



HIL/SAM/APCCF/45/2016/S

09.5.2016.

To,

**The Addl. Principal Chief Conservator of Forest (Central),
MoEF Regional Office (Western Zone)**

Kendriya Paryavaran Bhawan, Link Road-3, Ravisankar Nagar
Bhopal-462016 (M P)

Sub:- Status of compliance of EC condition (Half yearly status of compliance report) of Samri Bauxite Mine (Lease area- 2146.746 Ha.) of Hindalco Industries Limited of Chhattisgarh state from October-2015 to March-2016.

Ref No:- Environment Clearance Letter No-J-11015/353/2007-IA. II(M) dated July 27, 2007

Dear Sir,

We do herewith submit half yearly status of EC compliance report from Oct-2015 to Mar-2016 of Samri Bauxite Mine, Lease area -2146.746 Ha, of Hindalco Industries Limited P.O- Kusmi, Dist- Balrampur-Ramanujganj, Chhattisgarh state, PIN-497224.

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' faithfully

For, Hindalco Industries Limited

(M. K. Nayak)

Agent of Mines

Encl:-

1. Half Yearly Status of compliance of Environment condition as annexure-I.
2. Copy of Diversion of Revenue Forest Land enclosed as annexure -II.
3. Environment Status Report from Jan-2016 to Mar-2016, enclosed as annexure -III
4. Renewal copy of Consent to Operate from CECB enclosed as annexure -IV
5. Yearly Production report enclosed as annx-V.
6. Status report of mined out, reclaimed and afforested land as annexure-VI.
7. Actual expenditure incurred in environment measure from Oct-2015 to Mar-2016 as annx-VII.

HINDALCO INDUSTRIES LIMITED

Samri Mines Division, Baba Chowk
At & Post - Kusmi, PIN : 497 224,
Distt. - Balrampur-Ramanujganj (CG), INDIA
Telephone + 91 7778 274326-27,
FAX + 91 7778 274325

REGISTERED OFFICE

Century Bhawan, 3rd Floor,
Dr. Annie Besant Road,
Worli, Mumbai 400 030
Telephone +91 22 6662 6666.

Website www.hindalco.com

E mail hindalco@adityabirla.com
Corporate Identity No- L27020MH1958PLC011238.

06.5.2016

**Status of Compliance from October-2015 to March-2016 of Environmental
Condition laid down by MOEF**

Samri Bauxite Mine

The status of compliance of the conditions (as per point no.4) with reference to, environment clearance letter no.J-11015/353/2007-IA. II(M) dated 27.07.07 of Ministry of Environment & Forests, New Delhi, to maintain production capacity of Samri Bauxite Mine is as under.

A Specific condition:-

- (i) The wild life management plan has been approved.- Annexure-A
- (ii) We accept the condition.
- (iii) The conservation plan for schedule I fauna have been prepared and approved. Annexure-B
- (iv) The report has been submitted to ministry. The rehabilitation of land ousters are not involved in the project.
- (v) Top soil and solid waste is being utilized for simultaneous back filling of mined out area for reclamation purpose and practice is followed.
- (vi) OB is being stacked at earmark location and slope of dump is maintained less than 28 degree/ concurrently reclaimed in the mined out area. All protective measure such as reclaiming walls, bunds are being taken to prevent erosion of soil.
- (vii) Garland drains have been made around the active mining pits coupled with arrester to arrest silt from soil and dumps are maintained.
- (viii) The slope of bench as per provision of approved mining scheme is being maintained.
- (ix) Wet drilling and dust extractors are being used during drilling operations.
- (x) The plantation in reclaimed area is carried out as per plan and being carried out as suggested. The density is being maintained about 2500 plant per hectare with the species like Karanj, accasia, mango, babul, Pears, Jamun, Amla & guava etc. Social forestry is also being encouraged among the local villagers.


**Agent of Mines
Samri Mines Division
Hindalco Industries Ltd**

The ground water table does not intersect our mining operation because of shallow depth of mining.

- (xi) Regular monitoring of ground water quality is being carried out. The analysis reports are being submitted to Regional Office, CECB, Ambikapur.
- (xii) If required, the permission will be taken from competent authority.
- (xiii) 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.
- (xiv) We accept the condition.

(B) General Condition.

- (i) No change in mining technology and scope of working will be done without approval of MOEF New Delhi.
- (ii) Calendar plan will be followed and there will not be any change in calendar plan.
- (iii) The suggestion of local forest department will be implemented for conservation of flora and fauna in and around lease hold area.
- (iv) Ambient Air quality monitoring is being carried out as per guideline and will be followed.
- (v) Data of ambient air quality (RPM, SPM, SO₂, Nox) are being submitted to CECB and will be submitted as per guidelines.
- (vi) Fugitive dust emission from generating sources is being controlled. The dust extractor, wet drilling, regular water spraying with 12 KL water tanker in the mine lease hold area is being carried out regularly.
- (vii) The noise level in working area being maintained below the limit prescribed and will be maintained. The operators of HEMM are being provided earplug/muffs. The proper maintenance of HEMM is being carried out to control noise emission
- (viii) No waste water is generated from the mine however as suggested measures will be taken if required.

- (ix) All workers have provided personal protective equipment and training are also being imparted to them for safety & health in our Group vocational training centre – Samri and will be continued as per guidelines.
- (x) Periodical and Initial medical examination of all workers are being carried out as per provision of Mines Act.
- (xi) Environment cell is already in place at Samri Mines Division headed by GM (Mines) and comprises of suitable qualified persons.
- (xii) In case of final closure of mine the information will be submitted to Regional Office, Ministry of Environment & Forests, Bhopal.
- (xiii) Adequate fund provision is already earmarked for environmental protection measures and will not be diverted to other purpose. The year wise expenditure will be submitted to concern authorities as per guidelines.
- (xiv) The same information is being intimated to Regional Office, Ministry of Environment & Forests, Bhopal.
- (xv) All cooperation is being extended to regulatory authorities and will be extended as earlier.
- (xvi) Although no suggestion/representation has been received by any Panchayat/Local NGO while processing the proposal. However we have forwarded the copy of clearance letter to Panchayat in our area. The copy of same has been already submitted to your good office.
- (xvii) The copy has been displayed by CECB in Balrampur Collectorate.
- (xviii) The information regarding environment clearance has been published in two local new papers namely Hari Bhumi & Ambika Vani. The copy of same has been already submitted to your good office.

Hope the above compliance will be found in order.

Yours truly,
(For Hindalco Industries Limited)



(M K Nayak)
Agent of Mines.
Encl. As Above

Agent of Mines
Samri Mines Division
Hindalco Industries Ltd

कार्यालय प्रधान मुख्य वन संरक्षक (वन्यप्राणी प्रबंधन एवं जैव विविधता
संरक्षण सह मुख्य वन्यप्राणी अभिरक्षक), छत्तीसगढ़
पर्याय गवन मेडिकल कॉलेज रोड, रायपुर

ईमेल: ncd@wcc.gov.in

(Ph. 0771-2552228, Fax 0771-2552227)

क्रमांक/व.प्रा./प्रबंध-12/13/2967

रायपुर दिनांक 07/10/2013

प्रति,

संचालक,
इन्वायरनमेंट क्लियरेंस सेल
भारत सरकार, वन एवं पर्यावरण मंत्रालय,
पर्यावरण भवन, सी.जी.ओ. कॉम्प्लेक्स,
लोधी रोड, नई दिल्ली-111003

विषय:- छत्तीसगढ़ के बलरामपुर जिले (तत्कालीन सरगुजा जिला) में स्थित सामरी बॉक्सार्ट
माईन्स, कुदाग बॉक्सार्ट माईन्स एवं टाटीझरिया बॉक्सार्ट माईन्स की क्षमता बढ़ाये हेतु
इन्वायरमेंट क्लियरेंस।

- 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-11015/357/2007-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.

—0—

कृपया आपके उपरोक्त संदर्भित पत्रों का अवलोकन करने का कष्ट करें। जिसके द्वारा बलरामपुर जिले
(पुराने सरगुजा जिले) के सामरी बॉक्सार्ट खुली खदान (1 LTPA) की क्षमता बढ़ाकर (5LTPA) करने, कुदाग बॉक्सार्ट
खदान (0.4 LTPA) की क्षमता बढ़ाकर (0.6 LTPA) करने तथा टाटीझरिया बॉक्सार्ट 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।

- 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
मंत्रालय 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 बॉक्सार्ट खनन की स्वीकृति प्राप्त कर संस्था द्वारा खनन
का कार्य किया जा रहा है।

1.0 LPTA से बढ़ाकर 5.0 LPTA किया जाना वृद्धि के लिये 0.4 LPTA से बढ़ाकर 0.6 LPTA किया जाना एवं टाटीझरिया के लिये 30,000 TPA से बढ़ाकर 4,00,000 TPA किया जाना प्रस्तावित है। भारत सरकार पर्यावरण व वन विभाग के द्वारा उपरोक्त वृद्धि हेतु प्रथम चरण की स्वीकृति क्रमशः 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 महत्वपूर्ण 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 रूप से वन्य प्राणी संरक्षण व प्रबंधन योजना तैयार की जाकर महाप्रबंधक, (खादान), हिन्डालको इन्डस्ट्रीज के पत्र क्रमांक HIL/SAM/300/2013 दिनांक 2.03.2013 द्वारा प्रस्तुत किया गया है जिसका समग्र रूप 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 वर्षों 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 पाँच, 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 लकड़बग्घं 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 हैं। प्रस्तावित क्षेत्र से 6 से 7 कि.मी.की दूरी पर झारखंड राज्य में भेड़िया अभयारण्य भी स्थापित है। अतः संस्था द्वारा दस वर्षों 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 संबंधित 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 गतिविधियों, स्थानीय ग्रामीणों के लिये आजीविका सृजन, टीकाकरण, जनजागृति कार्यक्रम जैसी गतिविधियों का

कामों पर करण दो 01 वर्षों के लिये राशि रुपये 160 लाख प्रावधानित की गयी है। जिसका क्रियान्वयन जन विभाग के द्वारा किया जायेगा। प्रस्ताव में प्रावधानित बजट का विवरण निम्नानुसार है -

Sl. No.	Works to be done	Cost for Four years (Rs. In lakhs)					Remarks
		1 st Year	2 nd Year	3 rd Year	4 th 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 staff.	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 Biodiversity management committees (BMC's)
Total		55.00	35.00	35.00	35.00	160.00	

14

- वन्यप्राणी संरक्षण योजना का लागत रु. 160.00 लाख वर्तमान दरों पर है, परियोजना में दर्श होना से यह लागत 2013-14 में बढ़ेगी। परियोजना के क्रियान्वयन के समय जो भी लागत आवेगी उसे परियोजना पर लागत वन विभाग में एकमुश्त जमा करानी होगी। जिससे मूल्य वृद्धि के प्रभाव को समाप्त करने में मदद मिलेगी।
- अनुसूचित वन्यप्राणी संरक्षण योजना की एक प्रति संलग्न प्रेषित है। कृपया वन्यप्राणी संरक्षण योजना में प्रावधानित राशि रु. 160.00 लाख एकमुश्त जमा करने हेतु परियोजना प्रस्तावकों को आदेशित करने का कष्ट करें।

संलग्न:-उपरोक्तानुसार।

Ramprakash
(रामप्रकाश) 01/12/13

प्रधान मुख्य वन संरक्षक (वन्यप्राणी)
छत्तीसगढ़, रायपुर

रायपुर दिनांक 01/10/2013

पृष्ठा क्रमांक/व.प्रा./प्रबंध-12/13/ 2968.

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 इन्डस्ट्रीज लिमिटेड, सामरी बॉक्सईट माइन्स, पोस्ट-कुसनी, जिला-सरगुजा, छत्तीसगढ़ की ओर मय योजना की प्रति सहित सूचनार्थ प्रेषित।

Ramprakash
प्रधान मुख्य वन संरक्षक (वन्यप्राणी) 01/12/13
छत्तीसगढ़, रायपुर


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
<i>Butea monosperma</i>	Palas	Fabaceae
<i>Acacia Arabica</i>	Babul	Mimosaceae
<i>Leucena leucophloe</i>	Sabubal	Mimosaceae
<i>Mangifera indica</i>	Aam	Anacardiaceae
<i>Citrus lemon</i>	Nimbu	Rutaceae
<i>Emblica officinalis</i>	Amla	Euphorbiaceae
<i>Ficus hispida</i>	Jungli anjir	Moraceae
<i>Spondias cythera</i>	Kathjamun	Myrtaceae
<i>Terminalia catapa</i>	Badam	Combretaceae
<i>Apluda mutica</i>	Grass	Poaceae
<i>Chloris dolichosta</i>	Grass	Poaceae
<i>Dichanthum annulatum</i>	Grass	Poaceae
<i>Imperata cylindrica</i>	Grass	Poaceae
<i>Themeda quadrivalvis</i>	Grass	Poaceae
<i>Aristida adscensionis</i>	Grass	Poaceae
<i>Eragrostis biferla</i>	Grass	Poaceae
<i>Eragrostis tenella</i>	Grass	Poaceae
<i>Setaria glauca</i>	Grass	Cyperaceae
<i>Thysanolaena maxima</i>	Grass	Graminae
<i>Parthenium hysterophorus</i>	Congress grass	Compositae
<i>Cassia tora</i>	-	Caesalpinaceae
<i>Delonix regia</i>	Kachnar	Caesalpinaceae
<i>Dalbergia sissoo</i>	Sisoo	Caesalpinaceae

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

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

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

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

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

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

Sr. No.	Technical Name	Family	Life Form
292	<i>Dactylectinium annualatum</i>	Poaceae	Therophyte
293	<i>Digetaria bicornis</i>	Poaceae	Hemicryptophyte
294	<i>Digetaria Segetaria</i>	Poaceae	Hemicryptophyte
295	<i>Eragrostis biferia</i>	Poaceae	Therophyte
296	<i>Eragrostis tenella</i>	Poaceae	Therophyte
297	<i>Ischaemum rugosum</i>	Poaceae	Hemicryptophyte
298	<i>Setaria glauca</i>	Cyperaceae	Hemicryptophyte
299	<i>Eulaliopsis binata</i>	Graminae	Hemicryptophyte
300	<i>Thysanolaena maxima</i>	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		
<i>Phalacrocorax niger</i>	Little cormorant	Sch-IV
<i>Nycticorax nycticorax</i>	Night heron	Sch-IV
<i>Ardeola grayii grayii</i>	Paddy bird	Sch-IV
<i>Bubulcus ibis coromandus</i>	Cattle egret	Sch-IV
<i>Eudynamys scolopacea</i>	Indian koel	Sch-IV
<i>Meops philippinus philippinus</i>	Bluetailed bee-eater	Sch-IV
<i>Dinopium benghalense tehminae</i>	Malabar golden backed Woodpecker	Sch-IV
<i>Acridotheres tristis tristis</i>	Common myna	Sch-IV
<i>Nectarinia minima</i>	Small sunbird	Sch-IV
<i>Passer domesticus indicus</i>	Indian house sparrow	Sch-IV
Butterflies		
<i>Hypolimnas bolina Lin.</i>	Great eggfly	-
<i>Euploea core Cramer</i>	Common crow	-
<i>Neptis hylas Moore</i>	Common sailor	-
<i>Eurema hecabe Lin.</i>	Common grass yellow	-
<i>Parantica aglea Stoll.</i>	Glassy tiger	-
Mammals		
<i>Funambulus palmarum</i>	Squirrel	Sch-IV
<i>Sus sucrofa</i>	Wild pig	Sch-III
<i>Herpestes edwardii</i>	Common mongoose	Sch-IV
<i>Vulpus benghalensis</i>	Wild fox	Sch-II
<i>Hystrix indica</i>	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		
<i>Phalacrocorax niger</i>	Little cormorant	Sch-IV
<i>Ardea purpurea manilensis</i>	Eastern purple heron	Sch-IV
<i>Nycticorax nycticorax</i>	Night heron	Sch-IV
<i>Ardeola grayii grayii</i>	Paddy bird	Sch-IV
<i>Dupetor flavicollis</i>	Black bittern	Sch-IV
<i>Ardea alba modesta</i>	Large egret	Sch-IV
<i>Bubulcus ibis coromandus</i>	Cattle egret	Sch-IV
<i>Milvus migrans govinda</i>	Common pariah kite	Sch-IV
<i>Haliastur indus indus</i>	Brahminy kite	Sch-IV
<i>Vanellus indicus indicus</i>	Redwattled lapwing	Sch-IV
<i>Tringa hypoleucos</i>	Common sandpiper	Sch-IV
<i>Gelochelidon nilotica nilotica</i>	Gullbilled tern	Sch-IV
<i>Eudynamys scolopacea</i>	Indian koel	Sch-IV
<i>Halcyon smyrnensis fusca</i>	Indian white breasted Kingfisher	Sch-IV

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

तार
Telegram: PARYAVARAN,
NEW DELHI

दूरभाष :
Telephone :
टेलिक्स (द्विभाषीय) :

Telex : (bi-lingual) : W-66185
FAX : 4360678

भारत सरकार
पर्यावरण एवं वन मंत्रालय
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS
पर्यावरण भवन, सी० जी० एच० कॉम्प्लेक्स
PARYAVARAN BHAWAN, C.O. COMPLEX
लोदी रोड, नई दिल्ली - 110003
LODHI ROAD, NEW DELHI - 110003
Dated: 12th March, 1996.

