ADITYA BIRLA

HINDALCO

28.11.2022

To,
The Addl. Principal Chief Conservator of Forest (Central),
Ministry of Env., Forest and Climate Change,
Regional Office (WCZ)
Ground Floor, East Wing, New Secretariat Building, Civil Line,
Nagpur-440001 (MS)

Sub: - Status of compliance of EC condition (Half yearly status of compliance report) in respect of Tatijharia Bauxite Mine (Lease area- 2146.746 Ha.) of M/s Hindalco Industries Limited of Chhattisgarh state for the period from April- 2022 to Sept. -2022.

Ref No: - Environment Clearance Letter No-J-11015/337/2007-IA. II (M) dated Aug. 9, 2007

Dear Sir,

We do herewith submit half yearly status of EC compliance report in respect of Tatijharia Bauxite Mine, Lease area – 1218.762 Ha, of M/s Hindalco Industries Limited P.O- Kusmi, Dist.- Balrampur- Ramanujganj, Chhattisgarh state, PIN-497224 for the period from April- 2022 to September -2022. The lease details is as below: -

Lease area	Production Capacity	Lease Period
1218.762 Ha.	400000 Tonnes	25.06.1998 to 24.06.2048 (50years)

We are also sending you the soft copy of the report to your good on E mail – moef.ddn@gmail.com for your ready reference. We trust that the measures taken towards environment safeguard comply with the stipulated environmental conditions.

We assure that we comply all the conditions laid down in the consent letter and also abide to follow all the Rules and Regulations.

Thanking you,

Yours's faithfully

For, Hindalco Industries Limited

Agent of Mines
Samri Mines Division
Hindalco Industries Ltd

(Vijay Chauhan)
Agent of Mines
E-Mail – chauhan.vijaykumar@adityabirla.com

Encl:-

1. Half yearly status of compliance of Environment condition as annexure-I.
2. Environment Status Report from April- 2022 to Sept. -2022, enclosed as annexure–II.
3. Renewal copy of Consent to Operate from CECB enclosed as annexure –III.
4. Production report from April- 2022 to Sept. -2022 enclosed as annexure-IV.
5. Status report of mined out, reclaimed and afforested land as annexure-V.
6. Actual expenditure incurred in protection of environment from April- 2022 to Sept. -2022 as annexure-VI.
7. Ground Water NOC enclosed at Annexure – VII.
8. Soft copy of documents by CD.
9.
10. C.C.- The Regional Officer, CECB, Ambikapur

HINDALCO INDUSTRIES LIMITED
Samri Mines Division, Baba Chowk,
At & Post - Kusmi, PIN : 497 224,
Distt.- Balrampur-Ramanujganj (CG), INDIA,
Telephone +91 7778 274326-27,

REGISTERED OFFICE
Ahura Centre, 1st Floor, B-Wing
Mahakali Caves Road, Andheri (East),
Mumbai 400 093, INDIA,
Telephone +91 22 6662 6666,

Website : www.hindalco.com
E-mail : hindalco@adityabirla.com,
corporate Identity No. L27020MH1958PLC011238

EC COMPLIANCE REPORT

(April 2022 – September 2022)

of

Tatijharia Bauxite Mine

(Mine Lease Area of 1218.762 Ha)
Capacity -4.00 LTPA

Located in

Village –Tatijharia, Gopatu, Betpani, Charhatkhurd, Tehsil - Kusmi, District – Balrampur-Ramanujganj, State - Chhattisgarh

M/s Hindalco Industries Limited

(Samri Mines Division)
Balrampur-Ramanujganj District (C.G.)

26.11.2022

Status of Compliance from April 2022 – September 2022of Environmental Condition laid down by MOEF for Tatijharia Bauxite Mine

The status of compliance of the conditions with reference to environment clearance letter no. J-11015/337/2007– IA.(IIM) dated 09.08.2007of Ministry of Environment & Forest, New Delhi, for Tatijharia Bauxite Mine is as under:-

COMPLIANCE STATUS

S.N.	Conditions	Action
A.	**Specific Conditions**	
i.	Environmental clearance is subject to obtaining clearance under the Wildlife (Protection) Act, 1972 from the competent authority.	The Wild life Management plan has been approved by competent Authority. ***(Annexure –A).***
ii.	Environmental clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs. Union of India in Writ petition (Civil) No. 460 of 2004 as may be applicable to this project.	Noted.
iii.	Conservation plan for schedule I fauna (if found in the study area) shall be prepared in consultation with Wildlife Department for implementation.	The Conservation plan for schedule I fauna have been prepared. The authenticated list of flora and fauna for core and buffer zone is enclosed for perusal please. ***(Annexure –B)***
iv.	The mining operations shall be restricted to above ground water table and it shall not intersect ground water table. Prior approval of the Ministry and CGWA should be obtained for mining if any below water table.	The mining operation is restricted to well above ground water table. As per our current mining operation, ultimate depth of working is about 15 meters below. The ground water table is below the depth of our mining operation. Piezometer has been installed at strategic location in the Lease area for monitoring the ground water level and the average depth of which is 25-30m. Hence there is no intersection of groundwater level during course of mining operation.
v.	Top soil, if any shall be stacked properly with proper slope with adequate safeguards and shall must be used for reclamation and rehabilitation of mined out area.	Top soil generated during mining operation is being concurrently spread on backfilled area to restore its original forms. However, if required it will be stacked properly with proper slope and adequate safeguards.
vi.	Over burden shall be stacked at earmarked dump site (s) only and shall not be kept active	As such there is no any active OB dump at present. As per approved

S.N.	Conditions	Action
	for long period. The maximum height of the dump shall not exceed 30m, each stage shall preferably be of 10m and over all slope of the dump shall not exceed 28^0. The mine pit area shall be reclaimed by back filling the OB in a phased manner. The OB dumps shall be scientifically vegetated with suitable native species to prevent erosion and surface run off. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment & Forests on six monthly basis.	Mining Plan, OB generated during mine operation is being utilized for concurrently back filling of the mined out area for reclamation purpose. Old inactive OB dump has been stabilized by vegetation with suitable native species to prevent erosion and surface run off. Photo attached as ***Annexure-C.***
vii.	Garland drains shall be constructed to arrest silt and sediment flows from soil and mineral dump. The water so collected shall be utilized for watering the mine area, roads, greens belt development etc. The drains shall be regularly desilted particularly after monsoon and maintained properly. Garland drain (size, gradient and length) shall be constructed for both mine pit and for waste dump and sump capacity shall be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity shall also provide adequate retention period to allow proper settling of silt material. Sedimentation pits shall be constructed at the corners of the garlands drains and desilted at regular intervals.	Old inactive OB dump has been stabilized by vegetation. Garland drain is provided to arrest silt and sediments flows from above mentioned OB dump. At present there is no any active OB dump. Entire waste generated during mining operation is being simultaneously backfilled in the mined out pit. Garland drains & Parapet wall of appropriate size, gradient and length have been made around the active mining pits coupled with arrester to arrest silt from run-off and drains are being maintained. The drains are regularly desilted before the monsoon. The Water so collected are being used for green belt development and in sprinkling of the haul road. Sump of adequate capacity is also developed. Photographs attached as ***Annexure – D.***
viii.	The project proponent shall ensure that no natural water course shall be obstructed due to mining operation.	We undertake that no natural water course is obstructed during mining operation.
ix.	Blasting operations shall be carried out only during the day time. Controlled blasting shall be practiced. The drills should be operated with drill extractors. The mitigative measures for control of ground vibrations and arrest fly rocks	Controlled blasting is being practiced in the mine. Wet drilling Machines are being used during drilling operations. Nonel & effective blast design are used to control blast vibration and fly

S.N.	Conditions	Action
	shall be implemented. Blasting scientific based on peak particle velocity, charge per delay and blast geometry shall be evolved for maximum production. The same shall be submitted to the Ministry within six months.	rocks. Blasting is carried out only in day hours.
x.	Plantation shall be raised in an area of 40.84 ha including green belt of adequate width by planting native species around the ML area, roads; OB dump sites etc. in consultation with the local DFO/Agriculture Department. The density of the trees shall be around 2500 plants per ha. Selection of plant species shall be as per CPCB guidelines. Herbs and shrubs shall also form a part of afforestation programme besides tree plantation.	April to September 2022 total of 5.628 ha of land have been afforested, with cumulative 92.564 Ha. have been afforested with native species till date. The plantation in reclaimed area has been carried out as per plan. The density is being maintained about 2500 plant per hectare with the species like Amla, Kashia Samia, mango, babul, pears & guava and Jamun. Social forestry is also being encouraged among the local villagers. Apart from that local food grain rice & Tau has been planted over the reclaimed area of 1.500 Ha. Year wise plantation is enclosed as ***Annexure-E***.
xi.	The project authority shall implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.	Rain water harvesting structure (Ponds and Wells) of area 0.79 Ha. , 0.69 Ha. and 5ft. x 10 ft.) has been constructed as conservation measures in mined out area for the conservation/augmentation of ground water resources. Such measures also help in increasing the water credit of the Lease area. Photograph of recharge well and rainwater harvesting structure/Pond is enclosed as ***Annexure –F.***
xii.	Regular water sprinkling shall be carried in critical areas prone to air pollution and having high levels of SPM and RSPM such as haul road, loading, unloading and transfer points and other vulnerable areas. It should be ensured that the ambient air quality parameters conform to the norms prescribed by the CPCB in this regard.	Regular water spraying with 12 KL water tanker in the mine lease hold area is being carried out regularly to control air pollution. The ambient air quality is within the stipulated norms.
xiii.	Regular monitoring of ground water level and quality shall be carried out by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring shall be carried out four times in a year-pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter	The depth of our mining operation varies from 15-20mts. Piezometer has been installed at strategic location within the lease area to monitor the Ground Water level and the average depth of which is 25 to 30Mts. The ground water

S.N.	Conditions	Action
	(January) and the data thus collected may be sent regularly to MOEF, Central Ground Water Authority and Regional Director Central Ground Water Board.	table is below the depth of our mining operation. Hence there is no intersection of groundwater level during course of mining operation. Regular monitoring of ground water quality is being carried out. The analysis reports are being submitted to Regional Office, CECB, Ambikapur and Raipur. Regular monitoring of ground water level is being carried out and is found below level of mining operation. The ground water Quality report is attached in ***Annexure – II*** (along with Environment status Report).
xiv.	Rainwater harvesting measures on long term basis shall be planned and implemented in consultation with Regional Director, CGWB.	Rain water harvesting ponds/Recharge well has been made at lease hold area. Photograph of recharge well and rainwater harvesting structure/Pond is enclosed as ***Annexure –F*.**
xv.	Prior permission from the competent authority shall be obtained for drawl of ground water, if any.	Ground water NOC has been obtained from the competent authority for domestic purpose. We are not drawing ground water for industrial use, if required: the permission will be taken from competent authority.
xvi.	Existing ecological status of the project area shall be conserved and protected. The project proponent should take all possible precautionary measures during mining operation for conservation and protection of endangered fauna.	All efforts are being taken to conserve and protect existing ecological status of the project area. We are taking important measures for conservation of flora and fauna are as follows. a) Company have been provided solar LED torch and florescent jacket to Staff of forest department ,Ambikapur for patrolling and monitoring the movement of wildlife, encroachment, cutting , poaching, fire etc. b) Veterinary camp is being conducted for immunization of cattle with the help of block veterinary staff.

S.N.	Conditions	Action
		c) Awareness programme related to wildlife conservation is being conducted. d) Eco-development activities like poultry, piggery, bee keeping etc. are being organized. e) Controlled blasting is being carried out so as reduce vibration and noise. Such operation is being carried out in day time only and its use is minimized. f) Plantation is regular activity. g) Fish farming with seeds of has been done in water recharge pond.
xvii.	Vehicular emissions shall be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral. The vehicles shall be covered with a tarpaulin and shall not be overloaded.	Regular and periodic maintenance of HEMM is being carried out for control of vehicular emission in mines area. The bauxite ore are transported in trucks with tarpaulin cover upto EUP/Railway siding. Vehicle used for transportation are having valid permit. No overloading of ores for transportation is allowed to prevent spillage of material.
xviii.	Occupational health and safety measures for the workers including training on modern eradication, HIV and health effects on exposure to mineral dust etc. shall be carried out. The company shall engage a full time qualified doctor who is trained in occupational health surveillance and health record of the workers shall be maintained.	Company has provided with personal protective equipment to all workers and training are also being imparted to them for safety & health, sanitation, health awareness camps including HIV are being organized for all workmen. One doctor having MBBS qualification has been appointed for facilitation of OHS. We have undergone through initial & periodical test of all workers employed in the mines by the certified team. The records related to initial and periodical medical examination of all workmen is being maintained.
xix.	A Final Mine Closure Plan, along with details of Corpus Fund, shall be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.	We accept the condition. A progressive mine closure plan approved by IBM is in place. IBM is competent authority to approve the final mine closure plan. Our

S.N.	Conditions	Action
		lease is valid upto 2048 and Final Mine closure mine plan along with details of Corpus fund will be submitted within prescribed timelines in accordance with law to competent authority.
B.	**General Conditions**	
i.	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment & Forests.	Noted
ii.	No change in the calendar plan including excavation, quantum of mineral bauxite ore shall be made.	Calendar plan (IBM Approved Mining Plan) prepared for the mine is being followed.
iii.	Conservation measures for protection of flora and fauna in the core and buffer zone shall be drawn up in consultation with the local forest and wildlife department.	The suggestions of local forest department are being implemented for conservation of flora and fauna in and around lease hold area. Important measure being implemented for conservation of flora and fauna are as follows. a) Company have been provided solar LED torch and florescent Jackets to Staff of forest department, Ambikapur for patrolling and monitoring the movement of wildlife ,encroachment, cutting ,poaching ,fire etc. b) Veterinary camp is being conducted for immunization of cattle with the help of block veterinary staff. c) Awareness programme related to wildlife conservation is being conducted. d) Eco-development activities like poultry, piggery, bee keeping etc. are being organized.
iv.	Four ambient air quality-monitoring stations shall be established in the core zone as well as in the buffer zone for RPM, SPM, SO_2, NOx, monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in	Ambient Air quality monitoring is being carried out as per guideline and is being followed. For this, We have already appointed Anacon Laboratories Pvt. Ltd. NABL accredited by MoEF/NABET for conducting regular environmental monitoring. Analysis Report (from

S.N.	Conditions	Action
	consultation with the State Pollution Control Board.	April 22 to Sept 22) is enclosed as ***Annexure-II.***
v.	Data on ambient air quality (RPM, SPM, SO_2, and NOx) should be regularly submitted to the Ministry including its Regional office located at Bhopal and the State Pollution Control Board / Central Pollution Control Board once in six months.	Data of ambient air quality (RPM, SPM, SO2, and NOx) are being submitted to CECB and are being submitted to other regulatory authorities as per guidelines. Data of ambient air quality (RPM, SPM, SO2 and NOx) from April 22 to Sept 22 is enclosed as ***Annexure-II*****.**
vi.	Fugitive dust emission from all the sources shall be controlled regularly. Water spraying arrangements on haul roads, loading and unloading and at transfer points shall be provided and properly maintained.	Fugitive dust emission from generating sources is being controlled. The dust extractor, wet drilling, regular water spraying with 12 KL portable water tanker in the mine lease hold area is being carried out regularly. Rainwater collected into the mine pit is being utilized for dust suppression purpose. Black top road has been constructed up to pit head to reduce dust problem. Photo attached as ***Annexure- G*****.**
vii.	Measures shall be taken for control of noise levels below 85dBA in the work environment. Workers engaged in operations of HEMM, etc. shall be provided with ear plugs / muffs.	The noise level in working area is being maintained below the prescribed limit. As protective measures, Workers engaged in operations of HEMM, etc. is being provided with ear plugs / muffs. The proper maintenance of HEMM is being carried out to control noise emission.
viii.	Industrial waste water (workshop and waste water from the mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December, 1993 or as amended from time to time. Oil and grease trap shall be installed before discharge of workshop effluents.	For the waste water generated from workshop, oil and grease separation pits are provided further no waste water is generated from our mining operation,
ix.	Personnel working in dusty areas shall wear protective respiratory devices and they shall also be provided with adequate training and information on safety and health aspects.	Company has provided adequate personal protective equipment to all workers and it is also ensured that they use the same. Regular awareness training are also being imparted to them for safety & health in our Group vocational training center– Samri is being continued as per guidelines. All employees undergo Lung Function Tests during the Medical

S.N.	Conditions	Action
		Examination. Periodical Medical Examination of employees and contractor workers are organized regularly to observe any contractions due to exposure to dust and other occupational hazards.
x.	Occupational health surveillance program of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.	Periodical and Initial medical examination of all workers are being carried out as per provision of Mines Act.
xi.	A separate environmental management cell with suitable qualified personnel shall be set-up under the control of a Senior Executive, who will report directly to the Head of the Organization.	Environment cell is already in place at Samri Mines Division headed by Head (Mines) and comprises of suitable qualified persons. Constitution of Environment Management cell is enclosed in ***Annexure-H*****.**
xii.	The project authorities shall inform to the Regional Office located at Bhopal regarding of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.	Financial closure plan not applicable as it is an operational mines.
xiii.	The funds earmarked for environmental protection measures shall be kept in separate account and should not be diverted for other purpose. Year wise expenditure shall be reported to the Ministry and its Regional Office located at Bhopal.	Adequate fund provision is already earmarked for environmental protection measures and will not be diverted to other purpose. The year wise expenditure is being submitted to concern authorities as per guidelines
xiv.	The project authorities shall inform to the Regional Office located at Bhopal regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development.	Financial closure plan not applicable as it is an operational mine.
xv.	The Regional Office of this Ministry located at Bhopal shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data/information/ monitoring reports.	All cooperation is being extended to regulatory authorities.
xvi.	A copy of clearance letter will be marked to concerned Panchayat / local NGO, if any, from whom suggestion / representation has been received while processing the proposal.	We have forwarded the copy of clearance letter to Panchayat in our area. The copy of same has already been submitted to your good office.

S.N.	Conditions	Action
xvii.	State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and Collector's office/Tehsildar's office for 30 days.	The copy has been displayed by CECB in Surguja Collectorate.
xviii.	The project authorities should advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and Forests at http://envfor.nic and a copy of the same shall be forwarded to the Regional Office of this Ministry located Bhopal.	The information regarding environment clearance has been published in two local newspaper Hari Bhumi & Ambika Vani. The copy of same has been already submitted to your good office. News paper clip is attached in ***Annexure I***.
5.	The Ministry or any other competent authority may alter/modify the above conditions or stipulate any further condition in the interest of environment protection.	Noted.
6.	Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.	Noted.
7.	The above conditions shall be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules.	Noted.

Hope the above compliance will be found in order.

Yours truly,

(For Hindalco Industries Limited)

(Vijay Chauhan)

Agent of Mines

Encl.: As above

ANNEXURE - A

कार्यालय प्रधान मुख्य वन संरक्षक (वन्यप्राणी प्रबंधक एवं जैव विविधता संरक्षण सह मुख्य वन्यप्राणी अभिरक्षक), छत्तीसगढ़
अरण्य भवन, मेडिकल कॉलेज रोड, रायपुर
ई मेल - pccfwl@sify.com (Ph 0771-2552228, Fax 0771-2552227)

क्रमांक/व प्र /प्रबंध- 12/13/2967 रायपुर दिनांक 07/10/2013

प्रति,

संचालक,
इन्वायरनमेंट क्लीयरेंश सेल
भारत सरकार, वन एवं पर्यावरण मंत्रालय,
पर्यावरण भवन, सी.जी.ओ. काम्प्लेक्स,
लोधी रोड़, नई दिल्ली–111003

विषय :– छत्तीसगढ़ के बलरामपुर जिले (तत्कालीन सरगुजा जिला) में स्थित सामरी बॉक्साईट माईन्स, कुदाग बॉक्साईट माईन्स एवं टाटीझरिया बॉक्साईट माईन्स की क्षमता बढ़ाये हेतु ईन्वायरमेंट क्लीयरेंस।

संदर्भ:– 1. पर्यावरण व वन मंत्रालय, भारत सरकार का पत्र क्रमांक J-11015/353/2007-IA.II(M) दिनांक 27 जुलाई 2007.
2. पर्यावरण व वन मंत्रालय, भारत सरकार का पत्र क्रमांक J-11015/337/2007-IA.II(M) दिनांक 27 जुलाई 2007.
3. पर्यावरण व वन मंत्रालय, भारत सरकार का पत्र क्रमांक J-11015/337/2007-IA.II(M) दिनांक 9 अगस्त 2007.

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कृपया आपके उपरोक्त संदर्भित पत्रों का अवलोकन करने का कष्ट करें। जिसके द्वारा बलरामपुर जिले (पुराने सरगुजा जिले) के सामरी बॉक्साईट खुली खदान (1 LTPA) की क्षमता बढ़ाकर (5LTPA) करने, कुदाग बॉक्साईट खदान (0.4 LTPA) की क्षमता बढ़ाकर (0.6 LTPA) करने तथा टाटीझरिया बॉक्साईट खदान (0.5 TPA) की क्षमता बढ़ाकर (4 TPA) करने के परियोजना प्रस्ताव के संबंध में वन्य प्राणी (संरक्षण) अधिनियम,1972 के तहत अनुसूची–1 के वन्यप्राणियों हेतु "वन्य प्राणी संरक्षण व प्रबंधन योजना" तैयार की जाकर इस कार्यालय की सहमति दिये जाने का लेख किया है।

1. विषयांकित परियोजना हेतु खदान के लीज के अनुबंध दिसंबर 1996 एवं जून 1998 में हस्ताक्षरित हुये थे। सामरी क्षेत्र में भारत सरकार पर्यावरण व वन मंत्रालय के आदेश क्रमांक J-11015/353/2007-IA.II/M दिनांक 27 जुलाई, 2007 द्वारा 2146.746 हे. में, कुदाग क्षेत्र में भारत सरकार पर्यावरण व वन मंत्रलाय आदेश क्रमांक J-11015/354/2007-IA.II/M दिनांक 27 जुलाई 2007 द्वारा 377.116 हे. में, तथा टाटीझरिया में भारत सरकार पर्यावरण व वन मंत्रालय के आदेश क्रमांक J-11015/337/2007-IA.II/M दिनांक 9 अगस्त 2007 द्वारा 1218.762 हे. में बॉक्साईट खनन की स्वीकृति प्राप्त कर संस्था द्वारा खनन का कार्य किया जा रहा है।

Vijay/Steno/Prabandh

2 वर्तमान प्रस्ताव में उपरोक्त [illegible] के लिये 1.0 LPA से बढ़ाकर 5.0 LPA किया जाना, कुदारा के लिये 0.1 LPA से बढ़ाकर 0.6 LPA किया जाना एवं लालीझरिया के लिये 50,000 TPA से बढ़ाकर 4,00,000 TPA किया जाना प्रस्तावित है। भारत सरकार पर्यावरण व वन मंत्रालय के द्वारा उपरोक्त [illegible] की स्वीकृति क्रमश आदेश क्रमांक J-11015/353/2007-IA.II/M दिनांक 27 जुलाई 2007, J 11015/354/2007-IA.II/M दिनांक 27 जुलाई 2007 एवं J-11015/337/2007-IA.II/M दिनांक 9 अगस्त 2007 द्वारा कुछ शर्तों के साथ दी गई है, जिसमें एक महत्वपूण शर्त यह भी उल्लेखित है कि संबंधित क्षेत्र में वन्य प्राणी (संरक्षण) अधिनियम के शेड्यूल 1 के पाये जाने वाले वन्य प्राणियों के संरक्षण हेतु प्रबंध योजना तैयार की जाकर राज्य के मुख्य वन्य जीव अभिरक्षक के अभिमत सहित प्रस्तुत किया जाये। जिसके पालन में संस्था द्वारा एक वन्य प्राणी संरक्षण योजना तैयार की गयी है।

3. खनन क्षमता बढ़ाने से संबंधित प्रस्तावित तीनों ही परियोजनाओं के एक दूसरे से 4 कि.मी. की परिधि में स्थित होने एवं सभी के बफर क्षेत्र ओवरलैपिंग होने के कारण सभी के लिये संयुक्त रुप से वन्य प्राणी संरक्षण व प्रबंधन योजना तैयार की जाकर महाप्रबंधक, (खादान), हिन्डालको इन्डस्ट्रीज के पत्र क्रमांक HIL/SAM/300/2013 दिनाक 2.03.2013 द्वारा प्रस्तुत किया गया है जिसका समग्र रुप से परीक्षण किया गया। प्रस्तावित परियोजनाओं के कोर क्षेत्र से 10 कि.मी. की परिधि में आने वाले ओवरलैपिंग बफर क्षेत्र में वन्य प्राणियों एवं उपलब्ध वनस्पतियों का सर्वे किया जाकर पाये गये स्पेसिज को परियोजना प्रस्ताव में अनेक्सर–4 के में उल्लेखित किया गया है।

4. उल्लेखित सूचि में वन्य प्राणी (संरक्षण) अधिनियम के शेड्यूल 1 के वन्य प्राणी नहीं पाये गये हैं। परंतु इस कार्यालय द्वारा वन संरक्षक (वन्य प्राणी), सरगुजा से विगत दस वर्षो में वन्य प्राणियों द्वारा की गई क्षति की जानकारी चाही गयी। वन संरक्षक ने अपने पत्र क्रमांक 749 दिनांक 24.05.2012 से यह जानकारी उपलब्ध कराया है कि उक्त क्षेत्र में हाथियों का वर्ष 2005 में दो बार, वर्ष 2006 में आठ बार, 2007 में एक बार, 2008 में दो बार, 2009 में सात बार आना जाना हुआ है। इसी प्रकार भालुओं के द्वारा वर्ष 2007–08 में आठ, वर्ष 2008–09 में पॉच, वर्ष 2009–10 में छः एवं 2010–11 में 4 जनहानि व जनघायल के प्रकरण तथा वर्ष 2007–08 तथा 2008–09 में तेंदुआ द्वारा पशु हानि के दो प्रकरण तथा लकड़बग्घे के कारण एक प्रकरण दर्ज किये गये हैं। इस प्रकार वन्य प्राणी (संरक्षण) अधिनियम के शेड्यूल 1 के उपरोक्त उल्लेखित वन्य प्राणियों के परियोजना क्षेत्र में आने जाने के प्रमाण पाये गये है। प्रस्तावित क्षेत्र से 6 से 7 कि.मी.की दूरी पर झारखंड राज्य में भेड़िया अभ्यारण्य भी स्थापित है। अतः संस्था द्वारा दस वर्षो के लिये वन्य प्राणी संरक्षण व प्रबंध योजना श्री पी. के. सेन पूर्व वन्य प्राणी अभिरक्षक, झारखंड से तैयार कराया जाकर प्रस्तुत किया गया है। जिसका समग्र व विस्तृत अध्ययन किया गया। प्रबंधन योजना में प्रस्तावित प्रबंधन संबधित मुख्य गतिविधियों का विवरण निम्नानुसार है।

5. योजना में वन्य प्राणियों के लिये जलग्रहण क्षेत्र विकास, रहवास–विकास, पेयजल व्यवस्था, विभाग के क्षेत्रीय अमले के सहयोग से क्षेत्र में पेट्रोलिंग व मॉनिटरिंग, अग्नि सुरक्षा, ईको विकास की गतिविधियॉ, स्थानीय ग्रामीणों के लिये आजीविका सृजन, टीकाकरण, जनजागृति कार्यक्रम जैसी गतिविधियों का

समावेश करते हुये 04 वर्षों के लिए [illegible] प्रावधानित की गयी है। जिसका क्रियान्वयन वन विभाग के द्वारा किया जायेगा। प्रस्तावित कार्यों का विवरण निम्नानुसार है –

Sr. No.	Works to be done	Cost for four years (Rs. in lakhs)					Remarks
		1st Year	2nd Year	3rd Year	4th Year	Total	
1	Plantation including soil and moisture Conservation works as per norms of forest department surrounding the lease hold	5.00	5.00	5.00	5.00	20.00	
2	Silvicultural Operation on degraded forest Land and cut back in rooted waste	2.00	2.00	2.00	2.00	8.00	
3	Habitat Management Eradication of unwanted species in buffer Zone area, Fire Protection work including wages for fire watchman, Creation of Fire line etc. surrounding lease hold and in buffer area.	2.50	2.50	2.50	2.50	10.00	
4	Monitoring - One Staff of forest department to monitor movement of wild life, encroachment, illicit cutting,poaching, fire etc. including Salary of 1 staff	3.00	3.00	3.00	3.00	12.00	
5	Construction of water holes, their maintenance and patrolling (One per Annum)	10.00	10.00	10.00	10.00	40.00	
6	Eco-development activities like poultry, piggery, bee keeping etc.	5.00	5.00	5.00	5.00	20.00	
7	Vocational Training to weaker section, females, old persons and minors of the surrounding villages in three centre in the buffer Zone of the mining lease @ 50000/- per centre.	3.00	3.00	3.00	3.00	12.00	
8	Veterinary camp for immunization of Cattle with the help of block veterinary sataff.	2.00	2.00	2.00	2.00	8.00	
9	Awareness Programme including Signages, distribution of Pamphlets related to wild life conservation etc.	2.50	2.50	2.50	2.50	10.00	
10	Provision for conservation of Biodiversity among flora and fauna of the area & Preparation of Biodiversity register	20.00	0.00	0.00	0.00	20.00	The amount is to be deposited in the account of Biodiversity Board as this work is to be done by Bio-diversity management committees (BMC's)
	Total	55.00	35.00	35.00	35.00	160.00	

योजना की लागत रू. 160.00 लाख [illegible] से यह लागत सम्पूर्ति [illegible] इन्डेक्स के हिसाब से वृद्धि होगी। परियोजना के क्रियान्वयन के दौरान जो भी लागत आयेगी वह परियोजना प्रस्तावकों को वन विभाग में एकमुश्त जमा करानी होगी। जिससे मूल्य वृद्धि के प्रभाव को समाप्त किया जा सके। वन विभाग एकमुश्त जमा की गई राशि से वन्यप्राणी संरक्षण योजना क्रियान्वित करेगा।

7. अनुमोदित वन्यप्राणी संरक्षण योजना की एक प्रति संलग्न प्रेषित है। कृपया वन्यप्राणी संरक्षण योजना में प्रावधानित राशि रू. 160.00 लाख एकमुश्त जमा कराने हेतु परियोजना प्रस्तावकों को आदेशित करने का कष्ट करें।

