge in secure containment system with HDPE and clay liners, it is capped with 1.5mm thick HDPE liner, supportive clay layers, and vegetation soil cover. Here all the sludge quantities need to be transferred from old ponds to this new system and large area is required to accommodate high volume of sludge. Hence they informed that insitu method is more feasible for

Kerala Minerals and Metals Limited, which has only limited vaccant land available.

- **Insitu Secure Containment System**: In this method contaminent cells, are proposed to be excavated one by one, repaired by removing damaged old lining, relined, filled & then will be capped as per Central Pollution Control Board guidelines.

The unit authority informed that the proposed DPR can be submitted before the Government only after getting approval from the Board. After the presentation Chairman informed the following.

1) The proposal for construction of Garland drain is accepted and the unit can proceed with the proposal.
2) The proposal for remediation of contaminated area around Kerala Minerals and Metals Limited is also accepted. But, it is recommended to establish a pilot model. After assessing the performance of that model, further necessary action shall be initiated.
3) The 3rd proposal for storage of Iron Oxide is agreed in principle. But the proposal is to be finalized after further detailed scrutiny.

Meeting came to an end at 12.30 p.m.

CHAIRMAN

The Kerala Minerals and Metals Ltd.
(A Govt. Of Kerala Undertaking)
(An ISO 9001, ISO 14001, OHSAS 18001 & TL 8000 Certified Company)
SANKARAMANGALAM, CHAVARA-691 583
KOLLAM, KERALA, INDIA.
Phone : +91 - 476 - 2651215 to 2651217
Fax : +91-0476-2680101, 2686721
E-mail : contact@kmml.com, URL www.kmml.com
CIN-U14109KL1972SGC002399

TP/TS/CPCB
22.11.2022

To

The Member Secretary
Central Pollution Control Board,
Parivesh Bhawan,
East Arjun Nagar,
Delhi - 110032.

Sir,

Sub: Authorization for Conducting Trial- Geotube filling and containment of iron oxide from new elevated iron oxide pond– reg:

Ref: (1) Minutes of meeting PCB/HO/KLM/ICO/08/08 dt. 07.01.2019.
(2) Letter to KSPCB Chairman TP/TS/PCB dt. 22.02.2022.
(3) Letter to KSPCB Chairman TP/TS/PCB dt. 29.04.2022.
(4) Letter from KSPCB Chairman PCB/HO/KLM/ICO/08/08 (Vol.X) dt. 11.05.2022.
(5) Letter to KSPCB District Office Kollam dt. 13.06.2022.
(6) Letter to KSPCB Chairman TP/TS/PCB dt. 11.10.2022.
(7) Letter to KSPCB Chairman TP/TS/PCB dt. 07.11.2022.
(8) Technical Presentation done by OEM in KSPCB Chairman Office on 14.10.2022 at 11 AM.

The Kerala Minerals and Metals Limited (KMML) is a fully Integrated rutile grade Titanium dioxide plant under Government of Kerala and its Tio2 pigment unit got commissioned in 1984 at Sankaramangalam, Chavara, Kollam, Kerala. The company is providing employment to nearly 3000 persons directly and more than 10000 persons indirectly. KMML has efficient and effective methods employed for effluent treatment generated as part of the Tio2 manufacturing process. The effluent generated in all the plants are pumped into a common effluent neutralization plant where the effluent is treated with lime to neutralize the slurry.

The solid waste generated in KMML also includes Iron oxide from acid regeneration plant (ARP) apart from process sludge pumped to effluent treatment plant. The iron oxide residue generated from ARP is also neutralized with lime at the source. Both iron oxide and ETP sludge (around 50 MT per day each) are stored separately in two ponds constructed above the ground level with seven layer system as per the guidelines of the CPCB. Earlier these sludge were stored in underground ponds which was constructed with three liner system as per the recommendation of M/s NEERI and the CPCB guidelines prevailing at that time. These underground ponds were abandoned in 2008 as the storage space in these ponds got exhausted.

Received
Hardcopy
.5/12/22

A meeting was convened by the Environment Department, Government of Kerala, on 07.04.2014, based on the complaint on nearby ground water contamination. It was decided to remove entire sludge from abandoned sludge storage pond and transfer the same at TSDF Ambalamugal in a time bound manner. As per the decision taken in the meeting, KMML engaged M/s NEERI, Nagpur, a Central Government entity, for an EIA study near the iron oxide disposal site. The report was further taken by Hon'ble NGT Court to detail a petition received at their end regarding KMML Environmental compliance.