SAMRI

No. 8-22/95-FC

To

The Secretary (Forests)
Government of Madhya Pradesh
Bhopal.

SJG
Suraj Gupta

Sub: Diversion of 798.827 ha. of revenue forest land in favour of M/s HINDALCO Industries Ltd. for Bauxite mining in District Sarguja.

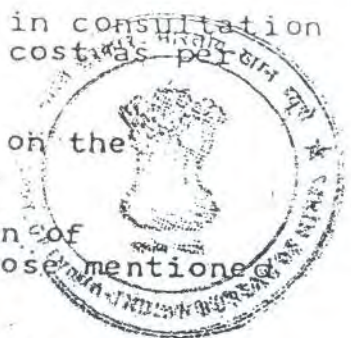
Sir,

I am directed to refer to your letter no.F.5/18/95/10/3 dated 9.3.95 on the above mentioned subject seeking prior approval of the Central Government in accordance with Section-2 of the Forest (Conservation) Act, 1980, and to say that the proposal has been examined by the Advisory Committee constituted by the Central Government under Section-3 of the aforesaid Act.

2. After careful consideration of the proposal of the State Government and on the basis of the recommendation of the above mentioned Advisory Committee, the Central Government hereby conveys its approval under Section-2 of the Forest (Conservation) Act, 1980 for diversion of 798.827 ha. of revenue forest land in favour of M/s HINDALCO Industries Ltd. for Bauxite mining in District Sarguja subject to the following conditions:

- i) Legal status of forest land shall remain unchanged.
- ii) Compensatory afforestation shall be carried out over double the degraded forest land at the project cost.

- iii) Reclamation of the mining area will be done in consultation with the State Forest Deptt. at the project cost as per the plan prepared in this regard.
- iv) Demarcation of the mining area will be done on the ground at the project cost.
- v) Forest land will not be used for construction of buildings etc. and any purpose other than those mentioned in the proposal.
- vi) Lease period shall remain coterminus with lease under MMRD Act subject to maximum of 20 years.
- vii) Free fuelwood will be provided to the labourers and staff working at the project site at the project cost.
- viii) A ny other condition the State Govt. may impose.
- ix) This clearance is subject to the environmental clearance of the project under the Environment Protection Act.



Yours faithfully,

(R.K. CHAUDHRY)

Asstt. Inspector General of Forests.

Copy to:

1. The P rincipal Chief Conservator of Forests Government of Madhya Pradesh, Bhopal.
2. Nodal Officer, Office of the Principal Chief Conservator of Forests, Govt. of Madhya Pradesh, Bhopal.
3. The CCF (Central), Regional Office, Bhopal.
4. RO(HQ), New Delhi.
5. Guard file.

(R.K. CHAUDHRY)
AIGF.

APPROVED

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

Duration: January-February-March-2016

Name of Industry:-



[Signature]
Agent of Mines
Samri Mines Division
Hindalco Industries Ltd.

M/s. Hindalco Industries Limited.,

Name of Laboratory:-



Recognised by MoEF (GOI) Notifn. No. D.L.33004/99 Dt.24.10.2007
NABL T-1550 (Chemical), T-1826 (Biological), T-2344 (Mechanical) dt.04/10/2012 valid up to
03.10.2016

Accredited under the QCI-NABET Scheme for EIA Consultant
BIS vide No.CI/CQAPD/OSL (7124116) dt.16.12.2011
Certified by ISO 9001:2008, ISO 14001:2004, ISO 18001:2007
Head Office: 60, Bajiprabhu Nagar, Nagpur-440 033, MS
Lab. : FP-34, 35, Food Park, MIDC, Butibori, Nagpur- 441122
Ph.: (0712) 2242077, 9373287475 Fax: (0712) 2242077

Email: labngp@anacon.in
info@anacon.in

Website: www.anaconlaboratories.com,

Foreword

The protection of environment plays a crucial role in maintaining the local environment quality for any mining industry. Hence compliance of the statutory requirements becomes very important to conserve the ecological balance within and surrounding the mine area. Therefore, environment protection is becoming a prerequisite for sustainable development. In line with this requirement, the management of **M/s Hindalco Industries Ltd.** has adopted a corporate responsibility of environment protection.

In order to comply with the Environment protection act, to fulfill statutory requirement and to be in tune with Environmental Preservation and sustainable development, **M/s Hindalco Industries Ltd.** has retained **ANACON LABORATORIES PVT. LTD.,** Nagpur as Environment Consultants and for various Environmental issues related to their mines.

This report presents the Environmental Status for the period **January-2016 to March-2016** as compliance to the statutory requirements.

The co-operation extended by the Staff and Management of **M/s Hindalco Industries Ltd.** during the work execution period is gratefully acknowledged.

for **ANACON LABORATORIES PVT. LTD.**



[Handwritten Signature]

Authorized Signatory

Place : Nagpur

Date : March, 2016



1.1 Introduction

HINDALCO INDUSTRIES LIMITED (Hindalco) is one among the flagship 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 Aluminium.

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. HINDALCO possesses bauxite mine leases of Kudag, Samri and Tatijharia 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 Environmental monitoring of parameters for assessing pollution levels and preparation of monthly report (January, February & March-2016) as per the requirement of Chhattisgarh Environment Conservation Board (CECB) and Ministry of Environment and Forest (MoEF) for Samri mining leases in Balrampur District, Chhattisgarh State.

1.2 Background Information of Samri Mine

HINDALCO was granted Samri Bauxite mining lease over an area of 2146.746 hec in Samri, Dumarkholi, Gopatu villages in Post Office & Tehsil Samri (Kusmi) of Balrampur district, Chhattisgarh on 24/06/1998 for a period of 20 years. The mining operations were started on 25/05/1999. The production capacity of Bauxite is 5.0 Lakh Tonnes Per Annum (LTPA).

1.3 Salient Features of Samri Bauxite Mine

The deposits occur in Samri block, Post Office & Tahsil Samri (Kusmi) 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 Samri Bauxite Mines

S.No.	Particulars	Details
1.	Survey of India Topo sheet No.	64 M /15
2.	Latitude	23 ^o 23' 02"N to 23 ^o 27' 05"N
3.	Longitude	83 ^o 53' 50"E to 83 ^o 57' 59"E
4.	Elevation	1140-m above Mean Sea Level
5.	Climatic Conditions (as per IMD, Ambikapur)	Annual maximum temperature : 30.3 ^o C Annual minimum temperature : 17.7 ^o C Average annual rainfall : 1401.1 mm
6.	Mining lease area	2146.746 hec.
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 (146.06 km, ESE)
12.	Nearest Town	Ambikapur (127 km, SW)

1.4 Environmental Monitoring

Regular monitoring of environmental parameters is of immense importance to assess status of environment during mining operation. With the knowledge of baseline conditions, monitoring program will serve as an indicator for any deterioration in environmental 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 for the control of pollution since the efficiency of control measures can only be determined through monitoring.

In order to find out the impact of mining activity on sensitive receptors, it is necessary to monitor Environmental Quality to know the level of concentrations of pollutants within and around the mining lease area. Accordingly Hindalco Industries through Anacon Laboratories Pvt. Ltd., Nagpur has been monitoring at following locations for air, water and Noise on a 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 Samri mine lease area as shown in (Fig. 1).

Table 2

Locations of Ambient Air Quality Monitoring (AAQM) & Fugitive Emission
(2146.746 hec.)

S.No.	Core zone	Sr. No.	Buffer zone
1	Samri-Gopatu/Near Weigh Bridge	5	Sairaidh Campus
2	Rajendrapur/Near Mining Area	6	Jaljali Village
3	Kutku Village/Near V.T.Center	7	Tatijharia Village/Near Weigh Bridge
4	Dumerkholi/Near Mining Area	8	Piprapat/Near 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. Anacon Laboratories Pvt. Ltd., Nagpur is carrying out regular monitoring for PM_{2.5}, RPM(PM₁₀), SO₂, NO_x and SPM, RSPM, SO₂, NO_x, Pb, Hg, As and Cr at above Ambient Air Quality Monitoring (AAQM) locations and Fugitive Emission. The dust fall rate was measured in the mining area and Samri chowk during January-February-March-2016. The AAQM and Fugitive Emission sampling sites are selected considering seasonal variation in wind speed and wind direction.

Sampling Duration and Frequency

Ambient air quality monitoring and Fugitive Emission monitoring was carried out for the parameters PM_{2.5}, RPM (PM₁₀), SO₂, NO_x and SPM, RSPM, SO₂, NO_x Pb, Hg, As and Cr, from January-February-March-2016 as per CPCB norms. Sampling Duration and Frequency is given in (Table 3).

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



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 Suspended Particulate Matter (SPM), Respirable Particulate Matter (RPM), Sulphur Dioxide (SO_2), Oxides of Nitrogen (NO_x), Pb, Hg, As and Cr were monitored for establishing the baseline status. SPM and RPM was collected with the help of Respirable Particulate Sampler operating 24 hours by drawing air which passes through the cyclone at the rate of $1.0 - 1.3 \text{ m}^3/\text{min}$ which collects the particles less than $10 \mu\text{m}$ diameter over glass fiber filter paper and the bigger particulates from 10 to $100 \mu\text{m}$ are collected into the cup provided at the bottom of the cyclone. The dust deposited over the filter paper is measured as RPM and the smaller particulates from $2.5 \mu\text{m}$ are collected into the Membrane Filter Paper. The dust fall rate was measured using dust fall jar. The jar was exposed for one month in the mining area and Samri-Gopatu during pre and post monsoon period. The jar was filled with 2 lit of distilled water. The water in the jar is mixed with copper sulphate solution (0.02 N solution) to prevent any growth of algae. The water level in the jar is constantly maintained in such a way that 2 lit of water is always retained. The measurement techniques used for various pollutants and other details are given in (Table 4).

Sampling was carried out continuously for 24 hourly monitoring twice a week at each station during the stipulated study period using pre-calibrated Respirable Dust Samplers in each of the stations.

Earmarked samples were collected for Particulate Matter- PM_{10} , Particulate Matter- $\text{PM}_{2.5}$, Sulphur Dioxide (SO_2) and NO_x for 24 hourly. Collected samples were sent to laboratories for analysis.

The baseline data of air environment is generated for the parameters namely: Suspended Particulate Matter (SPM), Particulate Matter (PM_{10}), Particulate Matter ($\text{PM}_{2.5}$), Sulphur Dioxide (SO_2), Oxides of Nitrogen (NO_x), Lead (Pb), Mercury (Hg), Arsenic (As) and Chromium (Cr). **Table-3.0**


tion		Hindalco Industries Limited Samri Mining Environmental Status Report for January-2016 To March-2016	Introduction
------	--	--	---------------------

Table-3.0

Parameters	Sampling frequency
Suspended Particulate Matter	24 hourly sample twice a week for Three months
Respirable Particulate Matter	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 _x)	24 hourly sample twice a week for Three months
Pb, Hg, As, Cr	8 hourly basis for 24 hour sample for three months

Table 4.0

Measurement Techniques for various pollutants

S.No.	Parameter	Technique	Technical Protocol	Minimum Reportable Value (µg/ m ³)
1	Suspended Particulate Matter	Respirable Dust Sampler (Gravimetric Method)	IS-5182 (Part-23)	5
2	Respirable Particulate Matter	Respirable Dust Sampler (Gravimetric Method)	IS-5182 (Part-23)	5
3	Particulate Matter 2.5	Respirable Dust Sampler (Gravimetric Method)	Gravimetric Method	5
4	Sulphur Dioxide	Modified West and Gaeke	IS-5182 (Part - II)	4
5	Oxide of Nitrogen	Jacob & Hochheiser Method	IS-5182 (Part - VI)	4
6	Pb, As, Hg, Cr	Acid Digestion Method	EPA Method	0.1
7	Dust Full	Gravimetric	IS-5182 (Part-I)	-

1.6 Fugitive Emission Monitoring

The summary of Fugitive Emission monitoring results for the month of January-February-March-2016 are presented in detail in **Table 6.0**. 98th percentile; maximum and minimum values etc have been computed from the collected raw data for all the Fugitive monitoring station. The data has been compared with the standards prescribed by Central Pollution Control Board (CPCB)/NAAQ for residential and rural zone.

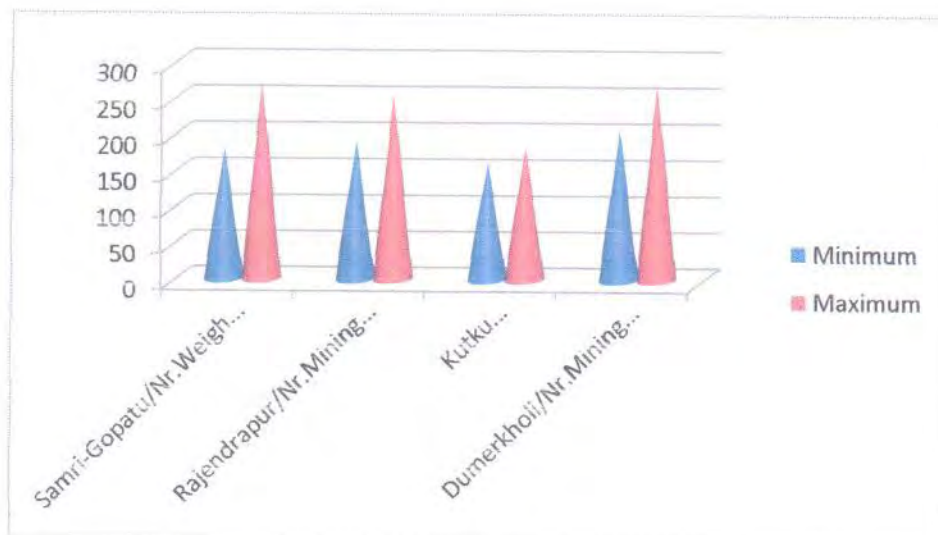
1.6.1 Presentation of Results.

Suspended Particulate Matter-SPM

The minimum and maximum concentrations for Suspended Particulate Matter (SPM) were recorded as 163 $\mu\text{g}/\text{m}^3$ and 273 $\mu\text{g}/\text{m}^3$ respectively. The average concentrations were ranged between 171 to 260 $\mu\text{g}/\text{m}^3$. and 98th percentile values range between 179 to 272 $\mu\text{g}/\text{m}^3$ in the study area (**Table 6**).

Graphical Presentation Of Fugitive Emission Monitoring

SPM

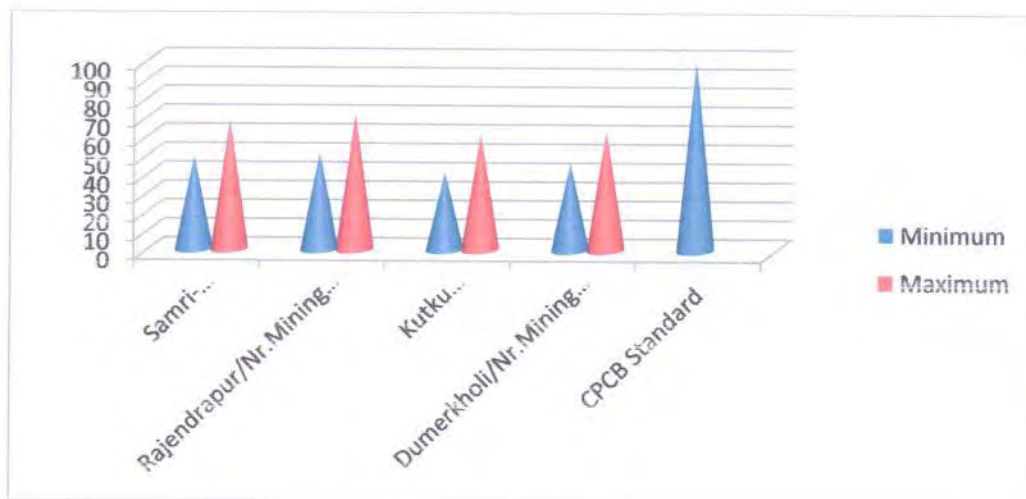




Respirable Suspended Particulate Matter –RSPM

The minimum and maximum concentrations for RSPM were recorded as 41 $\mu\text{g}/\text{m}^3$ and 71 $\mu\text{g}/\text{m}^3$ respectively. The average values were observed to be in the range of 47 to 67 $\mu\text{g}/\text{m}^3$ and 98th percentile values ranged between 52 to 71 $\mu\text{g}/\text{m}^3$ in the study area (Table 7).