संलग्नः–उपरोक्तानुसार।

(रामप्रकाश) 04/X/13
प्रधान मुख्य वन संरक्षक (वन्यप्राणी)
छत्तीसगढ़, रायपुर

पृष्ठां क्रमांक/व.प्रा./प्रबंध–12/13/2968. रायपुर दिनांक 07/10/2013

प्रतिलिपि :–

1. प्रमुख सचिव, छत्तीसगढ़ शासन, वन विभाग, महानदी मंत्रालय भवन, नया रायपुर की ओर मय योजना की प्रति सहित सूचनार्थ प्रेषित।
2. श्री एम. के. नायक, जी. एम. माइन्स हिन्डालको ईन्डस्ट्रीज लिमिटेड, सामरी बॉक्साईट माईन्स, पोस्ट–कुसमी, जिला–सरगुजा, छत्तीसगढ़ की ओर मय योजना की प्रति सहित सूचनार्थ प्रेषित।

04/X/13
प्रधान मुख्य वन संरक्षक (वन्यप्राणी)
छत्तीसगढ़, रायपुर

Agent of Mines
Samri Mines Division
Hindalco Industries Ltd

Vijay/Sinha/Prabandh

TATIJHARIA BAUXITE MINE

Agent of Mines
Samri Mines Division
Hindalco Industries Ltd

Annexure B

Annexure-6
Details of Flora and Fauna

ANNEXURE-6
DETAILS OF FLORA & FAUNA

TABLE-1
DETAILS OF DOMINANT PLANT SPECIES IN MINE LEASE AREA (CORE ZONE)

Name of the plant Species	Local Name	Family
Butea monosperma	Palas	Fabaceae
Acacia Arabica	Babul	Mimosaceae
Leucena leucophloe	Sabubal	Mimosacaae
Mangifera indica	Aam	Anacardiaceae
Citrus lemon	Nimbu	Rutaceae
Emblica officinalis	Amla	Euphorbiaceae
Ficus hispida	Jungli anjir	Moraceae
Spondias cythera	Kathjamun	Myrtaceae
Terminalia catapa	Badam	Combretaceae
Apluda mutica	Grass	Poaceae
Chloris dolichosta	Grass	Poaceae
Dichanthium annulatum	Grass	Poaceae
Inpurta cylendrica	Grass	Poaceae
Themeda quadrivalvis	Grass	Poaceae
Aristida adscensionsis	Grass	Poaceae
Eragrostis biferia	Grass	Poaceae
Eragrostis tenella	Grass	Poaceae
Setaria glauca	Grass	Cyperaceae
Thysanolaena maxima	Grass	Graminae
Parthenium hysterophorus	Congress grass	Compositae
Cassia tora	-	Caesalpinaceae
Delonix regia	Kachnar	Caesalpinaceae
Dalbergia Sissoo	Sisoo	Caesalpinaceae

TABLE-2
FLORA/VEGETATION IN STUDY AREA (BUFFER ZONE)

Sr. No.	Technical Name	Family	Life Form
I. Agricultural Crops			
1	*Hordium vulgare*	Poaceae	Hemicryptophyte
2	**Sorghum vulgare**	Poaceae	Hemicryptophyte
3	*Triticum vulgare*	Poaceae	Hemicryptophyte
4	*Zea mays*	Poaceae	Hemicryptophyte
5	*Oryza sativa*	Poaceae	Hemicryptophyte
6	*Pennisetum typhoideum*	Poaceae	Hemicryptophyte
II. Commercial Crops (including Vegetables)			
7	*Abelomoschus indicus*	Malvaceae	Therophyte
8	*Allium cepa*	Liliaceae	Geophyte
9	*Allium sativum*	Liliaceae	Geophyte
10	*Annona squamosa*	Annonaceae	Phanerophyte
11	*Arachis hypogia*	Fabaceae	Geophyte
12	*Catharanthes pusillus*	Compositae	Therophyte
13	**Cicer arietinum**	Fabaceae	Hemicryptophyte
14	*Citrus lemon*	Ruataceae	Therophyte
15	*Colacasia esculenta*	Areaceae	Geophyte
16	*Coreandrum sativum*	Umbelliferae	Hemicryptophyte
17	*Daucus carota*	Umbelliferae	Geophyte
18	*Lycopersicum esculentus*	Solanaceae	Therophyte
19	*Mangifera indica*	Anacardiaceae	Phanerophyte
20	*Memordia charantia*	Cucurbitaceae	Therophyte
21	*Pisum sativum*	Fabaceae	Therophyte
22	*Psidium guava*	Myrtaceae	Phanerophyte
23	*Solanum tuberosum*	Solanaceae	Geophyte
24	*Litchi chinensis*	Sapindaceae	Phanerophyte
III. Plantations			
25	*Bauhinia cormbosa*	Caesalpinaceae	Phanerophyte
26	*Acacia nilotica*	Mimosaceae	Phanerophyte
27	*Albizia lebbeck*	Mimosaceae	Phanerophyte
28	*Albizia odorattissima*	Mimosaceae	Phanerophyte
29	*Albizia procera*	Mimosaceae	Phanerophyte

Sr. No.	Technical Name	Family	Life Form
30	*Azadirachta indica*	Meliaceae	Phanerophyte
31	*Bauhinia variegate*	Caesalpinaceae	Phanerophyte
32	*Bauhinia purpuria*	Caesalpinaceae	Phanerophyte
33	*Bambusa arundanaceae*	Poaceae	Phanerophyte
34	*Butea monosperma*	Caesalpinaceae	Phanerophyte
35	*Butea frondosa*	Caesalpinaceae	Phanerophyte
36	*Eucalyptus sp*	Myrtaceae	Phanerophyte
37	*Delonix regia*	Caesalpinaceae	Phanerophyte
38	*Leucena leucophloe*	Caesalpinaceae	Phanerophyte
IV. Natural Vegetation/Forest Type			
39	*Abrus precatorius*	Fabaceae	Therophyte
40	*Abutilon indicum*	Malvaceae	Phanerophyte
41	*Acacia Arabica*	Mimosaceae	Phanerophyte
42	*Acacia auriculiformis*	Mimosaceae	Phanerophyte
43	*Acacia catechu*	Mimosaceae	Phanerophyte
44	*Acacia intinsia*	Mimosaceae	Phaneophyte
45	*Acacia fernacea*	Mimosaceae	Phanerophyte
46	*Acacia leucophloe*	Mimosaceae	Phanerophyte
47	*Acalypha lanceolata*	Euphorbiaceae	Therophyte
48	*Acanthospermum hispidum*	Compositae	Therophyte
49	*Achyranthes aspera*	Amaranthaceae	Therophyte
50	*Adathoda vasica*	Acanthaceae	Therophyte
51	*Adina cordifolia*	Rubiaceae	Phanerophyte
52	*Aegle marmelos*	Rutaceae	Phanerophyte
53	*Aerva lanata*	Compositae	Phanerophyte
54	*Ageratum conyzoides*	Compositae	Therophyte
55	*Ailanthes excela*	Simaroubaceae	Phanerophyte
56	*Alangium salivus*	Alangiceae	Phanerophyte
57	*Albizia odoratissima*	Caesalpinaceae	Phanerophyte
58	*Albizia procera*	Caesalpinaceae	Phanerophyte
59	*Alstonia scholaris*	Apocyanaceae	Phanerophyte
60	*Alternanthera sessilis*	Amaranthaceae	Therophyte
61	*Alysicarpus hamosus*	Fabaceae	Therophyte
62	*Anogeissus latifolia*	Combretaceae	Phanerophyte
63	*Anogeissus serica*	Combretaceae	Phanerophyte
64	*Argemone mexicana*	Papevaraceae	Phanerophyte
65	*Azadirachta indica*	Meliaceae	Phanerophyte
66	*Barleria prionoites*	Acanthaceae	Therophyte
67	*Bidens biternata*	Compositae	Therophyte
68	*Blepharis asperima*	Acanthaceae	Phanerophyte
69	*Blepharis madaraspatens*	Acanthaceae	Therophyte
70	*Blumea lacera*	Compositae	Therophyte
71	*Boerheavia chinensis*	Nycataginaceae	Therophyte
72	*Boerheavia diffusa*	Nyctaginaceae	Therophyte
73	*Bombax ceiba*	Bombacaceae	Phanerophyte
74	*Borreria hispida*	Rubiaceae	Therophyte
75	*Borreria stricta*	Rubiaceae	Therophyte
76	*Boswellia serrata*	Burseraceae	Phanerophyte
77	*Brassica camprestris*	Cruciferae	Therophyte
78	*Bridelia retusa*	Euphorbiaceae	Phanerophyte
79	*Bridelia superba*	Euphorbiaceae	Phanerophyte
80	*Caesalpina pulcherima*	Caesalpinaceae	Phanerophyte
81	*Calotropis procera*	Asclipiadaceae	Phanerophyte
82	*Canthium diddynum*	Rubiaceae	Phanerophyte
83	*Capparis aphylla*	Capparidaceae	Therophyte
84	*Capparis deciduas*	Capparidaceae	Phanerophyte
85	*Carissa carandus*	Apocyanaceae	Phanerophyte
86	*Carissa spinarium*	Apocyanaceae	Phanerophyte
87	*Casearia graveolens*	Samydiaceae	Phanerophyte
88	*Cassia absus*	Caesalpinaceae	Phanerophyte
89	*Cassia absus*	Caesalpinaceae	Therophyte
90	*Cassia auriculata*	Caesalpinaceae	Therophyte
91	*Cassia occidentalis*	Caesalpinaceae	Therophyte
92	*Cassia tora*	Caesalpinaceae	Phanerophyte
93	*Cestrum diurnum*	Rubiaceae	Theophyte
94	*Cestrum noctrunum*	Rubiaceae	Therophyte

Sr. No.	Technical Name	Family	Life Form
95	*Chloris varigata*	Poaceae	Therophyte
96	*Cissus quadrangularis*	Vitaceae	Therophyte
97	*Citrus limon*	Rutaceae	Phanerophyte
98	*Cleome gynandra*	Capparidaceae	Therophyte
99	*Combretum ovalifolium*	Rubiaceae	Phanerophyte
100	*Cordia myxa*	Rubiaceae	Phanerophyte
101	*Crotalaria medicagenia*	Fabaceae	Therophyte
102	*Croton bonplandinum*	Amaryllidaceae	Therophyte
103	*Cuscuta reflexa*	Cuscutaceae	Epiphyte
104	*Datura fastulosa*	Solanaceae	Therophyte
105	*Datura metal*	Solanaceae	Therophyte
106	*Desmodium triflorum*	Asclepiadaceae	Therophyte
107	*Diospyros melanoxylon*	Lythraceae	Phanerophyte
108	*Diospyros Montana*	Lythraceae	Phanerophyte
109	*Echinops echinatus*	Compositae	Therophyte
110	*Eclipta prostrate*	Compositae	Hemicryptophyte
111	*Emblica officinale*	Euphorbiaceae	Phanerophyte
112	*Emilia lajerium*	Compositae	Hemicryptophyte
113	*Erythrina indica*	Papillionaceae	Phanerophyte
114	*Euphorbia geniculata*	Euphorbiaceae	Therophyte
115	*Euphorbia hirta*	Euphorbiaceae	Therophyte
116	*Euphorbia hyperocifolia*	Euphorbiaceae	Therophyte
117	*Euphorbia neruri*	Euphorbiaceae	Therophyte
118	*Euphorbia nivula*	Euphorbiaceae	Therophyte
119	*Euphorbia piluliflora*	Euphorbiaceae	Hemicryptophyte
120	*Euphorbia tricauli*	Euphorbiaceae	Hemicryptophyte
121	*Evolvulus alsinoides*	Convolvulaceae	Therophyte
122	*Evolvulus numalaris*	Convolvulaceae	Therophyte
123	*Feronia elephantum*	Rutaceae	Phanerophyte
124	*Ficus benghalensis*	Moraceae	Phanerophyte
125	*Ficus carica*	Moraceae	Phanerophyte
126	*Ficus glomerata*	Moraceae	Phanerophyte
127	*Ficus hispida*	Moraceae	Phanerophyte
128	*Ficus racemosus*	Moraceae	Phanerophyte
129	*Ficus relisiosa*	Moraceae	Phanerophyte
130	*Ficvus gibbosa*	Moraceae	Phanerophyte
131	*Gardenia latifolia*	Rubiaceae	Phanerophyte
132	*Gardenia lucida*	Rubiaceae	Phanerophyte
133	*Garuga pinnata*	Burseraceae	Phanerophyte
134	*Glossocardia bosvellia*	Compositae	Hemicryptophyte
135	*Gmelina arborea*	Rubiaceae	Phanerophyte
136	*Gomphrena globosa*	Amaranthaceae	Therophyte
137	*Gossypium herbaceum*	Malvaceae	Therophyte
138	*Grewia abutifolia*	Tiliaceae	Phanerophyte
139	*Grewia salivifolia*	Tiliaceae	Phanerophyte
140	*Grewia subinaqualis*	Tiliaceae	Phanerophyte
141	*Gynandropis gynandra*	Capparidaceae	Hemicryptophyte
142	*Helictris isora*	Rubiaceae	Phanerophyte
143	*Heliotropium indicum*	Rubiaceae	Hemicryptophyte
144	*Helitropium ovalifolium*	Rubiaceae	Hemicryptophyte
145	*Hemidesmus indicus*	Asclepiadaceae	Phanerophyte
146	*Hibsicus caesus*	Malvaceae	Hemicryptophyte
147	*Holarrhena antidycenterica*	Asclepiadaceae	Phanerophyte
148	*Holostemma annularia*	Aslepiadaceae	Phanerophyte
149	*Hygrophylla auriculata*	Acanthaceae	Hemicryptophyte
150	*Hyptis suavalens*	Labiatae	Therophyte
151	*Ichnocarpus frutens*	Poaceae	Hemicryptophyte
152	*Impatiens balasamania*	Balsaminaceae	Therophyte
153	*Indigofera hirsute*	Caesalpinaceae	Therophyte
154	*Indigofera limnacea*	Caesalpinaceae	Therophyte
155	*Indigofera tinctoria*	Caesalpinaceae	Therophyte
156	*Ipomea aquatica*	Convolvulaceae	Hydrophyte
157	*Ipomea coccinea*	Convolvulaceae	Therophyte
158	*Ipomea tuba*	Convolvulaceae	Hemicryptophyte
159	*Ixora arborea*	Rubiaceae	Phanerophyte
160	*Ixora parviflora*	Rubiaceae	Phanerophyte

Sr. No.	Technical Name	Family	Life Form
161	*Ixora singapuriens*	Rubiaceae	Phanerophyte
162	*Jasmimum arborens*	Oleaceae	Phanerophyte
163	*Jatropha gossypifolia*	Euphorbiaceae	Therophyte
164	*Jussiaea suffraticosa*	Onagraceae	Hydrophyte
165	*Justia diffusa*	Acanthaceae	Therophyte
166	*Justicia diffusa*	Acanthaceae	Therophyte
167	*Lactuca punctata*	Compositae	Therophyte
168	*Lannea coramandalica*	Anacardiaceae	Phanerophyte
169	*Lannea grandis*	Anacardiaceae	Phanerophyte
170	*Lannea procumbens*	Anacardiaceae	Therophyte
171	*Lantana camara*	Verbinacaee	Phanerophyte
172	*Lawsonia inermis*	Lythraceae	Phanerophyte
173	*Lepidogathis cristata*	Acanthaceae	Therophyte
174	*Leptodenia reticulate*	Asclepiadaceae	Phanerophyte
175	*Leucas aspera*	Labiatae	Therophyte
176	*Leucas longifolia*	Labiatae	Therophyte
177	*Leucas longifolia*	Labiatae	Therophyte
178	*Leucena leucophloe*	Caesalpinaceae	Phanerophyte
179	*Linderbergia indica*	Scrophulariaceae	Therophyte
180	*Lindernbergia ciliate*	Scrophulariaceae	Therophyte
181	*Lophophora tridinatus*	Scrophulariaceae	Geophyte
182	*Luffa acutangularia*	Cucurbitaceae	Therophyte
183	*Lycopersicum esculentus*	Solanaceae	Therophyte
184	*Madhuca latifolia*	Sapotaceae	Phanerophyte
185	*Mallotus philippinus*	Euphorbiaceae	Phanerophyte
186	*Malvastrum coramandalicum*	Malvaceae	Therophyte
187	*Mangifera indica*	Anacardiaceae	Phanerophyte
188	*Marselia quadrifolia*	Marseliaceae	Phanerophyte
189	*Melia azadirachta*	Meliaceae	Phanerophyte
190	*Memordica diocea*	Cucurbitaceae	Therophyte
191	*Merremia emerginata*	Convolvulaceae	Therophyte
192	*Michaelia champaca*	Annonaceae	Phanerophyte
193	*Millingtonia hartensis*	Bignoniaceae	Phanerophyte
194	*Mimosa hamata*	Mimosaceae	Therophyte
195	*Mitragyna parviflora*	Rubiaceae	Phanerophyte
196	*Mollugo cerviana*	Aizoaceae	Therophyte
197	*Mollugo hirta*	Aizoaceae	Therophyte
198	*Moringa oleifera*	Moringaceae	Phanerophyte
199	*Morus alba*	Moraceae	Phanerophyte
200	*Mucuna prurita*	Papillionaceae	Hemicryptophyte
201	*Murraya exotica*	Rutaceae	Phanerophyte
202	*Murraya koenigii*	Rutaceae	Phanerophyte
203	*Musa paradisica*	Musaceae	Therophyte
204	*Nymphia sp*	Magnoliaceae	Hydrophyte
205	*Ocimum americanum*	Labiatae	Therophyte
206	*Ocimum basillum*	Labiatae	Therophyte
207	*Ocimum canum*	Labiatae	Therophyte
208	*Ocimum sanctum*	Labiatae	Therophyte
209	*Oldenlandia umbellate*	Convolvulaceae	Therophyte
210	*Oldenlandiua corymbosa*	Rubiaceae	Therophyte
211	*Oogeinia oojensis*	Papillionaceae	Phanerophyte
212	*Opuntia dillinii*	Opuntiaceae	Therophyte
213	*Opuntia elator*	Cacataceae	Therophyteq
214	*Oxalis corniculata*	Oxalidaceae	Therophyte
215	*Panicum milliria*	Poaceae	Hemicryptophyte
216	*Panicum notatum*	Poaceae	Hemicryptophyte
217	*Papaver somniferum*	Papaveraceae	Hemicryptophyte
218	*Parkinsonia aculata*	Mimosaceae	Phanerophyte
219	*Parthenium hysterophorus*	Compositae	Therophyte
220	*Paspalum strobilanthus*	Passifloraceae	Hemicryptophyte
221	*Passiflora foetida*	Passifloraceae	Phanerophyte
222	*Pavonia zeylanica*	Malvaceae	Phanerophyte
223	*Peltophorum ferrusinum*	Caesalpinaceae	Phanerophyte
224	*Phoenix aculis*	Palmae	Phanerophyte
225	*Phyllanthes asperulatus*	Euphorbiaceae	Phanerophyte
226	*Phyllanthes emblica*	Euphorbiaceae	Phanerophyte

Sr. No.	Technical Name	Family	Life Form
227	*Phyllanthes nirurii*	Euphorbiaceae	Therophyte
228	*Phyllanthes reticulates*	Euphorbiaceae	Therophyte
229	*Physalis minima*	Solanaceae	Therophyte
230	*Pithocolobium dulce*	Mimosaceae	Phanerophyte
231	*Polyalthia longifolia*	Annonaceae	Phanerophyte
232	*Polygala ererptera*	Polygalaceae	Therophyte
233	*Pongamia pinnata*	Fabaceae	Phanerophyte
234	*Portulaca oleracea*	Portulaccaceae	Therophyte
235	*Psidium guava*	Myrtaceae	Phanerophyte
236	*Punica granulatum*	Puniaceae	Therophyte
237	*Randia dumatorum*	Rubiaceae	Phanerophyte
238	*Rosa indica*	Rosaceae	Therophyte
239	*Rosa machata*	Rosaceae	Therophyte
240	*Saccharum munja*	Poaceae	Hemicryptophyte
241	*Saccharum officinarum*	Poaceae	Therophyte
242	*Salmalia malabarica*	Salmaliaceae	Phanerophyte
243	*Sapindus emerginatus*	Sapindaceae	Phanerophyte
244	*Schleichera trijuga*	Combretaceae	Phanerophyte
245	*Scherebera sweitenoides*	Sapindaceae	Phanerophyte
246	*Schleichera oleosa*	Sapindaceae	Phanerophyte
247	*Sesamum indicum*	Pedaliaceae	Hemicryptophyte
248	*Shorea robusta*	Dipterocarpaceae	Phanerophyte
249	*Sida orientalis*	Malvaceae	Phanerophyte
250	*Sida cernanifolia*	Malvaceae	Hemicryptophyte
251	*Solanum nigrum*	Solanaceae	Therophyte
252	*Solanum xanthocarpum*	Solanaceae	Therophyte
253	*Sterculia villosa*	Tiliaceae	Therophyte
254	*Stereospermum chelinoides*	Bignoniaceae	Phanerophyte
255	*Sygyglum cumini*	Myrtaceae	Phanerophyte
256	*Tamarindus indica*	Caesalpinaceae	Phanerophyte
257	*Tecomella undulate*	Bignoniaceae	Therophyte
258	*Tectona grandis*	Verbinaceae	Phanreophyte
259	*Tephrosia purpuria*	Fabaceae	Therophyte
260	*Terminalia bellarica*	Combretaceae	Phanerophyte
261	*Terminalia chebula*	Combretaceae	Phanerophyte
262	*Terminalia tomentosa*	Combretaceae	Phanerophyte
263	*Tinospora cordifolia*	Rhamnaceae	Therophyte
264	*Tragus biflorus*	Poaceae	Hemicryptophyte
265	*Tribulus terrestris*	Zygophyllaceae	Therophyte
266	*Tridax procumbens*	Compositae	Therophyte
267	*Triumferta pilosa*	Tiliaceae	
268	*Vernonia cinera*	Compositae	Therophyte
269	*Vicoa indica*	Compositae	Phanerophyte
270	*Vitex Negundo*	Verbinaceae	Phanerophyte
271	*Vitex negungo*	Verbinaceae	Therophyte
272	*Vitis vermifera*	Vitaceae	Therophyte
273	*Vivevera zizanoides*	Poaceae	Therophyte
274	*Wrightia tomentosa*	Apocyanaceae	Phanerophyte
275	*Xanthium strumariumk*	Compositae	Therophyte
276	*Yucca gloriosa*	Agavaceae	Therophyte
277	*Zizyphus jujube*	Rhamnaceae	Phanerophyte
278	*Zizyphus mauritiana*	Rhamanaceae	Phanrophyte
V. Grasslands			
279	*Apluda mutica*	Poaceae	Hemicryptophyte
280	*Chloris dolichosta*	Poaceae	Hemicryptophyte
281	*Cyanodactylon sp*	Poaceae	Geophyte
282	*Dichanthium annulatum*	Poaceae	Hemicryptophyte
283	*Impurta cylendrica*	Poaceae	Hemicryptophyte
284	*Sachharum spontanseum*	Poaceae	Hemicryptophyte
285	*Themeda quadrivalvis*	Poaceae	Hemicryprophyte
286	*Aristida adscensionsis*	Poaceae	Hemicryptophyte
287	*Cenchrus ciliaris*	Poaceae	Therophyte
288	*Cenchrus setifgera*	Poaceae	Therophyte
289	*Cymbopogon jwarancusa*	Cyperaceae	Hemicrptophyte
290	*Cyperus aristatus*	Cyperaceae	Therophyte
291	*Cyperus triceps*	Cyperaceae	Therophyte

Sr. No.	Technical Name	Family	Life Form
292	*Dactylectinium annualatum*	Poaceae	Therophyte
293	*Digetaria bicornis*	Poaceae	Hemicryptophyte
294	*Digetaria Segetaria*	Poaceae	Hemicryptophyte
295	*Eragrostis biferia*	Poaceae	Therophyte
296	*Eragrostis tenella*	Poaceae	Therophyte
297	*Ischaemum rugosum*	Poaceae	Hemicryptophyte
298	*Setaria glauca*	Cyperaceae	Hemicryptophyte
299	*Eulaliopsis binata*	Graminae	Hemicryptophyte
300	*Thysanolaena maxima*	Graminae	Hemicryptophyte
	Endangered plants	**No endangered plant species observed during study period and also from records of Botanical Survey of India (Red data of Books of Indian Plants)**	

TABLE-3

FAUNA AND THEIR CONSERVATION STATUS FROM MINE LEASE AREA (CORE ZONE)

Technical Name	English Name/ Local Name	Wild Life Protection Act (1972) Status
Aves		
Phlacrocorax niger	Little cormorant	Sch-IV
Nycticorax nycticorax	Night heron	Sch-IV
Ardeola grayii grayii	Paddy bird	Sch-IV
Bubulcus ibis coromandus	Cattle egret	Sch-IV
Eudynamys scolopacea	Indian koel	Sch-IV
Meops philippinus philippinus	Bluetailed bee-eater	Sch-IV
Dinopium benghalense tehminae	Malabar golden backed Woodpecker	Sch-IV
Acridotheres tristis tristis	Common myna	Sch-IV
Nectarinia minima	Small sunbird	Sch-IV
Passer domesticus indicus	Indian house sparrow	Sch-IV
Butterflies		
Hypolimnas bolina Lin.	Great eggfly	-
Euploea core Cramer	Common crow	-
Neptis hylas Moore	Common sailor	-
Eurema hecabe Lin.	Common grass yellow	-
Parantica aglea Stoll.	Glassy tiger	-
Mammals		
Funambulus palmarum	Squirrel	Sch-IV
Sus sucrofa	Wild pig	Sch-III
Herpestes edwardii	Common mongoose	Sch-IV
Vulpus benghalensis	Wild fox	Sch-II
Hystrix indica	Porcupine	Sch-IV

TABLE-4

FAUNA AND THEIR CONSERVATION STATUS IN STUDY AREA (BUFFER ZONE)

Technical Name	English Name/Local Name	Wild Life Protection Act (1972)
Aves		
Phlacrocorax niger	Little cormorant	Sch-IV
Ardea purpurea manilensis	Eastern purple heron	Sch-IV
Nycticorax nycticorax	Night heron	Sch-IV
Ardeola grayii grayii	Paddy bird	Sch-IV
Dupetor flavicollis	Black bittern	Sch-IV
Ardea alba modesta	Large egret	Sch-IV
Bubulcus ibis coromandus	Cattle egret	Sch-IV
Milvus migrans govinda	Common pariah kite	Sch-IV
Haliastur indus indus	Brahminy kite	Sch-IV
Vanellus indicus indicus	Redwattled lapwing	Sch-IV
Tringa hypoleucos	Common sandpiper	Sch-IV
Gelochelidon nilotica nilotica	Gullbilled tern	Sch-IV
Eudynamys scolopacea	Indian koel	Sch-IV
Halcyon smyrnensis fusca	Indian white breasted Kingfischer	Sch-IV
Meops philippinus philippinus	Bluetailed bee-eater	Sch-IV

Technical Name	English Name/Local Name	Wild Life Protection Act (1972)
Coracias benghalensis indica	Southern Indian Roller	Sch-IV
Dinopium benghalense tehminae	Malabar golden backed Woodpecker	Sch-IV
Acridotheres tristis tristis	Common myna	Sch-IV
Corvus splendens protegatus	Ceylon house crow	Sch-IV
Nectarinia minima	Small sunbird	Sch-IV
Nectarenia. zeylonica sola	Indian purple rumped sunbird	Sch-IV
Arachnothera longirostris longirostris	Little spinder hunter	Sch-IV
Passer domesticus indicus	Indian house sparrow	Sch-IV
Copsychus saularis ceyonensis	Southern magpie-robin	Sch-IV
Orthotomus sutorius	Tailor bird guzurata	Sch-IV
Pavocristatus	Peacock	Part-III of Sch-I
Amphibians		
Rana tigriana	Common frog	Sch-IV
Buto melanosticus	Toad	Sch-IV
Reptiles		
Calotes versicolor	Lizard	Sch-IV
Calotes versicolor	Common garden lizard	Sch-IV
Chamaleon zeylanicus	Indian chamaeleon	Sch-II
Lycodon spp.	Wolf snake	Sch-III
Boiga spp.	Cat snake	Sch-III
Bangarus spp.	Krait	Sch-II
Naja naja	Indian cobra	Sch-III
Vipera spp.	Russels viper	Sch-III
Phyton sp	Python sp	Sch-I
Butterfiles		
Pachliopta hector Lin.	Crimson rose	-
Papilio demoleus Lin.	Lime butterfly	-
Graphium agamemnon Lin.	Tailed jay	-
Junoria almana Lin.	Peacock pansy	-
Hypolimnas bolina Lin.	Great eggfly	-
Euploea core Cramer	Common crow	-
Neptis hylas Moore	Common sailor	-
Eurema hecabe Lin.	Common grass yellow	-
Catopsilia sp.	Emigrant	-
Mammals		
Rattus sp.	Rat	Sch-IV
Lepus nigricollis	Hare	Sch-IV
Canis auries	Jackal	Sch-III
Presbytis entellus	Langur	Sch-II
Presbytis phayrei	Monkey	Sch-I
Funambulus spp.	Squirrel	Sch-IV
Funambulus palmarum	Squirrel	Sch-IV
Sus sucrofa	Wild pig	Sch-III
Rattus norvegicus	Field mouse	Sch-V
Rattus rattus	House rat	Sch-V
Rhinolopus spp.	Bat	Sch-V
Hipposiderus spp.	Bat	Sch-V
Herpestes edwardii	Common mongoose	Sch-IV
Bandicota indica	Bandicoot	Sch-V
Bandicota bengalensis	Bandicoot	Sch-V
Vulpus benghalensis	Wild fox	Sch-III
Melsurus ursinus	Bear	Sch-III
Hystrix indica	Porcupine	Sch-IV
Axis axis	Spotted deer	Sch-III
Canis lupaspallipes	Indian wolf	Part-I of Sch-I
Mellivora capensis	Indian Ratel	Part-I of Sch-I
Elephas maximas	Indian Elephant	Part-I of Sch-I
Felis chaus	Jungle cat	Part-II of sch-II
Parodoxurus hermophroiditus	Indian Small civet	Part-I of sch-I
Muntiacus muntiacus	Barking deer	Sch-III
Macaca mulata	Monkey	Part-I of Sch-I

Annexure-C

View of one small old inactive OB dump stabilized by vegetation with suitable native species at Tatijharia Lease

Agent of Mines
Sambri Mines Division
Hindalco Industries Ltd

ANNEXURE - D

Photographs of Garland Drain & Parapat Wall

Agent of Mines
Samri Mines Division
Hindalco Industries Ltd

Hindalco Industries Limited

Mines Division ,Samri

ANNEXURE - E

Annexure -

Year wise /Lease wise Details of Afforestation

Year	Kudag Bauxite Mines		Samri Bauxite Mines		Tatijharia Bauxite Mines		Total	
	No.of Sapling	Area in hect.	No.of Sapling	Area in hect.	No.of Sapling	Area in hect.	No.of Sapling	Area in hect.
1998-2017	117570	49.980	167211	68.154	78925	32.060	363706	150.194
2017-18	2960	1.220	11681	4.970	8868	3.540	23509	9.730
2018-19	2780	1.110	19730	7.900	19967	7.990	42477	17.000
2019-20	2980	1.200	34360	31.590	32715	18.970	70055	51.760
2020-21	4865	2.405	36160	16.918	28739	12.819	69764	32.142
2021-22	3270	0.354	47307	11.465	21947	5.557	72524	17.376
2022-23 (Upto Sept.)	6020	2.024	39071	10.918	17110	5.628	62201	18.570
Total (Till Date)	140445	58.293	355520	151.915	208271	86.564	704236	296.772

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Annexure-F

Photographs of Pond and RWH Structure

A View of Pears Plantation

View of Digital Water Meter Installed in the Lease area

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Hindalco Industries Ltd

Annexure-G

Agent of Mines
Sarda Mines Division
Hindalco Industries Ltd

View of Black top road constructed up to pit head to reduce dust problem.