As per the Hon'ble NGT judgment, KMML need to prepare the schedule for both short term and long term measures to mitigate environmental impacts and as suggested by M/s NEERI to execute through competent and expert developers/ contractors with suitable time frame for completion after presenting the design to the KSPCB for its approval. KITCO was awarded the work for DPR preparation for short term measures suggested by NEERI and report submitted to KSPCB on 20.07.2018 for approval. After the meeting with Chairman, KSPCB, on 10.12.2018, approval letter received from KSPCB dated 07.01.2019.

Short Term Measures - Solid Waste Management in KMML - (In-situ/Ex-situ storage) - Geo tube

In-situ/Ex-situ storage of sludge was one of the Short Term measures proposed in the Hon'ble NGT Court Judgment. The volume of sludge stored in pond is huge, considering the constraint for shifting the entire quantity of sludge to newly proposed containment system and limitation of vacant land availability, another technological option was identified by KMML in discussion with certain consultants/OEMS.

The new technology identified is dewatering and storage of solid waste using GEOTUBES which was presented to KSPCB in the meeting held on 10.12.2018.

Vide ref (2), KMML forwarded a letter in compliance to environmental protection regulatory requirements to Kerala State Pollution control Board (KSPCB) and seeking statutory clearance, for Geotube filling and containment of iron oxide from new elevated iron oxide pond on trial basis. The scheme for Geotubes was prepared in line with the "Criteria for Hazardous Waste Landfills", Hazardous Waste management Series: HAZWAMS/17/2000-01, published by Central Pollution Control Board. Vide ref (3,4,5 & 6) KMML with Original Equipment manufacturer (OEM) had done a technical presentation at KSPCB, Trivandrum on containment of iron oxide slurry in Geotubes in KSPCB Head office, Trivandrum on 16.05.2022 & 14.10.2022 respectively.

Vide ref (4), KMML already forwarded the Geotube proposal to KSPCB, Head & District offices. The proposal includes pumping, collection and containment of iron oxide slurry in Geotubes, dewatering, pumping squeezed out water back to IOP. Vide ref (5), all the remarks of proposal addressed by KSPCB was submitted to District office, Kollam. As a summary of Technical presentation, KSPCB, Chairman has advised KMML to obtain authorization for conducting Geotube trial from CPCB (ref 7).

In the above context, we kindly request your good office to issue authorization for the collection and containment of iron oxide in Geotubes on trial basis by using 6 nos of Geotubes and with respect to Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016.

Thanking You,
Yours faithfully,

For The Kerala Minerals and Metals Ltd

MANAGING DIRECTOR

Enclosure: (1) Minutes of meeting PCB/HO/KLM/ICO/08/08 dt. 07.01.2019.
(2) Letter to KSPCB Chairman TP/TS/PCB dt. 22.02.2022.
(3) Letter to KSPCB Chairman TP/TS/PCB dt. 29.04.2022.
(4) Letter from KSPCB Chairman PCB/HO/KLM/ICO/08/08 (Vol.X) dt. 11.05.2022.
(5) Letter to KSPCB District Office Kollam dt. 13.06.2022.
(6) Letter to KSPCB Chairman TP/TS/PCB dt. 11.10.2022.
(7) Letter to KSPCB Chairman TP/TS/PCB dt. 07.11.2022.
(8) Technical Presentation done by OEM in KSPCB Chairman Office on 14.10.2022 at 11 AM.

CC: (1) The Chairman
Kerala State Pollution Control Board,
Plamoodu Junction, Pattom P.O.
Thiruvananthapuram – 695 004.

(2) The Chief Environmental Engineer
Kerala State Pollution Control Board,
Pattom P. O, Thiruvananthapuram - 695 004

(3) The Environmental Engineer
Kerala State Pollution Control Board,
District Office, Ushas Building,
Big Bazar, Kollam – 691 001.