Graphical Presentation Of Fugitive Emission Monitoring RSPM



Particulate Matter -PM_{2.5}

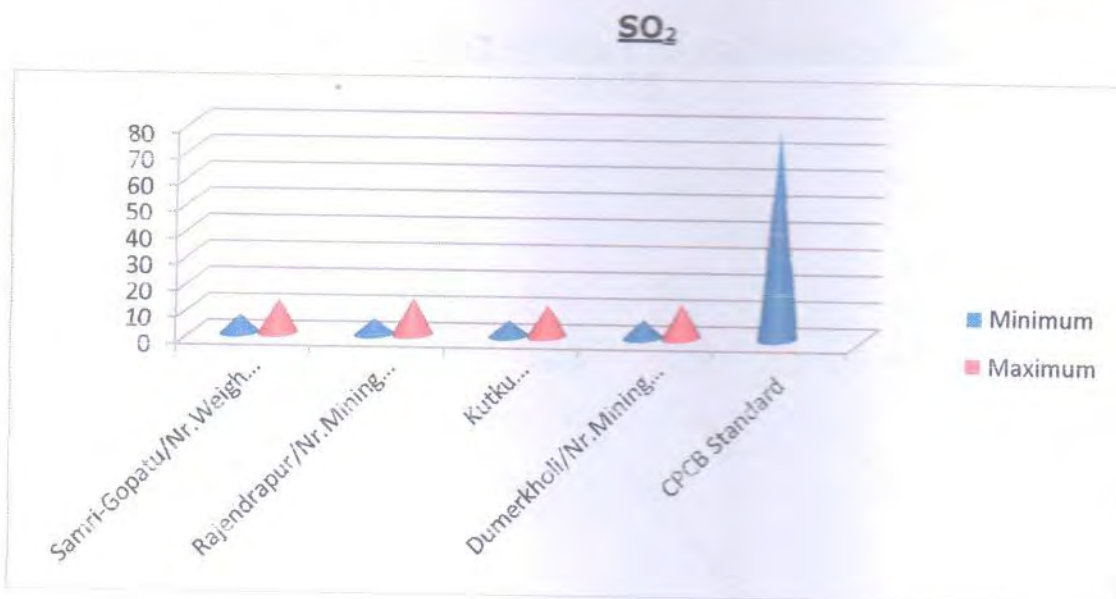
The minimum and maximum values of PM_{2.5} concentrations varied between 16 to 32 $\mu\text{g}/\text{m}^3$ respectively. The average values range between 20 to 28 $\mu\text{g}/\text{m}^3$ and 98th percentile values varied between 21 to 32 $\mu\text{g}/\text{m}^3$ (Table 8).



Sulphur Dioxide (SO₂)

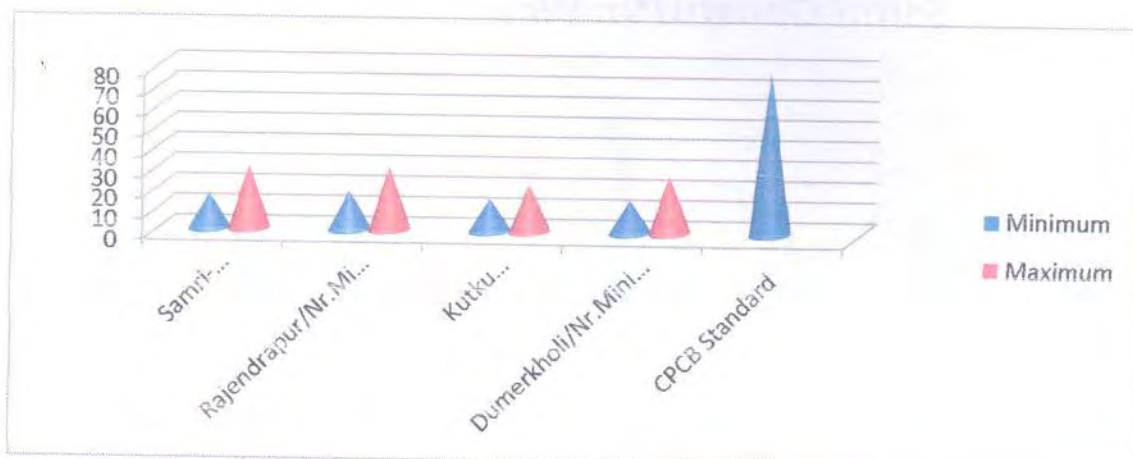
The minimum and maximum SO₂ concentrations were recorded as 6 µg/m³ and 14 µg/m³ respectively. The average values were observed to be in the range of 8 to 12 µg/m³ and 98th percentile values varied between 9 to 14 µg/m³ (Table 9).

Graphical Presentation Of Fugitive Emission Monitoring



Nitrogen Oxide (NO_x)

The minimum and maximum NO_x concentrations were recorded as 16 µg/m³ and 28 µg/m³ respectively. The average concentrations were ranged between 18 to 28 µg/m³ and percentile values varied between 19 to 31 µg/m³ (Table 10).





Lead (Pb)

/m³ and
12 µg/

The minimum and maximum Lead detected between <0.005 to 0.038 µg/m³ respectively. The average Lead detected between <0.005 to 0.033 µg/m³ & 98th percentile values varied between <0.005 to 0.038 µg/m³ in the study region. **(Table 11).**

Mercury (Hg)

The maximum concentrations of Hg varied 0.023 µg/m³ respectively. The average concentration varied 0.021 µg/m³ 98th percentiles values varied 0.023 µg/m³ in the study region. **(Table 12).**

Arsenic (As)

The maximum concentrations of As varied 0.24 µg/m³ respectively. The average concentration varied 0.23 µg/m³ and 98th percentiles values varied 0.24 µg/m³ in the study region **(Table 13).**

Chromium (Cr)

Chromium was not detected at any of the locations in SPM samples as well as RSPM Samples.

g/m³ and
m³ and

1.7 Ambient Air Quality (Buffer Zone)

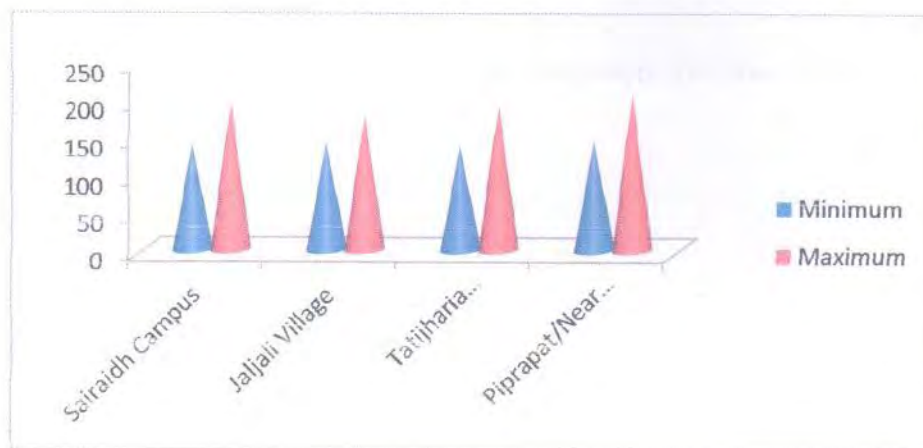
The background levels of SPM, RPM (PM_{10}), $PM_{2.5}$, SO_2 , NO_x , Pb, Hg, As and Cr measurements are required to compute Ambient Air Quality. The sampling locations are selected at the above mentioned locations in downwind and upwind directions of the mine. The Minimum, Maximum concentration, Arithmetic mean (AM), Geometric mean (GM) and 98 Percentile are presented in tabular form (**Table 6**).

1.7.1 Presentation of Results.

The summary of Ambient Air Quality monitoring results for the month of January-February-March-2016 are presented in detail in **Table 3**. 98th percentile; maximum and minimum values etc have been computed from the collected raw data for all the 4 monitoring stations. The data has been compared with the standards prescribed by Central Pollution Control Board (CPCB)/NAAQ for residential and rural zone.

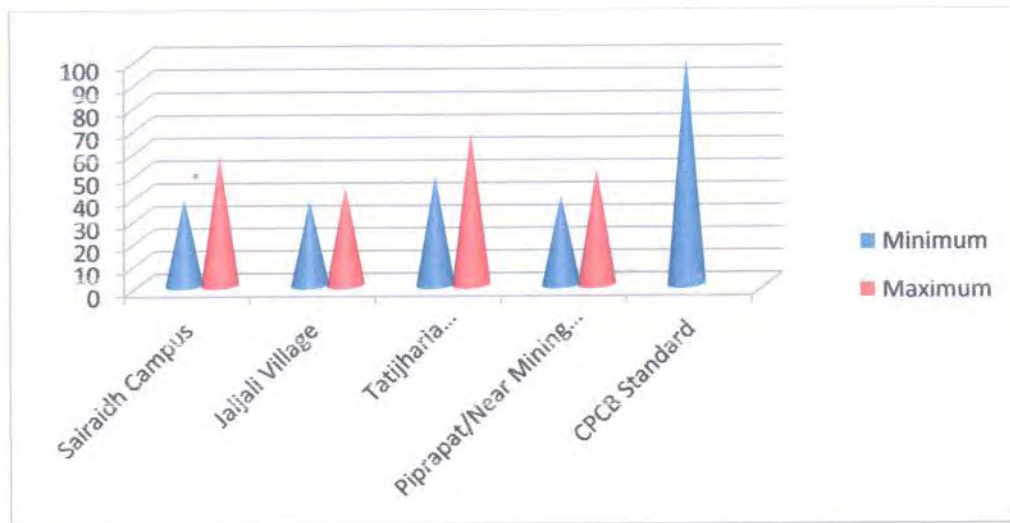
Suspended Particulate Matter-SPM

The statistical analysis of SPM is presented in **Table 6** for the mining area. The minimum and maximum values varied between 139 to 207 $\mu g/m^3$ respectively during the study period at all the 4 locations. The average values ranged between 152 to 195 $\mu g/m^3$ and 98th percentile values ranged between 163 to 207 $\mu g/m^3$ in the study area.



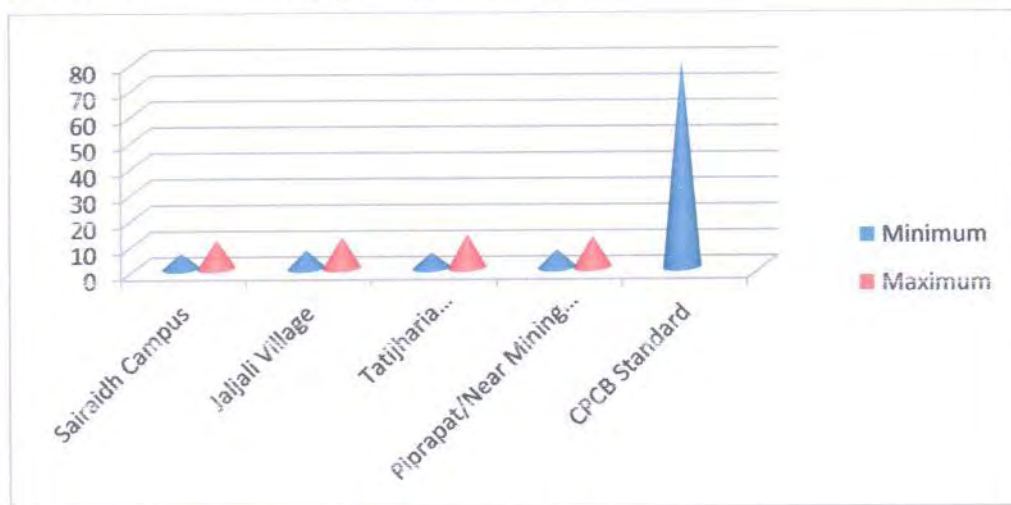
Particulate Matter-RSPM

The minimum and maximum values of RSPM varied between 37 to 67 $\mu\text{g}/\text{m}^3$ respectively (**Table 7**). The average values varied between 40 to 62 $\mu\text{g}/\text{m}^3$. The 98th percentile values varied between 43 to 67 $\mu\text{g}/\text{m}^3$ in the mining area. The overall values of SPM and RSPM were well within the CPCB limits prescribe for industrial and residential area in the study area during the study period.



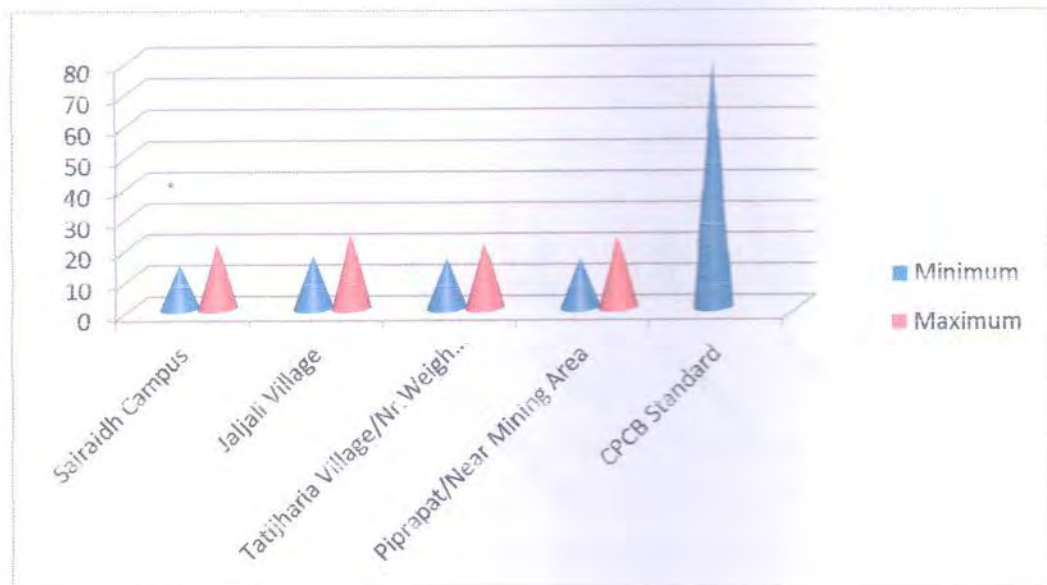
Sulphur Dioxide (SO₂)

The minimum and maximum values of SO₂ concentrations varied between 6 to 11 $\mu\text{g}/\text{m}^3$ respectively. The average values range between 7 to 11 $\mu\text{g}/\text{m}^3$ and 98th percentile values varied between 8 to 13 $\mu\text{g}/\text{m}^3$ (**Table 9**).



Nitrogen Oxide (NO_x)

The minimum and maximum values of NO_x concentrations varied between 14 to 24 $\mu\text{g}/\text{m}^3$ respectively. The average values range between 16 to 21 $\mu\text{g}/\text{m}^3$ and 98th percentile values varied between 17 to 24 $\mu\text{g}/\text{m}^3$ (Table 10).



Lead (Pb)

The minimum and maximum Lead detected between <0.005 to 0.027 $\mu\text{g}/\text{m}^3$ respectively. The average Lead detected between <0.005 to 0.024 $\mu\text{g}/\text{m}^3$ and 98th percentile values varied between <0.005 to 0.027 $\mu\text{g}/\text{m}^3$ in the study region

(Table 11).

Mercury (Hg)

The maximum concentrations of Hg varied 0.023 $\mu\text{g}/\text{m}^3$ respectively. The average concentration varied 0.021 $\mu\text{g}/\text{m}^3$ 98th percentiles values varied 0.023 $\mu\text{g}/\text{m}^3$ in the study region.

(Table 12).



ween 14
and 98

Arsenic (As)

Arsenic was not detected at any of the locations in SPM samples as well as RSPM Samples.

(Table 13).

Chromium (Cr)

Chromium was not detected at any of the locations in SPM samples as well as RSPM Samples.

The dust fall rate was measured by exposing a jar during January-February-March-2016 in Rajendrapur/Nr.Mining Area and Samri-Gopatu/Nr.Weigh Bridge. The dust fall rate was observed to be 21.22 and 19.78 MT/km²/month respectively as given in **(Table 14)**.

Overall the ambient air concentrations of SPM, RSPM, SO₂, NO_x, Pb, Hg, As, Cr and Dust fall were well within the limits of concentrations promulgated by CPCB, New Delhi in the study area.

027 µg/m³
percent

tively. The
g/m³ in t



1.8 Meteorology: Wind Pattern

The data of wind pattern collected during the study period (Jan-Feb-March 2016) indicates that the wind was blowing predominantly from (NNE and NE) directions, during study period, for 6.67 % wind was found to be calm. The details of wind pattern in the form of wind frequency distribution are presented in table. The wind rose diagram and graphical illustration is presented in Figures 1 & 2 respectively.