Annexure - H

Hindalco Industries Limited

Mines Division, Samri

Date - 19.04.2022

Environment Management Cell

An Environment Management Cell is re-constituted by the following members which is compliance of the EC conditions for the Samri, Kudag and Tatijharia Bauxite Mines.

S.No.	Name	Designation	Position
1.	Mr. Vijay Chauhan	Agent of Mines	Chairman
2.	Mr. Amit Tiwary	Manager-Mines	Secretary
3.	Mr. Praween Pradhan	Manager Geology	Member
4.	Dr. M.Kumar	Sr. Medical Officer	Member
5.	Mr. K.K.Singh	Dy. Manager	Member
6.	Mr. J.P.Thakur	Dy.Officer -Lab	Member

Agent of Mines
Samri Mines Division
Hindalco Industries Ltd

Vijay Chauhan
(Agent of Mines)

ANNEXURE - I

ण पत्र//

...ग्राम.....तहसील .....जिला को पिछले वर्षो से जानता हूं। इनको
पत्र इन्हें नगर सेना विभाग में स्वयं सेवी नगर सैनिक की भर्ती के लिए

(सरपंच/पार्षद का हस्ताक्षर)
नाम .....
पद मुद्रा

र २० अंक दिये जा सकेंगे।
रखने पर अधिकतम १० अंक की पात्रता होगी।
अकुशल टेक्समेन के लिए जिला स्तरीय उप समिति टेस्ट लेकर प्रमाण

की जांच के पश्चात योग्य पाये गये उम्मीदवारों का ट्रेड टेस्ट लिया

धक अंकों की योग्यता होने पर भी कुल बोनस अंक ३० से अधिक

नहीं होना चाहिए।
ी भी प्रकार का अवकाश स्वीकृत नहीं किया जावेगा।
के लिए न होकर सीमित अवधि की स्वयं सेवा है जिसके बदले शासन
में प्रशिक्षण उपरांत मात्र ०३ (तीन) वर्ष के लिए स्वयं सेवी नगर
पश्चात पुनः नामांकन होने की कोई ग्यारंटी नहीं है।
के उम्मीदवार को भर्ती हेतु भर्ती स्थल तक आने,जाने हेतु किसी

दिनांक ०३.१०.२००७ के प्रातः ८ बजे भर्ती स्थल पी.जी. कॉलेज

जिला सेनानी
नगर सेना अम्बिकापुर

हेतु आवेदन पत्र

राजपत्रित अधिकारी द्वारा अभिप्रमाणित पासपोर्ट साइज का फोटो

..... सेंमी.
..... सेंमी.

है ?

प्रमाण पत्र //

ग पत्र।

आवेदक के हस्ताक्षर

ी / 20235

अम्बिकापुर/

लायंस क्लब अम्बिकापुर सेन्ट्रल के सत्र ०७-०८ में विभिन्न सेवा कार्य गतिविधियों पर विचार विमर्श हेतु एक बैठक आनंद नगर एमजी रोड में संपन्न हुई। तत्पश्चात पहला सेवा कार्य जे.बी. मिंज आयकर अधिकारी के मुख्य अतिथ्य में लायंस क्लब के सभी सदस्यों द्वारा स्थानीय वृद्धाश्रम में निःशक्त वृद्धाजनों को फल वितरण कर शुरू किया गया।

लायंस क्लब सेंट्रल के अध्यक्ष प्रदीप गुप्ता सचिव राजीव स्वर्णकार कोषाध्यक्ष राजेश सिंह सहित लायन विजय जायसवाल कनक गुप्ता रोशन अग्रवाल, लक्ष्मी प्रकाश जायसवाल, सुरेन्द्र सिंह छाबड़ा, रविन्द्र छाबडा, एच.एस. जायसवाल राकेश अग्रवाल, पीके लोहिया, एन.जे. जोसेफ सहित अन्य सदस्य उपस्थित थे।

आज हुई सामान्य सभाकी बैठक पूरे दे दिवस से म शा.उ में स्व कार्यक सेंट्रल छात्रा से उन्हें गया।

HINDALCO
ADITYA BIRLA GROUP

हिण्डालको इण्डस्ट्रीज लिमिटेड

(सामरी खान प्रभाग)

सूचना

सर्व साधारण को सूचित किया जाता है कि वन एवं पर्यावरण मंत्रालय, नई दिल्ली से उनके पत्र क्रमांक जे. 11015/337/2007-IA.II(M) दिनांक 09.08.2007 के तहत हिण्डालको इण्डस्ट्रीज लिमिटेड के टाटीझरिया बॉक्साईट खदान की क्षमता विस्तार(0.40 मिलियन टन बॉक्साईट उत्पादन प्रतिवर्ष) हेतु पर्यावरणीय स्वीकृति अनुमोदित होकर प्राप्त हो चुकी है। उपरोक्त स्वीकृति पत्र की प्रतिलिपि छ.ग.पर्यावरण संरक्षण मंडल कार्यालय में उपलब्ध है एवं वन एवं पर्यावरण मंत्रालय की बेबसाईट http://envfor.nic.in. पर भी देखी जा सकती है।

भवदीय
हिण्डालको इण्डस्ट्रीज लिमिटेड
सामरी खान प्रभाग

अधि अम्बिकावाणी 12 अगस्त 2007

Agent of Mines
Samri Mines Division
Hindalco Industries Ltd

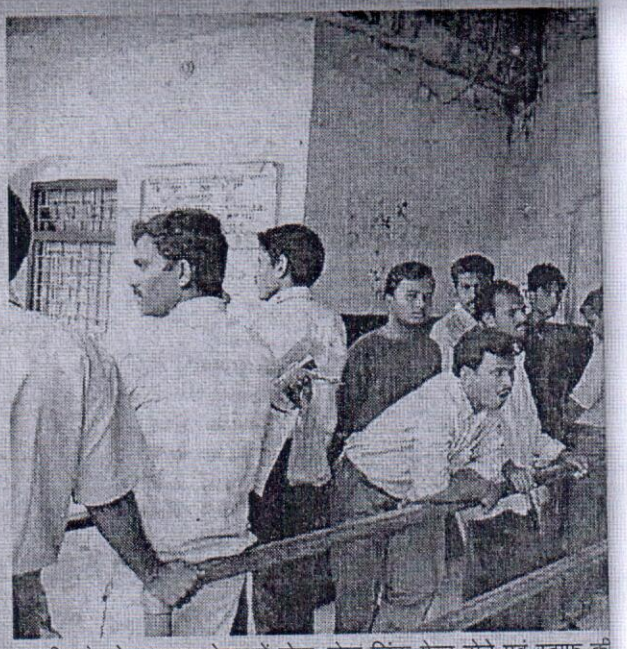
हेतु निर्देशित किया है।

स्वास्थ्य जागरूकता शिविर आयोजित

राजपुर। क्षेत्रांगर्तत दूरस्थ ग्रामों में स्वास्थ्य विभाग द्वारा परीक्षण एवं जागरूकता शिविर का आयोजन किया गया। जिसमें सैकड़ों लोगों के स्वास्थ्य परीक्षण किया गाय। मौसमी बीमारियों को देखते हुए पंचायत करजी उधवा कठरा, मदनेश्वर, भटगांव में शिविर आयोजित किया गया। डॉक्टरों को नि:शुल्क दवाईयां बांटी। खण्ड चिकित्सा अधिकारी डॉ.प्रीत राम ने बताया कि शिविर के माध्यम से लोगों का स्वास्थ्य परीक्षण के साथ साथ बीमारी के बारे में पता लगाना है। गांव के लोग छोटी छोटी बीमारी में चिकित्सालय नहीं आते है, जिससे यह बढ़ जाती है। उन्होंने कहा कि हमारा प्रयास है कि ऐसे बीमारी को शुरू में ही समाप्त किया जाएग। शिविर में डॉक्टर के अलावा डिपो होल्डर, स्वास्थ्य कार्यकर्ता सहित मितानित शामिल रहते है।

सूरजपुर में संसदीय सचिव करेंगे ध्वजारोहण

सूरजपुर। स्वतंत्रता दिवस की 60 वीं वर्षगांठ पर सूरजपुर के जिला स्तरीय आयोजन में संसदीय सचिव एवं विधायक रामसेवक पैंकरा ध्वजा रोहण करेगें।



स्थानीय रेलवे आरक्षण केन्द्र में रोज-रोज लिंक फेल होने एवं स्टाफ की की मजबूरी बन गई है।

अधूरी पड़ी पुलिया निर्माण को पूर्ण कराने की मांग

राजपुर। सेमरा बकसपुर मार्ग पर अधूरी पड़ी पुलिया के पुनः निर्माण एवं अनियमितता की जांच की मांग वार्ड क्रमांक-8 के पार्षद अभय जायसवाल ने कलेक्टर से की है। उन्होंने बताया है कि नगर पंचायत के वार्ड क्रमांक-3 से होकर सेमरा बकसपुर जाने के लिए तीन वर्ष पूर्व तत्कालीन सांसद खेलसाय सिंह ने तीन लाख रूपए अपने मद से दिया था। निर्माण एजेंसी नगर पंचायत को बनाया गया था। पुलिया बनने से पूर्व नगर पंचायत चुनाव हुए एवं पुलिया का कार्य बंद हो गया। नगर पंचायत गठन के बाद पार्षदों ने पुनः कार्य करवाने एवं पूर्ण करने का निर्णय लिया था। लेकिन कार्य अब तक प्रारंभ नहीं हुआ तथा इसकी फाईल भी कार्यालय से गायब हो गई। पार्षद अभय जायसवाल ने इसकी शिकायत कलेक्टर सरगुजा से कर इसकी जांच कराए जाने एवं तत्काल पुल-पुलिया निर्माण प्रारंभ कराए जाने की मांग की है ताकि बरसात में आने-जाने की समस्या समाप्त हो सके।

हरिभूमि 13 अगस्त 2007

Agent of Mines
Samri Mines Division
Hindalco Industries Ltd

ANNEXURE - II

Environmental Status Report
For
Tatijharia Bauxite Mine
at
Post & Teh.: Samri,(Kusmi)
Dist: Balrampur–Ramanujganj(C.G.)

Duration: April-May-June-2022

Name of Industry:-

M/s. Hindalco Industries Limited.,

Name of Laboratory:-

QCI-NABET, MoEF & CC (GOI)
ISO 9001:2015, ISO 14001:2015, ISO 45001:2018
60, Bajiprabhu Nagar, Nagpur - 440 033, MS
Lab. & Consultancy: FP-34, 35, Food Park,
MIDC, Butibori, Nagpur – 441122
Ph.: (0712) 2242077, 9373287475
Email: *info@anacon.in*, *ngp@anacon.in*
website: *www.anaconlaboratories.com*

1.1 Introduction

Hindalco Industries Limited (Hindalco) is one among the flag ship companies of the Aditya Birla Group of Industries and is one of the largest corporate groups in India. This group is a leading manufacturer of Aluminum in India, having integrated facilities encompassing bauxite, mining, refining and smelting to achieve Aluminum.

Various processing units of Hindalco are strategically located in different parts of the nation to achieve optimum benefits. Over the past few decades the group has grown multifold in its production capacities, product mix and diversification in mining. The Chhattisgarh Environment Conservation Board (CECB) granted permission for establishing the Bauxite mine to Hindalco at block Tatijharia, Kudag and Samri mines in Balrampur District of Chhattisgarh State.

HINDALCO INDUSTRIES LTD. awarded the work to M/s ANACON LABORATORIES PVT. LTD. NAGPUR (ALPL) for carrying out monitoring of parameters for assessing pollution levels and preparation of monthly report (April-May-June-2022) as per the requirement of Chhattisgarh Environment Conservation Board (CECB) and Ministry of Environment Forest and climate change (MoEF & CC) for Tatijharia mining lease in Balrampur District, Chhattisgarh State.

1.2 Background Information of Tatijharia Mine

Hindalco was granted Tatijharia Bauxite mining lease over an area of 1218.762hec.inTatijharia, Post Jamira, Tehsil Samri of Balrampur district, Chhattisgarh on 25/06/1998 for a period of 20 years. As per the Mines and Mineral (Development and Regulation) Amendment Act, 2015, Tatijharia lease has been extended up to 30 years i.e 24/06/2048. The mining operations were started on 01/04/2004. The production capacity of Tatijharia bauxite mine is 4.0 Lakh Tone/Year.

1.3 Salient Features of Tatijharia Bauxite Mine

The deposits occur in Tatijharia block, Post Jamira Tehsil Samri of Balrampur district. This deposit has been identified as one of the resources to cater the raw material requirements of the Hindalco Alumina refinery at Renukoot, Uttar Pradesh. The salient features of the project are presented below :(**Table-1**)

Table-1

Salient Features of Tatijharia Bauxite Mines

S.No.	Particulars	Details
1.	Survey of India Toposheet No.	64 M /15
2.	Latitude	23^0 21' 02"N to 23^0 24' 15"N
3.	Longitude	83^0 54' 50"E to 83^0 56' 30"E
4.	Elevation	1282-m above Mean Sea Level
5.	Climatic Conditions (as per IMD, Ambikapur)	Annual maximum temperature : 30.3^{0}C Annual minimum temperature : 17.7^{0}C Average annual rainfall : 1401.1 mm
6.	Mining lease area	1218.762hec.
7.	Method of mining	Open cast (Semi-Mechanized)
8.	Mode of transportation	Trucks
9.	Land use	Agricultural and Barren land
10.	Nearest Road	Samri to Kusmi (17 km)
11.	Nearest Airport	Ranchi (143.56 km, E)
12.	Nearest Town	Ambikapur (127 km, SW)

1.4 Environmental Monitoring

Regular monitoring of environmental parameters is of immense importance to assess the status of environment during mining operation. With the knowledge of baseline conditions, the monitoring program will serve as an indicator for any deterioration in environment conditions due to mining operation of the project. Suitable mitigation steps will be taken in time to safeguard the environment, based on monitoring reports. Monitoring is important in the control of pollution since the efficiency of control measures can only be determined by monitoring.

In order to find out impact of mining activity on sensitive receptors, it is necessary to monitor Environmental Quality to know ground level l concentrations of pollutants within and around the mining lease area, accordingly Hindalco Industries through ALPL has been monitoring at the following locations air, water and Noise quality on monthly basis during these months **(Table 2)**.

1.5 Air Environment

1.5.1 'Ambient Air Quality Monitoring

Ambient Air Quality monitored at 8 locations in the core zone and buffer zone with reference to Tatijharia mine lease area shown in **(Fig. 1)**.

Table 2

Locations of Ambient Air Quality Monitoring (AAQM)

(1218.762 hec.)

Sl. No.	(Core Zone)	Sl. No.	Buffer Zone
1	Piprapat/Nr.Mining Area	5	Kutku Village/Nr.V.T.Center
2	Betpani	6	Sairaidh Campus
3	Virhorepat	7	Rajendrapur/Nr.Mining Area
4	Tatijharia Village/Nr.Weigh Bridge	8	Dumerkholi/Nr.Mining Area

The sampling stations are selected at the above mentioned locations, in downwind and upwind directions of the mining site in the core zone and buffer zone. ALPL is carrying out regular monitoring for PM_{10}, $PM_{2.5}$, SO_2, NO_2, CO and, Pb, Hg, As and Cr above Ambient Air Quality Monitoring (AAQM) locations. The AAQM sampling sites are selected considering seasonal variation in wind speed and wind direction.

1.5.2 Sampling Duration and Frequency

Ambient air quality monitoring was carried out for the parameters PM_{10}, $PM_{2.5}$, SO_2, NO_2, CO and Pb, Hg, As and Cr from April-2022 to June-2022 as per CPCB norms.

Data is compared with the present revised standards mentioned in the latest Gazette Notification of the Central Pollution Control Board (CPCB) (November-18, 2009), and as per consent conditions mentioned in consent letter.

1.5.3 MONITORED PARAMETERS AND FREQUENCY Of SAMPLING

Methods and Instruments used for Sampling

The air samples were analyzed as per methods specified by Central Pollution Control Board (CPCB).

The levels of Particulate Matter (PM_{10}), Sulphur Dioxide ($SO_{2,}$), Oxides of Nitrogen (NO_2), CO, Pb, Hg, As and Cr were monitored for establishing the baseline status. PM_{10} was collected with the help of Respirable particulate sampler operating 24 hours by drawing air which passes through the cyclone at the rate of 1.0 -1.3 m^3/min which collects the particles less than 10 µm diameter over glass fiber filter paper. **(Table3)**.

Table 3

MONITORED PARAMETERS AND FREQUENCY OF SAMPLING

Parameters	Sampling frequency
Particulate Matter (PM_{10})	24 hourly sample twice a week for Three months
Particulate Matter ($PM_{2.5}$)	24 hourly sample twice a week for Three months
Particulate Matter 2.5	24 hourly sample twice a week for Three months
Sulphur dioxide (SO_2)	24 hourly sample twice a week for Three months
Oxides of Nitrogen (NO_2)	24 hourly sample twice a week for Three months
CO, Pb, Hg, As, Cr	8 hourly samples for 24 hour twice a week for three months

Table 4.0

Measurement Techniques for various pollutants

Sr. No.	Parameter	Technique	Technical Protocol	Minimum Reportable Value(µg/ m^3)
1.	Particulate Matter PM_{10}	Respirable Dust Sampler (Gravimetric Method)	IS-5182 (Part-23)	5
2.	Particulate Matter $PM_{2.5}$	Respirable Dust Sampler (Gravimetric Method)	USEPA-40 (Part-50)	5
3.	Sulphur Dioxide	Modified West and Gaeke	IS-5182 (Part – II)	4
4.	Oxide of Nitrogen	Jacob &Hochheiser Method	IS-5182 (Part – VI)	4
5.	Carbon Monoxide	NDIR Spectroscopy	IS-5182 (Part – X)	2
6.	Pb, As, Hg, Cr	Acid Digestion Method	EPA Method	0.1

1.6 Meteorology: Wind Pattern

The data of wind pattern collected during the study period (April-May-June-2022) indicates that the wind was blowing predominately from (NW and NNW) directions, during study period.

Wind Frequency Distribution Data

Sr. No.	Directions / Wind Classes (m/s)	0.5 - 2.1	2.1 - 3.6	3.6 - 5.7	5.7 - 8.8	8.8 - 11.1	>= 11.1	Total (%)
1	348.75 - 11.25	1.37363	3.38828	0.73260	0.00000	0.00000	0.00000	5.49451
2	11.25 - 33.75	1.55678	2.42674	0.09158	0.00000	0.00000	0.00000	4.07509
3	33.75 - 56.25	1.55678	1.51099	0.09158	0.00000	0.00000	0.00000	3.15934
4	56.25 - 78.75	1.32784	0.86996	0.04579	0.00000	0.00000	0.00000	2.24359
5	78.75 - 101.25	1.19048	0.54945	0.09158	0.00000	0.00000	0.00000	1.83150
6	101.25 - 123.75	0.86996	0.45788	0.04579	0.00000	0.00000	0.00000	1.37363
7	123.75 - 146.25	1.37363	0.77839	0.09158	0.09158	0.00000	0.00000	2.33516
8	146.25 - 168.75	3.47985	2.88462	0.91575	0.13736	0.00000	0.00000	7.41758
9	168.75 - 191.25	3.20513	3.47985	0.96154	0.45788	0.00000	0.00000	8.10440
10	191.25 - 213.75	2.60989	4.02930	0.41209	0.45788	0.00000	0.00000	7.50916
11	213.75 - 236.25	3.66300	1.55678	2.42674	0.54945	0.00000	0.00000	8.19597
12	236.25 - 258.75	1.96886	2.56410	1.51099	0.54945	0.00000	0.00000	6.59341
13	258.75 - 281.25	1.28205	2.01465	2.24359	0.91575	0.00000	0.00000	6.45604
14	281.25 - 303.75	1.51099	2.88462	2.28938	1.23626	0.00000	0.00000	7.92125
15	303.75 - 326.25	1.96886	3.98352	6.86813	1.32784	0.00000	0.00000	14.14840
16	326.25 - 348.75	1.78571	4.53297	4.16667	1.14469	0.00000	0.00000	11.63000
	Sub-Total	**30.72340**	**37.91210**	**22.98530**	**6.86813**	**0.00000**	**0.00000**	**98.48900**
	Calms							1.51099
	Missing/Incomplete							0.00000
	Total							100.00

Summary of Wind Pattern

Season	First Pre-Dominant Wind Direction	Second Pre-Dominant Wind Direction	Calm Condition	Average Wind Speed
April-May-June-2022	**NW (14.15%)**	**NNW (11.63%)**	**1.51 %**	**2.93 m/s**

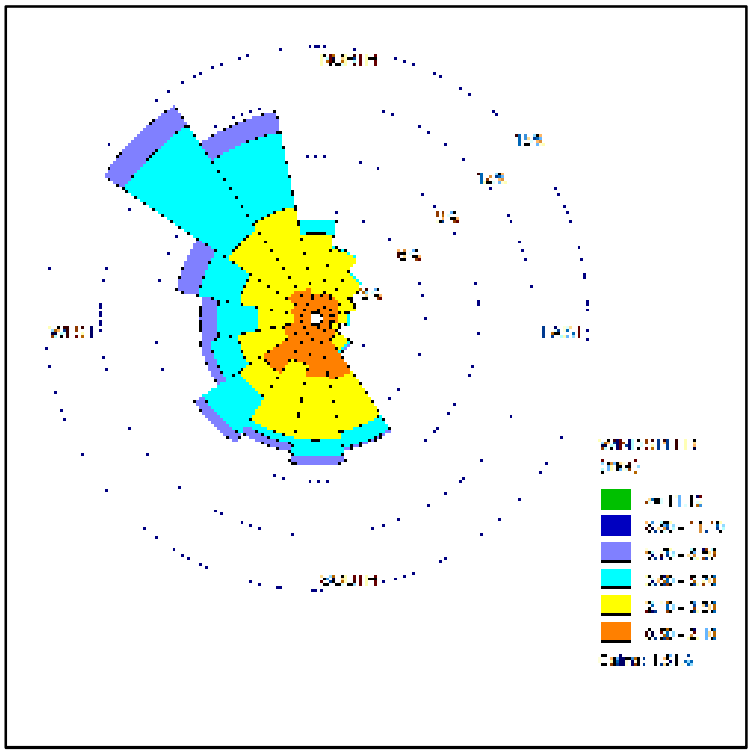


Figure.01: Wind Rose Diagram (April-May-June-2022)

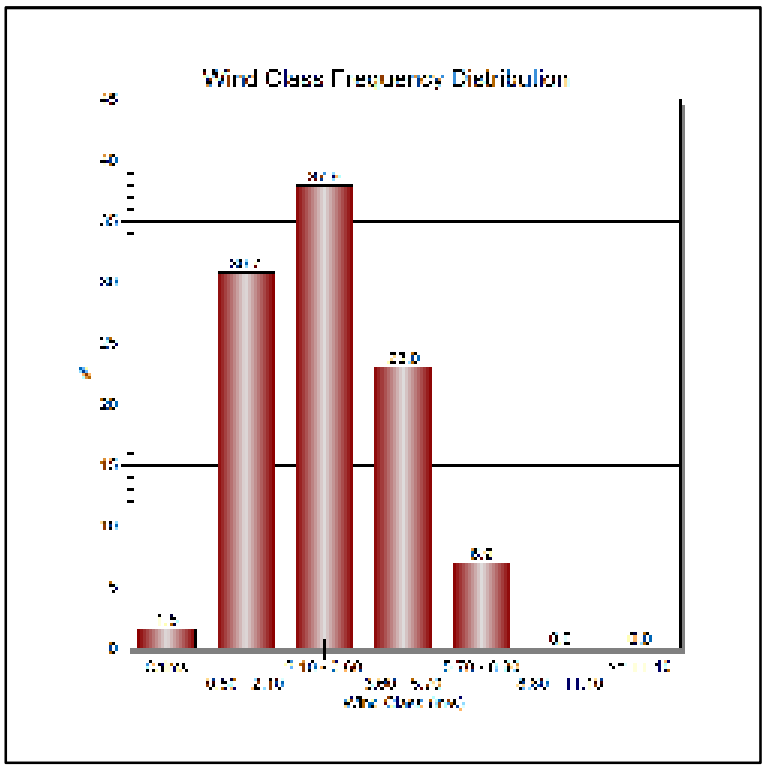


Figure.02: Wind Class Frequency Distribution (April-May-June-2022)

Table 6

Statistical Analysis

Location	Month & Year	PM-10 (µg /m^3)	PM-2.5 (µg/m^3)	SO_2 (µg /m^3)	NO_2 (µg /m^3)	CO (mg /m^3)	Pb (µg /m^3)	Hg (µg /m^3)	As (ng/m^3)	Cr (µg /m^3)
Core Zone										
Tatijharia Vllage/ Nr.Weigh Bridge	April-2022	59.7	21.3	10.3	17.6	0.206	0.015	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	May-2022	60.2	21.4	10.7	20.6	0.225	0.019	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	June-2022	51.7	18.5	7.3	16.3	0.208	0.013	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
Piprapat/ Nr. Mining Area	April-2022	55.9	19.3	8.8	17.8	0.169	0.018	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	May-2022	55.4	20.0	7.8	17.6	0.227	0.016	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	June-2022	50.1	17.5	8.6	17.1	0.214	0.017	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
Virhorepat	April-2022	61.0	22.1	10.0	18.3	0.212	0.016	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	May-2022	60.9	20.6	9.5	19.7	0.205	0.017	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	June-2022	54.5	19.0	9.7	18.6	0.191	0.015	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
Betpani	April-2022	60.0	21.1	10.9	19.0	0.214	0.017	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	May-2022	52.7	20.6	10.0	18.7	0.207	0.013	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	June-2022	51.0	17.6	8.7	17.4	0.179	0.014	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
CPCB Standards		**100 (24 hrs)**	**60 (24 hrs)**	**80 (24 hrs)**	**80 (24 hrs)**	**2 (8 hrs)**	**1.0 (24 hrs)**	**---**	**6.0 (annual)**	**---**
Minimum		**50.1**	**17.5**	**7.3**	**16.3**	**0.169**	**0.013**	**---**	**---**	**---**
Maximum		**61.0**	**22.1**	**10.9**	**20.6**	**0.227**	**0.019**	**---**	**---**	**---**
Average		**56.1**	**19.9**	**9.4**	**18.2**	**0.205**	**0.016**	**---**	**---**	**---**
98% le		**61.0**	**21.9**	**10.9**	**20.4**	**0.227**	**0.019**	**---**	**---**	**---**

NOTE: ● BDL- Below detection limit ● DL- Indicates detection limit of instrument/method and shall be considered as 'absent'.

- The Average Concentration of PM_{10} within the Core Zone of Tatijharia Lease is 56.1 µg/m^3.
- The Average Concentration of $PM_{2.5}$ within the Core Zone of Tatijharia Lease is 19.9 µg/m^3.
- The Average Concentration of SO_2 within the Core Zone of Tatijharia Lease is 9.4 µg/m^3.
- The Average Concentration of NO_2 within the Core Zone of Tatijharia Lease is 18.2 µg/m^3.
- The Average Concentration of CO within the Core Zone of Tatijharia Lease is 0.205 mg/m^3.
- The Average Concentration of Pb within the Core Zone of Tatijharia Lease is 0.016 µg/m^3.

Conclusion: -The Average Concentration within the Core Zone of Tatijharia Lease during this period (**April-May-June-2022**). It is within permissible limits as per CPCB Standards.

Location	Month & Year	PM-10 (µg /m^3)	PM-2.5 (µg/m^3)	SO_2 (µg /m^3)	NO_2 (µg /m^3)	CO (mg /m^3)	Pb (µg /m^3)	Hg (µg /m^3)	As (ng/m^3)	Cr (µg /m^3)
Buffer Zone										
KutkuVillage /Nr.V.T.Center	April-2022	60.9	20.4	9.0	18.7	0.272	BDL (DL-0.01)	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	May-2022	54.8	26.7	9.2	14.4	0.209	0.016	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	June-2022	49.1	16.4	6.8	16.1	0.161	BDL (DL-0.01)	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
Sairaidh Campus	April-2022	59.9	26.8	10.2	18.2	0.324	0.017	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	May-2022	63.1	25.0	10.2	20.6	0.231	0.017	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	June-2022	51.7	18.5	7.3	16.3	0.208	BDL (DL-0.01)	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
Rajendrapur/ Nr.Mining Area	April-2022	61.3	22.5	9.2	16.2	0.300	0.017	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	May-2022	53.1	23.1	8.6	15.1	0.249	0.017	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	June-2022	52.9	19.5	8.3	17.6	0.185	0.013	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
Dumerkholi/ Nr.Mining Area	April-2022	59.3	20.1	9.0	18.6	0.285	0.017	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	May-2022	62.1	25.2	9.1	14.5	0.255	0.017	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	June-2022	56.1	20.6	10.7	17.6	0.228	0.014	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
CPCB Standards		**100 (24 hrs)**	**60 (24 hrs)**	**80 (24 hrs)**	**80 (24 hrs)**	**2 (8 hrs)**	**1.0 (24 hrs)**	**---**	**6.0 (annual)**	**---**
Minimum		**49.1**	**16.4**	**6.8**	**14.4**	**0.161**	**---**	**---**	**---**	**---**
Maximum		**63.1**	**26.8**	**10.7**	**20.6**	**0.324**	**0.017**	**---**	**---**	**---**
Average		**57.0**	**22.1**	**9.0**	**17.0**	**0.242**	**0.016**	**---**	**---**	**---**
98% le		**62.9**	**26.8**	**10.6**	**20.2**	**0.319**	**0.017**	**---**	**---**	**---**

NOTE: ● BDL- Below detection limit ● DL- Indicates detection limit of instrument/method and shall be considered as 'absent'.

- The Average Concentration of PM_{10} within the Buffer Zone of Tatijharia Lease is 57.0 µg/m^3.
- The Average Concentration of $PM_{2.5}$ within the Buffer Zone of Tatijharia Lease is 22.1 µg/m^3.
- The Average Concentration of SO_2 within the Buffer Zone of Tatijharia Lease is 9.0 µg/m^3.
- The Average Concentration of NO_2 within the Buffer Zone of Tatijharia Lease is 17.0 µg/m^3.
- The Average Concentration of CO within the Buffer Zone of Tatijharia Lease is 0.242 mg/m^3
- The Average Concentration of Pb within the Buffer Zone of Tatijharia Lease is 0.016 µg/m^3.