From: Arun G Nath [dmenv@kmml.com]
Sent: Tuesday, January 03, 2023 2:02 PM
To: dmedp@kmml.com; vckmml@gmail.com
Cc: hodenv@kmml.com; menv@kmml.com
Subject: FW: Virtual Meeting at 3.00 P.M to discus regarding the Geotube Technology - reg:

From: DEEPTI KAPIL SEE, CPCB [mailto:deepti.cpcb@nic.in]
Sent: Tuesday, January 03, 2023 12:29 PM
To: dmenv@kmml.com
Cc: Vinod Babu Bommathula; Mohd Salik
Subject: Virtual Meeting at 3.00 P.M to discus regarding the Geotube Technology - reg:

Sir

In reference to the trailing mail, please find below the link for the meeting to discuss regarding the Geotube Technology at 3.00 P.M onwards :

Title: Meeting regarding technical presentation on Geo-tube technology by M/s Kerala Minerals & Mines Limited : CPCB2
Time: Tuesday, January 3, 2023 at 03:00 PM onward

Join on your computer or mobile app
https://teams.microsoft.com/l/meetup-join/19%3ameeting_YWY4ZjkxYjUtZjQ5OC00ODk5LTk0YmMtOWFlMGRlMjljNmU2%40thread.v2/0?context=%7b%22Tid%22%3a%22b9e2357f-a574-4d46-b21f-5e27b9456f2c%22%2c%22Oid%22%3a%2279e55d79-27b7-4038-b6e3-379c3d2957bf%22%7d

With kind regards

Deepti Kapil
Scientist- D (Senior Environment Engineer)
Waste Management -II Division
Central Pollution Control Board
'Parivesh Bhawan', East Arjun Nagar
Shahdara, Delhi - 110032
Office : +91 - 11-43102319
Fax: 011-22307643

From: "Member Secretary CPCB" <mscb.cpcb@nic.in>
To: "Vinod Babu Bommathula" <bvbabu.cpcb@nic.in>
Sent: Tuesday, December 20, 2022 4:35:46 PM
Subject: Fwd: Permission for presentation of Geotube Technology before the technical committee of CPCB for obtaining the approval for Geotube trial - reg:

आवश्यक कार्यवाही हेतु।

From: dmenv@kmml.com
To: "Member Secretary CPCB" <mscb.cpcb@nic.in>

1235 o/c

The Kerala Minerals and Metals Ltd.
(A Govt. Of Kerala Undertaking)
(An ISO 9001, ISO 14001, OHSAS 18001 & SA 8000 Certified Company)
SANKARAMANGALAM, CHAVARA-691 583
KOLLAM, KERALA, INDIA.
Phone : +91- 476-2651215 to 2651217
Fax : +91- 0476-2680101, 2686721
E-mail : contact@kmml.com, URL : www.kmml.com

ISO 9001/ISO 14001 OHSAS 18001 BUREAU VERITAS Certification
SA8000 BUREAU VERITAS Certification
CIN-U14109KL1972SGC002399

R1 (C)

TP/TS/ENV
07.06.2023

To

The Member Secretary
Central Pollution Control Board,
Parivesh Bhawan,
East Arjun Nagar,
Delhi – 110032

Sub : Authorization for Conducting Trial- Geotube filling and containment of iron oxide from new elevated iron oxide pond :reg

Ref : (1) TP/TS/CPCB letter to The Member Secretary, CPCB dated 22/11/2022.
(2)Email from CPCB dated 03/01/2023 regarding Technical presentation on Geotubes by M/s Kerala Minerals and Metals Ltd.

Vide ref(1) KMML officials visited CPCB on 28/11/2022 and submitted the requisition letter for granting authorization for conducting trial- Geotube filling and containment of iron oxide from elevated iron oxide pond.

Subsequently vide ref (2) your good office conducted an online virtual meeting with KMML regarding technical presentation on Geotubes on 03/01/2023 at 3:00pm.During the meeting all queries addressed by CPCB officials were replied by KMML. Finally in the meeting, it was informed by CPCB officials that they will grant authorization for conducting trial- Geotube with conditions. KMML was making regular follow up on the above matter till date. So far no response regarding authorization has been received from CPCB.

So we kindly request your good office to grant us authorization for conducting Trial- Geotube filling and containment of Iron Oxide from new elevated Iron Oxide Pond.

Thanking You,
Yours faithfully,

07/06/23

HEAD OF DEPARTMENT (ENV)

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
परिवेश भवन, पूर्वी अर्जुन नगर, दिल्ली-110 032
09 JUN 2023
Central Pollution Control Board
Parivesh Bhawan, East Arjun Nagar, Delhi-110032

Annexure-6

☎ General: 0471 2312910, 2318153, 2318154, 2318155 Chairman: 2318150 Member Secretary: 2318151
E-mail: ms.kspcb@gov.in FAX: 0471 – 2318134, 2318152 web: www.keralapcb.nic.in
KERALA STATE POLLUTION CONTROL BOARD
കേരള സംസ്ഥാന മലിനീകരണ നിയന്ത്രണ ബോർഡ്
Pattom P.O., Thiruvananthapuram – 695 004
പട്ടം പി.ഒ., തിരുവനന്തപുരം - 695 004

PCB/HO/KLM/ICO/08/08 (Vol. XII) Date: 24/09/2022

From

The Member Secretary

To

The Member Secretary,
IPC-VII, Central Pollution Control Board
Parivesh Bhavan, East Arjun Nagar,
Delhi-110032

KERALA STATE POLLUTION CONTROL BOARD THIRUVANANTHAPURAM
24-9-22
DESPATCH

Sub: Transfer of Iron Oxide sludge - reg.