Table.1
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	0.08368	0.01255	0	0	0	0	0.09583
2	11.25 - 33.75	0.14226	0.01674	0	0	0	0	0.15833
3	33.75 - 56.25	0.12552	0	0	0	0	0	0.125
4	56.25 - 78.75	0.05021	0.00837	0	0	0	0	0.05833
5	78.75 - 101.25	0.05858	0.00418	0	0	0	0	0.0625
6	101.25 - 123.75	0.0251	0.00418	0	0	0	0	0.02917
7	123.75 - 146.25	0.0251	0.01255	0	0	0	0	0.0375
8	146.25 - 168.75	0.01674	0.00418	0	0	0	0	0.02083
9	168.75 - 191.25	0.00418	0	0	0	0	0	0.00417
10	191.25 - 213.75	0.03766	0.00418	0	0	0	0	0.04167
11	213.75 - 236.25	0.01255	0.01255	0.00418	0	0	0	0.02917
12	236.25 - 258.75	0.00418	0.00837	0.00418	0	0	0	0.01667
13	258.75 - 281.25	0.00837	0.0251	0	0	0	0	0.03333
14	281.25 - 303.75	0.02092	0.02929	0.00418	0	0	0	0.05417
15	303.75 - 326.25	0.03347	0.04184	0.00837	0	0	0	0.08333
16	326.25 - 348.75	0.04603	0.02929	0.00418	0	0	0	0.07917
	Sub-Total	0.69167	0.2125	0.025	0	0	0	0.92917
	Calms							0.06667
	Missing/Incomplete							0.00417
	Total							1

ction



SUMMARY OF WIND PATTERN

at the w
 d was fou
 d in table

Season	First Predominant Wind Direction	Second Predominant Wind Direction	Calm Condition
Jan-Feb-March 2016	NNE (15.8%)	NE (12.5%)	6.67 %

Total

0.09583

0.15833

0.125

0.05833

0.0625

0.02917

0.0375

0.02083

0.00417

0.04167

0.02917

0.01667

0.03333

0.05417

0.08333

0.07917

0.92917

0.06667

0.00417

1

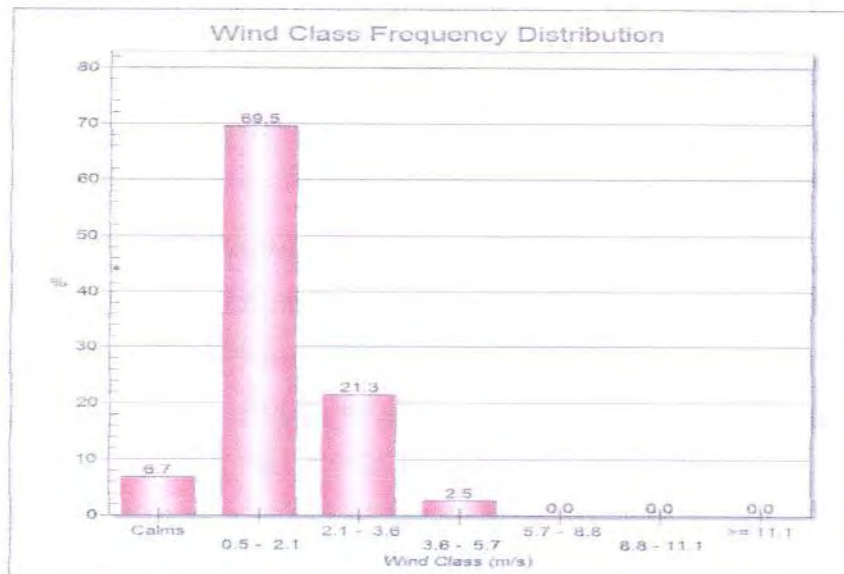


Figure.01: Wind Class Frequency Distribution

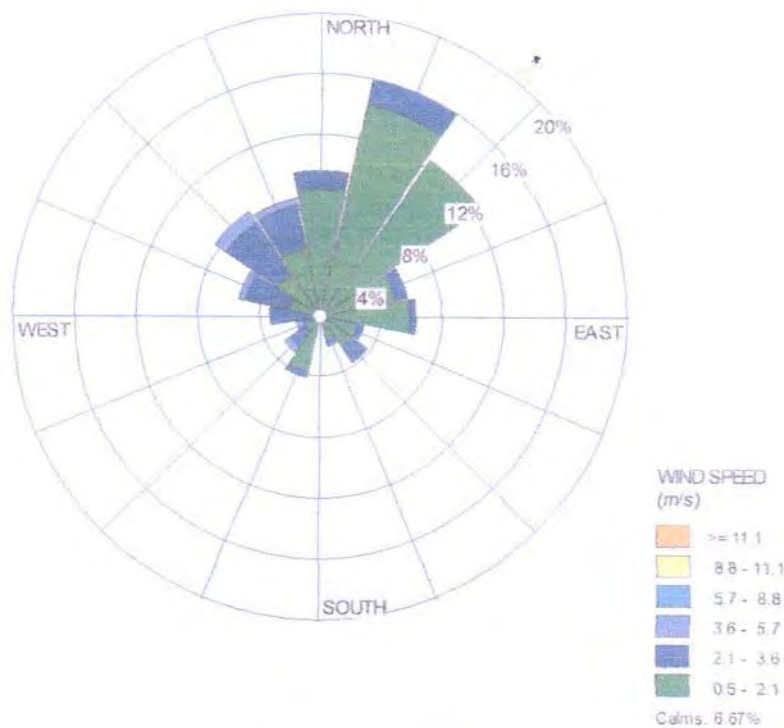


Figure.02: Wind Rose Diagram (Jan-Feb-March, 2016)



1.9 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 and 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 daytime only. The daytime equivalent noise levels, when all the machineries are in operation, shall be minimized as if machineries have been provided with noise control equipment. Noise monitoring is carried out on monthly basis at three locations. The noise levels each month are shown in (Fig. 3).


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.

Instrument used for monitoring

Noise levels were measured using integrated sound level meter manufactured by Envirotech made in India (Model no. SLM-100). This instrument is capable of measuring Sound Pressure Level (SPL), L_{eq} .

Introduction		<p align="center">Hindalco Industries Limited Samri Mining Environmental Status Report for January-2016 To March-2016</p>	<p align="center">Introduction</p>
--------------	--	--	---

75, has **Method of Monitoring**

ift period Sound Pressure Level (SPL) measurements were monitored at three 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 three 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 3 locations are found to be below the stipulated standard of CPCB for Industrial area as 75dB (A) and 70dB (A) for day and night respectively as given in **(Table 15)**

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 village Samri, Kudag, Rajnariya, Saraidih, Rajendrapur and surface water sample from Nallahs nearby Samri mines. The physico-chemical analysis of water samples collected during study period reported the average of three months given in **(Table 16)**. 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. Surface water quality is satisfactory as per IS: 10500-2012. Thus the impacts due to mining activities in each month have been found to be insignificant.



Hindalco Industries Limited
Samri Mining Environmental Status
Report for January-2016 To March-2016

Introduction

Table 6
Statistical Analysis of SPM

Unit: $\mu\text{g}/\text{m}^3$

Location	Month & Year	Min.	Max.	A.M.	G.M.	98%ile
Fugitive Emission (Core Zone):-						
Samri-Gopatu/ Nr.weigh bridge	January-2016	227	261	244	244	260
	February-2016	239	273	256	256	272
	March-2016	182	197	190	190	197
Rajendrapur/ Nr.Mining Area	January-2016	208	239	224	224	238
	February-2016	237	256	247	247	256
	March-2016	192	207	200	200	207
Kutku Village/ Nr.V.T. Center	January-2016	163	179	171	171	179
	February-2016	172	186	179	179	186
	March-2016	169	181	175	175	181
Dumerkholi/ Nr.Mining Area	January-2016	231	259	245	245	258
	February-2016	246	273	260	260	272
	March-2016	209	246	228	228	245

Location	Month & Year	Min.	Max.	A.M.	G.M.	98%ile
Buffer Zone :-						
Sairaidh Campus	January-2016	172	187	180	180	187
	February-2016	183	196	190	190	196
	March-2016	141	169	155	155	168
Jaljai Village	January-2016	154	163	159	159	163
	February-2016	168	179	174	174	179
	March-2016	143	167	155	155	167
Tatijharia Village/ Nr. Weigh bridge	January-2016	151	181	166	166	180
	February-2016	157	193	175	175	192
	March-2016	139	164	152	152	164
Piprapat/ Nr.Mining Area	January-2016	146	173	160	160	172
	February-2016	167	194	181	181	193
	March-2016	182	207	195	195	207

Conclusion-A:-

- 1) Samri-Gopatu/ Nr.weigh bridge Lease Area Core Zone: For the Months of Jan-Feb-March-2016 Average of SPM is $230 \mu\text{g}/\text{m}^3$
 - 2) Rajendrapur/Nr.Mining Lease Area Core Zone:- For the Months of Jan-Feb-March-2016 Average of SPM is $224 \mu\text{g}/\text{m}^3$
 - 3) Kutku Village / Nr.V.T. Center Lease Area Core Zone:- For the Months of Jan-Feb-March-2016 Average of SPM is $175 \mu\text{g}/\text{m}^3$
 - 4) Dumerkholi/ Nr.Mining Lease Area Core Zone:- For the Months of Jan-Feb-March-2016 Average of SPM is $244 \mu\text{g}/\text{m}^3$
- The Average Concentration of SPM within the core zone of Samri Lease is $218 \mu\text{g}/\text{m}^3$.

Conclusion-B:-

- 1) Sairaidh Campus Lease Area Buffer zone:- For the Months of Jan-Feb-March-2016 Average of SPM is $175 \mu\text{g}/\text{m}^3$.
 - 2) Jaljai Village Lease Area Buffer zone:- For the Months of Jan-Feb-March-2016 Average of SPM is $163 \mu\text{g}/\text{m}^3$.
 - 3) Tatijharia Village/ Nr. Weigh bridge Buffer zone:- For the Months of Jan-Feb-March-2016 Average of SPM is $164 \mu\text{g}/\text{m}^3$
 - 4) Piprapat/ Nr.Mining Area Buffer zone:- For the Months of Jan-Feb-March-2016 Average of SPM is $179 \mu\text{g}/\text{m}^3$.
- The Average Concentration of SPM within the Buffer Zone of Samri Lease is $170 \mu\text{g}/\text{m}^3$.



Monthwise Summary of Statistical Analysis of SPM

3.0 Fugitive Emission (Core Zone):-

3.0.1 Presentation of Results.

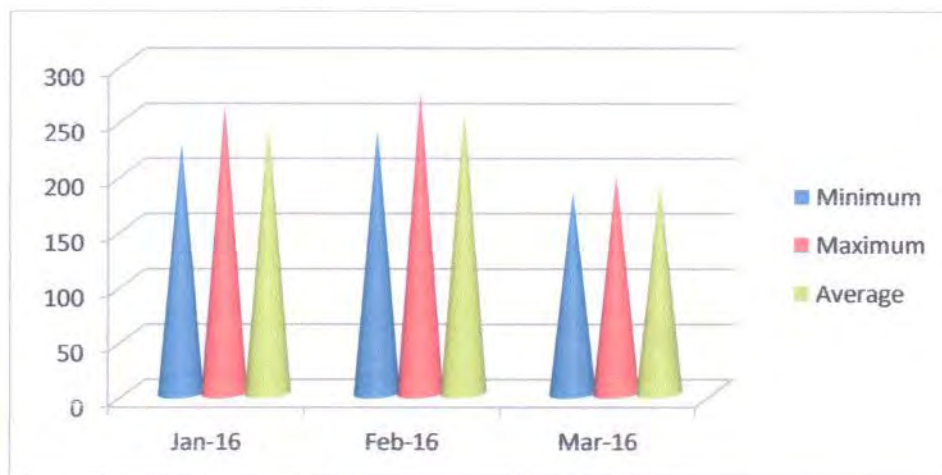
The summary of Statistical Analysis of SPM results for the month of January 2016 to March-2016 are presented in detail in **Table 6**. 98th percentile; maximum, minimum and average values etc have been computed from the collected raw data for all the Fugitive emission monitoring station.

Samri-Gopatu/ Nr.weigh bridge

For the month of January-2016 the minimum and maximum concentrations for SPM were recorded as 227 $\mu\text{g}/\text{m}^3$ and 261 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 244 $\mu\text{g}/\text{m}^3$.

For the month of February-2016 the minimum and maximum concentrations for SPM were recorded as 239 $\mu\text{g}/\text{m}^3$ and 273 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 256 $\mu\text{g}/\text{m}^3$.

For the month of March-2016 the minimum and maximum concentrations for SPM were recorded as 182 $\mu\text{g}/\text{m}^3$ and 197 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 190 $\mu\text{g}/\text{m}^3$.



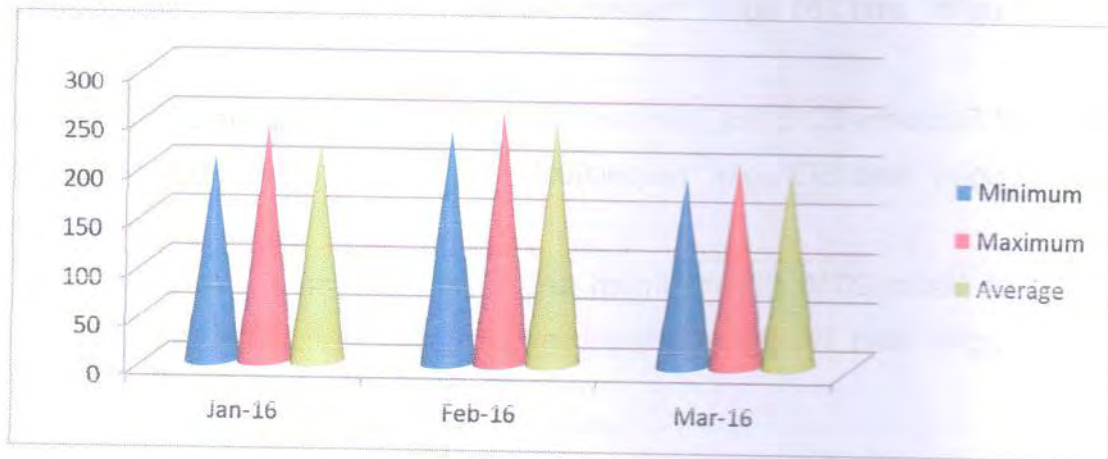
Graph :- Samri-Gopatu/ Nr.weigh bridge

Rajendrapur/ Nr.Mining Area

For the month of January-2016 the minimum and maximum concentrations for SPM were recorded as $208 \mu\text{g}/\text{m}^3$ and $239 \mu\text{g}/\text{m}^3$ respectively and average concentration of $224 \mu\text{g}/\text{m}^3$.

For the month of February-2016 the minimum and maximum concentrations for SPM were recorded as $237 \mu\text{g}/\text{m}^3$ and $256 \mu\text{g}/\text{m}^3$ respectively and average concentration of $247 \mu\text{g}/\text{m}^3$.

For the month of March-2016 the minimum and maximum concentrations for SPM were recorded as $192 \mu\text{g}/\text{m}^3$ and $207 \mu\text{g}/\text{m}^3$ respectively and average concentration of $200 \mu\text{g}/\text{m}^3$.



Graph:- Rajendrapur/ Nr.Mining Area

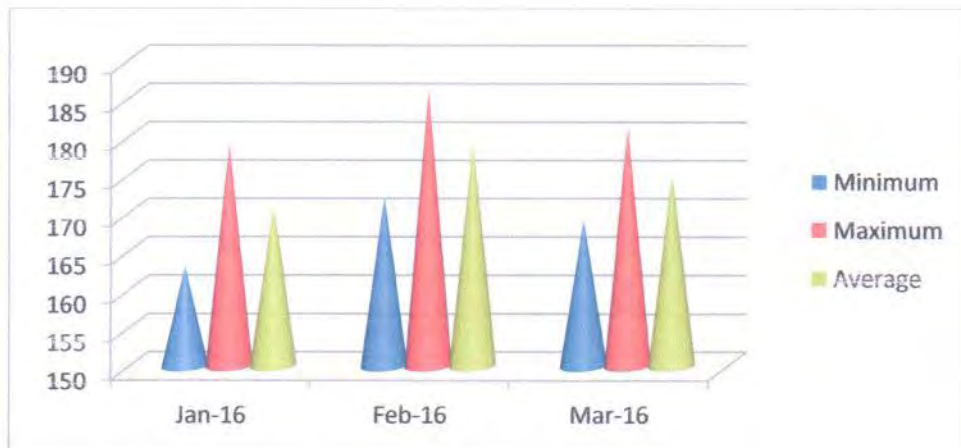


Kutku Village/ Nr.V.T. Center

For the month of January-2016 the minimum and maximum concentrations for SPM were recorded as 163 $\mu\text{g}/\text{m}^3$ and 179 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 171 $\mu\text{g}/\text{m}^3$.

For the month of February-2016 the minimum and maximum concentrations for SPM were recorded as 172 $\mu\text{g}/\text{m}^3$ and 186 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 179 $\mu\text{g}/\text{m}^3$.

For the month of March-2016 the minimum and maximum concentrations for SPM were recorded as 169 $\mu\text{g}/\text{m}^3$ and 181 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 175 $\mu\text{g}/\text{m}^3$.