Conclusion: -The Average Concentration within the Buffer Zone of Tatijharia Lease during this period (**April-May-June-2022**). It is within permissible limits as per CPCB Standards.

Month-wise Summary of Statistical Analysis

Tatijharia Lease (Core Zone):-

1.6 Ambient Air Quality:

Ambient air quality has been generated as per NAAQS 2009 for the month of April-May-June-2022. PM_{10}, $PM_{2.5}$, SO_2 , NO_2 & CO, The values obtained were then compared vis-a-vis the standards prescribed by CPCB for Industrial/ Rural / Residential uses.

1.6.1 Presentation of Results:

The summary of Ambient Air Quality monitoring results from April-2022 to June- 2022 are presented in detail in Table 4.0. 98th percentile, maximum and minimum values etc. have been computed from the collected raw data for all the AAQ monitoring station. The data has been compared with the standards prescribed by Central Pollution Control Board (CPCB)/NAAQS for residential and rural zone.

A. Particulate Matter-PM_{10}:

The minimum and maximum concentrations for Particulate Matter-PM_{10} were recorded as 50.1 µg/m^3 and 61.0 µg/m^3 at Piprapat/Nr. Mining area and Virhorepat respectively. The average concentration of PM_{10} was 56.1 µg/m^3.

B. Particulate Matter-$PM_{2.5}$:

The minimum and maximum concentrations for Particulate Matter-$PM_{2.5}$ were recorded as 17.5 µg/m^3 & 22.1 µg/m^3 at Piprapat/Nr. Mining area and Virhorepat respectively. The average concentration of $PM_{2.5}$ was 19.9 µg/m^3.

C. Sulphur Dioxide (SO_2):

The minimum and maximum for SO_2 concentrations were recorded as 7.3 µg/m^3 and 10.9 µg/m^3 respectively. The minimum concentration was recorded at Tatijharia Vllage/ Nr.Weigh Bridge and maximum concentration was also recorded at Betpani location. The average concentration of SO_2 was 9.4 µg/m^3.

D. Nitrogen Dioxide (NO_2):

The minimum and maximum for NO_2 concentrations were recorded as 16.3 µg/m^3 and 20.6 µg/m^3. The maximum and minimum concentration was recorded at Tatijharia Vllage/ Nr.Weigh Bridge. The average concentration of NO_2 was 18.2 µg/m^3.

E. Carbon Monoxide (CO):

The minimum and maximum for CO concentrations were recorded as 0.169 mg/m^3 and 0.227 mg/m^3. The maximum and minimum concentration was recorded at Piprapat/Nr. Mining area.. The average concentration of CO was 0..205 mg/m^3.

F. Lead (Pb):

Maximum Lead detected in PM_{10} samples was 0.019 µg/m^3 at Tatijharia Vllage/ Nr.Weigh Bridge. No lead could be detected in $PM_{2.5}$ samples at any of the Ambient Air samples at any of the locations.

G. Mercury(Hg):

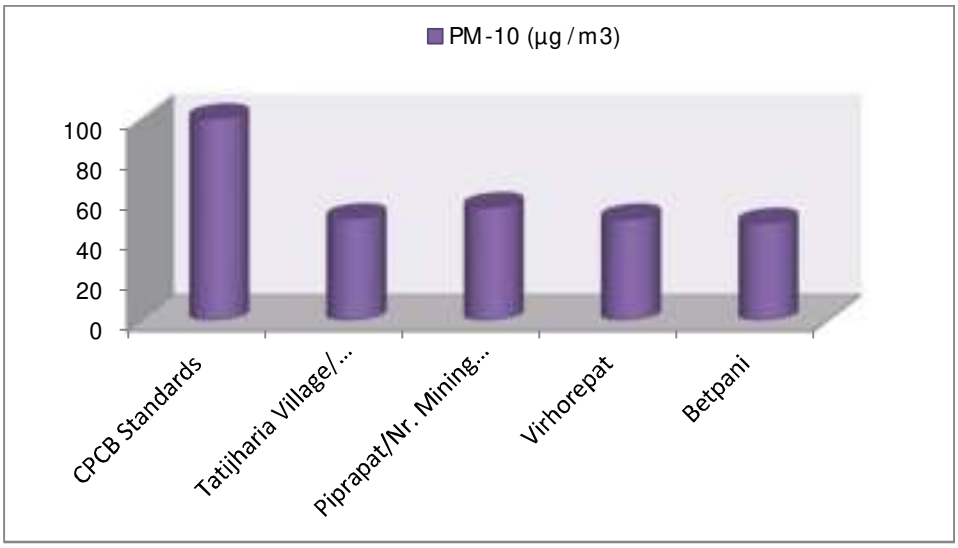
Mercury was not detected at any of the locations in PM_{10} samples as well as $PM_{2.5}$ Samples.

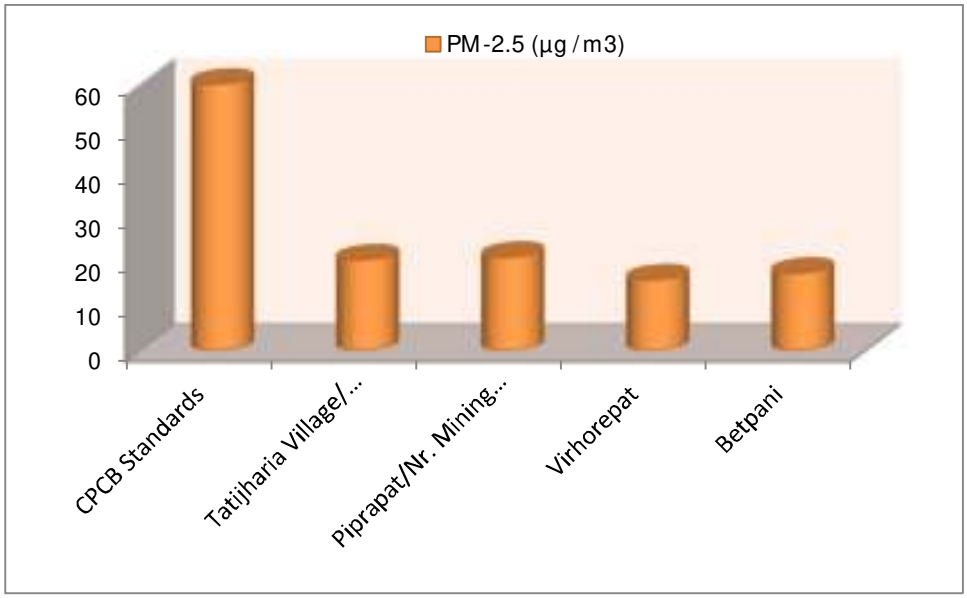
H. Arsenic (As):

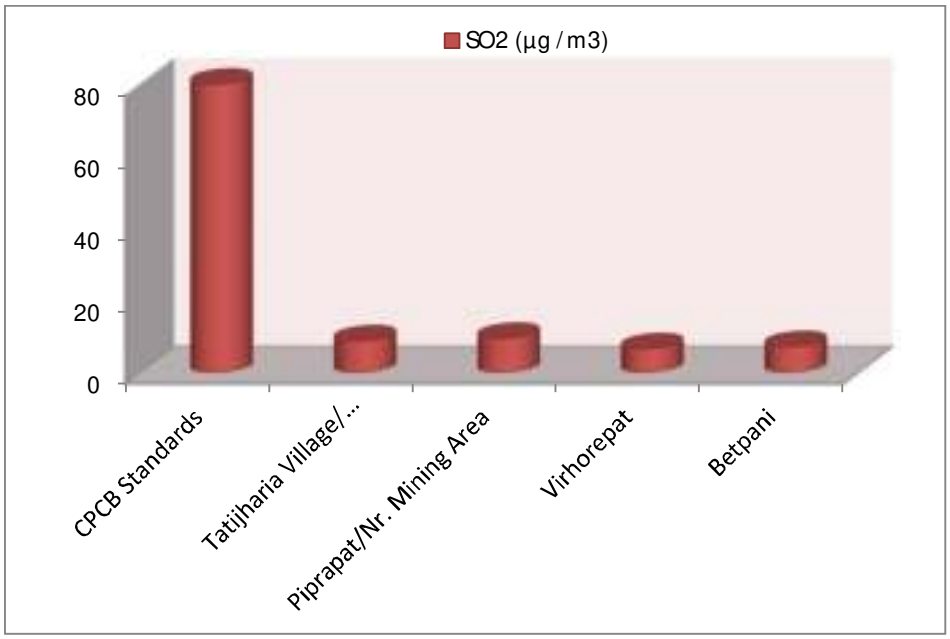
Arsenic was not detected at any of the locations in PM_{10} samples as well as $PM_{2.5}$ Samples.

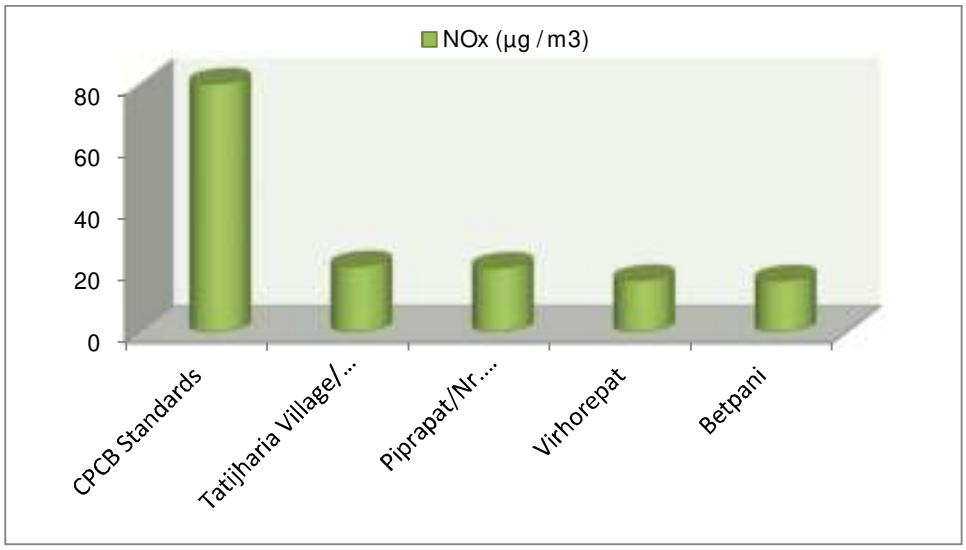
I. Chromium(Cr):

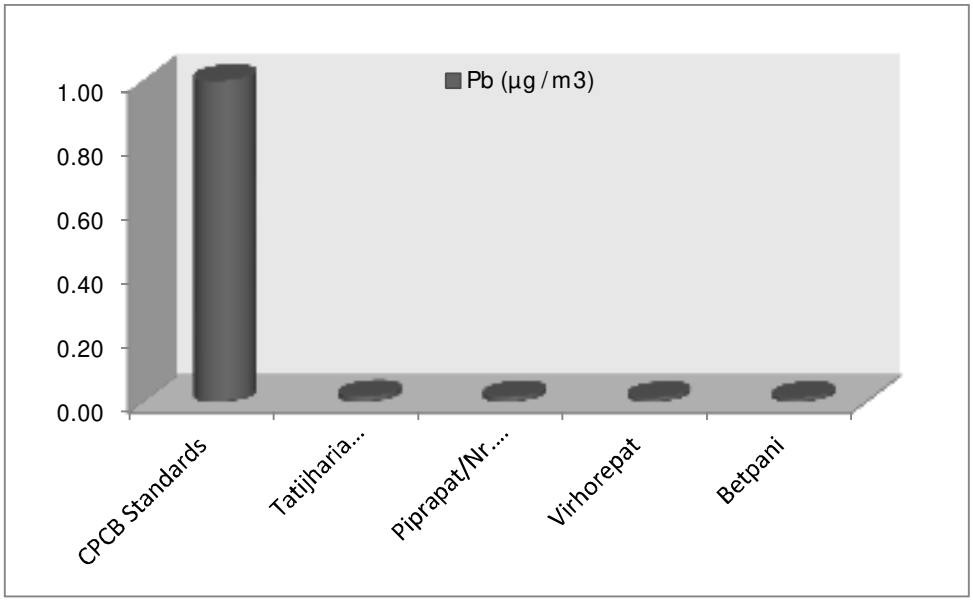
Chromium was not detected at any of the locations in PM_{10} samples as well as $PM_{2.5}$ Samples.

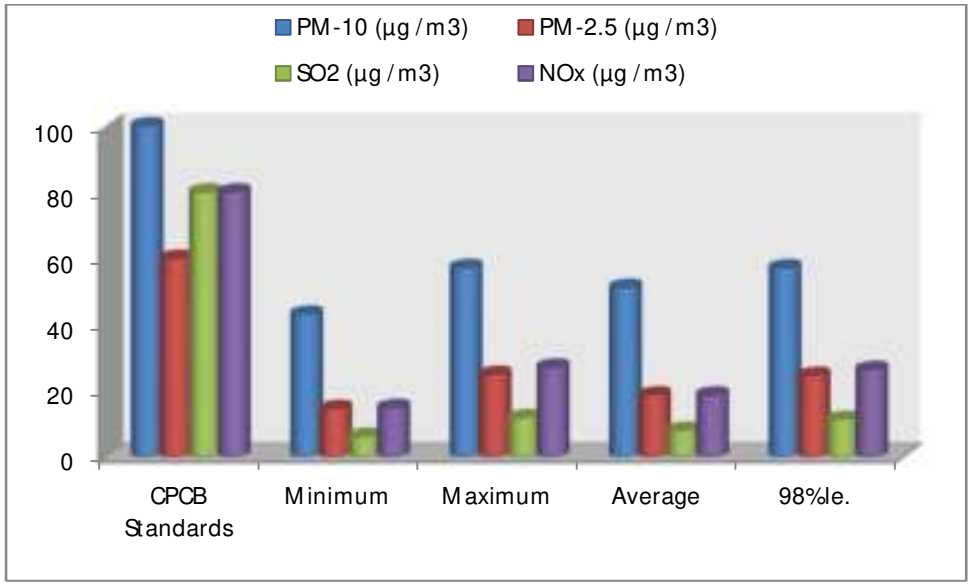

PM-10 (µg / m3)
100
80
60
40
20
0
CPCB Standards
Tatijharia Village/...
Piprapat/Nr. Mining...
Virhorepat
Betpani


PM-2.5 (µg / m3)
60
50
40
30
20
10
0
CPCB Standards
Tatijharia Village/...
Piprapat/Nr. Mining...
Virhorepat
Betpani


SO2 (µg / m3)
80
60
40
20
0
CPCB Standards
Tatijharia Village/...
Piprapat/Nr. Mining Area
Virhorepat
Betpani


NOx (µg / m3)
80
60
40
20
0
CPCB Standards
Tatijharia Village/...
Piprapat/Nr....
Virhorepat
Betpani


Pb (µg / m3)
1.00
0.80
0.60
0.40
0.20
0.00
CPCB Standards
Tatijharia...
Piprapat/Nr....
Virhorepat
Betpani


PM-10 (µg / m3)
PM-2.5 (µg / m3)
SO2 (µg / m3)
NOx (µg / m3)
100
80
60
40
20
0
CPCB Standards
Minimum
Maximum
Average
98%le.

Tatijharia Lease (Buffer Zone):-

1.7 Ambient Air Quality:

Ambient air quality has been generated as per NAAQS 2009 for the month of April-May-June-2022. PM_{10}, $PM_{2.5}$, SO_2, NO_2 and CO, the values obtained were then compared vis-a-vis the standards prescribed by CPCB for Industrial/ Rural / Residential uses.

1.7.1 Presentation of Results:

The summary of Ambient Air Quality monitoring results from April-2022 to June- 2022 are presented in detail in Table 4.0. 98th percentile, maximum and minimum values etc. have been computed from the collected raw data for all the AAQ monitoring station. The data has been compared with the standards prescribed by Central Pollution Control Board (CPCB)/NAAQS for residential and rural zone.

A. Particulate Matter-PM_{10}:

The minimum and maximum concentrations for Particulate Matter-PM_{10} were recorded as 49.1 µg/m^3 and 63.1 µg/m^3 at Kutku Village Location and Sairaidh Campus. The average concentration of PM_{10} was 57.0 µg/m^3.

B. Particulate Matter-$PM_{2.5}$:

The minimum and maximum both concentrations for Particulate Matter-$PM_{2.5}$ were recorded as 16.4 µg/m^3 & 26.8 µg/m^3 at Kutku Village and Sairaidh Campus location. The average concentration of $PM_{2.5}$ was 22.1 µg/m^3.

C. Sulphur Dioxide (SO_2):

The minimum and maximum for SO_2 concentrations were recorded as 6.8 µg/m^3 and 10.7 µg/m^3 respectively. The minimum and maximum concentration was recorded at Kutku Village and Dumerkholi/ Nr.Mining Area location. The average concentration of SO_2 was 9.0 µg/m^3.

D. Nitrogen Dioxide (NO_2):

The minimum and maximum for NO_2 concentrations were recorded as 14.4 µg/m^3 and 20.6 µg/m^3 at Kutku Village and Sairaidh Campus location respectively. The average concentration of NO_2 was 17.0 µg/m^3.

E. Carbon Monoxide (CO):

The minimum and maximum for CO concentrations were recorded as 0.161 mg/m^3 and 0.324 mg/m^3 at Kutku Village & Sairaidh Campus respectively. The average concentration of CO was 0.242 mg/m^3.

F. Lead (Pb):

Maximum Lead detected in PM_{10} samples was 0.017 µg/m^3 at Sairaidh Campus location No lead could be detected in $PM_{2.5}$ samples at any of the Ambient Air samples at any of the locations.

G. Mercury (Hg):

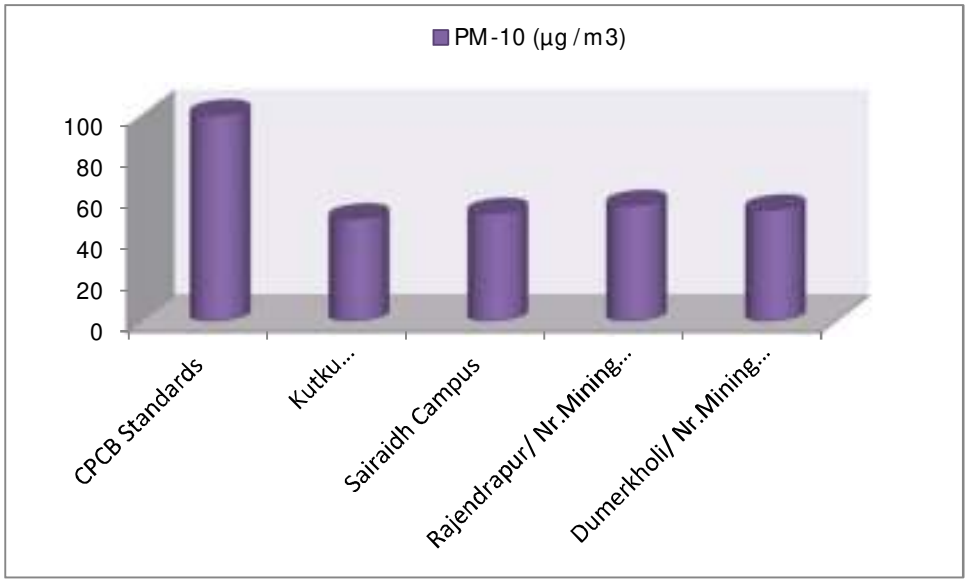
Mercury was not detected at any of the locations in PM_{10} samples as well as $PM_{2.5}$ Samples.

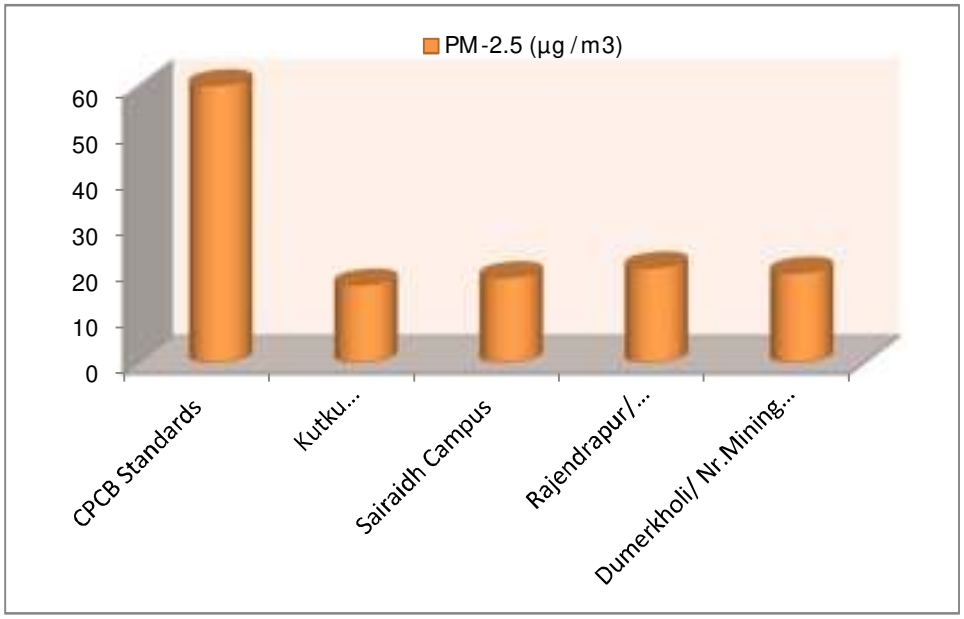
H. Arsenic (As):

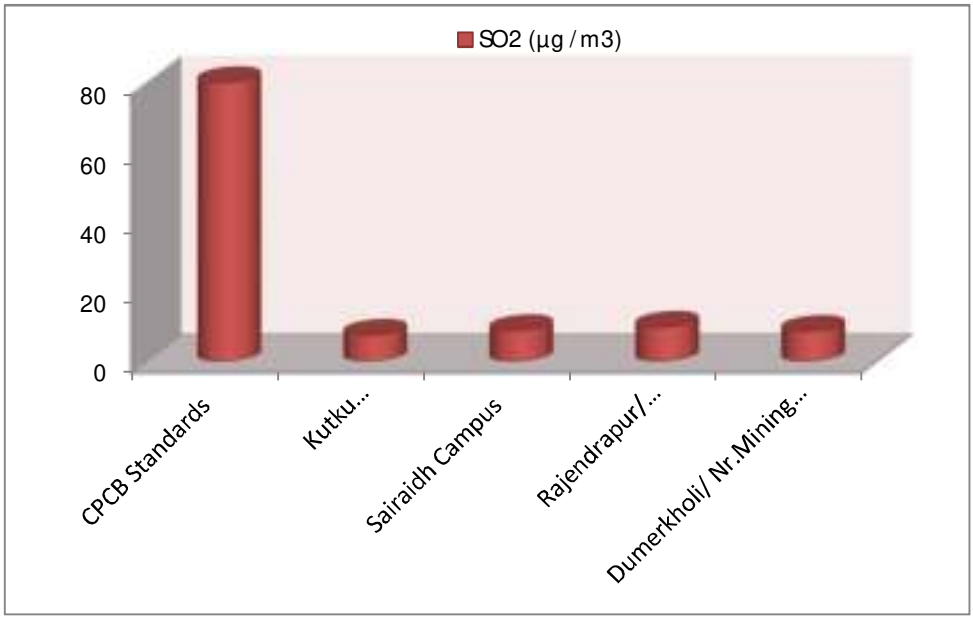
Arsenic was not detected at any of the locations in PM_{10} samples as well as $PM_{2.5}$ Samples.

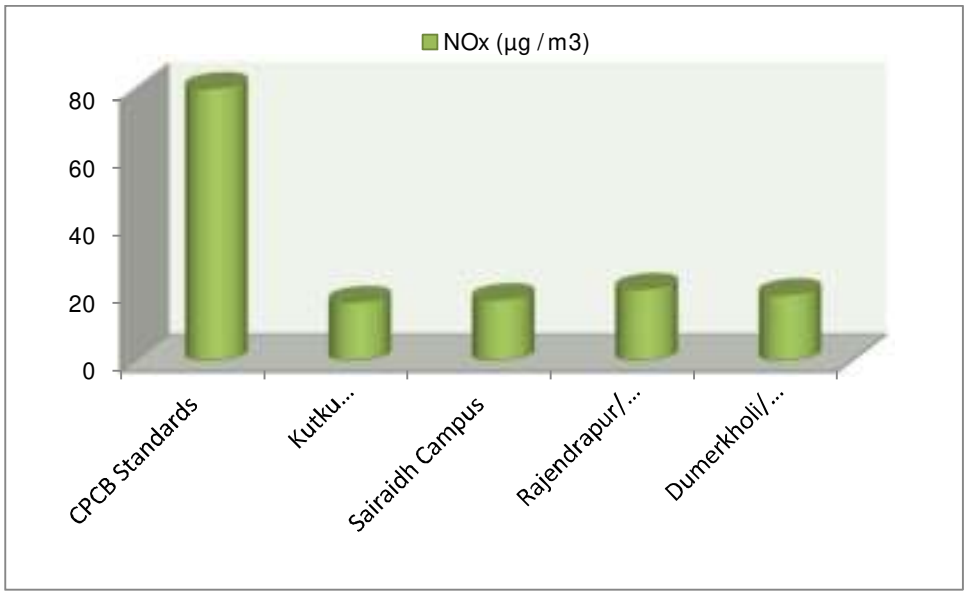
I. Chromium (Cr):

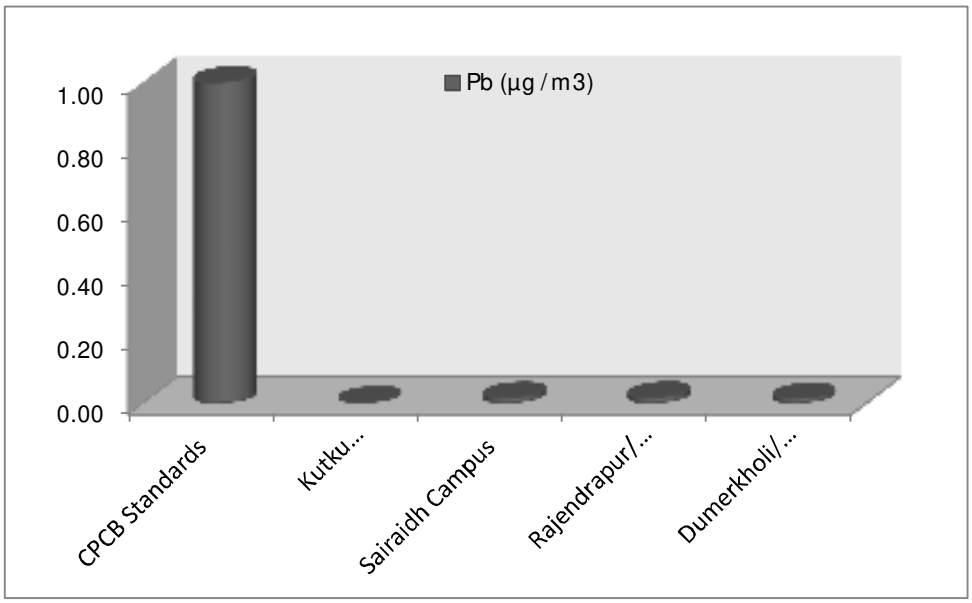
Chromium was not detected at any of the locations in PM_{10} samples as well as $PM_{2.5}$ Samples.

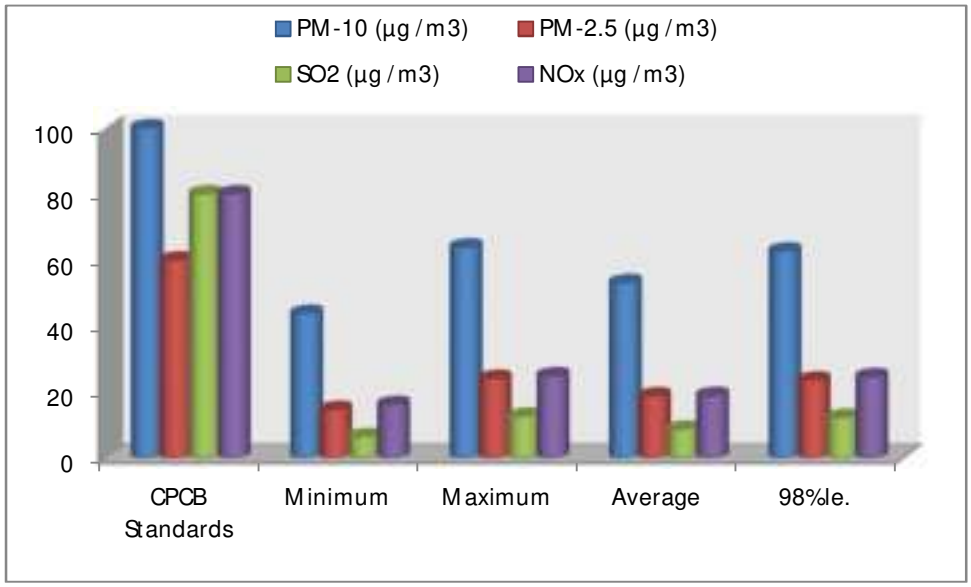

PM-10 (µg/m3)
100
80
60
40
20
0
CPCB Standards
Kutku...
Sairaidh Campus
Rajendrapur/ Nr.Mining...
Dumerkholi/ Nr.Mining...


PM-2.5 (µg/m3)
60
50
40
30
20
10
0
CPCB Standards
Kutku...
Sairaidh Campus
Rajendrapur/...
Dumerkholi/ Nr.Mining...


SO2 (µg/m3)
80
60
40
20
0
CPCB Standards
Kutku...
Sairaidh Campus
Rajendrapur/...
Dumerkholi/ Nr.Mining...


NOx (µg / m3)
80
60
40
20
0
CPCB Standards
Kutku...
Sairaidh Campus
Rajendrapur/...
Dumerkholi/...


Pb (µg / m3)
1.00
0.80
0.60
0.40
0.20
0.00
CPCB Standards
Kutku...
Sairaidh Campus
Rajendrapur/...
Dumerkholi/...


PM-10 (µg / m3)
PM-2.5 (µg / m3)
SO2 (µg / m3)
NOx (µg / m3)
100
80
60
40
20
0
CPCB Standards
Minimum
Maximum
Average
98%le.

1.8 Noise Environment

The Director General of Mines Safety in its circular No. DG (Tech)/18 of 1975, has prescribed the noise level in mining occupations (TLV) for workers, in an 8 hour shift period with unprotected ear as 90 dB(A) or less. There will be some noise sources in mines, which produce noise levels above 90 dB(A), however, the workers are not expected to be exposed continuously for 8 hours. In order to maintain this statutory requirement Noise monitoring has been carried out in and around the mining lease area.