Ref: 1) Letter no. PCB/HO/KLM/ICO/08/08 (Vol. XI) dated 23/08/2022. (Copy enclosed)
2) Letter no. TP/ENV/PCB-GL dated 19/09/2022.
3) Detailed project proposal by M/s. Miracle Sands & Chemicals dated 18/03/2021. (Copy enclosed)

Sir,

The Kerala Minerals and Metals Limited (KMML), Titanium Pigment unit, Chavara is engaged in the production of Titanium Dioxide from ilmenite. through Chloride process. The Solid Waste generated in KMML includes about 75 TPD of Iron Oxide sludge from acid regeneration plant and around 50 TPD of ETP sludge. There are three Iron oxide ponds in the industry, two abandoned old ponds and a new one (pond 3) constructed in 2008. The industry informed that pond no. 3 is almost completely filled up at present. M/s. KMML had requested that they may be permitted to transfer a fraction of the sludge from iron oxide pond no.3 to iron oxide ponds 1&2 to avoid closing down of the industry due to filling up of the iron oxide pond no.3. The Board had permitted the same as a temporary arrangement subject to stringent control measures. However this cannot be continued indefinitely as public complaints exist alleging continuous seepage of contaminants from the old abandoned ponds.

As per the decision of the meeting chaired by Chief Secretary on 22/07/2022, the industry was directed to transfer the Iron oxide sludge to CTSDF of Kerala Enviro Infrastructure Limited at Ambalamedu vide letter under

reference (1), M/s. KMML vide letter under reference (2) has requested for shifting 10000 MT of Iron Oxide residue to M/s. Miracle Sands & Chemicals, Turicorin. In the discussion held on 19/09/2022, M/s. KMML has informed that only dry sludge is accepted at the common TSDF and hence expressed the inability to transfer the Iron Oxide sludge, which is in a slurry form to KEIL.

Whileso M/s. Miracle Sands & Chemicals, vide reference (3), has already submitted a detailed project proposal for manufacturing Iron Oxide concrete bricks, along with the consent order from TNPCB valid upto March 2025 and the sale order of Iron Oxide residue (10000 MT) issued by KMML on 09/06/2020.

During the discussion held on 19/09/2022 with the officials of KMML and Miracle Sands & Chemicals, the matter was addressed and M/s. Miracle Sands & Chemicals informed that they have obtained only Consent to Establish from the TNPCB. The operational consent will be issued only, after inspecting the production of Iron Oxide Concrete Bricks from Iron Oxide residue for which a trial run needs to be conducted. Hence they requested to issue authorization as per Hazardous & Other Wastes (Management and Transboundary Movement) Rules, 2016 for interstate transport of Iron Oxide sludge for conducting trial run It is also requested to permit further disposal of remaining sludge also for manufacturing of concrete bricks subject to obtaining of Consent to Operate from TNPCB. Since disposal of Iron Oxide sludge from KMML is a key issue of utmost importance that needs urgent redressal in light of the order of Hon'ble NGT in OA. No. 142/2013 and various public complaints, kindly advice on the matter cited at the earliest.

Yours faithfully,

Encl: As above

MEMBER SECRETARY

Copy to:

Tamil Nadu Pollution Control Board,
76, Mount Salai,
Guindy, Chennai - 600 032

BEFORE THE HONOURABLE
NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE, CHENNAI

Original Application No 74 of 2023

In the Matter of:
Padma Kumar, Kerala : Applicant

Vs.

State of Kerala,
Through its Chief Secretary
and others : Respondents

REPLY AFFIDAVIT FILED BY THE 6th RESPONDENT

M/s. B. S. Krishnan Associates
ADVOCATES
DIWANS ROAD, KOCHI – 682016
bskrishnanassociates@gmail.com
0484-2351768, 2373869
9567300123, 6238918736