Graph:- Kutku Village/ Nr.V.T. Center

Dumerkholi/ Nr.Mining Area

For the month of January-2016 the minimum and maximum concentrations for SPM were recorded as 231 $\mu\text{g}/\text{m}^3$ and 259 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 245 $\mu\text{g}/\text{m}^3$.

For the month of February-2016 the minimum and maximum concentrations for SPM were recorded as 246 $\mu\text{g}/\text{m}^3$ and 273 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 260 $\mu\text{g}/\text{m}^3$.

For the month of March-2016 the minimum and maximum concentrations for SPM were recorded as 209 $\mu\text{g}/\text{m}^3$ and 246 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 228 $\mu\text{g}/\text{m}^3$.



Graph:- Dumerkholi/ Nr.Mining Area



3.1 Fugitive Emission (Buffer Zone):-

for SPM wa
 of 245 $\mu\text{g}/\text{m}^3$

3.1.1 Presentation of Results.

for SPM wa
 of 260 $\mu\text{g}/\text{m}^3$

The summary of Statistical Analysis of SPM results for the month of January 2016 to March-2016 are presented in detail in **Table 6**. 98th percentile; maximum, minimum and average values etc have been computed from the collected raw data for all the Fugitive emission monitoring station.

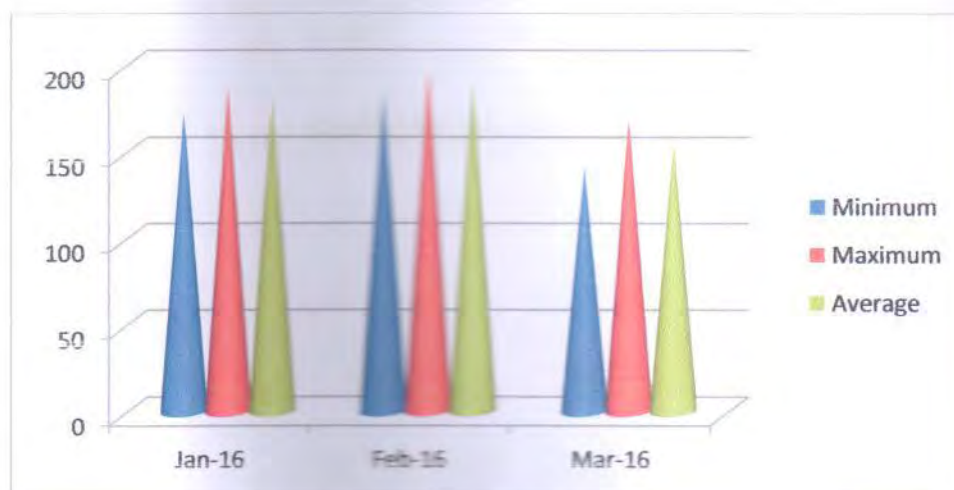
for SPM wa
 of 228 $\mu\text{g}/\text{m}^3$

Sairaidh Campus

For the month of January-2016 the minimum and maximum concentrations for SPM were recorded as 172 $\mu\text{g}/\text{m}^3$ and 187 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 180 $\mu\text{g}/\text{m}^3$.

For the month of February-2016 the minimum and maximum concentrations for SPM were recorded as 183 $\mu\text{g}/\text{m}^3$ and 196 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 190 $\mu\text{g}/\text{m}^3$.

For the month of March-2016 the minimum and maximum concentrations for SPM were recorded as 141 $\mu\text{g}/\text{m}^3$ and 169 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 155 $\mu\text{g}/\text{m}^3$.



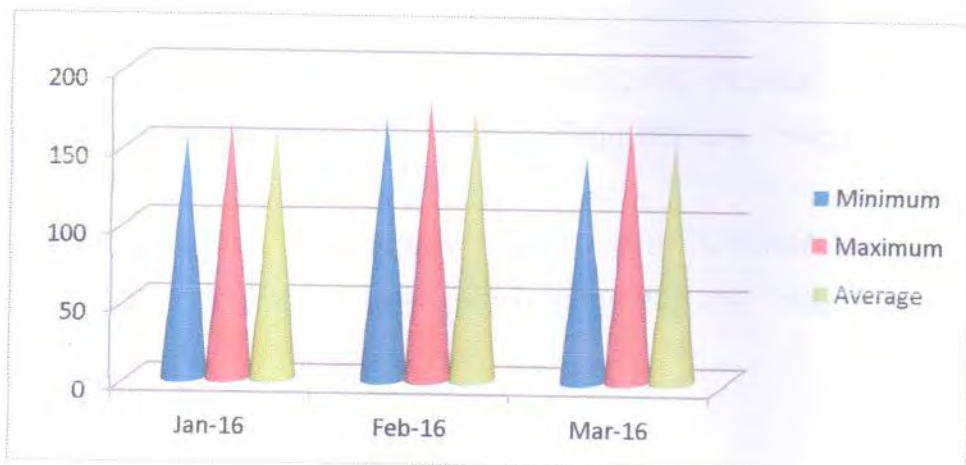
Graph:- Sairaidh Campus

Jajjali Village

For the month of January-2016 the minimum and maximum concentrations for SPM were recorded as $154 \mu\text{g}/\text{m}^3$ and $163 \mu\text{g}/\text{m}^3$ respectively and average concentration of $159 \mu\text{g}/\text{m}^3$.

For the month of February-2016 the minimum and maximum concentrations for SPM were recorded as $168 \mu\text{g}/\text{m}^3$ and $179 \mu\text{g}/\text{m}^3$ respectively and average concentration of $174 \mu\text{g}/\text{m}^3$.

For the month of March-2016 the minimum and maximum concentrations for SPM were recorded as $143 \mu\text{g}/\text{m}^3$ and $167 \mu\text{g}/\text{m}^3$ respectively and average concentration of $155 \mu\text{g}/\text{m}^3$.



Graph:- Jajjali Village



Tatijharia Village/Nr.Weigh Bridge

SPM wa
59 µg/m³

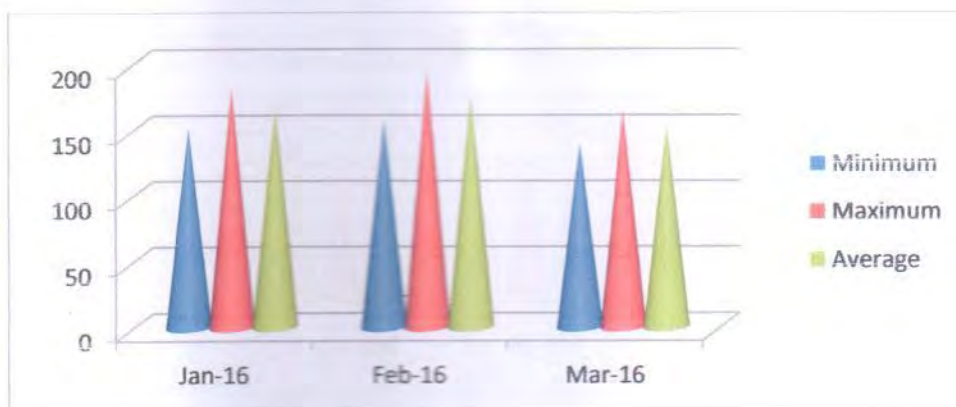
For the month of January-2016 the minimum and maximum concentrations for SPM were recorded as 151 µg/m³ and 181 µg/m³ respectively and average concentration of 166 µg/m³.

SPM wa
74 µg/m³

For the month of February-2016 the minimum and maximum concentrations for SPM were recorded as 157 µg/m³ and 193 µg/m³ respectively and average concentration of 175 µg/m³.

SPM wa
55 µg/m³

For the month of March-2016 the minimum and maximum concentrations for SPM were recorded as 139 µg/m³ and 164 µg/m³ respectively and average concentration of 152 µg/m³.



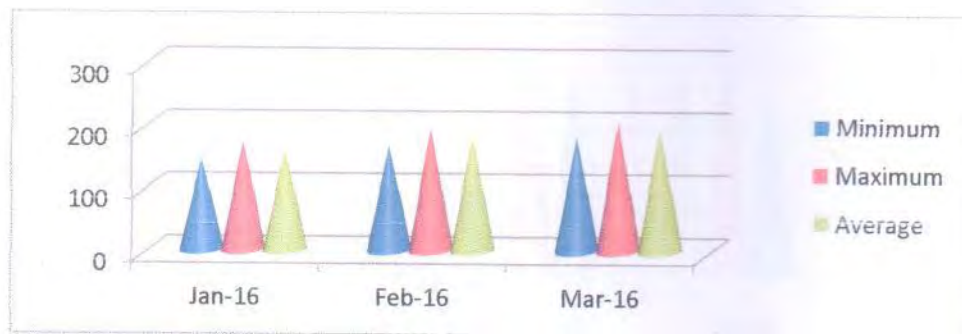
Graph:- Tatijharia Village/Nr.Weigh Bridge

Piprapat/Nr.Mining Area

For the month of January-2016 the minimum and maximum concentrations for SPM were recorded as $146 \mu\text{g}/\text{m}^3$ and $173 \mu\text{g}/\text{m}^3$ respectively and average concentration of $160 \mu\text{g}/\text{m}^3$.

For the month of February-2016 the minimum and maximum concentrations for SPM were recorded as $167 \mu\text{g}/\text{m}^3$ and $194 \mu\text{g}/\text{m}^3$ respectively and average concentration of $181 \mu\text{g}/\text{m}^3$.

For the month of March-2016 the minimum and maximum concentrations for SPM were recorded as $182 \mu\text{g}/\text{m}^3$ and $207 \mu\text{g}/\text{m}^3$ respectively and average concentration of $195 \mu\text{g}/\text{m}^3$.



Graph:- Piprapat/Nr.Mining Area



Table 7
Statistical Analysis of RSPM

Unit : $\mu\text{g}/\text{m}^3$

Location	Month & Year	Min.	Max.	A.M.	G.M.	98%ile	
Fugitive Emission (Core Zone):-							
SPM wa 160 $\mu\text{g}/\text{m}^3$ Nr.weigh bridge	January-2016	53	64	59	59	64	
	February-2016	57	68	63	63	68	
	March-2016	49	56	53	53	56	
SPM wa 181 $\mu\text{g}/\text{m}^3$ Nr.Mining Area	January-2016	57	68	63	63	68	
	February-2016	62	71	67	67	71	
	March-2016	51	62	57	57	62	
SPM wa 195 $\mu\text{g}/\text{m}^3$ Nr.V.T. Center	January-2016	48	56	52	52	56	
	February-2016	53	61	57	57	61	
	March-2016	41	52	47	47	52	
Dumerkholi/ Nr.Mining Area	January-2016	57	63	60	60	63	
	February-2016	53	59	56	56	59	
	March-2016	46	54	50	50	54	
CPCB Standard		100 (24 hrs)					

Location	Month & Year	Min.	Max.	A.M.	G.M.	98%ile	
Buffer Zone :-							
Sairaidh Campus	January-2016	43	52	48	48	52	
	February-2016	46	57	52	52	57	
	March-2016	38	46	42	42	46	
Jaljali Village	January-2016	48	53	51	51	53	
	February-2016	43	47	45	45	47	
	March-2016	37	43	40	40	43	
Tatijharia Village/ Nr. Weigh bridge	January-2016	53	62	58	58	62	
	February-2016	56	67	62	62	67	
	March-2016	48	59	54	54	59	
Piprapat/ Nr.Mining Area	January-2016	41	48	45	45	48	
	February-2016	39	43	41	41	43	
	March-2016	42	51	47	47	51	
CPCB Standard		100 (24 hrs)					

Conclusion: A)

- 1) Samri-Gopatu/ Nr.weigh bridge Lease Area Core Zone: For the Months of Jan-Feb-Mar-2016 Average of RSPM is $58 \mu\text{g}/\text{m}^3$.
- 2) Rajendrapur/Nr.Mining Area Lease Area Core Zone: For the Months of Jan-Feb-Mar-2016 Average of RSPM is $62 \mu\text{g}/\text{m}^3$.
- 3) Kutku Village / Nr.V.T. Center Lease Area Core Zone: For the Months of Jan-Feb-Mar-2016 Average of RSPM is $52 \mu\text{g}/\text{m}^3$.
- 4) Dumerkholi/ Nr.Mining Area Lease Area Core Zone: For the Months of Jan-Feb-Mar-2016 Average of RSPM is $55 \mu\text{g}/\text{m}^3$.

- The Average Concentration of RSPM within the Core Zone of Samri Lease is $57 \mu\text{g}/\text{m}^3$ and it is within permissible limits as per CPCB Standard.

Conclusion (B)

- 1) Sairaidh Campus Lease Area Buffer Zone: For the Months of Jan-Feb-Mar-2016 Average of RSPM is $47 \mu\text{g}/\text{m}^3$.
- 2) Jaljali Village Lease Area Buffer Zone: For the Months of Jan-Feb-Mar-2016 Average of RSPM is $45 \mu\text{g}/\text{m}^3$.
- 3) Tatijharia Village/ Nr. Weigh bridge Buffer Zone: For the Months of Jan-Feb-Mar-2016 Average of RSPM is $58 \mu\text{g}/\text{m}^3$.
- 4) Piprapat/ Nr.Mining Area Buffer Zone: For the Months of Jan-Feb-Mar-2016 Average of RSPM is $44 \mu\text{g}/\text{m}^3$.

- The Average Concentration of RSPM within the Buffer Zone of Samri Lease is $49 \mu\text{g}/\text{m}^3$ and it is within permissible limits as per CPCB Standard.

Monthwise Summary of Statistical Analysis of RSPM

3.2 Fugitive Emission (Core Zone):-

3.2.1 Presentation of Results.

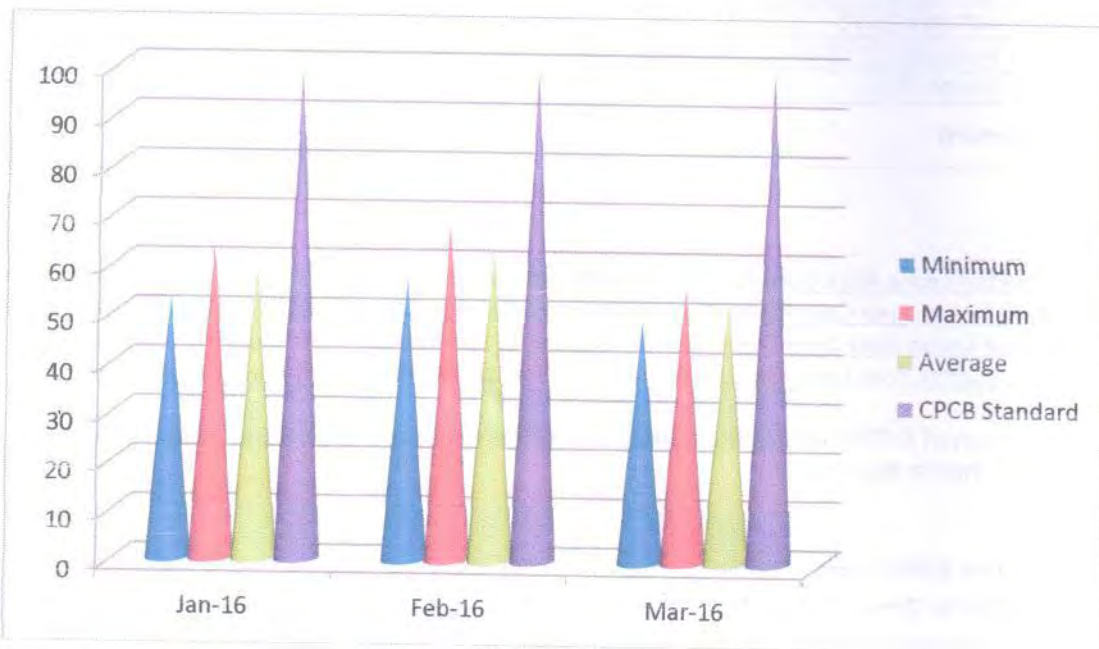
The summary of Statistical Analysis of RSPM results for the month of January-2016 to March-2016 are presented in detail in Table 7. 98th percentile, maximum, minimum and average values etc have been computed from the collected raw data for all the Fugitive emission monitoring station.

Samri-Gopatu/ Nr.weigh bridge

For the month of January-2016 the minimum and maximum concentrations for RSPM recorded as 53 $\mu\text{g}/\text{m}^3$ and 64 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 59 $\mu\text{g}/\text{m}^3$.

For the month of February-2016 the minimum and maximum concentrations for RSPM recorded as 57 $\mu\text{g}/\text{m}^3$ and 68 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 63 $\mu\text{g}/\text{m}^3$.

For the month of March-2016 the minimum and maximum concentrations for RSPM recorded as 49 $\mu\text{g}/\text{m}^3$ and 56 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 53 $\mu\text{g}/\text{m}^3$.