Work zone noise level in the mining area shall increase due to blasting excavation and transportation. The impacts due to the mining activities on the noise levels shall be negligible if all the precautions for the elimination of the noise are taken. The mining activities will be undertaken during day time only. The daytime equivalent noise levels, when all the machineries are in operation, shall be minimized as the machineries have been provided with noise control equipment. Noise monitoring carried out on monthly basis at eight locations namely core and buffer zone.

Identification of sampling locations

Noise at different noise generating sources has been identified based on the activities in the village area and ambient noise due to traffic.

The noise monitoring has been conducted for determination of ambient noise levels in the mining area and villages. The noise levels at each location were recorded for 24 hours.

Method of Monitoring

Sound Pressure Level (SPL) measurements were monitored at eight locations. The readings were taken for every hour for 24 hours. The day noise levels have been monitored during 6 am to 10 pm and night levels during 10 pm to 6 am at eight locations within 10-km radius of the study area.

Noise level monitoring was carried out continuously for 24 hours with one hour interval starting at 06.00 hrs to 06.00 hrs next day.

Noise levels monitored during day and night at 8 locations are found to be below the stipulated standard of CPCB as for Industrial area as 75dB(A) and 70dB(A) for day and night respectively as given in **(Table7)**.

Instrument used for monitoring

Noise levels were measured using integrated sound level meter Model no. HTC- SL-1352. This instrument is capable of measuring the Sound Pressure Level (SPL), Leq.

Table 7

Noise Emission Monitoring Report

SR. NO.	LOCATION	Month	Noise-dB(A)	
			Day Time	Night Time
Core Zone				
1	Tatijharia Village/Nr.Weigh Bridge	April-2022	53.9	42.1
		May-2022	51.7	41.6
		June-2022	48.3	37.6
2	Piprapat/Nr. Mining Area	April-2022	61.7	56.3
		May-2022	64.1	56.2
		June-2022	56.1	43.2
Buffer Zone				
1	Samri-Gopatu/Near Weigh bridge	April-2022	61.7	56.2
		May-2022	64.9	56.2
		June-2022	57.2	48.1
2	Rajendrapur/Nr.Mining Area	April-2022	58.3	49.1
		May-2022	57.1	47.1
		June-2022	62.9	51.7
CPCB Standards				
Industrial Area			**75**	**70**
Residential area			**55**	**45**

Conclusion: -The Noise Monitoring Results at Tatijharia Lease during this period (**April-May-June-2022**), it is within permissible limits as per CPCB Standards.

Table 8

HEMM Spot Noise Level Monitoring

Unit: dB(A)

Sl. No.	Location	April-2022		May-2022		June-2022	
		Min.	Max.	Min.	Max.	Min.	Max.
1.	Piprapat/Nr.Mining Area	62.7	64.9	68.1	71.6	67.1	71.3
2.	Tatijharia Village/ Nr.Weigh Bridge	59.3	62.1	64.7	66.3	59.7	62.4

2.0 Water Quality

The existing status of water quality for ground water and surface water was assessed by collecting the water samples from underground wells from the piprapat/Nr.mining area.

The purpose of the study is to assess the water quality characteristics for critical parameters, evaluate the impacts on agricultural productivity, habitat conditions, recreational resources and aesthetics in the vicinity and identification of impact on water quality by this project and related activities.

The physico-chemical analysis of water samples collected during the study period is given in **(Table-10 and Fig.5)**. The overall water quality found to be below the stipulated standards of IS 10500-2012 for ground water & found to be fit for drinking purpose for tested parameters. Thus the impacts due to mining activities have been found to be insignificant.

The drinking water is supplied by the tankers from for-away sources. Hence, additional care now be taken to chlorinate the tankers before leaving the supply source.

Table-10 : Report on Chemical Examination of Ground Water (June - 2022)

Location Name	GW-1:- Piprapat/Near Mining Area
Sample Source	Borewell Water

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 3		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Biological Testing 1. Water**					
1	Total coliform	Per 100 ml	IS 15185 : 2016	Absent	Absent	Absent
2	*Escherichia coli*	Per 100 ml	IS 15185 : 2016	Absent	Absent	Absent
II	**Chemical Testing 1. Water**					
3	Alkalinity (as $CaCO_3$)	mg/l	IS 3025 (Part 23) : 1986	200	600	153.19
4	Ammonia (as N)	mg/l	IS 3025 (Part 34) : 1988	0.5	No relaxation	BDL (DL – 0.1)
5	Anionic surface active agents (as MBAS)	mg/l	IS 13428 : 2005 Annex K	0.2	1.0	BDL (DL – 0.01)
6	Colour	Hazen units	IS 3025 (Part 4) : 2021	5	15	1
7	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	No relaxation	BDL (DL – 0.005)
8	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :1988	250	1000	27.52
9	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	53.81
10	Chloramines (as Cl_2)	mg/l	IS 3025 (Part 26) : 2021	4.0	No relaxation	BDL (DL – 0.1)
11	Free residual chlorine	mg/l	IS 3025 (Part 26) : 2021	Min. 0.2	1	BDL (DL – 0.1)
12	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	0.21
13	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	14.32
14	Nitrate (as NO_3)	mg/l	APHA 23rd Edition	45	No relaxation	BDL (DL – 2)
15	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
16	pH	-	IS 3025 (Part 11) : 1983	6.5 to 8.5	No relaxation	6.93 at 25°C
17	Phenolic compounds (as C_6H_5OH)	mg/l	IS 3025 (Part 43) : 1992	0.001	0.002	BDL (DL – 0.001)
18	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24) : 1986	200	400	18.32
19	Sulphide (as H_2S)	mg/l	IS 3025 (Part 29) : 1986	0.05	No relaxation	BDL (DL – 0.03)
20	Taste	-	IS 3025 (Part 8) : 1984	Agreeable	Agreeable	Agreeable
21	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	481
22	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.6
23	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) : 2009	200	600	193.33
24	Mineral Oil	mg/l	ANtr/7.2/RES/06: 2018	0.5	No relaxation	BDL (DL – 0.001)
II	**Chemical Testing 2. Residues In Water**					
25	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 1988	0.01	No relaxation	BDL (DL - 0.01)
26	Aluminium (as Al)	mg/l	IS 3025 (Part 2) : 2019	0.03	0.2	BDL (DL - 0.01)
27	Barium (as Ba)	mg/l	IS 3025 (Part 2) : 2019	0.7	No relaxation	BDL (DL - 0.01)
28	Boron (as B)	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4	BDL (DL - 0.1)
29	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	BDL (DL - 0.03)
30	Cadmium (as Cd)	mg/l	IS 3025 (Part 2) : 2019	0.003	No relaxation	BDL (DL - 0.001)
31	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	No relaxation	0.17
32	Lead (as Pb)	mg/l	IS 3025 (Part 2) : 2019	0.01	No relaxation	BDL (DL - 0.001)
33	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	BDL (DL – 0.05)
34	Mercury (as Hg)	mg/l	IS 3025 (Part 48) : 1994	0.001	No relaxation	BDL (DL - 0.0005)
35	Molybdenum (as Mo)	mg/l	IS 3025 (Part 2) : 2019	0.07	No relaxation	BDL (DL - 0.01)
36	Nickel (as Ni)	mg/l	IS 3025 (Part 2) : 2019	0.02	No relaxation	BDL (DL - 0.01)
37	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2003	0.01	No relaxation	BDL (DL- 0.001)
38	Silver (as Ag)	mg/l	IS 13428 : 2005	0.1	No relaxation	BDL (DL - 0.001)
39	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	BDL (DL - 0.03)
40	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL (DL - 0.1)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 3		Test Results
				Acceptable Limit	Permissible Limit #	
II	**Chemical Testing** **2. Residues In Water**					
41	**Polychlorinated biphenyls**					
	2,2',5-trichlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,4,4'-trichlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,2',5,5'-tetrachlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,2',4,5,5'-pentachlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,2',3,4,4',5'-hexachlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,2',4,4',5,5'-hexachlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,2',3,4,4',5,5'-heptachlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
42	**Polynuclear aromatic hydrocarbons**					
	Naphthalene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Acenaphthylene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Acenaphthene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Fluorene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Anthracene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Phenanthrene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Fluoranthene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Pyrene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Benzo(a)anthracene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Chrysene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Benzo(a)pyrene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Benzo(b)fluoranthene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Benzo(k)fluoranthene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Indeno(123,cd)pyrene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Dibenzo(a,h)anthracene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Benzo(ghi)perylene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
43	**Trihalomethanes**					
i	Bromoform	mg/l	ANtr/7.2/RES/05: 2018	0.1	No relaxation	BDL (DL -0.05)
ii	Dibromochloromethane	mg/l		0.1	No relaxation	BDL (DL -0.05)
iii	Bromodichloromethane	mg/l		0.06	No relaxation	BDL (DL -0.05)
iv	Chloroform	mg/l		0.2	No relaxation	BDL (DL -0.05)
44	**Pesticide Residues Organochlorine**					
i	Alpha-HCH	µg/l	ANtr/7.2/RES/01: 2018	0.01	No relaxation	BDL (DL - 0.01)
ii	Beta HCH	µg/l	ANtr/7.2/RES/01: 2018	0.04	No relaxation	BDL (DL - 0.03)
iii	Gamma - HCH (Lindane)	µg/l	ANtr/7.2/RES/01: 2018	2	No relaxation	BDL (DL - 0.03)
iv	Delta- HCH	µg/l	ANtr/7.2/RES/01: 2018	0.04	No relaxation	BDL (DL - 0.03)
v	Alachlor	µg/l	ANtr/7.2/RES/01: 2018	20	No relaxation	BDL (DL - 0.03)
vi	Aldrin	µg/l	ANtr/7.2/RES/01: 2018	0.03	No relaxation	BDL (DL - 0.03)
vii	Dieldrin	µg/l	ANtr/7.2/RES/01: 2018	0.03	No relaxation	BDL (DL - 0.03)
viii	Butachlor	µg/l	ANtr/7.2/RES/01: 2018	125	No relaxation	BDL (DL - 0.03)
ix	p,p´-DDE	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
x	o,p´-DDE	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
xi	p,p´-DDD	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
xii	o,p´-DDD	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
xiii	o,p´- DDT	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
xiv	p,p´- DDT	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
xv	Endosulphan					
	Alpha-Endosulphan	µg/l	ANtr/7.2/RES/01: 2018	0. 4	No relaxation	BDL (DL - 0.03)
	Beta-Endosulphan					
	Endosulphan sulphate					

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 3		Test Result
				Acceptable Limit	Permissible Limit #	
44	**Pesticide Residues Organophosphorus**					
xvi	2,4-Dichlorophenoxyacetic acid	µg/l	ANtr/7.2/RES/02 : 2018	30	No relaxation	BDL (DL - 0.03)
xvii	Monocrotophos	µg/l	ANtr/7.2/RES/02 : 2018	1	No relaxation	BDL (DL - 0.03)
xviii	Atrazine	µg/l	ANtr/7.2/RES/02 : 2018	2	No relaxation	BDL (DL - 0.03)
xix	Parathion methyl	µg/l	ANtr/7.2/RES/02 : 2018	0.3	No relaxation	BDL (DL - 0.03)
xx	Paraoxon methyl	µg/l	ANtr/7.2/RES/02 : 2018	-	-	BDL (DL - 0.03)
xxi	Isoproturon	µg/l	ANtr/7.2/RES/02 : 2018	9	No relaxation	BDL (DL - 0.03)
xxii	Malathion	µg/l	ANtr/7.2/RES/02 : 2018	190	No relaxation	BDL (DL - 0.03)
xxiii	Malaoxon	µg/l	ANtr/7.2/RES/02 : 2018	-	-	BDL (DL - 0.03)
xxiv	Ethion	µg/l	ANtr/7.2/RES/02 : 2018	3	No relaxation	BDL (DL - 0.03)
xxv	Chlorpyrifos	µg/l	ANtr/7.2/RES/02 : 2018	30	No relaxation	BDL (DL - 0.03)
xxvi	Phorate	µg/l	ANtr/7.2/RES/02 : 2018	2	No relaxation	BDL (DL - 0.03)
	Phorate-sulfone					
	Phorate-sulfoxide					

NOTES: ● Please see watermark "Original Test Report" to confirm the authenticity of this report.● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● 'µg/l' is equivalent to 'ppb'. ● **BDL- Below detection limit.** ● **DL- DL Indicates detection limit of instrument /method and shall be considered as 'absent'.** ● Result for test no. 11 is not relevant. ● **ANqr RES-: Inhouse validated method.**

REMARKS: As requested by the client, sample was tested for above parameters only. **Sample complies with IS:10500:2012, for tests conducted, indicating that it is fit for drinking purpose with respect to tested parameters.**

-------End of Report-------

Location Name	GW-2:- BKB Camp
Sample Source	Borewell Water

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 3		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Biological Testing 1. Water**					
1	Total coliform	Per 100 ml	IS 15185 : 2016	Absent	Absent	Absent
2	*Escherichia coli*	Per 100 ml	IS 15185 : 2016	Absent	Absent	Absent
II	**Chemical Testing 1. Water**					
3	Alkalinity (as $CaCO_3$)	mg/l	IS 3025 (Part 23) : 1986	200	600	146.21
4	Ammonia (as N)	mg/l	IS 3025 (Part 34) : 1988	0.5	No relaxation	BDL (DL – 0.1)
5	Anionic surface active agents (as MBAS)	mg/l	IS 13428 : 2005 Annex K	0.2	1.0	BDL (DL – 0.01)
6	Colour	Hazen units	IS 3025 (Part 4) : 2021	5	15	1
7	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	No relaxation	BDL (DL – 0.005)
8	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :1988	250	1000	27.46
9	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	42.91
10	Chloramines (as Cl_2)	mg/l	IS 3025 (Part 26) : 2021	4.0	No relaxation	BDL (DL – 0.1)
11	Free residual chlorine	mg/l	IS 3025 (Part 26) : 2021	Min. 0.2	1	BDL (DL – 0.1)
12	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	0.27
13	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	11.58
14	Nitrate (as NO_3)	mg/l	APHA 23rd Edition	45	No relaxation	BDL (DL – 2)
15	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
16	pH	-	IS 3025 (Part 11) : 1983	6.5 to 8.5	No relaxation	7.14 at 25°C
17	Phenolic compounds (as C_6H_5OH)	mg/l	IS 3025 (Part 43) : 1992	0.001	0.002	BDL (DL – 0.001)
18	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24) : 1986	200	400	16.43
19	Sulphide (as H_2S)	mg/l	IS 3025 (Part 29) : 1986	0.05	No relaxation	BDL (DL – 0.03)
20	Taste	-	IS 3025 (Part 8) : 1984	Agreeable	Agreeable	Agreeable
21	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	462
22	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.4
23	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) : 2009	200	600	154.83
24	Mineral Oil	mg/l	ANtr/7.2/RES/06: 2018	0.5	No relaxation	BDL (DL – 0.001)
II	**Chemical Testing 2. Residues In Water**					
25	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 1988	0.01	No relaxation	BDL (DL - 0.01)
26	Aluminium (as Al)	mg/l	IS 3025 (Part 2) : 2019	0.03	0.2	BDL (DL - 0.01)
27	Barium (as Ba)	mg/l	IS 3025 (Part 2) : 2019	0.7	No relaxation	BDL (DL - 0.01)
28	Boron (as B)	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4	BDL (DL - 0.1)
29	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	BDL (DL - 0.03)
30	Cadmium (as Cd)	mg/l	IS 3025 (Part 2) : 2019	0.003	No relaxation	BDL (DL - 0.001)
31	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	No relaxation	0.26
32	Lead (as Pb)	mg/l	IS 3025 (Part 2) : 2019	0.01	No relaxation	BDL (DL - 0.001)
33	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	BDL (DL – 0.05)
34	Mercury (as Hg)	mg/l	IS 3025 (Part 48) : 1994	0.001	No relaxation	BDL (DL - 0.0005)
35	Molybdenum (as Mo)	mg/l	IS 3025 (Part 2) : 2019	0.07	No relaxation	BDL (DL - 0.01)
36	Nickel (as Ni)	mg/l	IS 3025 (Part 2) : 2019	0.02	No relaxation	BDL (DL - 0.01)
37	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2003	0.01	No relaxation	BDL (DL- 0.001)
38	Silver (as Ag)	mg/l	IS 13428 : 2005	0.1	No relaxation	BDL (DL - 0.001)
39	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	BDL (DL - 0.03)
40	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL (DL - 0.1)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 3		Test Results
				Acceptable Limit	Permissible Limit #	
II	**Chemical Testing** **2. Residues In Water**					
41	**Polychlorinated biphenyls**					
	2,2',5-trichlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,4,4'-trichlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,2',5,5'-tetrachlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,2',4,5,5'-pentachlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,2',3,4,4',5'-hexachlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,2',4,4',5,5'-hexachlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,2',3,4,4',5,5'-heptachlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
42	**Polynuclear aromatic hydrocarbons**					
	Naphthalene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Acenaphthylene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Acenaphthene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Fluorene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Anthracene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Phenanthrene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Fluoranthene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Pyrene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Benzo(a)anthracene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Chrysene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Benzo(a)pyrene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Benzo(b)fluoranthene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Benzo(k)fluoranthene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Indeno(123,cd)pyrene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Dibenzo(a,h)anthracene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Benzo(ghi)perylene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
43	**Trihalomethanes**					
i	Bromoform	mg/l	ANtr/7.2/RES/05: 2018	0.1	No relaxation	BDL (DL -0.05)
ii	Dibromochloromethane	mg/l		0.1	No relaxation	BDL (DL -0.05)
iii	Bromodichloromethane	mg/l		0.06	No relaxation	BDL (DL -0.05)
iv	Chloroform	mg/l		0.2	No relaxation	BDL (DL -0.05)
44	**Pesticide Residues Organochlorine**					
i	Alpha-HCH	µg/l	ANtr/7.2/RES/01: 2018	0.01	No relaxation	BDL (DL - 0.01)
ii	Beta HCH	µg/l	ANtr/7.2/RES/01: 2018	0.04	No relaxation	BDL (DL - 0.03)
iii	Gamma - HCH (Lindane)	µg/l	ANtr/7.2/RES/01: 2018	2	No relaxation	BDL (DL - 0.03)
iv	Delta- HCH	µg/l	ANtr/7.2/RES/01: 2018	0.04	No relaxation	BDL (DL - 0.03)
v	Alachlor	µg/l	ANtr/7.2/RES/01: 2018	20	No relaxation	BDL (DL - 0.03)
vi	Aldrin	µg/l	ANtr/7.2/RES/01: 2018	0.03	No relaxation	BDL (DL - 0.03)
vii	Dieldrin	µg/l	ANtr/7.2/RES/01: 2018	0.03	No relaxation	BDL (DL - 0.03)
viii	Butachlor	µg/l	ANtr/7.2/RES/01: 2018	125	No relaxation	BDL (DL - 0.03)
ix	p,p´-DDE	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
x	o,p´-DDE	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
xi	p,p´-DDD	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
xii	o,p´-DDD	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
xiii	o,p´- DDT	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
xiv	p,p´- DDT	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
xv	Endosulphan					
	Alpha-Endosulphan	µg/l	ANtr/7.2/RES/01: 2018	0. 4	No relaxation	BDL (DL - 0.03)
	Beta-Endosulphan					
	Endosulphan sulphate					

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 3		Test Result
				Acceptable Limit	Permissible Limit #	
44	**Pesticide Residues Organophosphorus**					
xvi	2,4-Dichlorophenoxyacetic acid	µg/l	ANtr/7.2/RES/02 : 2018	30	No relaxation	BDL (DL - 0.03)
xvii	Monocrotophos	µg/l	ANtr/7.2/RES/02 : 2018	1	No relaxation	BDL (DL - 0.03)
xviii	Atrazine	µg/l	ANtr/7.2/RES/02 : 2018	2	No relaxation	BDL (DL - 0.03)
xix	Parathion methyl	µg/l	ANtr/7.2/RES/02 : 2018	0.3	No relaxation	BDL (DL - 0.03)
xx	Paraoxon methyl	µg/l	ANtr/7.2/RES/02 : 2018	-	-	BDL (DL - 0.03)
xxi	Isoproturon	µg/l	ANtr/7.2/RES/02 : 2018	9	No relaxation	BDL (DL - 0.03)
xxii	Malathion	µg/l	ANtr/7.2/RES/02 : 2018	190	No relaxation	BDL (DL - 0.03)
xxiii	Malaoxon	µg/l	ANtr/7.2/RES/02 : 2018	-	-	BDL (DL - 0.03)
xxiv	Ethion	µg/l	ANtr/7.2/RES/02 : 2018	3	No relaxation	BDL (DL - 0.03)
xxv	Chlorpyrifos	µg/l	ANtr/7.2/RES/02 : 2018	30	No relaxation	BDL (DL - 0.03)
xxvi	Phorate	µg/l	ANtr/7.2/RES/02 : 2018	2	No relaxation	BDL (DL - 0.03)
	Phorate-sulfone					
	Phorate-sulfoxide					

NOTES: ● Please see watermark "Original Test Report" to confirm the authenticity of this report.● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● 'µg/l' is equivalent to 'ppb'. ● **BDL- Below detection limit. ● DL- DL Indicates detection limit of instrument /method and shall be considered as 'absent'.** ● Result for test no. 11 is not relevant. ● **ANqr RES-: Inhouse validated method.**

REMARKS: As requested by the client, sample was tested for above parameters only. **Sample complies with IS:10500:2012, for tests conducted, indicating that it is fit for drinking purpose with respect to tested parameters.**

-------End of Report-------

Table 11 Report on Chemical Examination of Soil (June-2022)

S1) Soil:-

Location:- S1 – Tatijharia

S.N.	Test Parameter	Measurement Unit	Test Method	Test Resulta
1	Infiltration rate	mm/hr	Lab/SOP	21.43
2	Bulk density	g/cm^3	Lab/SOP	1.662
3	Water holding capacity	%	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	29.66
4	Particle size distribution			
	Sand	%	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India	21.49
	Silt	%	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India	50.39
	Clay	%	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India	28.12
5	Texture	-	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India	Silt Loam
6	pH (1:2.5 Aq. Extract) at 25^{0}C	-	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	7.08 at 25^{0}C
7	Electrical Conductivity (1:2.5 Aq. Extract)	µs/cm	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	39.6
8	Water soluble Calcium (as Ca)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	389
9	Water soluble Magnesium (as Mg)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	143
10	Water soluble Sodium (as Na)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	32.7
11	Water soluble Potassium (as K)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	239
12	Water soluble Chloride (as Cl)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	1396
13	Water soluble Sulphate (as SO_4)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	23.4
14	Exchangeable Sodium (as Na)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	32.7
15	Exchangeable Potassium (as K)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	239
16	Exchangeable Calcium (as Ca)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	389
17	Exchangeable Magnesium (as Mg)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	143
18	Sodium adsorption ratio	-	By Calculation	2.00
19	Total Organic matter	%	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	0.24
20	Total Organic Carbon	%	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	0.14
21	Available Nitrogen (as N)	Kg/hec	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	2.74
22	Available Phosphorous (as P)	Kg/hec	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	40.20
23	Available Potassium (as K)	Kg/hec	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	535.4
24	CEC	meq/100g	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	5.14

S.N.	Test Parameter	Measurement Unit	Test Method	Test Result
25	Arsenic (As)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	Absent
26	Boron (B)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	0.24
27	Cadmium (Cd)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	Absent
28	Chromium (Cr)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	Absent
29	Copper (Cu)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	1.52
30	Lead (Pb)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	Absent
31	Nickel (Ni)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	Absent
32	Cobalt (Co)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	0.26
33	Iron (Fe)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	6.94
34	Manganese (Mn)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	13.46
35	Zinc (Zn)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	1.31
36	Selenium (Se)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	Absent

NOTES:●Please see watermark "Original Test Report" to confirm the authenticity of this report. ● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise ● **'**g/100 g' is equivalent to '%w/w'.● 'mg/kg' is equivalent to 'ppm'

Remarks: As requested by the client, sample was tested for above paraeters only**.**

----------END OF REPORT----------

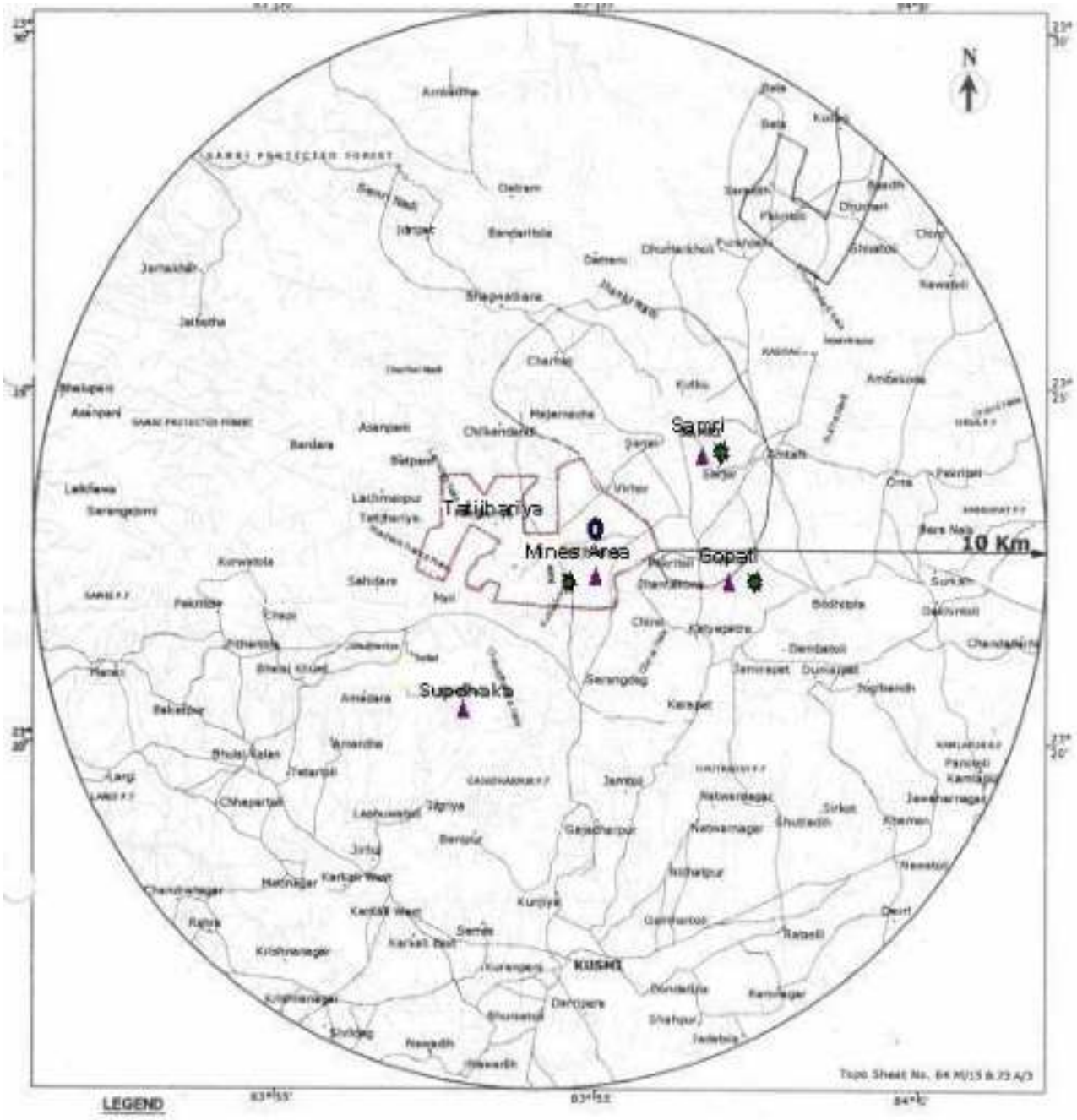


FIG 4 : SAMPLING LOCATIONS FOR WATER

Agent of Mines
Sapni Mines Division
Hindalco Industries Ltd

Environmental Status Report
For
Tatijharia Bauxite Mine
at
Post & Teh.: Samri,(Kusmi)
Dist: Balrampur–Ramanujganj(C.G.)

Duration: July-August-September-2022

Name of Industry:-

M/s. Hindalco Industries Limited.,

Name of Laboratory:-

QCI-NABET, MoEF & CC (GOI)
ISO 9001:2015, ISO 14001:2015, ISO 45001:2018
60, Bajiprabhu Nagar, Nagpur - 440 033, MS
Lab. & Consultancy: FP-34, 35, Food Park,
MIDC, Butibori, Nagpur – 441122
Ph.: (0712) 2242077, 9373287475
Email: *info@anacon.in*, *ngp@anacon.in*
website: *www.anaconlaboratories.com*

1.1 Introduction

Hindalco Industries Limited (Hindalco) is one among the flag ship companies of the Aditya Birla Group of Industries and is one of the largest corporate groups in India. This group is a leading manufacturer of Aluminum in India, having integrated facilities encompassing bauxite, mining, refining and smelting to achieve Aluminum.

Various processing units of Hindalco are strategically located in different parts of the nation to achieve optimum benefits. Over the past few decades the group has grown multifold in its production capacities, product mix and diversification in mining. The Chhattisgarh Environment Conservation Board (CECB) granted permission for establishing the Bauxite mine to Hindalco at block Tatijharia, Kudag and Samri mines in Balrampur District of Chhattisgarh State.

HINDALCO INDUSTRIES LTD. awarded the work to M/s ANACON LABORATORIES PVT. LTD. NAGPUR (ALPL) for carrying out monitoring of parameters for assessing pollution levels and preparation of monthly report (July-August-September-2022) as per the requirement of Chhattisgarh Environment Conservation Board (CECB) and Ministry of Environment Forest and climate change (MoEF & CC) for Tatijharia mining lease in Balrampur District, Chhattisgarh State.

1.2 Background Information of Tatijharia Mine

Hindalco was granted Tatijharia Bauxite mining lease over an area of 1218.762hec.inTatijharia, Post Jamira, Tehsil Samri of Balrampur district, Chhattisgarh on 25/06/1998 for a period of 20 years. As per the Mines and Mineral (Development and Regulation) Amendment Act, 2015, Tatijharia lease has been extended up to 30 years i.e 24/06/2048. The mining operations were started on 01/04/2004. The production capacity of Tatijharia bauxite mine is 4.0 Lakh Tone/Year.