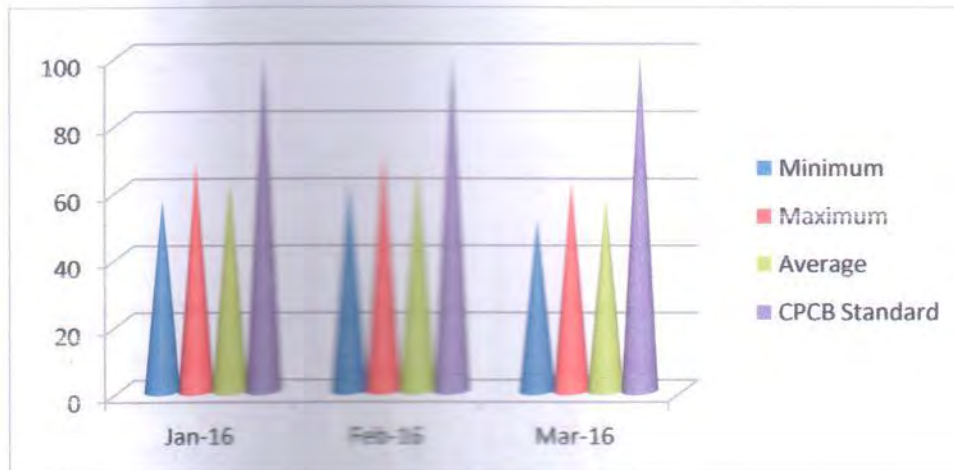


Rajendrapur/Nr.Mining Area

For the month of January-2016 the minimum and maximum concentrations for RSPM were recorded as 57 $\mu\text{g}/\text{m}^3$ and 68 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 63 $\mu\text{g}/\text{m}^3$.

For the month of February-2016 the minimum and maximum concentrations for RSPM were recorded as 62 $\mu\text{g}/\text{m}^3$ and 71 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 67 $\mu\text{g}/\text{m}^3$.

For the month of March-2016 the minimum and maximum concentrations for RSPM were recorded as 51 $\mu\text{g}/\text{m}^3$ and 62 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 57 $\mu\text{g}/\text{m}^3$.

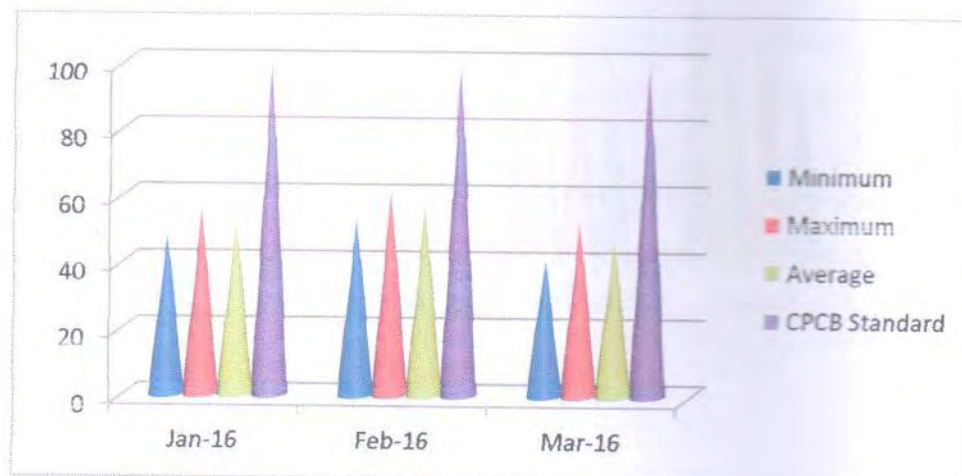


Kutku Village/Nr.V.T. Center

For the month of January-2016 the minimum and maximum concentrations for RSPM recorded as $48 \mu\text{g}/\text{m}^3$ and $56 \mu\text{g}/\text{m}^3$ respectively and average concentration of $52 \mu\text{g}/\text{m}^3$.

For the month of February-2016 the minimum and maximum concentrations for RSPM recorded as $53 \mu\text{g}/\text{m}^3$ and $61 \mu\text{g}/\text{m}^3$ respectively and average concentration of $57 \mu\text{g}/\text{m}^3$.

For the month of March-2016 the minimum and maximum concentrations for RSPM recorded as $41 \mu\text{g}/\text{m}^3$ and $52 \mu\text{g}/\text{m}^3$ respectively and average concentration of $47 \mu\text{g}/\text{m}^3$.



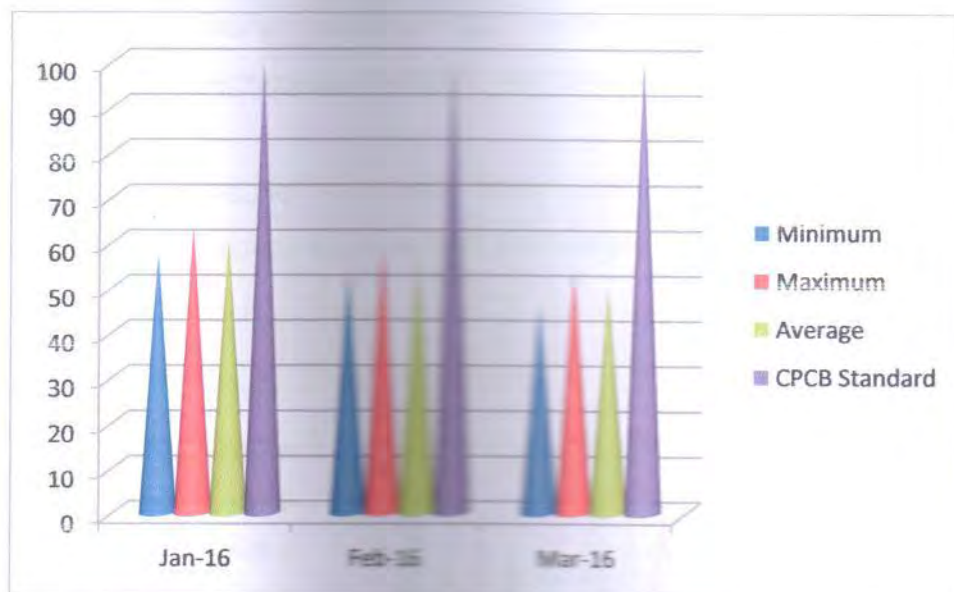


Dumerkholi/Nr.Mining Area

For the month of January-2016 the minimum and maximum concentrations for RSPM were recorded as 57 $\mu\text{g}/\text{m}^3$ and 63 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 60 $\mu\text{g}/\text{m}^3$.

For the month of February-2016 the minimum and maximum concentrations for RSPM were recorded as 53 $\mu\text{g}/\text{m}^3$ and 59 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 56 $\mu\text{g}/\text{m}^3$.

For the month of March-2016 the minimum and maximum concentrations for RSPM were recorded as 46 $\mu\text{g}/\text{m}^3$ and 54 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 50 $\mu\text{g}/\text{m}^3$.



3.3 Fugitive Emission (Buffer Zone):-

3.3.1 Presentation of Results.

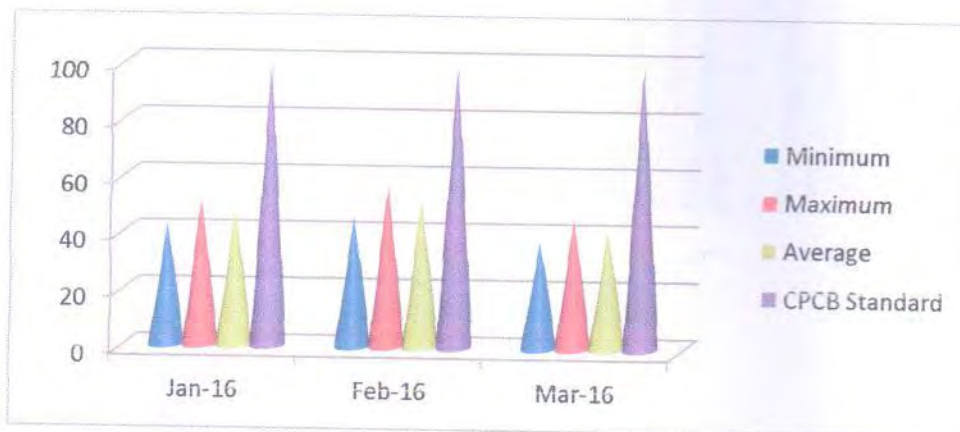
The summary of Statistical Analysis of RSPM results for the month of January-2016 to March-2016 are presented in detail in **Table 6**. 98th percentile; maximum, minimum and average values etc have been computed from the collected raw data for all the Fugitive emission monitoring station.

Sairaidh Campus

For the month of January-2016 the minimum and maximum concentrations for RSPM recorded as 43 $\mu\text{g}/\text{m}^3$ and 52 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 48 $\mu\text{g}/\text{m}^3$.

For the month of February-2016 the minimum and maximum concentrations for RSPM recorded as 46 $\mu\text{g}/\text{m}^3$ and 57 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 52 $\mu\text{g}/\text{m}^3$.

For the month of March-2016 the minimum and maximum concentrations for RSPM recorded as 38 $\mu\text{g}/\text{m}^3$ and 46 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 42 $\mu\text{g}/\text{m}^3$.

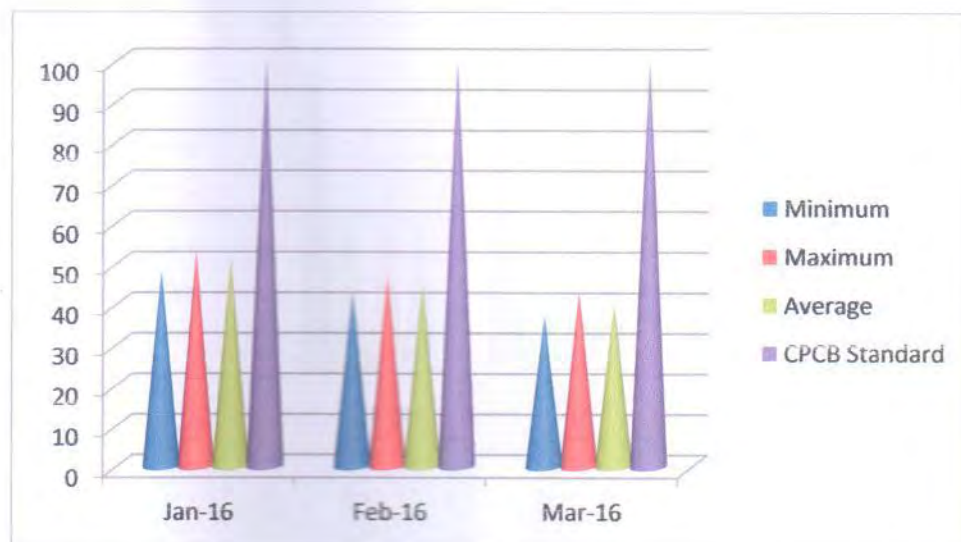


Jaliali Village

For the month of January-2016 the minimum and maximum concentrations for RSPM were recorded as $48 \mu\text{g}/\text{m}^3$ and $53 \mu\text{g}/\text{m}^3$ respectively and average concentration of $51 \mu\text{g}/\text{m}^3$.

For the month of February-2016 the minimum and maximum concentrations for RSPM were recorded as $43 \mu\text{g}/\text{m}^3$ and $47 \mu\text{g}/\text{m}^3$ respectively and average concentration of $45 \mu\text{g}/\text{m}^3$.

For the month of March-2016 the minimum and maximum concentrations for RSPM were recorded as $37 \mu\text{g}/\text{m}^3$ and $43 \mu\text{g}/\text{m}^3$ respectively and average concentration of $40 \mu\text{g}/\text{m}^3$.

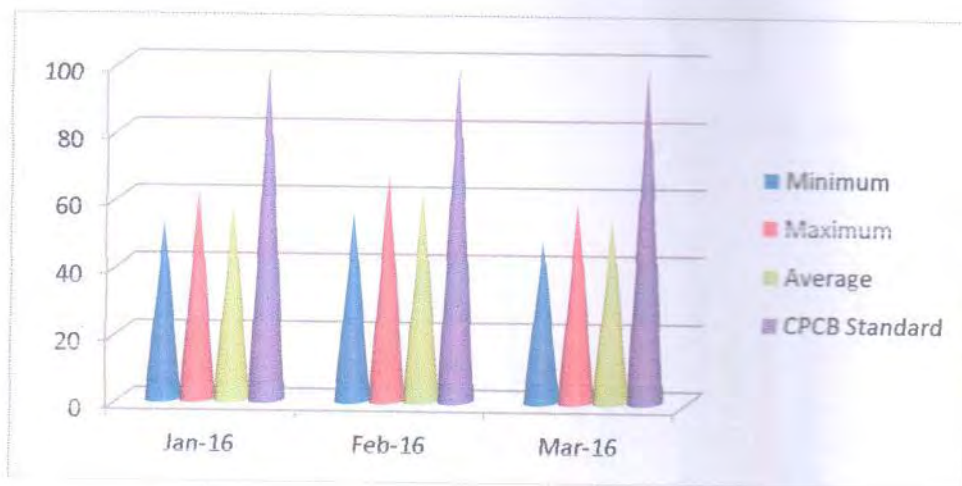


Tatijharia Village

For the month of January-2016 the minimum and maximum concentrations for RSPM were recorded as $53 \mu\text{g}/\text{m}^3$ and $62 \mu\text{g}/\text{m}^3$ respectively and average concentration of $58 \mu\text{g}/\text{m}^3$.

For the month of February-2016 the minimum and maximum concentrations for RSPM were recorded as $56 \mu\text{g}/\text{m}^3$ and $67 \mu\text{g}/\text{m}^3$ respectively and average concentration of $62 \mu\text{g}/\text{m}^3$.

For the month of March-2016 the minimum and maximum concentrations for RSPM were recorded as $48 \mu\text{g}/\text{m}^3$ and $59 \mu\text{g}/\text{m}^3$ respectively and average concentration of $54 \mu\text{g}/\text{m}^3$.





RSPM wa
4 $\mu\text{g}/\text{m}^3$.

Piprapat/Nr.Mining Area

For the month of January-2016 the minimum and maximum concentrations for RSPM were recorded as 41 $\mu\text{g}/\text{m}^3$ and 48 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 45 $\mu\text{g}/\text{m}^3$.

RSPM wa
2 $\mu\text{g}/\text{m}^3$.

For the month of February-2016 the minimum and maximum concentrations for RSPM were recorded as 39 $\mu\text{g}/\text{m}^3$ and 43 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 41 $\mu\text{g}/\text{m}^3$.

RSPM wa
4 $\mu\text{g}/\text{m}^3$.

For the month of March-2016 the minimum and maximum concentrations for RSPM were recorded as 42 $\mu\text{g}/\text{m}^3$ and 51 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 47 $\mu\text{g}/\text{m}^3$.

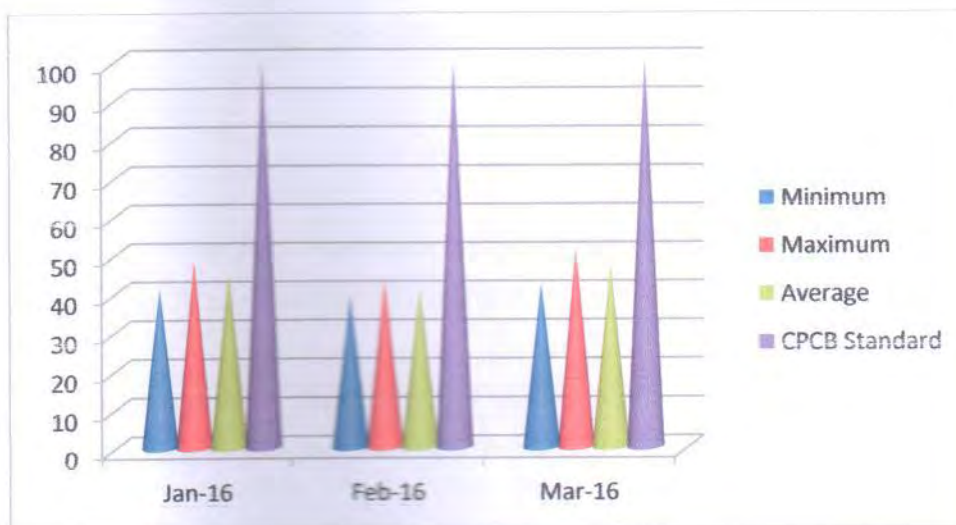


Table 8
Statistical Analysis of PM 2.5

Location	Month & Year	Unit : $\mu\text{g}/\text{m}^3$				
		Min.	Max.	A.M.	G.M.	98%
Samri-Gopatu/ Near Weigh bridge	January-2016	16	23	20	20	23
	February-2016	24	32	28	28	32
	March-2016	18	21	20	20	21
CPCB Standard		60 (24 hrs)				

Conclusion :- The Average Concentration of $\text{PM}_{2.5}$ within Samri Lease during this period (January to March-2016) is $23 \mu\text{g}/\text{m}^3$ and it is within permissible limits as per CPCB Standard.

3.4 Statistical Analysis of PM 2.5:-

3.4.1 Presentation of Results.

The summary of Statistical Analysis of $\text{PM}_{2.5}$ results for the month of January 2016 to March 2016 are presented in detail in **Table 8**. 98th percentile, maximum, minimum and average values etc have been computed from the collected raw data for all the Fugitive emission monitoring station.

Samri-Gopatu/Near Weigh Bridge

For the month of January-2016 the minimum and maximum concentrations for $\text{PM}_{2.5}$ were recorded as $16 \mu\text{g}/\text{m}^3$ and $23 \mu\text{g}/\text{m}^3$ respectively and average concentration of $20 \mu\text{g}/\text{m}^3$.

For the month of February-2016 the minimum and maximum concentrations for $\text{PM}_{2.5}$ were recorded as $24 \mu\text{g}/\text{m}^3$ and $32 \mu\text{g}/\text{m}^3$ respectively and average concentration of $28 \mu\text{g}/\text{m}^3$.

For the month of March-2016 the minimum and maximum concentrations for $\text{PM}_{2.5}$ were recorded as $18 \mu\text{g}/\text{m}^3$ and $21 \mu\text{g}/\text{m}^3$ respectively and average concentration of $20 \mu\text{g}/\text{m}^3$.

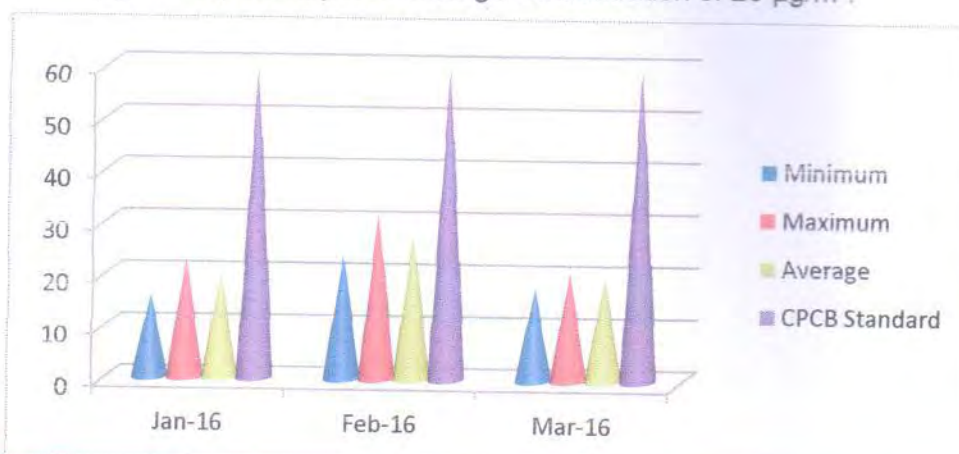




Table 9
Statistical Analysis of SO₂

Unit : $\mu\text{g}/\text{m}^3$

Location	Month & Year	Min.	Max.	A.M.	G.M.	98%
Fugitive Emission (Core Zone):-						
Samri-Gopatu/ Nr.weigh bridge	January-2016	9	12	11	11	12
	February-2016	7	9	8	8	9
	March-2016	9	13	11	11	13
Rajendrapur/ Nr.Mining Area	January-2016	8	12	10	10	12
	February-2016	9	14	12	12	14
	March-2016	6	9	8	8	9
Kutku Village/ Nr.V.T. Center	January-2016	7	9	8	8	9
	February-2016	6	11	9	9	11
	March-2016	7	12	10	10	12
Dumerkholi/ Nr.Mining Area	January-2016	7	11	9	9	11
	February-2016	9	13	11	11	13
	March-2016	7	9	8	8	9
CPCB Standard		80 (24 hrs)				

Location	Month & Year	Min.	Max.	A.M.	G.M.	98%
Buffer Zone :-						
Sairaidh Campus	January-2016	6	8	7	7	8
	February-2016	8	11	10	10	11
	March-2016	6	9	8	8	9
Jaljali Village	January-2016	7	11	9	9	11
	February-2016	8	12	10	10	12
	March-2016	7	9	8	8	9
Tatijharia Village/ Nr. Weigh bridge	January-2016	9	13	11	11	13
	February-2016	7	11	9	9	11
	March-2016	6	12	9	9	12
Piprapat/ Nr.Mining Area	January-2016	9	11	10	10	11
	February-2016	7	9	8	8	9
	March-2016	8	12	10	10	12
CPCB Standard		80 (24 hrs)				

Conclusion:- A)

- 1) Samri-Gopatu/ Nr.weigh bridge Lease Area Core Zone: For the Months of Jan-Feb-March-2016 Average of SO₂ is 10 $\mu\text{g}/\text{m}^3$.
- 2) Rajendrapur/Nr.Mining Area Lease Area Core Zone: For the Months of Jan-Feb-March-2016 Average of SO₂ is 10 $\mu\text{g}/\text{m}^3$.
- 3) Kutku Village / Nr.V.T. Center Lease Area Core Zone: For the Months of Jan-Feb-March-2016 Average of SO₂ is 9 $\mu\text{g}/\text{m}^3$.
- 4) Dumerkholi/ Nr.Mining Area Core Zone: For the Months of Jan-Feb-March-2016 Average of SO₂ is 9 $\mu\text{g}/\text{m}^3$.

- The Average Concentration of SO₂ within the Core Zone of Samri Lease during this period (Jan-Feb-March-2016) is 10 $\mu\text{g}/\text{m}^3$ and it is within permissible limits as per CPCB Standard.

Conclusion : B)

- 1) Sairaidh Campus Lease Area Buffer Zone:- For the Months of Jan-Feb-March-2016 Average of SO₂ is 8 $\mu\text{g}/\text{m}^3$.
- 2) Jaljali Village Lease Area Buffer Zone:- For the Months of Jan-Feb-March-2016 Average of SO₂ is 9 $\mu\text{g}/\text{m}^3$.
- 3) Tatijharia Village/ Nr. Weigh bridge Lease Area Buffer Zone:- For the Months of Jan-Feb-March-2016 Average of SO₂ is 10 $\mu\text{g}/\text{m}^3$.
- 4) Piprapat/ Nr.Mining Lease Area Buffer Zone:- For the Months of Jan-Feb-March-2016 Average of SO₂ is 9 $\mu\text{g}/\text{m}^3$.

- The Average Concentration of SO₂ within the Buffer Zone of Samri Lease during this period (Jan-Feb-March-2016) is 9 $\mu\text{g}/\text{m}^3$ and it is within permissible limits as per CPCB Standard.

Monthwise Summary of Statistical Analysis of SO₂

3.5 Fugitive Emission (Core Zone):-

3.5.1 Presentation of Results.

The summary of Statistical Analysis of SO₂ results for the month of January-2016 to March-2016 are presented in detail in **Table 7**. 98th percentile; maximum, minimum and average values etc have been computed from the collected raw data for all the Fugitive emission monitoring station.

Samri-Gopatu/ Nr.weigh bridge

For the month of January-2016 the minimum and maximum concentrations for SO₂ recorded as 9 µg/m³ and 12 µg/m³ respectively and average concentration of 11 µg/m³.

For the month of February-2016 the minimum and maximum concentrations for SO₂ recorded as 7 µg/m³ and 9 µg/m³ respectively and average concentration of 8 µg/m³.

For the month of March-2016 the minimum and maximum concentrations for SO₂ recorded as 9 µg/m³ and 13 µg/m³ respectively and average concentration of 11 µg/m³.



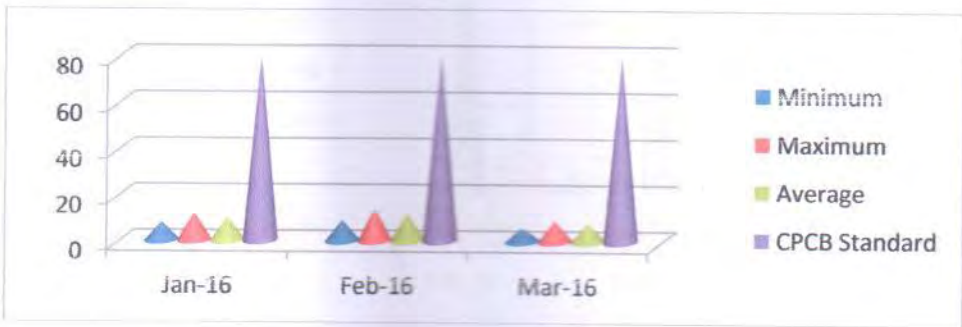


Rajendrapur/Nr.Mining Area

For the month of January-2016 the minimum and maximum concentrations for SO₂ were recorded as 8 µg/m³ and 12 µg/m³ respectively and average concentration of 10 µg/m³.

For the month of February-2016 the minimum and maximum concentrations for SO₂ were recorded as 9 µg/m³ and 14 µg/m³ respectively and average concentration of 12 µg/m³.

For the month of March-2016 the minimum and maximum concentrations for SO₂ were recorded as 6 µg/m³ and 9 µg/m³ respectively and average concentration of 8 µg/m³.

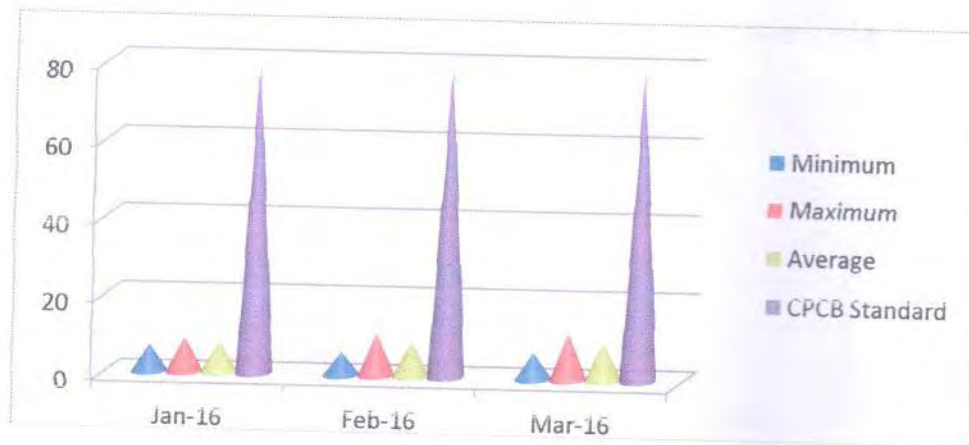


Kutku Village/Nr.V.T. Center

For the month of January-2016 the minimum and maximum concentrations for SO₂ recorded as 7 µg/m³ and 9 µg/m³ respectively and average concentration of 8 µg/m³.

For the month of February-2016 the minimum and maximum concentrations for SO₂ recorded as 6 µg/m³ and 11 µg/m³ respectively and average concentration of 9 µg/m³.

For the month of March-2016 the minimum and maximum concentrations for SO₂ recorded as 7 µg/m³ and 12 µg/m³ respectively and average concentration of 10 µg/m³.



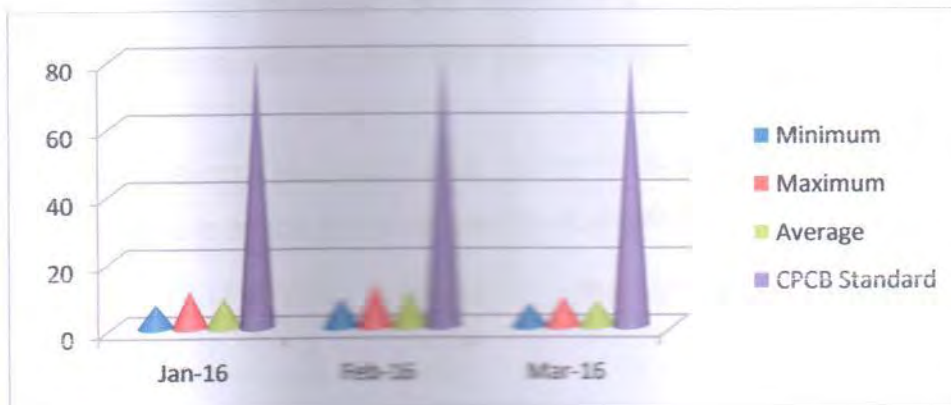


Dumerkholi/Nr.Mining Area

For the month of January-2016 the minimum and maximum concentrations for SO₂ were recorded as 7 µg/m³ and 11 µg/m³ respectively and average concentration of 9 µg/m³.

For the month of February-2016 the minimum and maximum concentrations for SO₂ were recorded as 9 µg/m³ and 13 µg/m³ respectively and average concentration of 11 µg/m³.

For the month of March-2016 the minimum and maximum concentrations for SO₂ were recorded as 7 µg/m³ and 9 µg/m³ respectively and average concentration of 8 µg/m³.



3.6 Fugitive Emission (Buffer Zone):-

3.6.1 Presentation of Results.

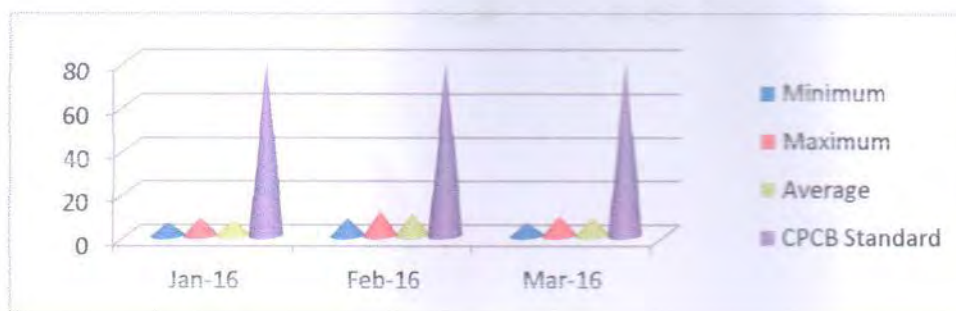
The summary of Statistical Analysis of SO_x results for the month of January 2016 to March 2016 are presented in detail in **Table 9**. 98th percentile, maximum, minimum and average values etc have been computed from the collected raw data for all the Fugitive emission monitoring station.

Sairaidh Campus

For the month of January-2016 the minimum and maximum concentrations for SO₂ was recorded as 6 µg/m³ and 8 µg/m³ respectively and average concentration of 7 µg/m³.

For the month of February-2016 the minimum and maximum concentrations for SO₂ was recorded as 8 µg/m³ and 11µg/m³ respectively and average concentration of 10 µg/m³.

For the month of March-2016 the minimum and maximum concentrations for SO₂ was recorded as 6 µg/m³ and 9 µg/m³ respectively and average concentration of 8 µg/m³.



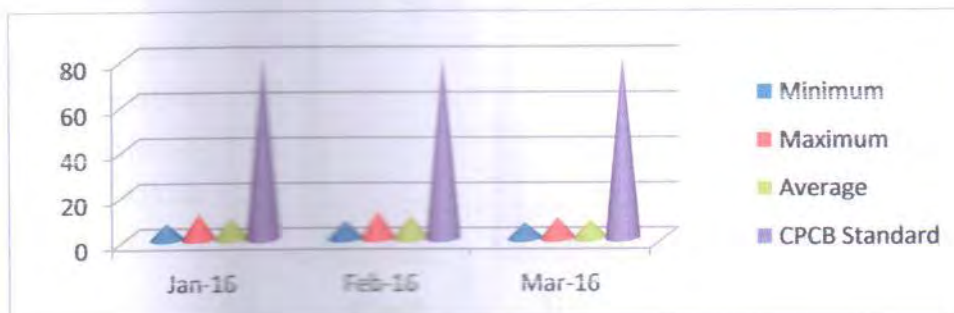


Jaljali Village

For the month of January-2016 the minimum and maximum concentrations for SO₂ were recorded as 7 µg/m³ and 11 µg/m³ respectively and average concentration of 9 µg/m³.

For the month of February-2016 the minimum and maximum concentrations for SO₂ were recorded as 8 µg/m³ and 12 µg/m³ respectively and average concentration of 10 µg/m³.

For the month of March-2016 the minimum and maximum concentrations for SO₂ were recorded as 7 µg/m³ and 9 µg/m³ respectively and average concentration of 8 µg/m³.



Tatijharia Village/Nr.Weigh Bridge

For the month of January-2016 the minimum and maximum concentrations for SO₂ recorded as 9 µg/m³ and 13 µg/m³ respectively and average concentration of 11 µg/m³.

For the month of February-2016 the minimum and maximum concentrations for SO₂ recorded as 7 µg/m³ and 11 µg/m³ respectively and average concentration of 9 µg/m³.

For the month of March-2016 the minimum and maximum concentrations for SO₂ recorded as 6 µg/m³ and 12 µg/m³ respectively and average concentration of 9 µg/m³.





SO₂ was
m³.

Piprapat/Nr.Mining Area

SO₂ was
m³.

For the month of January-2016 the minimum and maximum concentrations for SO₂ were recorded as 9 µg/m³ and 11 µg/m³ respectively and average concentration of 10 µg/m³.

SO₂ was
m³.