1.3 Salient Features of Tatijharia Bauxite Mine

The deposits occur in Tatijharia block, Post Jamira Tehsil Samri of Balrampur district. This deposit has been identified as one of the resources to cater the raw material requirements of the Hindalco Alumina refinery at Renukoot, Uttar Pradesh. The salient features of the project are presented below :(**Table-1**)

Table-1

Salient Features of Tatijharia Bauxite Mines

S.No.	Particulars	Details
1.	Survey of India Toposheet No.	64 M /15
2.	Latitude	23^0 21' 02"N to 23^0 24' 15"N
3.	Longitude	83^0 54' 50"E to 83^0 56' 30"E
4.	Elevation	1282-m above Mean Sea Level
5.	Climatic Conditions (as per IMD, Ambikapur)	Annual maximum temperature : 30.3^{0}C Annual minimum temperature : 17.7^{0}C Average annual rainfall : 1401.1 mm
6.	Mining lease area	1218.762hec.
7.	Method of mining	Open cast (Semi-Mechanized)
8.	Mode of transportation	Trucks
9.	Land use	Agricultural and Barren land
10.	Nearest Road	Samri to Kusmi (17 km)
11.	Nearest Airport	Ranchi (143.56 km, E)
12.	Nearest Town	Ambikapur (127 km, SW)

1.4 Environmental Monitoring

Regular monitoring of environmental parameters is of immense importance to assess the status of environment during mining operation. With the knowledge of baseline conditions, the monitoring program will serve as an indicator for any deterioration in environment conditions due to mining operation of the project. Suitable mitigation steps will be taken in time to safeguard the environment, based on monitoring reports. Monitoring is important in the control of pollution since the efficiency of control measures can only be determined by monitoring.

In order to find out impact of mining activity on sensitive receptors, it is necessary to monitor Environmental Quality to know ground level l concentrations of pollutants within and around the mining lease area, accordingly Hindalco Industries through ALPL has been monitoring at the following locations air, water and Noise quality on monthly basis during these months **(Table 2)**.

1.5 Air Environment

1.5.1 'Ambient Air Quality Monitoring

Ambient Air Quality monitored at 8 locations in the core zone and buffer zone with reference to Tatijharia mine lease area shown in **(Fig. 1)**.

Table 2

Locations of Ambient Air Quality Monitoring (AAQM)

(1218.762 hec.)

Sl. No.	(Core Zone)	Sl. No.	Buffer Zone
1	Piprapat/Nr.Mining Area	5	Kutku Village/Nr.V.T.Center
2	Betpani	6	Sairaidh Campus
3	Virhorepat	7	Rajendrapur/Nr.Mining Area
4	Tatijharia Village/Nr.Weigh Bridge	8	Dumerkholi/Nr.Mining Area

The sampling stations are selected at the above mentioned locations, in downwind and upwind directions of the mining site in the core zone and buffer zone. ALPL is carrying out regular monitoring for PM_{10}, $PM_{2.5}$, SO_2, NO_2, CO and, Pb, Hg, As and Cr above Ambient Air Quality Monitoring (AAQM) locations. The AAQM sampling sites are selected considering seasonal variation in wind speed and wind direction.

1.5.2 Sampling Duration and Frequency

Ambient air quality monitoring was carried out for the parameters PM_{10}, $PM_{2.5}$, SO_2, NO_2, CO and Pb, Hg, As and Cr from July-2022 to September-2022 as per CPCB norms.

Data is compared with the present revised standards mentioned in the latest Gazette Notification of the Central Pollution Control Board (CPCB) (November-18, 2009), and as per consent conditions mentioned in consent letter.

1.5.3 MONITORED PARAMETERS AND FREQUENCY Of SAMPLING

Methods and Instruments used for Sampling

The air samples were analyzed as per methods specified by Central Pollution Control Board (CPCB).

The levels of Particulate Matter (PM_{10}), Sulphur Dioxide ($SO_{2,}$), Oxides of Nitrogen (NO_2), CO, Pb, Hg, As and Cr were monitored for establishing the baseline status. PM_{10} was collected with the help of Respirable particulate sampler operating 24 hours by drawing air which passes through the cyclone at the rate of 1.0 -1.3 m^3/min which collects the particles less than 10 µm diameter over glass fiber filter paper. **(Table3)**.

Table 3

MONITORED PARAMETERS AND FREQUENCY OF SAMPLING

Parameters	Sampling frequency
Particulate Matter (PM_{10})	24 hourly sample twice a week for Three months
Particulate Matter ($PM_{2.5}$)	24 hourly sample twice a week for Three months
Particulate Matter 2.5	24 hourly sample twice a week for Three months
Sulphur dioxide (SO_2)	24 hourly sample twice a week for Three months
Oxides of Nitrogen (NO_2)	24 hourly sample twice a week for Three months
CO, Pb, Hg, As, Cr	8 hourly samples for 24 hour twice a week for three months

Table 4.0

Measurement Techniques for various pollutants

Sr. No.	Parameter	Technique	Technical Protocol	Minimum Reportable Value($\mu g/m^3$)
1.	Particulate Matter PM_{10}	Respirable Dust Sampler (Gravimetric Method)	IS-5182 (Part-23)	5
2.	Particulate Matter $PM_{2.5}$	Respirable Dust Sampler (Gravimetric Method)	USEPA-40 (Part-50)	5
3.	Sulphur Dioxide	Modified West and Gaeke	IS-5182 (Part – II)	4
4.	Oxide of Nitrogen	Jacob &Hochheiser Method	IS-5182 (Part – VI)	4
5.	Carbon Monoxide	NDIR Spectroscopy	IS-5182 (Part – X)	2
6.	Pb, As, Hg, Cr	Acid Digestion Method	EPA Method	0.1

1.6 Meteorology: Wind Pattern

The data of wind pattern collected during the study period (July-Aug-Sept – 2022) indicates that the wind was blowing predominately from (E and S) directions, during study period.

Wind Frequency Distribution Data

Sr. No.	Directions / Wind Classes (m/s)	0.5 - 2.1	2.1 - 3.6	3.6 - 5.7	5.7 - 8.8	8.8 - 11.1	>= 11.1	Total (%)
1	348.75 - 11.25	0.028080	0.011775	0.002717	0.002264	0.000000	0.000000	0.044837
2	11.25 - 33.75	0.029438	0.009511	0.001812	0.006341	0.000000	0.000000	0.047101
3	33.75 - 56.25	0.020380	0.010417	0.005435	0.004529	0.000000	0.000000	0.040761
4	56.25 - 78.75	0.018116	0.012681	0.020380	0.011322	0.000000	0.000000	0.062500
5	78.75 - 101.25	0.018116	0.016757	0.028986	0.027174	0.006793	0.000000	0.097826
6	101.25 - 123.75	0.020380	0.021286	0.020380	0.016304	0.000906	0.000000	0.079257
7	123.75 - 146.25	0.032156	0.029438	0.018116	0.008605	0.000906	0.000000	0.089221
8	146.25 - 168.75	0.027627	0.043478	0.008152	0.004529	0.000906	0.000000	0.084692
9	168.75 - 191.25	0.029438	0.034420	0.016304	0.007699	0.001359	0.000000	0.089221
10	191.25 - 213.75	0.036685	0.027174	0.022192	0.002717	0.000000	0.000000	0.088768
11	213.75 - 236.25	0.032156	0.015399	0.019475	0.000906	0.000000	0.000000	0.067935
12	236.25 - 258.75	0.028986	0.018116	0.002717	0.000906	0.000000	0.000000	0.050725
13	258.75 - 281.25	0.019022	0.013587	0.000906	0.000000	0.000000	0.004529	0.038043
14	281.25 - 303.75	0.014946	0.021286	0.000000	0.000000	0.000000	0.000000	0.036232
15	303.75 - 326.25	0.013587	0.013134	0.005435	0.000000	0.000000	0.000000	0.032156
16	326.25 - 348.75	0.014493	0.003170	0.004529	0.002264	0.000000	0.000000	0.024457
	Sub-Total	0.383605	0.301630	0.177536	0.095562	0.010870	0.004529	0.973732
	Calms							**0.026268**
	Missing/Incomplete							**0.000000**
	Total							**1.000000**

Summary of Wind Pattern

Season	First Pre-Dominant Wind Direction	Second Pre-Dominant Wind Direction	Calm Condition	Average Wind Speed
July-Aug-Sept-2022	**E (9.78%)**	**S (8.92%)**	**2.63**	**3.70 m/s**

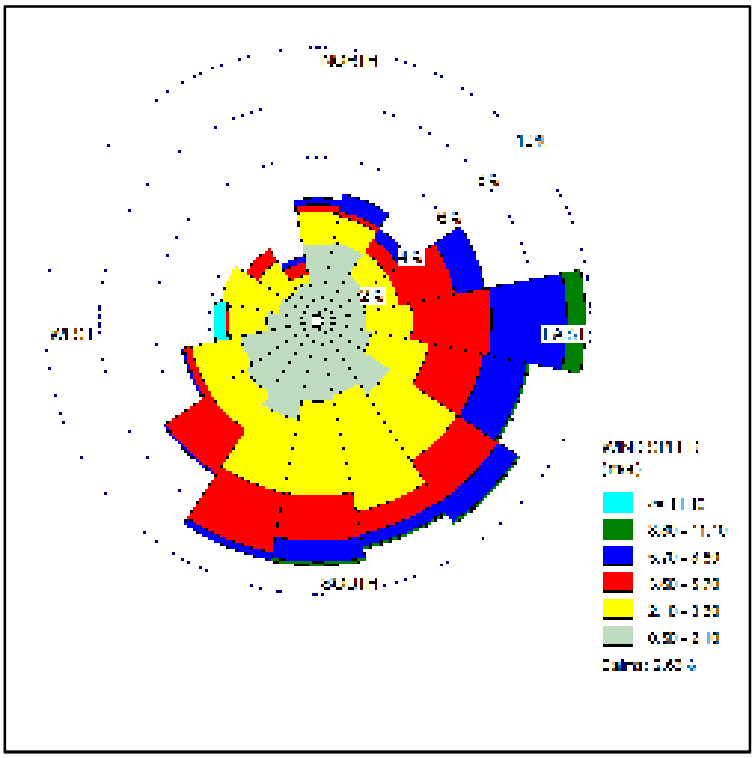


Figure.01: Wind Rose Diagram (July-August-September-2022)

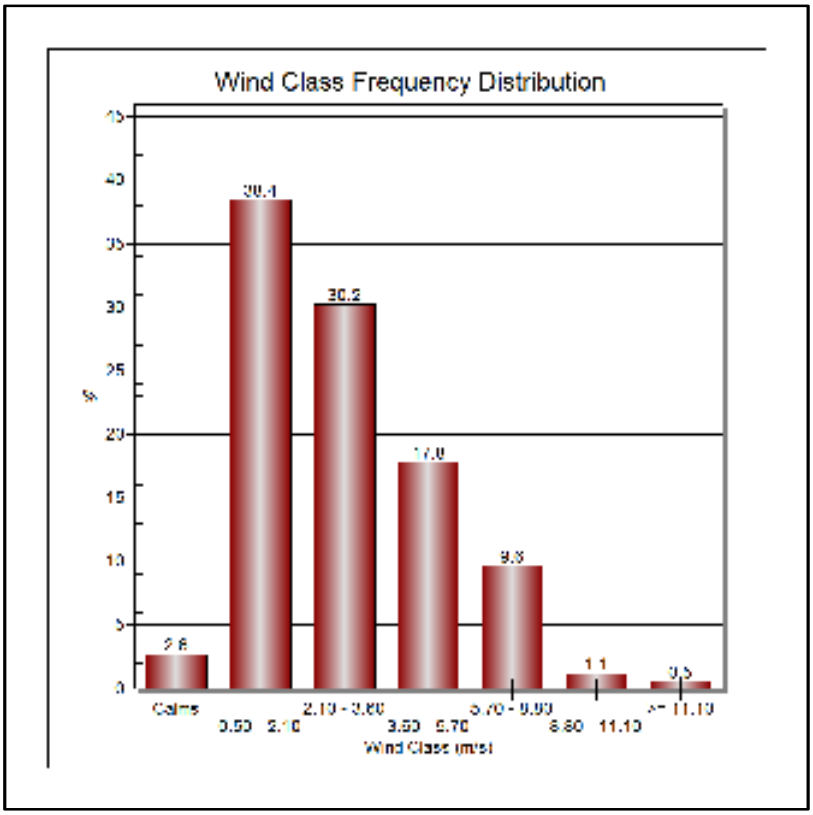


Figure.02: Wind Class Frequency Distribution (July-August-September-2022)

Table 6

Statistical Analysis

Location	Month & Year	PM-10 (µg /m^3)	PM-2.5 (µg/m^3)	SO_2 (µg /m^3)	NO_2 (µg /m^3)	CO (mg /m^3)	Pb (µg /m^3)	Hg (µg /m^3)	As (ng/m^3)	Cr (µg /m^3)
Core Zone										
Tatijharia Vllage/ Nr.Weigh Bridge	July-2022	50.5	16.9	7.1	16.5	0.173	0.014	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	Aug-2022	56.1	20.7	10.0	18.3	0.211	0.016	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	Sept-2022	60.3	24.4	9.3	20.5	0.227	0.017	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
Piprapat/ Nr. Mining Area	July-2022	57.8	20.9	9.8	19.0	0.209	0.017	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	Aug-2022	50.9	17.4	7.2	17.4	0.177	0.014	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	Sept-2022	62.2	24.5	13.0	19.7	0.237	0.020	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
Virhorepat	July-2022	56.1	20.6	10.7	17.6	0.228	0.016	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	Aug-2022	52.6	19.1	9.1	18.9	0.191	0.019	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	Sept-2022	61.1	20.0	9.9	17.1	0.192	0.016	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
Betpani	July-2022	52.5	18.5	7.7	17.4	0.181	0.015	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	Aug-2022	54.4	18.7	10.7	16.7	0.210	0.015	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	Sept-2022	62.1	19.4	11.1	20.8	0.219	0.018	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
CPCB Standards		**100 (24 hrs)**	**60 (24 hrs)**	**80 (24 hrs)**	**80 (24 hrs)**	**2 (8 hrs)**	**1.0 (24 hrs)**	**---**	**6.0 (annual)**	**---**
Minimum		**50.5**	**16.9**	**7.1**	**16.5**	**0.173**	**0.014**	**---**	**---**	**---**
Maximum		**62.2**	**24.5**	**13**	**20.8**	**0.237**	**0.020**	**---**	**---**	**---**
Average		**56.4**	**20.1**	**9.6**	**18.3**	**0.205**	**0.016**	**---**	**---**	**---**
98% le		**62.2**	**24.5**	**12.6**	**20.7**	**0.235**	**0.020**	**---**	**---**	**---**

NOTE: ● BDL- Below detection limit ● DL- Indicates detection limit of instrument/method and shall be considered as 'absent'.

- The Average Concentration of PM_{10} within the Core Zone of Tatijharia Lease is 56.4 µg/m^3.
- The Average Concentration of $PM_{2.5}$ within the Core Zone of Tatijharia Lease is 20.1 µg/m^3.
- The Average Concentration of SO_2 within the Core Zone of Tatijharia Lease is 9.6 µg/m^3.
- The Average Concentration of NO_2 within the Core Zone of Tatijharia Lease is 18.3 µg/m^3.
- The Average Concentration of CO within the Core Zone of Tatijharia Lease is 0.205 mg/m^3.
- The Average Concentration of Pb within the Core Zone of Tatijharia Lease is 0.016 µg/m^3.

Conclusion: -The Average Concentration within the Core Zone of Tatijharia Lease during this period (**July-Augusut-September-2022**). It is within permissible limits as per CPCB Standards.

Location	Month & Year	PM-10 (µg /m^3)	PM-2.5 (µg/m^3)	SO_2 (µg /m^3)	NO_2 (µg /m^3)	CO (mg /m^3)	Pb (µg /m^3)	Hg (µg /m^3)	As (ng/m^3)	Cr (µg /m^3)
Buffer Zone										
KutkuVillage /Nr.V.T.Center	July-2022	51.1	17.4	7.4	16.5	0.154	BDL (DL-0.01)	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	Aug-2022	57.4	18.8	7.7	16.7	0.198	BDL (DL-0.01)	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	Sept-2022	53.2	20.5	8.8	17.8	0.185	0.014	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
Sairaidh Campus	July-2022	54.7	19.7	9.5	21.9	0.197	BDL (DL-0.01)	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	Aug-2022	57.7	23.3	9.1	24.3	0.198	0.019	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	Sept-2022	59.8	19.1	10.8	19.0	0.207	0.017	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
Rajendrapur/ Nr.Mining Area	July-2022	55.9	21.9	9.4	18.4	0.202	0.015	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	Aug-2022	59.0	21.7	8.7	17.2	0.192	0.017	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	Sept-2022	58.4	19.3	8.6	18.0	0.196	0.014	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
Dumerkholi/ Nr.Mining Area	July-2022	52.5	18.6	11.3	17.0	0.207	0.015	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	Aug-2022	52.1	17.0	6.8	15.8	0.199	0.016	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
	Sept-2022	57.4	20.5	9.3	18.1	0.203	0.015	BDL (DL-0.0005)	BDL (DL-0.1)	BDL (DL-0.03)
CPCB Standards		**100 (24 hrs)**	**60 (24 hrs)**	**80 (24 hrs)**	**80 (24 hrs)**	**2 (8 hrs)**	**1.0 (24 hrs)**	**---**	**6.0 (annual)**	**---**
Minimum		**51.1**	**17.0**	**6.8**	**15.8**	**0.154**	**---**	**---**	**---**	**---**
Maximum		**59.8**	**23.3**	**11.3**	**24.3**	**0.207**	**0.019**	**---**	**---**	**---**
Average		**55.8**	**19.8**	**9.0**	**18.4**	**0.195**	**0.016**	**---**	**---**	**---**
98% le		**59.6**	**23.0**	**11.2**	**23.8**	**0.207**	**0.019**	**---**	**---**	**---**

NOTE: ● BDL- Below detection limit ● DL- Indicates detection limit of instrument/method and shall be considered as 'absent'.

- The Average Concentration of PM_{10} within the Buffer Zone of Tatijharia Lease is 55.8 µg/m^3.
- The Average Concentration of $PM_{2.5}$ within the Buffer Zone of Tatijharia Lease is 19.8 µg/m^3.
- The Average Concentration of SO_2 within the Buffer Zone of Tatijharia Lease is 9.0 µg/m^3.
- The Average Concentration of NO_2 within the Buffer Zone of Tatijharia Lease is 18.4 µg/m^3.
- The Average Concentration of CO within the Buffer Zone of Tatijharia Lease is 0.195 mg/m^3
- The Average Concentration of Pb within the Buffer Zone of Tatijharia Lease is 0.016 µg/m^3.

Conclusion: -The Average Concentration within the Buffer Zone of Tatijharia Lease during this period (**July-August-September-2022**). It is within permissible limits as per CPCB Standards.

Month-wise Summary of Statistical Analysis

Tatijharia Lease (Core Zone):-

1.6 Ambient Air Quality:

Ambient air quality has been generated as per NAAQS 2009 for the month of July-August-September-2022. PM_{10}, $PM_{2.5}$, SO_2 , NO_2 & CO, The values obtained were then compared vis-a-vis the standards prescribed by CPCB for Industrial/ Rural / Residential uses.

1.6.1 Presentation of Results:

The summary of Ambient Air Quality monitoring results from July-2022 to September-2022 are presented in detail in Table 4.0. 98th percentile, maximum and minimum values etc. have been computed from the collected raw data for all the AAQ monitoring station. The data has been compared with the standards prescribed by Central Pollution Control Board (CPCB)/NAAQS for residential and rural zone.

A. Particulate Matter-PM_{10}:

The minimum and maximum concentrations for Particulate Matter-PM_{10} were recorded as 50.5 µg/m^3 and 62.2 µg/m^3 at Tatijharia Vllage/ Nr.Weigh Bridge and Piprapat/Nr. Mining area respectively. The average concentration of PM_{10} was 56.4 µg/m^3.

B. Particulate Matter-$PM_{2.5}$:

The minimum and maximum concentrations for Particulate Matter-$PM_{2.5}$ were recorded as 16.9 µg/m^3 & 24.5 µg/m^3 at Tatijharia Vllage/ Nr.Weigh Bridge and Piprapat/Nr. Mining area respectively. The average concentration of $PM_{2.5}$ was 20.1 µg/m^3.

C. Sulphur Dioxide (SO_2):

The minimum and maximum for SO_2 concentrations were recorded as 7.1 µg/m^3 and 13.0 µg/m^3 respectively. The minimum concentration was recorded at Tatijharia Vllage/ Nr.Weigh Bridge and maximum concentration was also recorded at Piprapat/Nr. Mining area respectively. The average concentration of SO_2 was 9.6 µg/m^3.

D. Nitrogen Dioxide (NO_2):

The minimum and maximum for NO_2 concentrations were recorded as 16.5 µg/m^3 and 20.8 µg/m^3. The minimum concentration was recorded at Tatijharia Vllage/ Nr.Weigh Bridge and maximum concentration was also recorded at Betpani respectively. The average concentration of NO_2 was 18.3µg/m^3.

E. Carbon Monoxide (CO):

The minimum and maximum for CO concentrations were recorded as 0.173 mg/m^3 and 0.237 mg/m^3. The minimum concentration was recorded at Tatijharia Vllage/ Nr.Weigh Bridge and maximum concentration was also recorded at Piprapat/Nr. Mining area respectively. The average concentration of CO was 0..205 mg/m^3.

F. Lead (Pb):

Maximum Lead detected in PM_{10} samples was 0.020 µg/m^3 at Piprapat/Nr. Mining area respectively. No lead could be detected in $PM_{2.5}$ samples at any of the Ambient Air samples at any of the locations.

G. Mercury(Hg):

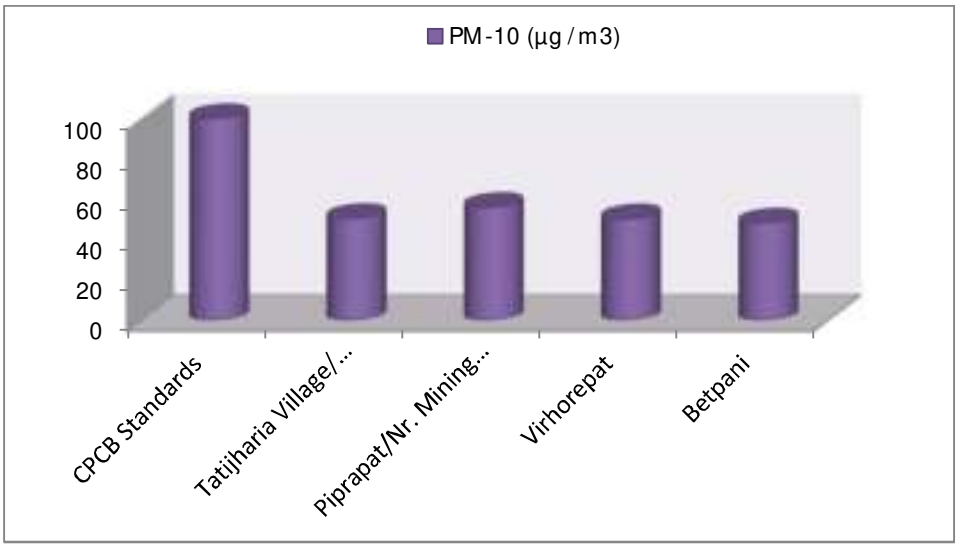
Mercury was not detected at any of the locations in PM_{10} samples as well as $PM_{2.5}$ Samples.

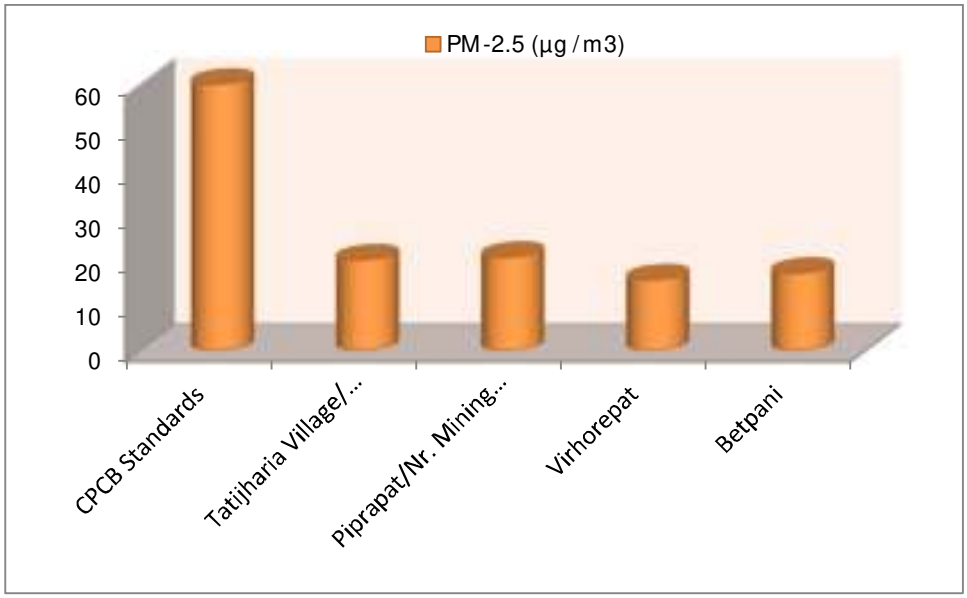
H. Arsenic (As):

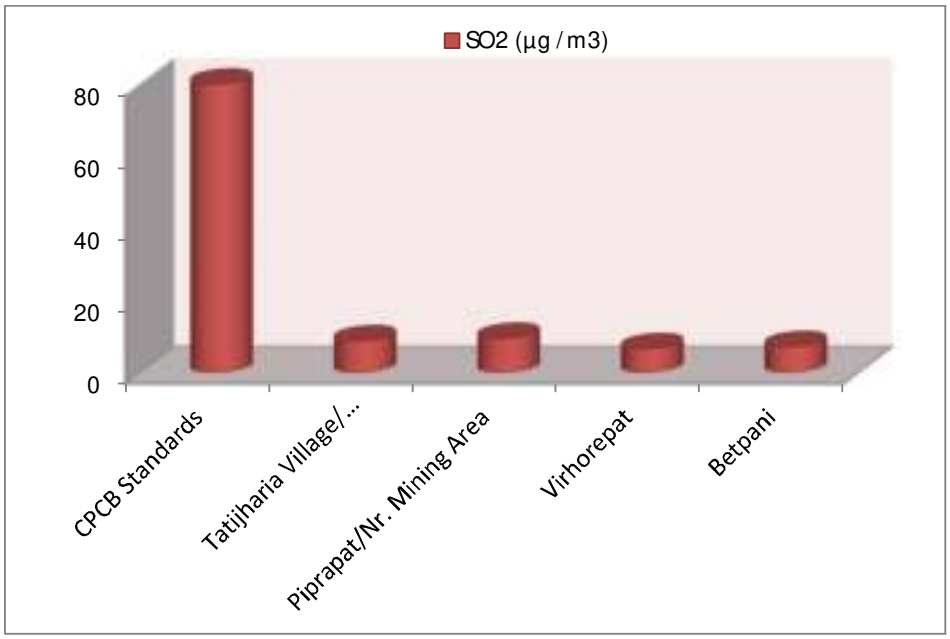
Arsenic was not detected at any of the locations in PM_{10} samples as well as $PM_{2.5}$ Samples.

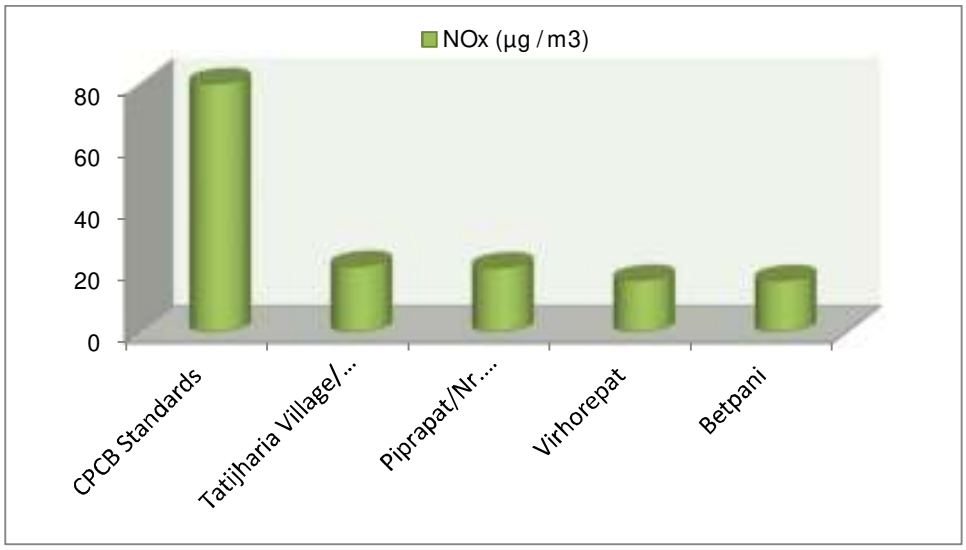
I. Chromium(Cr):

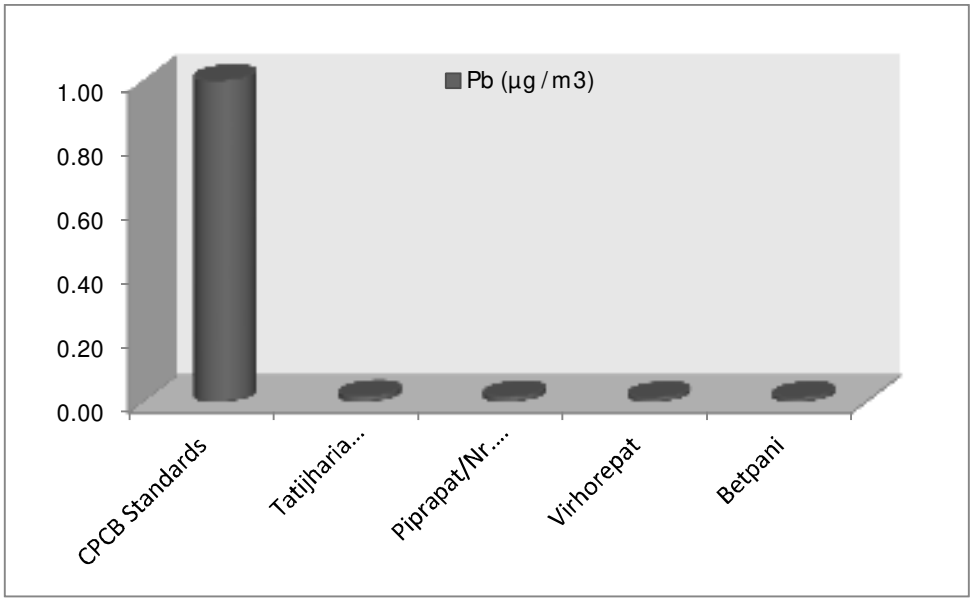
Chromium was not detected at any of the locations in PM_{10} samples as well as $PM_{2.5}$ Samples.

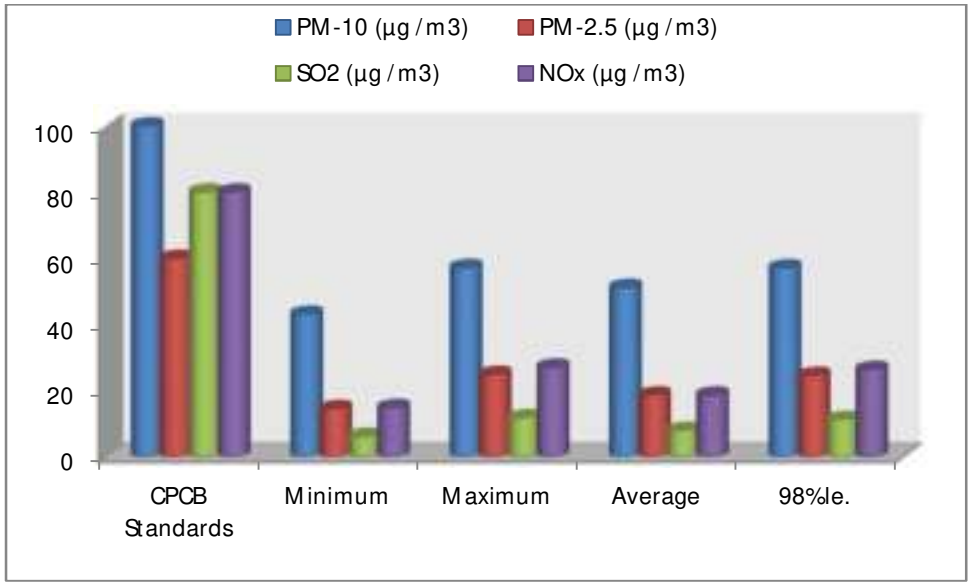

PM-10 (µg / m3)
100
80
60
40
20
0
CPCB Standards
Tatijharia Village/...
Piprapat/Nr. Mining...
Virhorepat
Betpani


PM-2.5 (µg / m3)
60
50
40
30
20
10
0
CPCB Standards
Tatijharia Village/...
Piprapat/Nr. Mining...
Virhorepat
Betpani


SO2 (µg / m3)
80
60
40
20
0
CPCB Standards
Tatijharia Village/...
Piprapat/Nr. Mining Area
Virhorepat
Betpani


NOx (µg / m3)
80
60
40
20
0
CPCB Standards
Tatijharia Village/...
Piprapat/Nr....
Virhorepat
Betpani


Pb (µg / m3)
1.00
0.80
0.60
0.40
0.20
0.00
CPCB Standards
Tatijharia...
Piprapat/Nr....
Virhorepat
Betpani


PM-10 (µg / m3)
PM-2.5 (µg / m3)
SO2 (µg / m3)
NOx (µg / m3)
100
80
60
40
20
0
CPCB Standards
Minimum
Maximum
Average
98%le.

Tatijharia Lease (Buffer Zone):-

1.7 Ambient Air Quality:

Ambient air quality has been generated as per NAAQS 2009 for the month of July-August-September-2022. PM_{10}, $PM_{2.5}$, SO_2, NO_2 and CO, the values obtained were then compared vis-a-vis the standards prescribed by CPCB for Industrial/ Rural / Residential uses.

1.7.1 Presentation of Results:

The summary of Ambient Air Quality monitoring results from July-2022 to Sept- 2022 are presented in detail in Table 4.0. 98th percentile, maximum and minimum values etc. have been computed from the collected raw data for all the AAQ monitoring station. The data has been compared with the standards prescribed by Central Pollution Control Board (CPCB)/NAAQS for residential and rural zone.

A. Particulate Matter-PM_{10}:

The minimum and maximum concentrations for Particulate Matter-PM_{10} were recorded as 51.1 µg/m^3 and 59.8 µg/m^3 at Kutku Village Location and Sairaidh Campus. The average concentration of PM_{10} was 55.8 µg/m^3.

B. Particulate Matter-$PM_{2.5}$:

The minimum and maximum both concentrations for Particulate Matter-$PM_{2.5}$ were recorded as 17.0 µg/m^3 & 23.3 µg/m^3 at Dumerkholi/ Nr.Mining Area and Sairaidh Campus location. The average concentration of $PM_{2.5}$ was 19.8 µg/m^3.

C. Sulphur Dioxide (SO_2):

The minimum and maximum for SO_2 concentrations were recorded as 6.8 µg/m^3 and 11.3 µg/m^3 respectively. The minimum and maximum concentration was recorded at Dumerkholi/ Nr.Mining Area location. The average concentration of SO_2 was 9.0 µg/m^3.

D. Nitrogen Dioxide (NO_2):

The minimum and maximum for NO_2 concentrations were recorded as 15.8 µg/m^3 and 24.3 µg/m^3 at Dumerkholi/ Nr.Mining Area and Sairaidh Campus location respectively. The average concentration of NO_2 was 18.4 µg/m^3.

E. Carbon Monoxide (CO):

The minimum and maximum for CO concentrations were recorded as 0.154 mg/m^3 and 0.207 mg/m^3 at Kutku Village & Sairaidh Campus respectively. The average concentration of CO was 0.195 mg/m^3.

F. Lead (Pb):

Maximum Lead detected in PM_{10} samples was 0.019 µg/m^3 at Sairaidh Campus location No lead could be detected in $PM_{2.5}$ samples at any of the Ambient Air samples at any of the locations.

G. Mercury (Hg):

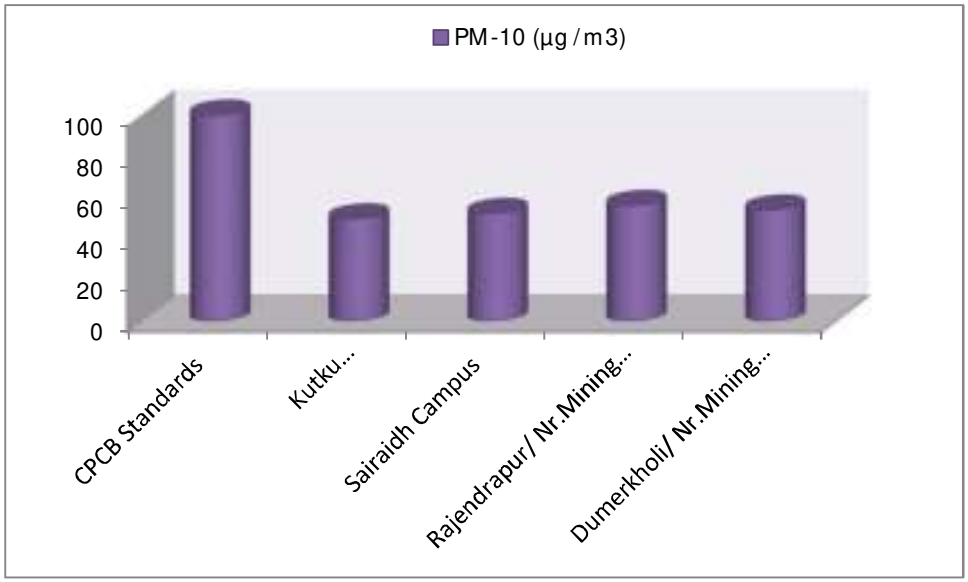
Mercury was not detected at any of the locations in PM_{10} samples as well as $PM_{2.5}$ Samples.

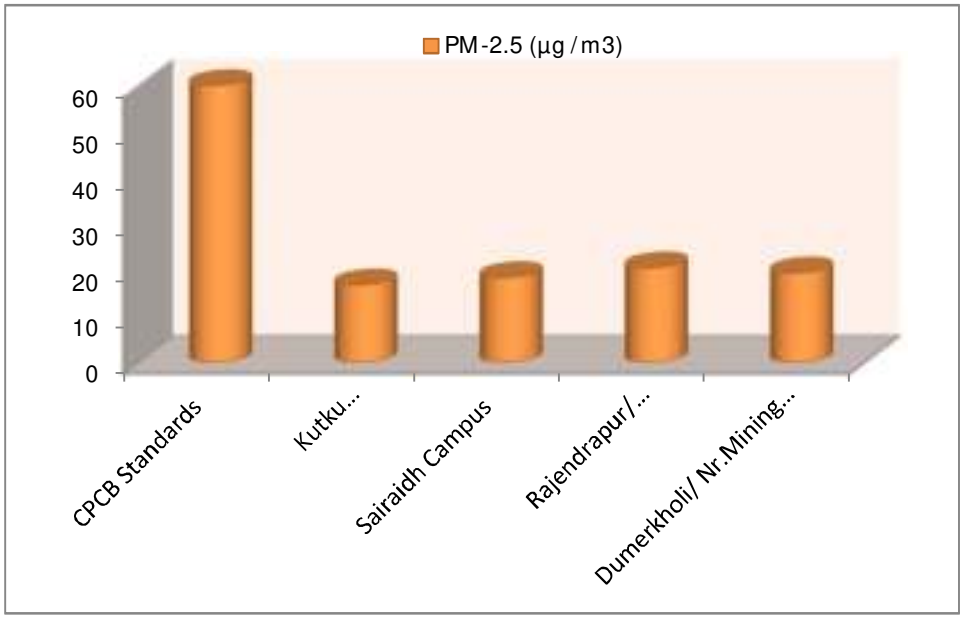
H. Arsenic (As):

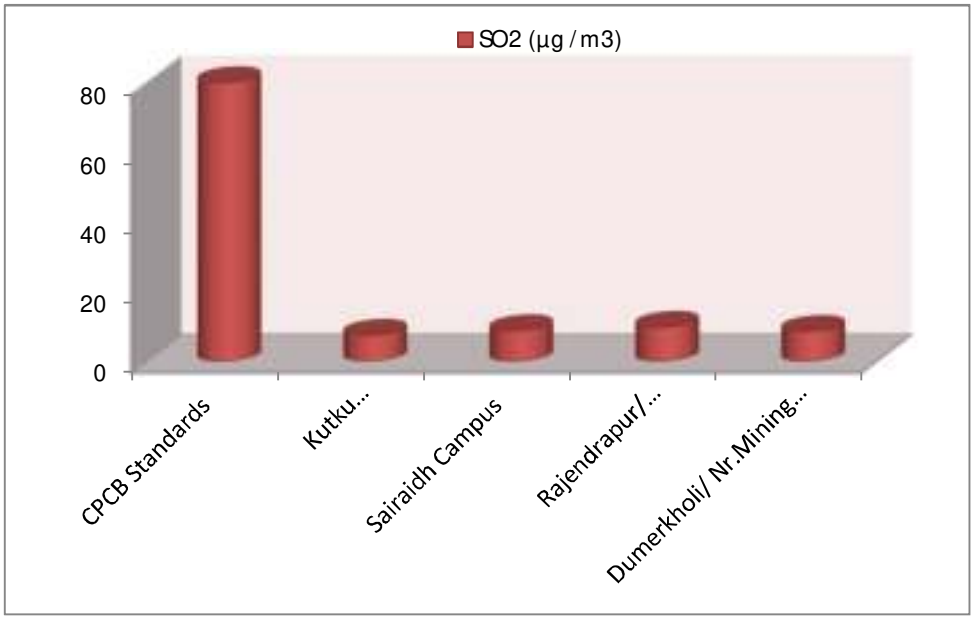
Arsenic was not detected at any of the locations in PM_{10} samples as well as $PM_{2.5}$ Samples.

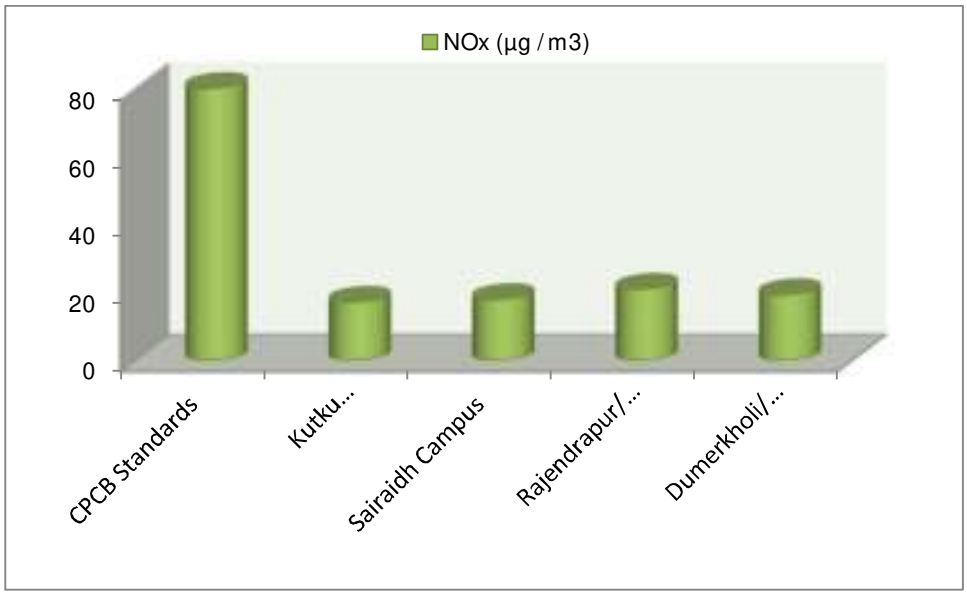
I. Chromium (Cr):

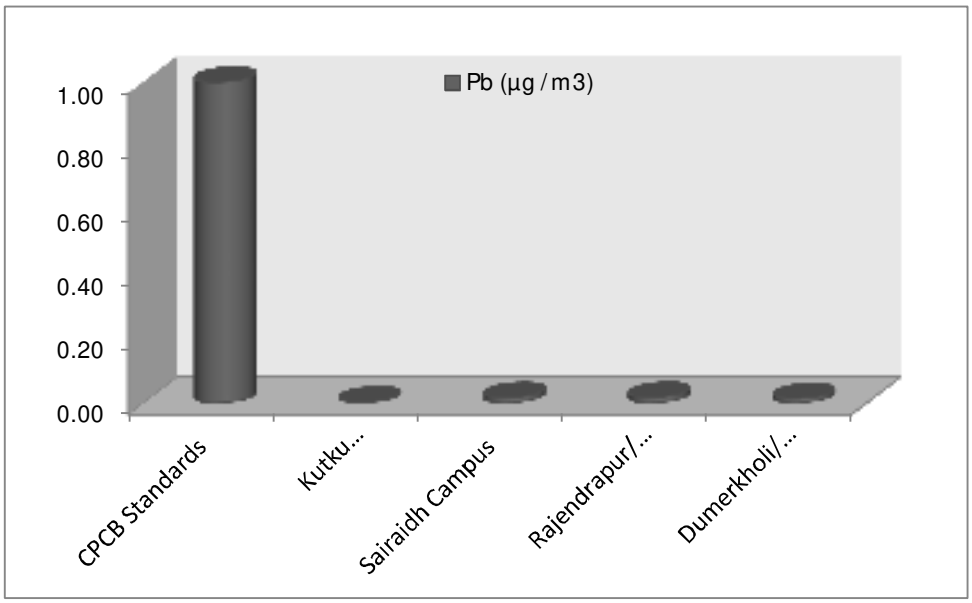
Chromium was not detected at any of the locations in PM_{10} samples as well as $PM_{2.5}$ Samples.

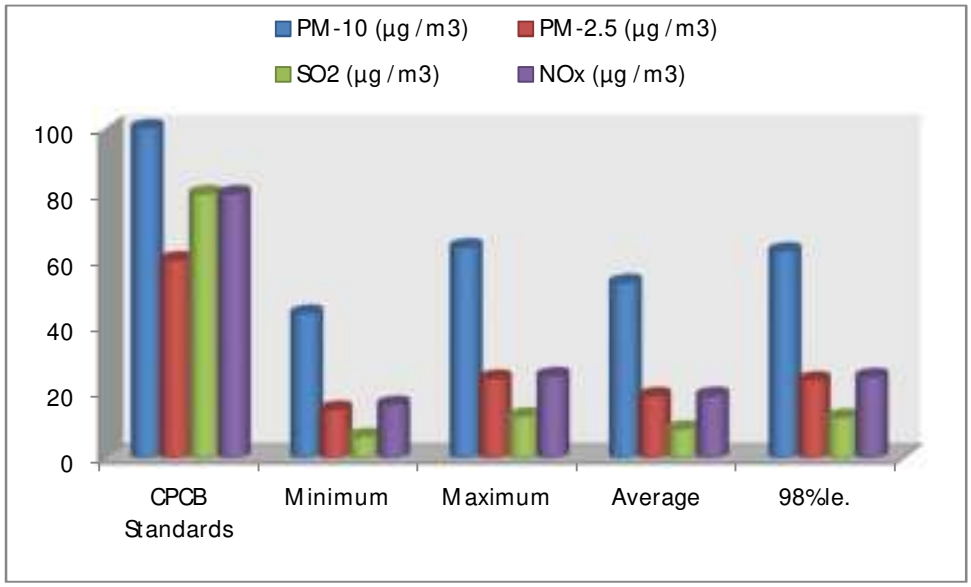

PM-10 (µg/m3)
100
80
60
40
20
0
CPCB Standards
Kutku...
Sairaidh Campus
Rajendrapur/ Nr.Mining...
Dumerkholi/ Nr.Mining...


PM-2.5 (µg/m3)
60
50
40
30
20
10
0
CPCB Standards
Kutku...
Sairaidh Campus
Rajendrapur/...
Dumerkholi/ Nr.Mining...


SO2 (µg/m3)
80
60
40
20
0
CPCB Standards
Kutku...
Sairaidh Campus
Rajendrapur/...
Dumerkholi/ Nr.Mining...


NOx (µg / m3)
80
60
40
20
0
CPCB Standards
Kutku...
Sairaidh Campus
Rajendrapur/...
Dumerkholi/...


Pb (µg / m3)
1.00
0.80
0.60
0.40
0.20
0.00
CPCB Standards
Kutku...
Sairaidh Campus
Rajendrapur/...
Dumerkholi/...


PM-10 (µg / m3)
PM-2.5 (µg / m3)
SO2 (µg / m3)
NOx (µg / m3)
100
80
60
40
20
0
CPCB Standards
Minimum
Maximum
Average
98%le.

1.8 Noise Environment

The Director General of Mines Safety in its circular No. DG (Tech)/18 of 1975, has prescribed the noise level in mining occupations (TLV) for workers, in an 8 hour shift period with unprotected ear as 90 dB(A) or less. There will be some noise sources in mines, which produce noise levels above 90 dB(A), however, the workers are not expected to be exposed continuously for 8 hours. In order to maintain this statutory requirement Noise monitoring has been carried out in and around the mining lease area.

Work zone noise level in the mining area shall increase due to blasting excavation and transportation. The impacts due to the mining activities on the noise levels shall be negligible if all the precautions for the elimination of the noise are taken. The mining activities will be undertaken during day time only. The daytime equivalent noise levels, when all the machineries are in operation, shall be minimized as the machineries have been provided with noise control equipment. Noise monitoring carried out on monthly basis at eight locations namely core and buffer zone.

Identification of sampling locations

Noise at different noise generating sources has been identified based on the activities in the village area and ambient noise due to traffic.

The noise monitoring has been conducted for determination of ambient noise levels in the mining area and villages. The noise levels at each location were recorded for 24 hours.

Method of Monitoring

Sound Pressure Level (SPL) measurements were monitored at eight locations. The readings were taken for every hour for 24 hours. The day noise levels have been monitored during 6 am to 10 pm and night levels during 10 pm to 6 am at eight locations within 10-km radius of the study area.

Noise level monitoring was carried out continuously for 24 hours with one hour interval starting at 06.00 hrs to 06.00 hrs next day.

Noise levels monitored during day and night at 8 locations are found to be below the stipulated standard of CPCB as for Industrial area as 75dB(A) and 70dB(A) for day and night respectively as given in **(Table7)**.

Instrument used for monitoring

Noise levels were measured using integrated sound level meter Model no. HTC- SL-1352. This instrument is capable of measuring the Sound Pressure Level (SPL), Leq.

Table 7

Noise Emission Monitoring Report

SR. NO.	LOCATION	Month	Noise-dB(A)	
			Day Time	Night Time
Core Zone				
1	Tatijharia Village/Nr.Weigh Bridge	July-2022	51.6	39.7
		August-2022	54.6	43.9
		September-2022	53.7	41.6
2	Piprapat/Nr. Mining Area	July-2022	67.3	58.1
		August-2022	67.2	52.8
		September-2022	62.1	51.4
Buffer Zone				
1	Samri-Gopatu/Near Weigh bridge	July-2022	57.2	48.1
		August-2022	67.1	54.2
		September-2022	68.1	54.7
2	Rajendrapur/Nr.Mining Area	July-2022	64.9	51.6
		August-2022	56.7	43.9
		September-2022	61.3	48.1
CPCB Standards				
Industrial Area			**75**	**70**
Residential area			**55**	**45**

Conclusion: -The Noise Monitoring Results at Tatijharia Lease during this period (**July-August-September-2022**), it is within permissible limits as per CPCB Standards.

Table 8

HEMM Spot Noise Level Monitoring

Unit: dB(A)

Sl. No.	Location	July-2022		August-2022		Sept-2022	
		Min.	Max.	Min.	Max.	Min.	Max.
1.	Piprapat/Nr.Mining Area	62.7	64.9	68.1	71.6	67.1	71.3
2.	Tatijharia Village/ Nr.Weigh Bridge	59.3	62.1	64.7	66.3	59.7	62.4

2.0 Water Quality

The existing status of water quality for ground water and surface water was assessed by collecting the water samples from underground wells from the piprapat/Nr.mining area.

The purpose of the study is to assess the water quality characteristics for critical parameters, evaluate the impacts on agricultural productivity, habitat conditions, recreational resources and aesthetics in the vicinity and identification of impact on water quality by this project and related activities.

The physico-chemical analysis of water samples collected during the study period is given in **(Table-10 and Fig.5)**. The overall water quality found to be below the stipulated standards of IS 10500-2012 for ground water & found to be fit for drinking purpose for tested parameters. Thus the impacts due to mining activities have been found to be insignificant.

The drinking water is supplied by the tankers from for-away sources. Hence, additional care now be taken to chlorinate the tankers before leaving the supply source.

Table-10 : Report on Chemical Examination of Ground Water (June - 2022)

Location Name	GW-1:- Piprapat/Near Mining Area
Sample Source	Borewell Water

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 3		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Biological Testing 1. Water**					
1	Total coliform	Per 100 ml	IS 15185 : 2016	Absent	Absent	Absent
2	*Escherichia coli*	Per 100 ml	IS 15185 : 2016	Absent	Absent	Absent
II	**Chemical Testing 1. Water**					
3	Alkalinity (as $CaCO_3$)	mg/l	IS 3025 (Part 23) : 1986	200	600	153.19
4	Ammonia (as N)	mg/l	IS 3025 (Part 34) : 1988	0.5	No relaxation	BDL (DL – 0.1)
5	Anionic surface active agents (as MBAS)	mg/l	IS 13428 : 2005 Annex K	0.2	1.0	BDL (DL – 0.01)
6	Colour	Hazen units	IS 3025 (Part 4) : 2021	5	15	1
7	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	No relaxation	BDL (DL – 0.005)
8	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :1988	250	1000	27.52
9	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	53.81
10	Chloramines (as Cl_2)	mg/l	IS 3025 (Part 26) : 2021	4.0	No relaxation	BDL (DL – 0.1)
11	Free residual chlorine	mg/l	IS 3025 (Part 26) : 2021	Min. 0.2	1	BDL (DL – 0.1)
12	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	0.21
13	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	14.32
14	Nitrate (as NO_3)	mg/l	APHA 23rd Edition	45	No relaxation	BDL (DL – 2)
15	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
16	pH	-	IS 3025 (Part 11) : 1983	6.5 to 8.5	No relaxation	6.93 at 25°C
17	Phenolic compounds (as C_6H_5OH)	mg/l	IS 3025 (Part 43) : 1992	0.001	0.002	BDL (DL – 0.001)
18	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24) : 1986	200	400	18.32
19	Sulphide (as H_2S)	mg/l	IS 3025 (Part 29) : 1986	0.05	No relaxation	BDL (DL – 0.03)
20	Taste	-	IS 3025 (Part 8) : 1984	Agreeable	Agreeable	Agreeable
21	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	481
22	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.6
23	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) : 2009	200	600	193.33
24	Mineral Oil	mg/l	ANtr/7.2/RES/06: 2018	0.5	No relaxation	BDL (DL – 0.001)
II	**Chemical Testing 2. Residues In Water**					
25	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 1988	0.01	No relaxation	BDL (DL - 0.01)
26	Aluminium (as Al)	mg/l	IS 3025 (Part 2) : 2019	0.03	0.2	BDL (DL - 0.01)
27	Barium (as Ba)	mg/l	IS 3025 (Part 2) : 2019	0.7	No relaxation	BDL (DL - 0.01)
28	Boron (as B)	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4	BDL (DL - 0.1)
29	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	BDL (DL - 0.03)
30	Cadmium (as Cd)	mg/l	IS 3025 (Part 2) : 2019	0.003	No relaxation	BDL (DL - 0.001)
31	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	No relaxation	0.17
32	Lead (as Pb)	mg/l	IS 3025 (Part 2) : 2019	0.01	No relaxation	BDL (DL - 0.001)
33	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	BDL (DL – 0.05)
34	Mercury (as Hg)	mg/l	IS 3025 (Part 48) : 1994	0.001	No relaxation	BDL (DL - 0.0005)
35	Molybdenum (as Mo)	mg/l	IS 3025 (Part 2) : 2019	0.07	No relaxation	BDL (DL - 0.01)
36	Nickel (as Ni)	mg/l	IS 3025 (Part 2) : 2019	0.02	No relaxation	BDL (DL - 0.01)
37	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2003	0.01	No relaxation	BDL (DL- 0.001)
38	Silver (as Ag)	mg/l	IS 13428 : 2005	0.1	No relaxation	BDL (DL - 0.001)
39	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	BDL (DL - 0.03)
40	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL (DL - 0.1)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 3		Test Results
				Acceptable Limit	Permissible Limit #	
II	**Chemical Testing** **2. Residues In Water**					
41	**Polychlorinated biphenyls**					
	2,2',5-trichlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,4,4'-trichlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,2',5,5'-tetrachlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,2',4,5,5'-pentachlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,2',3,4,4',5'-hexachlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,2',4,4',5,5'-hexachlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,2',3,4,4',5,5'-heptachlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
42	**Polynuclear aromatic hydrocarbons**					
	Naphthalene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Acenaphthylene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Acenaphthene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Fluorene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Anthracene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Phenanthrene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Fluoranthene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Pyrene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Benzo(a)anthracene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Chrysene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Benzo(a)pyrene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Benzo(b)fluoranthene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Benzo(k)fluoranthene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Indeno(123,cd)pyrene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Dibenzo(a,h)anthracene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Benzo(ghi)perylene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
43	**Trihalomethanes**					
i	Bromoform	mg/l	ANtr/7.2/RES/05: 2018	0.1	No relaxation	BDL (DL -0.05)
ii	Dibromochloromethane	mg/l		0.1	No relaxation	BDL (DL -0.05)
iii	Bromodichloromethane	mg/l		0.06	No relaxation	BDL (DL -0.05)
iv	Chloroform	mg/l		0.2	No relaxation	BDL (DL -0.05)
44	**Pesticide Residues Organochlorine**					
i	Alpha-HCH	µg/l	ANtr/7.2/RES/01: 2018	0.01	No relaxation	BDL (DL - 0.01)
ii	Beta HCH	µg/l	ANtr/7.2/RES/01: 2018	0.04	No relaxation	BDL (DL - 0.03)
iii	Gamma - HCH (Lindane)	µg/l	ANtr/7.2/RES/01: 2018	2	No relaxation	BDL (DL - 0.03)
iv	Delta- HCH	µg/l	ANtr/7.2/RES/01: 2018	0.04	No relaxation	BDL (DL - 0.03)
v	Alachlor	µg/l	ANtr/7.2/RES/01: 2018	20	No relaxation	BDL (DL - 0.03)
vi	Aldrin	µg/l	ANtr/7.2/RES/01: 2018	0.03	No relaxation	BDL (DL - 0.03)
vii	Dieldrin	µg/l	ANtr/7.2/RES/01: 2018	0.03	No relaxation	BDL (DL - 0.03)
viii	Butachlor	µg/l	ANtr/7.2/RES/01: 2018	125	No relaxation	BDL (DL - 0.03)
ix	p,p´-DDE	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
x	o,p´-DDE	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
xi	p,p´-DDD	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
xii	o,p´-DDD	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
xiii	o,p´- DDT	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
xiv	p,p´- DDT	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
xv	Endosulphan					
	Alpha-Endosulphan	µg/l	ANtr/7.2/RES/01: 2018	0. 4	No relaxation	BDL (DL - 0.03)
	Beta-Endosulphan					
	Endosulphan sulphate					

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 3		Test Result
				Acceptable Limit	Permissible Limit #	
44	**Pesticide Residues Organophosphorus**					
xvi	2,4-Dichlorophenoxyacetic acid	µg/l	ANtr/7.2/RES/02 : 2018	30	No relaxation	BDL (DL - 0.03)
xvii	Monocrotophos	µg/l	ANtr/7.2/RES/02 : 2018	1	No relaxation	BDL (DL - 0.03)
xviii	Atrazine	µg/l	ANtr/7.2/RES/02 : 2018	2	No relaxation	BDL (DL - 0.03)
xix	Parathion methyl	µg/l	ANtr/7.2/RES/02 : 2018	0.3	No relaxation	BDL (DL - 0.03)
xx	Paraoxon methyl	µg/l	ANtr/7.2/RES/02 : 2018	-	-	BDL (DL - 0.03)
xxi	Isoproturon	µg/l	ANtr/7.2/RES/02 : 2018	9	No relaxation	BDL (DL - 0.03)
xxii	Malathion	µg/l	ANtr/7.2/RES/02 : 2018	190	No relaxation	BDL (DL - 0.03)
xxiii	Malaoxon	µg/l	ANtr/7.2/RES/02 : 2018	-	-	BDL (DL - 0.03)
xxiv	Ethion	µg/l	ANtr/7.2/RES/02 : 2018	3	No relaxation	BDL (DL - 0.03)
xxv	Chlorpyrifos	µg/l	ANtr/7.2/RES/02 : 2018	30	No relaxation	BDL (DL - 0.03)
xxvi	Phorate	µg/l	ANtr/7.2/RES/02 : 2018	2	No relaxation	BDL (DL - 0.03)
	Phorate-sulfone					
	Phorate-sulfoxide					

NOTES: ● Please see watermark "Original Test Report" to confirm the authenticity of this report.● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● 'µg/l' is equivalent to 'ppb'. ● **BDL- Below detection limit.** ● **DL- DL Indicates detection limit of instrument /method and shall be considered as 'absent'.** ● Result for test no. 11 is not relevant. ● **ANqr RES-: Inhouse validated method.**

REMARKS: As requested by the client, sample was tested for above parameters only. **Sample complies with IS:10500:2012, for tests conducted, indicating that it is fit for drinking purpose with respect to tested parameters.**

-------End of Report-------

Location Name	GW-2:- BKB Camp
Sample Source	Borewell Water

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 3		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Biological Testing 1. Water**					
1	Total coliform	Per 100 ml	IS 15185 : 2016	Absent	Absent	Absent
2	*Escherichia coli*	Per 100 ml	IS 15185 : 2016	Absent	Absent	Absent
II	**Chemical Testing 1. Water**					
3	Alkalinity (as $CaCO_3$)	mg/l	IS 3025 (Part 23) : 1986	200	600	146.21
4	Ammonia (as N)	mg/l	IS 3025 (Part 34) : 1988	0.5	No relaxation	BDL (DL – 0.1)
5	Anionic surface active agents (as MBAS)	mg/l	IS 13428 : 2005 Annex K	0.2	1.0	BDL (DL – 0.01)
6	Colour	Hazen units	IS 3025 (Part 4) : 2021	5	15	1
7	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	No relaxation	BDL (DL – 0.005)
8	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :1988	250	1000	27.46
9	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	42.91
10	Chloramines (as Cl_2)	mg/l	IS 3025 (Part 26) : 2021	4.0	No relaxation	BDL (DL – 0.1)
11	Free residual chlorine	mg/l	IS 3025 (Part 26) : 2021	Min. 0.2	1	BDL (DL – 0.1)
12	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	0.27
13	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	11.58
14	Nitrate (as NO_3)	mg/l	APHA 23rd Edition	45	No relaxation	BDL (DL – 2)
15	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
16	pH	-	IS 3025 (Part 11) : 1983	6.5 to 8.5	No relaxation	7.14 at 25°C
17	Phenolic compounds (as C_6H_5OH)	mg/l	IS 3025 (Part 43) : 1992	0.001	0.002	BDL (DL – 0.001)
18	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24) : 1986	200	400	16.43
19	Sulphide (as H_2S)	mg/l	IS 3025 (Part 29) : 1986	0.05	No relaxation	BDL (DL – 0.03)
20	Taste	-	IS 3025 (Part 8) : 1984	Agreeable	Agreeable	Agreeable
21	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	462
22	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.4
23	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) : 2009	200	600	154.83
24	Mineral Oil	mg/l	ANtr/7.2/RES/06: 2018	0.5	No relaxation	BDL (DL – 0.001)
II	**Chemical Testing 2. Residues In Water**					
25	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 1988	0.01	No relaxation	BDL (DL - 0.01)
26	Aluminium (as Al)	mg/l	IS 3025 (Part 2) : 2019	0.03	0.2	BDL (DL - 0.01)
27	Barium (as Ba)	mg/l	IS 3025 (Part 2) : 2019	0.7	No relaxation	BDL (DL - 0.01)
28	Boron (as B)	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4	BDL (DL - 0.1)
29	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	BDL (DL - 0.03)
30	Cadmium (as Cd)	mg/l	IS 3025 (Part 2) : 2019	0.003	No relaxation	BDL (DL - 0.001)
31	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	No relaxation	0.26
32	Lead (as Pb)	mg/l	IS 3025 (Part 2) : 2019	0.01	No relaxation	BDL (DL - 0.001)
33	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	BDL (DL – 0.05)
34	Mercury (as Hg)	mg/l	IS 3025 (Part 48) : 1994	0.001	No relaxation	BDL (DL - 0.0005)
35	Molybdenum (as Mo)	mg/l	IS 3025 (Part 2) : 2019	0.07	No relaxation	BDL (DL - 0.01)
36	Nickel (as Ni)	mg/l	IS 3025 (Part 2) : 2019	0.02	No relaxation	BDL (DL - 0.01)
37	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2003	0.01	No relaxation	BDL (DL- 0.001)
38	Silver (as Ag)	mg/l	IS 13428 : 2005	0.1	No relaxation	BDL (DL - 0.001)
39	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	BDL (DL - 0.03)
40	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL (DL - 0.1)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 3		Test Results
				Acceptable Limit	Permissible Limit #	
II	**Chemical Testing** **2. Residues In Water**					
41	**Polychlorinated biphenyls**					
	2,2',5-trichlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,4,4'-trichlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,2',5,5'-tetrachlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,2',4,5,5'-pentachlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,2',3,4,4',5'-hexachlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,2',4,4',5,5'-hexachlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
	2,2',3,4,4',5,5'-heptachlorobiphenyl	µg/l	ANtr/7.2/RES/04: 2018	0.5	No relaxation	BDL (DL – 0.03)
42	**Polynuclear aromatic hydrocarbons**					
	Naphthalene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Acenaphthylene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Acenaphthene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Fluorene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Anthracene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Phenanthrene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Fluoranthene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Pyrene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Benzo(a)anthracene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Chrysene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Benzo(a)pyrene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Benzo(b)fluoranthene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Benzo(k)fluoranthene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Indeno(123,cd)pyrene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Dibenzo(a,h)anthracene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
	Benzo(ghi)perylene	µg/l	ANtr/7.2/RES/03: 2018	0.1	No relaxation	BDL (DL – 0.03)
43	**Trihalomethanes**					
i	Bromoform	mg/l	ANtr/7.2/RES/05: 2018	0.1	No relaxation	BDL (DL -0.05)
ii	Dibromochloromethane	mg/l		0.1	No relaxation	BDL (DL -0.05)
iii	Bromodichloromethane	mg/l		0.06	No relaxation	BDL (DL -0.05)
iv	Chloroform	mg/l		0.2	No relaxation	BDL (DL -0.05)
44	**Pesticide Residues Organochlorine**					
i	Alpha-HCH	µg/l	ANtr/7.2/RES/01: 2018	0.01	No relaxation	BDL (DL - 0.01)
ii	Beta HCH	µg/l	ANtr/7.2/RES/01: 2018	0.04	No relaxation	BDL (DL - 0.03)
iii	Gamma - HCH (Lindane)	µg/l	ANtr/7.2/RES/01: 2018	2	No relaxation	BDL (DL - 0.03)
iv	Delta- HCH	µg/l	ANtr/7.2/RES/01: 2018	0.04	No relaxation	BDL (DL - 0.03)
v	Alachlor	µg/l	ANtr/7.2/RES/01: 2018	20	No relaxation	BDL (DL - 0.03)
vi	Aldrin	µg/l	ANtr/7.2/RES/01: 2018	0.03	No relaxation	BDL (DL - 0.03)
vii	Dieldrin	µg/l	ANtr/7.2/RES/01: 2018	0.03	No relaxation	BDL (DL - 0.03)
viii	Butachlor	µg/l	ANtr/7.2/RES/01: 2018	125	No relaxation	BDL (DL - 0.03)
ix	p,p´-DDE	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
x	o,p´-DDE	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
xi	p,p´-DDD	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
xii	o,p´-DDD	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
xiii	o,p´- DDT	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
xiv	p,p´- DDT	µg/l	ANtr/7.2/RES/01: 2018	1	No relaxation	BDL (DL - 0.03)
xv	Endosulphan					
	Alpha-Endosulphan	µg/l	ANtr/7.2/RES/01: 2018	0. 4	No relaxation	BDL (DL - 0.03)
	Beta-Endosulphan					
	Endosulphan sulphate					

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 3		Test Result
				Acceptable Limit	Permissible Limit #	
44	**Pesticide Residues Organophosphorus**					
xvi	2,4-Dichlorophenoxyacetic acid	µg/l	ANtr/7.2/RES/02 : 2018	30	No relaxation	BDL (DL - 0.03)
xvii	Monocrotophos	µg/l	ANtr/7.2/RES/02 : 2018	1	No relaxation	BDL (DL - 0.03)
xviii	Atrazine	µg/l	ANtr/7.2/RES/02 : 2018	2	No relaxation	BDL (DL - 0.03)
xix	Parathion methyl	µg/l	ANtr/7.2/RES/02 : 2018	0.3	No relaxation	BDL (DL - 0.03)
xx	Paraoxon methyl	µg/l	ANtr/7.2/RES/02 : 2018	-	-	BDL (DL - 0.03)
xxi	Isoproturon	µg/l	ANtr/7.2/RES/02 : 2018	9	No relaxation	BDL (DL - 0.03)
xxii	Malathion	µg/l	ANtr/7.2/RES/02 : 2018	190	No relaxation	BDL (DL - 0.03)
xxiii	Malaoxon	µg/l	ANtr/7.2/RES/02 : 2018	-	-	BDL (DL - 0.03)
xxiv	Ethion	µg/l	ANtr/7.2/RES/02 : 2018	3	No relaxation	BDL (DL - 0.03)
xxv	Chlorpyrifos	µg/l	ANtr/7.2/RES/02 : 2018	30	No relaxation	BDL (DL - 0.03)
xxvi	Phorate	µg/l	ANtr/7.2/RES/02 : 2018	2	No relaxation	BDL (DL - 0.03)
	Phorate-sulfone					
	Phorate-sulfoxide					

NOTES: ● Please see watermark "Original Test Report" to confirm the authenticity of this report.● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● 'µg/l' is equivalent to 'ppb'. ● **BDL- Below detection limit. ● DL- DL Indicates detection limit of instrument /method and shall be considered as 'absent'.** ● Result for test no. 11 is not relevant. ● **ANqr RES-: Inhouse validated method.**

REMARKS: As requested by the client, sample was tested for above parameters only. **Sample complies with IS:10500:2012, for tests conducted, indicating that it is fit for drinking purpose with respect to tested parameters.**

-------End of Report-------

Table 11 Report on Chemical Examination of Soil (June-2022)

S1) Soil:-

Location:- S1 – Tatijharia

S.N.	Test Parameter	Measurement Unit	Test Method	Test Resulta
1	Infiltration rate	mm/hr	Lab/SOP	21.43
2	Bulk density	g/cm^3	Lab/SOP	1.662
3	Water holding capacity	%	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	29.66
4	Particle size distribution			
	Sand	%	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India	21.49
	Silt	%	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India	50.39
	Clay	%	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India	28.12
5	Texture	-	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India	Silt Loam
6	pH (1:2.5 Aq. Extract) at 25^{0}C	-	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	7.08 at 25^{0}C
7	Electrical Conductivity (1:2.5 Aq. Extract)	µs/cm	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	39.6
8	Water soluble Calcium (as Ca)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	389
9	Water soluble Magnesium (as Mg)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	143
10	Water soluble Sodium (as Na)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	32.7
11	Water soluble Potassium (as K)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	239
12	Water soluble Chloride (as Cl)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	1396
13	Water soluble Sulphate (as SO_4)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	23.4
14	Exchangeable Sodium (as Na)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	32.7
15	Exchangeable Potassium (as K)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	239
16	Exchangeable Calcium (as Ca)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	389
17	Exchangeable Magnesium (as Mg)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	143
18	Sodium adsorption ratio	-	By Calculation	2.00
19	Total Organic matter	%	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	0.24
20	Total Organic Carbon	%	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	0.14
21	Available Nitrogen (as N)	Kg/hec	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	2.74
22	Available Phosphorous (as P)	Kg/hec	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	40.20
23	Available Potassium (as K)	Kg/hec	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	535.4
24	CEC	meq/100g	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	5.14

S.N.	Test Parameter	Measurement Unit	Test Method	Test Result
25	Arsenic (As)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	Absent
26	Boron (B)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	0.24
27	Cadmium (Cd)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	Absent
28	Chromium (Cr)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	Absent
29	Copper (Cu)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	1.52
30	Lead (Pb)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	Absent
31	Nickel (Ni)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	Absent
32	Cobalt (Co)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	0.26
33	Iron (Fe)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	6.94
34	Manganese (Mn)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	13.46
35	Zinc (Zn)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	1.31
36	Selenium (Se)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	Absent

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Remarks: As requested by the client, sample was tested for above paraeters only**.**

----------END OF REPORT----------

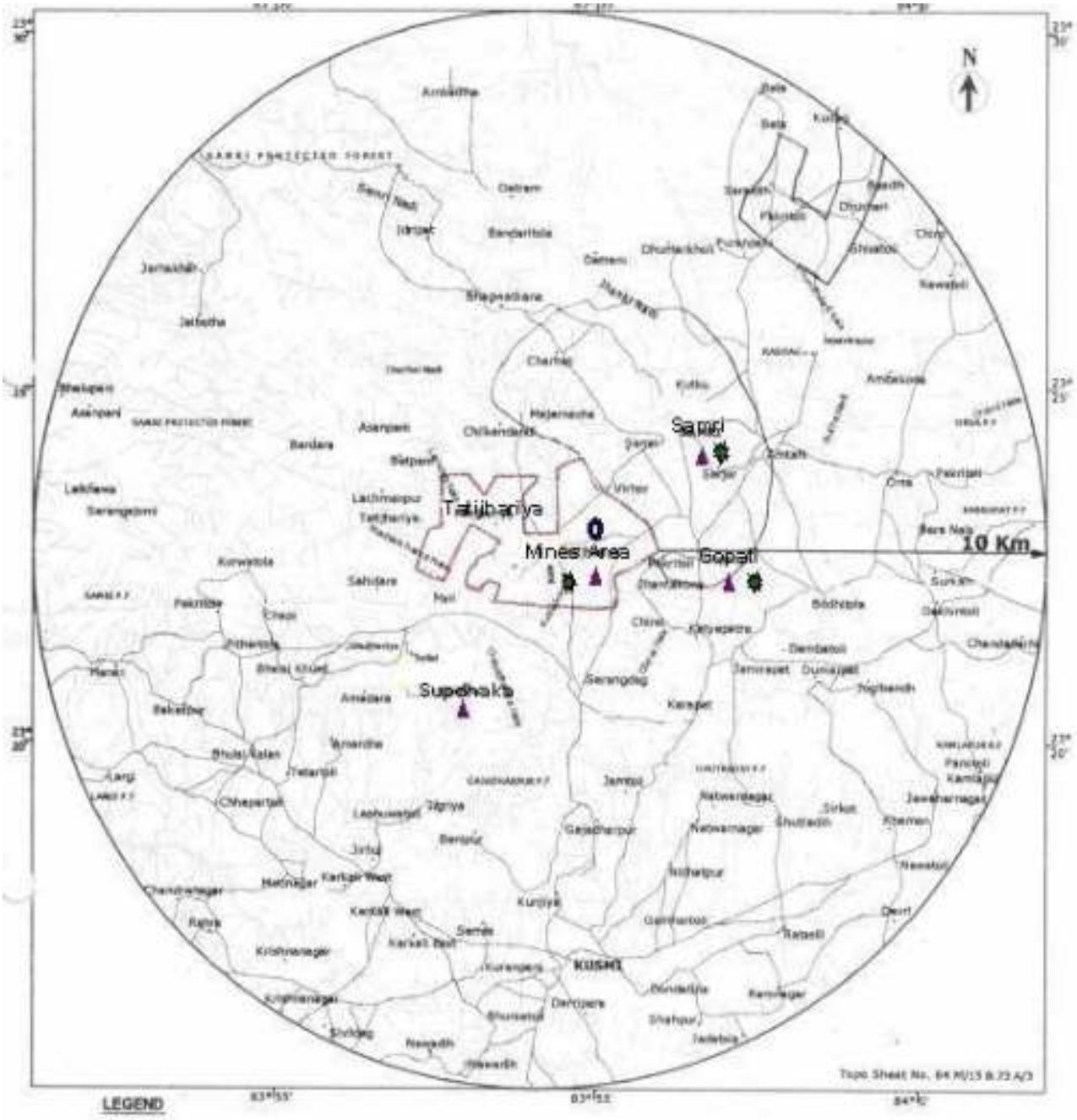

FIG 4 : SAMPLING LOCATIONS FOR WATER

Agent of Mines
Samri Mines Division
Hindalco Industries Ltd

Apur/Air/R/Aug 2017/1126/05/8/2017

ANNEXURE - III

REGIONAL OFFICE
CHHATTISGARH ENVIRONMENT CONSERVATION BOARD
Bank Colony, Behind B.T.I., Nawapara, Ambikapur (C.G.) Fax/Phone 07774-231936

No. 836 /RO/TS/CECB/2017 Ambikapur, Dt. 05/8/2017

To,

M/s Hindalco Industries Limited,
(Tatijharia Bauxite Mine)
Village- Tatijharia & Betapani,
Tehsil - Samri,
District - Balrampur-Ramanujganj (C.G.)

Subject : Renewal of consent of the board under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981.

Ref. : Your online application no. 486867 dated 21/07/2017 and subsequent correspondence ending dated 04/08/2017.

With reference to your above, application consent and license are hereby renewed for a period from **20/05/2018 to 30/11/2022** with the terms and conditions incorporated in the consent issued by Board Office letter No. 6886/TS/CECB/2007, Raipur, dated 24/12/2007, subsequent renewal of consent issued by Board and additional condition mentioned below:-

NAME	*PRODUCTION CAPACITY*
Mining of Bauxite Ore	***4.0 Lakhs T./Annum (Four Lakhs Tonnes Per Annum)***

Additional Conditions:

1. The Industry shall operate & maintain the air pollution control system effectively & regularly. Effective steps shall be taken to control fugitive dust emission. Fixed type automatic water sprinkling system shall be installed at haul roads/other roads, ore stock yard etc. Dust suppression system (water sprinkling arrangement) shall be made more effective to ensure ambient air quality within prescribed limit in and around the mine area all the time.
2. Regular monitoring for the measurement of air pollutants level in ambient shall be carried out. Industry shall submit air quality monitoring reports to the Board regularly.
3. Industry shall ensure safe and scientific arrangement for disposal of all solid wastes. Excavated area shall be reclaimed scientifically.
4. All internal roads shall be made pucca & shall be maintained properly. Dust, muck & sludge generated due to transportation on the road shall be cleaned and disposed off properly. Industry shall maintain good house keeping within mine lease area. Industry shall ensure the transportation of ore in duly covered vehicles.
5. Industry shall use fly ash brick, fly ash blocks or fly ash based products in their construction/ repairing activities.
6. Wide green belt of broad leaf local species shall be developed along the mine lease area. As for as possible maximum area of open spaces shall be utilized for plantation purposes.
7. Industry shall submit Environment statement to the Board as per provision of Environmental (Protection) Amendment Rule, 1993 for the previous year ending 31st March on or before 30th September every year.
8. Chhattisgarh Environment Conservation Board reserves the rights to revoke the Consent at any time for any violation/non-compliance.

Please acknowledge the receipt of this letter.

For and on behalf of
CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

05/8/17

Regional Officer,
Chhattisgarh Environment Conservation Board,
Ambikapur

Hindalco Industries Ltd.
Samri Mines Division
Distt.Balrampur (C.G.)
Date. 7/8/17 (125)
Received by .....

Agent of Mines
Samri Mines Division
Hindalco Industries Ltd

Apur/water/R/Aug2017/1126/05/8/2017

REGIONAL OFFICE

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

Bank Colony, Behind B.T.I., Nawapara, Ambikapur (C.G.) Fax/Phone 07774-231936

No. 835/RO/TS/CECB/2017 Ambikapur, Dt. 05/8/2017

To,

M/s Hindalco Industries Limited,
(Tatijharia Bauxite Mine)
Village- Tatijharia & Betapani,
Tehsil - Samri,
District - Balrampur-Ramanujganj (C.G.)

Subject : Renewal of consent of the board under Section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974.

Ref. : Your online application no. 486867 dated 21/07/2017 and subsequent correspondence ending dated 04/08/2017.

With reference to your above, application consent and license are hereby renewed for a period from **20/05/2018 to 30/11/2022** with the terms and conditions incorporated in the consent issued by Board Office letter No. 6884/TS/CECB/2007, Raipur, dated 24/12/2007, subsequent renewal of consent issued by Board and additional condition mentioned below:-

NAME	***PRODUCTION CAPACITY***
Mining of Bauxite Ore	***4.0 Lakhs T./Annum (Four Lakhs Tonnes Per Annum)***

Additional Conditions:

1. Industry shall operate and maintain the effluent treatment system effectively and regularly. Industry shall ensure treated effluent quality within the standards prescribed by Board published in Gazette Notification dated 25.03.1988. Treated effluent shall be used for dust suppression, domestic use, irrigation, other useful purposes etc. Industry shall not discharge any treated/untreated effluent into the river or any other surface water bodies. No effluent shall be discharged outside of the mine premises in any circumstances; hence zero discharge condition shall be maintained all the time; failing which, this renewal of consent may be cancelled.
2. Industry shall ensure safe and scientific arrangement for disposal of all solid wastes. Excavated area shall be reclaimed scientifically.
3. All internal roads shall be made pucca & shall be maintained properly. Dust, muck & sludge generated due to transportation on the road shall be cleaned and disposed off properly. Industry shall maintain good house keeping within mine lease area. Industry shall ensure the transportation of ore in duly covered vehicles.
4. Industry shall use fly ash brick, fly ash blocks or fly ash based products in their construction/ repairing activities.
5. Industry shall submit monitoring report of effluent regularly.
6. Wide green belt of broad leaf local species shall be developed along the mine lease area. As for as possible maximum area of open spaces shall be utilized for plantation purposes.
7. Provision of water harvesting system should be provided in the industry premises.
8. Industry shall submit Environment statement to the Board as per provision of Environmental (Protection) Amendment Rule, 1993 for the previous year ending 31st March on or before 30th September every year.
9. Chhattisgarh Environment Conservation Board reserves the rights to revoke the Consent at any time for any violation/non-compliance.

Please acknowledge the receipt of this letter.

For and on behalf of
CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

05/8/17
Regional Officer
Chhattisgarh Environment Conservation Board,
Ambikapur

Hindalco Industries Ltd.
Samri Mines Division
Distt.Balrampur (C.G.)
Date 7/8/17 (124)
Received by

Agent of Mines
Samri Mines Division
Hindalco Industries Ltd

Hindalco Industries Limited

Mines Division Samri

Annexure – IV & V

Lease Wise production 2022-23 (April'22 – Sept.'22)

Lease	Production (MT)	Mined out Area (Ha.)	Reclaimed Area (Ha.)
Samri	2,05,550	6.083	1.208
Tatijharia	2,03,500	7.027	2.438
Kudag	22,000	1.256	0.101
Total	**4,31,050**	**14.366**	**3.747**

Lease Wise Afforestation 2022-23 (April'22 – Sept.'22)

Lease	No. of Saplings planted	Afforested Area (Ha.)
Samri	39,071	10.918
Tatijharia	17,110	5.628
Kudag	6,020	2.024
Total	**62,201**	**18.57**

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Samri Mines Division
Hindalco Industries Ltd

Annexure-VI

Actual Expenditure incurred in Environment Management Plan: -

Total cost incurred for protection of environment in Samri, Tatijharia & Kudag Bauxite mine of Hindalco Industries Ltd. of Chhattisgarh state during the first half period of F.Y. 2022-23 (April 2022 to Sept. 2022).

S.No.	Environmental Protection measure	Actual Cost (Lac) FY. - 2022-23 (April'22 to Sept.'22)
1	Environment Monitoring	3.00
2	Green Belt	3.26
3	Occupational Health Monitoring	4.50
4	Reclamation/ Rehabilitation on mined out area (Samri – 1.208 Ha., Tatijharia – 2.438 Ha., Kudag – 0.101 Ha.) – **Total – 3.747 Ha.**	11.24
	Total	**22.00**

- Environment monitoring jobs has been out sourced to Annacon Lab, recognized by MoEF (GOI) & NABL etc.
- One centralized nursery has been established at Samri mines for Samri, Tatijharia & Kudag lease.
- Reclamation of mined out land has been out sourced along with production. Average cost of reclamation considered @ 3.00 Lac per ha

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Hindalco Industries Ltd

ANNEXURE - VII

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
और गंगा संरक्षण विभाग
केन्द्रीय भूमि जल प्राधिकरण
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Authority

(भूजल निकासी हेतु अनापत्ति प्रमाण पत्र)
NO OBJECTION CERTIFICATE (NOC) FOR GROUND WATER ABSTRACTION

Project Name:	Tatijharia Bauxite Mine Of M/s Hindalco Industries Limited		
Project Address:	Village-tatijharia		
Village:	Tatijhariya	Block:	Kusmi
District:	Balrampur	State:	Chhattisgarh
Pin Code:			
Communication Address:	Hindalco Industries Limited, Samri Mines Division, Baba Chowk,, At Post-kusmi, Kusmi, Balrampur, Chhattisgarh - 497224		
Address of CGWB Regional Office :	Central Ground Water Board North Central Chhattisgarh, 2nd Floor, Lk Corporate And Logistic Park, Dhamtari Road, Nh-30, Dumartarai, Raipur, Chhattisgarh - 492015		

1.	**NOC No.:**	CGWA/NOC/MIN/REN/1/2021/6173			
2.	Application No.:	21-4/1434/CT/MIN/2018	3.	Category: (GWRE 2017)	Safe
4.	Project Status:	Existing With Additional Ground Water Requirment	5.	NOC Type:	Renewal
6.	**Valid from:**	28/03/2021	7.	**Valid up to:**	27/03/2023

8. Ground Water Abstraction Permitted:

Fresh Water		Saline Water		Dewatering		Total	
m³/day	m³/year	m³/day	m³/year	m³/day	m³/year	m³/day	m³/year
5.00	1550.00						

9. Details of ground water abstraction /Dewatering structures

	Total Existing No.:5						Total Proposed No.:1					
	DW	DCB	BW	TW	MP	MPu	DW	DCB	BW	TW	MP	MPu
Abstraction Structure*	0	0	1	4	0	0	0	0	1	0	0	0

*DW- Dug Well; DCB-Dug-cum-Bore Well; BW-Bore Well; TW-Tube Well; MP-Mine Pit;MPu-Mine Pumps

10.	Ground Water Abstraction/Restoration Charges paid (Rs.):	1238.00

(Compliance Conditions given overleaf)

This is an auto generated document & need not to be signed.

Validity of this NOC shall be subject to compliance of the following conditions:

Mandatory conditions:

1) Installation of tamper proof digital water flow meter with telemetry on all the abstraction structure(s) shall be mandatory for all users seeking No Objection Certificate and intimation regarding their installation shall be communicated to the CGWA within 30 days of grant of No Objection Certificate.

2) Proponents shall mandatorily get water flow meter calibrated from an authorized agency once in a year.

3) Construction of purpose-built observation wells (piezometers) for ground water level monitoring shall be mandatory as per Section 14 of Guidelines. Water level data shall be made available to CGWA through web portal. Detailed guidelines for construction of piezometers are given in Annexure-II of the guidelines.

4) Proponents shall monitor quality of ground water from the abstraction structure(s) once in a year. Water samples from bore wells/ tube wells / dug wells shall be collected during April/May every year and analysed in NABL accredited laboratories for basic parameters (cations and anions), heavy metals, pesticides/ organic compounds etc. Water quality data shall be made available to CGWA through the web portal.

5) In case of mining projects, additional key wells shall be established in consultation with the Regional Director, CGWB for ground water level monitoring four (4) times a year (January, May, August and November) in core as well as buffer zones of the mine.

6) In case of mining project the firm shall submit water quality report of mine discharge/ seepage from Govt. approved/ NABL accredited lab.

7) The firm shall report compliance of the NOC conditions online in the website (www.cgwa-noc.gov.in) within one year from the date of issue of this NOC.

8) Industries abstracting ground water in excess of 100 m 3 /d shall undertake annual water audit through certified auditors and submit audit reports within three months of completion of the same to CGWA. All such industries shall be required to reduce their ground water use by at least 20% over the next three years through appropriate means.

9) Application for renewal can be submitted online from 90 days before the expiry of NOC. Ground water withdrawal, if any, after expiry of NOC shall be illegal & liable for legal action as per provisions of Environment (Protection) Act, 1986.

10) This NOC is subject to prevailing Central/State Government rules/laws/norms or Court orders related to construction of tube well/ground water abstraction structure / recharge or conservation structure/discharge of effluents or any such matter as applicable.

General conditions:

11) No additional ground water abstraction and/or de-watering structures shall be constructed for this purpose without prior approval of the Central Ground Water Authority (CGWA).

12) The proponent shall seek prior permission from CGWA for any increase in quantum of groundwater abstraction (more than that permitted in NOC for specific period).

13) Proponents shall install roof top rain water harvesting in the premise as per the existing building bye laws in the premise.

14) The project proponent shall take all necessary measures to prevent contamination of ground water in the premises failing which the firm shall be responsible for any consequences arising thereupon.

15) In case of industries that are likely to contaminate the ground water, no recharge measures shall be taken up by the firm inside the plant premises. The runoff generated from the rooftop shall be stored and put to beneficial use by the firm.

16) Wherever feasible, requirement of water for greenbelt (horticulture) shall be met from recycled / treated waste water.

17) Wherever the NOC is for abstraction of saline water and the existing wells (s) is /are yielding fresh water, the same shall be sealed and new tubewell(s) tapping saline water zone shall be constructed within 3 months of the issuance of NOC. The firm shall also ensure safe disposal of saline residue, if any.

18) Unexpected variations in inflow of ground water into the mine pit, if any, shall be reported to the concerned Regional Director, Central Ground Water Board.

19) In case of violation of any NOC conditions, the applicant shall be liable to pay the penalties as per Section 16 of Guidelines.

20) This NOC does not absolve the proponents of their obligation / requirement to obtain other statutory and administrative clearances from appropriate authorities.

21) The issue of this NOC does not imply that other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would consider the project on merits and take decisions independently of the NOC.

22) In case of change of ownership, new owner of the industry will have to apply for incorporation of necessary changes in the No Objection Certificate with documentary proof within 60 days of taking over possession of the premises.

23) This NOC is being issued without any prejudice to the directions of the Hon'ble NGT/court orders in cases related to ground water or any other related matters.

24) Proponents, who have installed/constructed artificial recharge structures in compliance of the NOC granted to them previously and have availed rebate of upto 50% (fifty percent) in the ground water abstraction charges/ground water restoration charges, shall continue to regularly maintain artificial recharge structures.

25) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, pharmaceutical, other hazardous units etc. (as per CPCE list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution as per Annexure III of the guidelines.

26) In case of new infrastructure projects having ground water abstraction of more than 20 m3/day, the firm/entity shall ensure implementation of dual water supply system in the projects.

27) In case of infrastructure projects, paved/parking area must be covered with interlocking/perforated tiles or other suitable measures to ensure groundwater infiltration/harvesting.

28) In case of coal and other base metal mining projects, the project proponent shall use the advance dewatering technology (by construction of series of dewatering abstraction structures) to avoid contamination of surface water.

29) The NOC issued is conditional subject to the conditions mentioned in the Public notice dated 27.01.2021 failing which penalty/EC/cancellation of NOC shall be imposed as the case may be.
30) This NOC is issued subject to the clearance of Expert Appraisal Committee (EAC) (if applicable).

(Non-compliance of the conditions mentioned above is likely to result in the cancellation of NOC and legal action against the proponent.)

Agent of Mines
Samri Mines Division
Hindalco Industries Ltd