For the month of February-2016 the minimum and maximum concentrations for SO₂ were recorded as 7 µg/m³ and 9 µg/m³ respectively and average concentration of 8 µg/m³.

For the month of March-2016 the minimum and maximum concentrations for SO₂ were recorded as 8 µg/m³ and 12 µg/m³ respectively and average concentration of 10 µg/m³.





Table 10
Statistical Analysis of NO_x

Location	Month & Year	Unit: µg/m ³				
		Min.	Max.	A.M.	G.M.	98%
Fugitive Emission (Core Zone):-						
Samri-Gopatu/ Nr.weigh bridge	January-2016	21	28	25	25	28
	February-2016	24	31	28	28	31
	March-2016	17	23	20	20	23
Rajendrapur/ Nr.Mining Area	January-2016	22	26	24	24	26
	February-2016	24	31	28	28	31
	March-2016	19	23	21	21	23
Kutku Village/ Nr.V.T. Center	January-2016	18	21	20	20	21
	February-2016	16	19	18	18	19
	March-2016	18	23	21	21	23
Dumerkholi/ Nr.Mining Area	January-2016	23	28	26	26	28
	February-2016	19	26	23	23	26
	March-2016	16	21	19	19	21
CPCB Standard		80 (24 hrs)				

Location	Month & Year	Unit: µg/m ³				
		Min.	Max.	A.M.	G.M.	98%
Buffer Zone :-						
Sairaidh Campus	January-2016	16	19	18	18	19
	February-2016	14	17	16	16	17
	March-2016	17	21	19	19	21
Jaljali Village	January-2016	18	24	21	21	24
	February-2016	17	23	20	20	23
	March-2016	18	24	21	21	24
Tatijharia Village/ Nr. Weigh bridge	January-2016	19	21	20	20	21
	February-2016	16	19	18	18	19
	March-2016	17	21	19	19	21
Piprapat/ Nr.Mining Area	January-2016	19	23	21	21	23
	February-2016	17	19	18	18	19
	March-2016	16	21	19	19	21
CPCB Standard		80 (24 hrs)				

Conclusion: A)

- 1) Samri-Gopatu/ Nr.weigh bridge Lease Area Core Zone: For the Months of Jan-Feb-March-2016 Average of NO_x is 24 µg/m³.
- 2) Rajendrapur/Nr.Mining Lease Area Core Zone:- For the Months of Jan-Feb-March-2016 Average of NO_x is 24 µg/m³.
- 3) Kutku Village / Nr.V.T. Center Lease Area Core Zone:- For the Months of Jan-Feb-March-2016 Average of NO_x is 20 µg/m³.
- 4) Dumerkholi/ Nr.Mining Lease Area Core Zone:- For the Months of Jan-Feb-March-2016 Average of NO_x is 23 µg/m³.

- The Average Concentration of NO_x within the Core Zone of Samri Lease during this period (Jan-Feb-March-2016) is 23 µg/m³ and it is within permissible limits as per CPCB Standard.

Conclusion: B)

- 1)Sairaidh Campus Lease Area Buffer Zone:- For the Months of Jan-Feb-March-2016 Average of NO_x is 18 µg/m³.
- 2)Jaljali VillageLease Area Buffer Zone:- For the Months of Jan-Feb-March-2016 Average of NO_x is 21 µg/m³.
- 3)Tatijharia Village/ Nr. Weigh bridge Lease Area Buffer Zone:- For the Months of Oct-Nov-Dec-2015 Average of NO_x is 19 µg/m³.
- 4) Piprapat/ Nr.Mining Lease Area Buffer Zone:- For the Months of Jan-Feb-March-2016 Average of NO_x is 19 µg/m³.

- The Average Concentration of NO_x within the Buffer Zone of Samri Lease during this period (Jan-Feb-March-2016) is 19 µg/m³ and it is within permissible limits as per CPCB Standard.



Monthwise Summary of Statistical Analysis of NOx

3.7 Fugitive Emission (Core Zone):-

3.7.1 Presentation of Results.

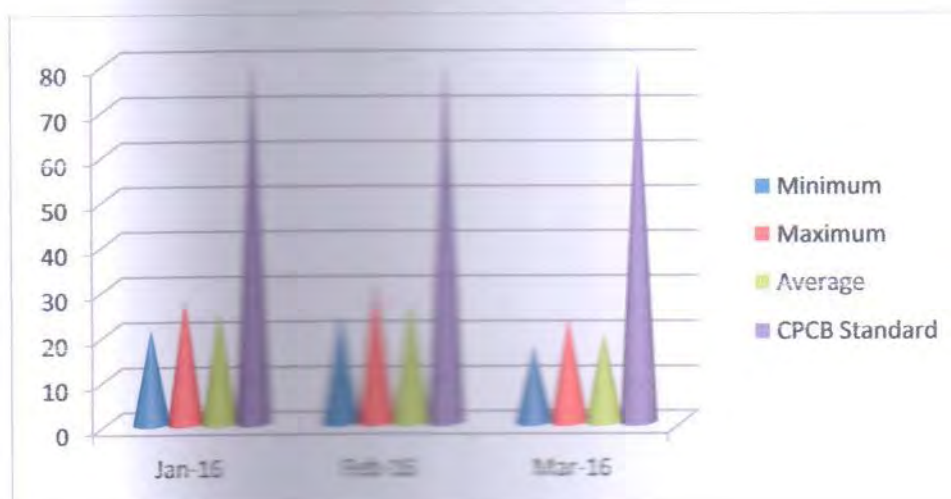
The summary of Statistical Analysis of NOx results for the month of January-2016 to March-2016 are presented in detail in Table 10. 98th percentile; maximum, minimum and average values etc have been computed from the collected raw data for all the Fugitive emission monitoring station.

Samri-Gopatu/ Nr.weigh bridge

For the month of January-2016 the minimum and maximum concentrations for NOx were recorded as 21 $\mu\text{g}/\text{m}^3$ and 28 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 25 $\mu\text{g}/\text{m}^3$.

For the month of February-2016 the minimum and maximum concentrations for NOx were recorded as 24 $\mu\text{g}/\text{m}^3$ and 31 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 28 $\mu\text{g}/\text{m}^3$.

For the month of March-2016 the minimum and maximum concentrations for NOx were recorded as 17 $\mu\text{g}/\text{m}^3$ and 23 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 20 $\mu\text{g}/\text{m}^3$.



b-March-

g/m³.

eb-March-

Rajendrapur/Nr.Mining Area

For the month of January-2016 the minimum and maximum concentrations for NO_x were recorded as 22 µg/m³ and 26 µg/m³ respectively and average concentration of 24 µg/m³.

For the month of February-2016 the minimum and maximum concentrations for NO_x were recorded as 24 µg/m³ and 31 µg/m³ respectively and average concentration of 28 µg/m³.

For the month of March-2016 the minimum and maximum concentrations for NO_x were recorded as 19 µg/m³ and 23 µg/m³ respectively and average concentration of 21 µg/m³.





Kutku Village/Nr.V.T. Center

NOx were
 ug/m³.

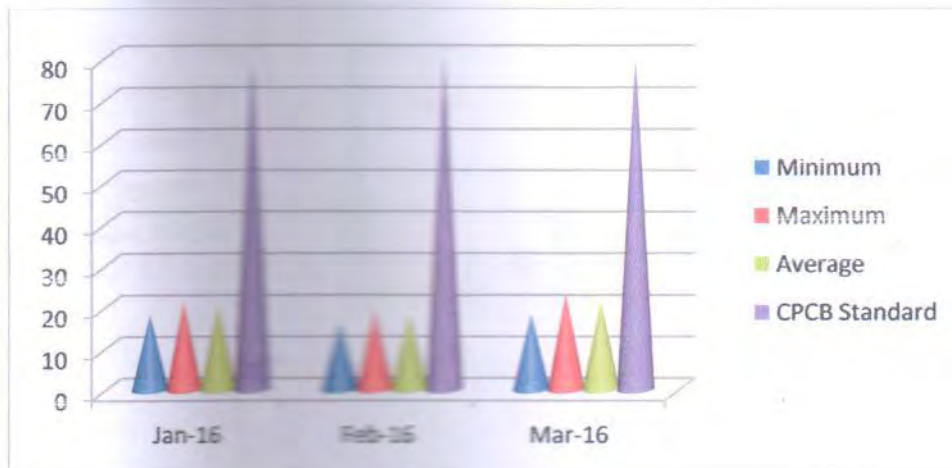
For the month of January-2016 the minimum and maximum concentrations for NOx were recorded as 18 µg/m³ and 21 µg/m³ respectively and average concentration of 20 µg/m³.

NOx were
 ug/m³.

For the month of February-2016 the minimum and maximum concentrations for NOx were recorded as 16 µg/m³ and 19 µg/m³ respectively and average concentration of 18 µg/m³.

NOx were
 ug/m³.

For the month of March-2016 the minimum and maximum concentrations for NOx were recorded as 18 µg/m³ and 23 µg/m³ respectively and average concentration of 21 µg/m³.

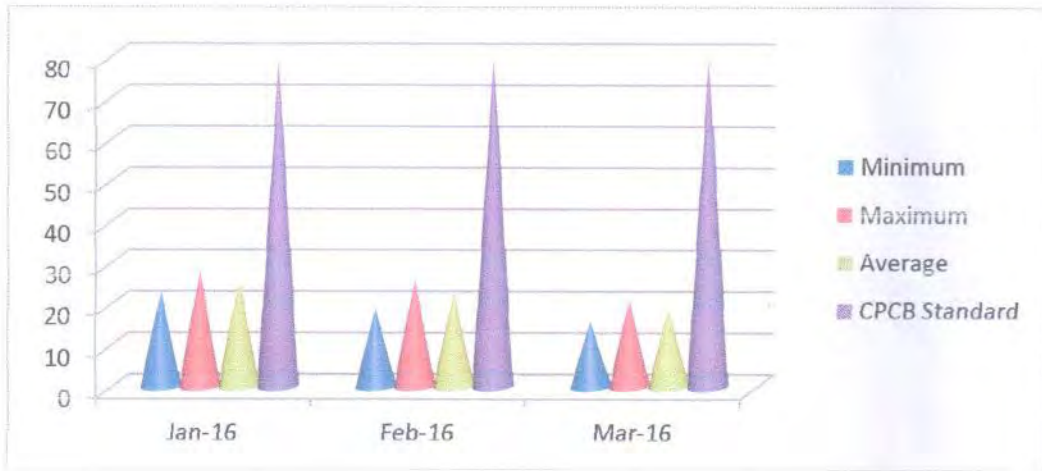


Dumerkholi/Nr.Mining Area

For the month of January-2016 the minimum and maximum concentrations for NO_x recorded as 23 µg/m³ and 28 µg/m³ respectively and average concentration of 26 µg/m³.

For the month of February-2016 the minimum and maximum concentrations for NO_x recorded as 19 µg/m³ and 26 µg/m³ respectively and average concentration of 23 µg/m³.

For the month of March-2016 the minimum and maximum concentrations for NO_x recorded as 16 µg/m³ and 21 µg/m³ respectively and average concentration of 19 µg/m³.





3.8 Fugitive Emission (Buffer Zone):-

3.8.1 Presentation of Results.

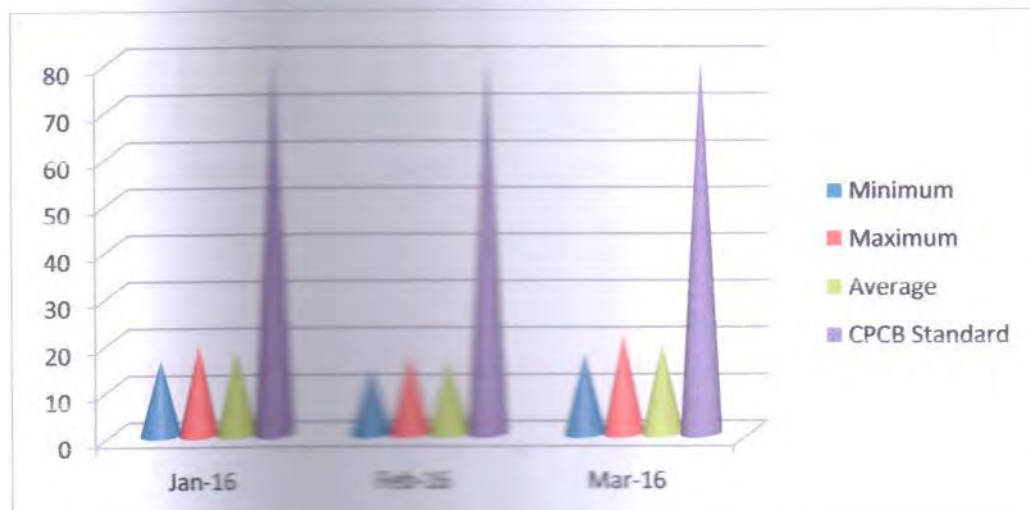
The summary of Statistical Analysis of NOx results for the month of January-2016 to March-2016 are presented in detail in Table 10. 98th percentile; maximum, minimum and average values etc have been computed from the collected raw data for all the Fugitive emission monitoring station.

Sairaidh Campus

For the month of January-2016 the minimum and maximum concentrations for NOx were recorded as 16 µg/m³ and 19 µg/m³ respectively and average concentration of 18 µg/m³.

For the month of February-2016 the minimum and maximum concentrations for NOx were recorded as 14 µg/m³ and 17 µg/m³ respectively and average concentration of 16 µg/m³.

For the month of March-2016 the minimum and maximum concentrations for NOx were recorded as 17 µg/m³ and 21 µg/m³ respectively and average concentration of 19 µg/m³.



Jaljali Village

For the month of January-2016 the minimum and maximum concentrations for NOx were recorded as 18 $\mu\text{g}/\text{m}^3$ and 24 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 21 $\mu\text{g}/\text{m}^3$.

For the month of February-2016 the minimum and maximum concentrations for NOx were recorded as 17 $\mu\text{g}/\text{m}^3$ and 23 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 20 $\mu\text{g}/\text{m}^3$.

For the month of March-2016 the minimum and maximum concentrations for NOx were recorded as 18 $\mu\text{g}/\text{m}^3$ and 24 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 21 $\mu\text{g}/\text{m}^3$.



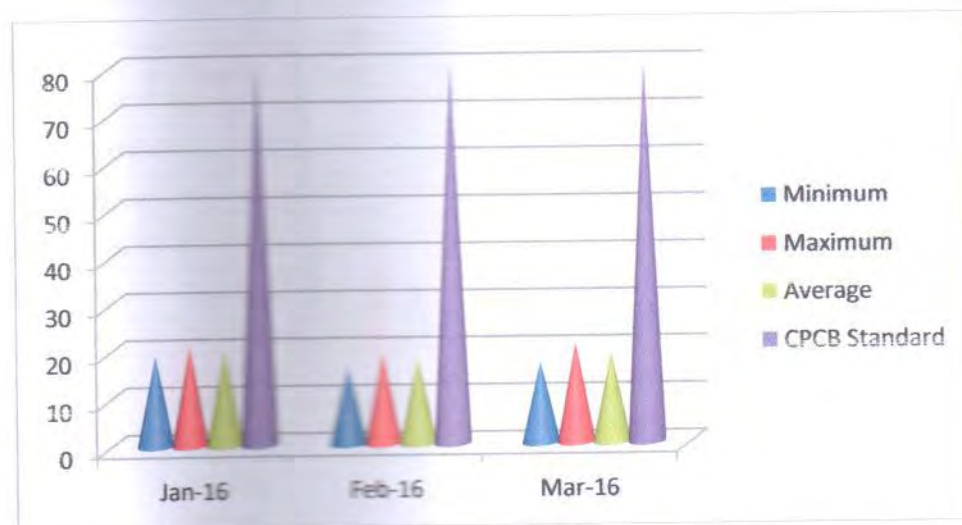


Tatijharia Village/Nr.Weigh Bridge

For the month of January-2016 the minimum and maximum concentrations for NOx were recorded as 19 $\mu\text{g}/\text{m}^3$ and 21 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 20 $\mu\text{g}/\text{m}^3$.

For the month of February-2016 the minimum and maximum concentrations for NOx were recorded as 16 $\mu\text{g}/\text{m}^3$ and 19 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 18 $\mu\text{g}/\text{m}^3$.

For the month of March-2016 the minimum and maximum concentrations for NOx were recorded as 17 $\mu\text{g}/\text{m}^3$ and 21 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 19 $\mu\text{g}/\text{m}^3$.



Piprapat/Nr.Mining Area

For the month of January-2016 the minimum and maximum concentrations for NO_x were recorded as 19 µg/m³ and 23 µg/m³ respectively and average concentration of 21 µg/m³.

For the month of February-2016 the minimum and maximum concentrations for NO_x were recorded as 17 µg/m³ and 19 µg/m³ respectively and average concentration of 18 µg/m³.

For the month of March-2016 the minimum and maximum concentrations for NO_x were recorded as 16 µg/m³ and 21 µg/m³ respectively and average concentration of 19 µg/m³.

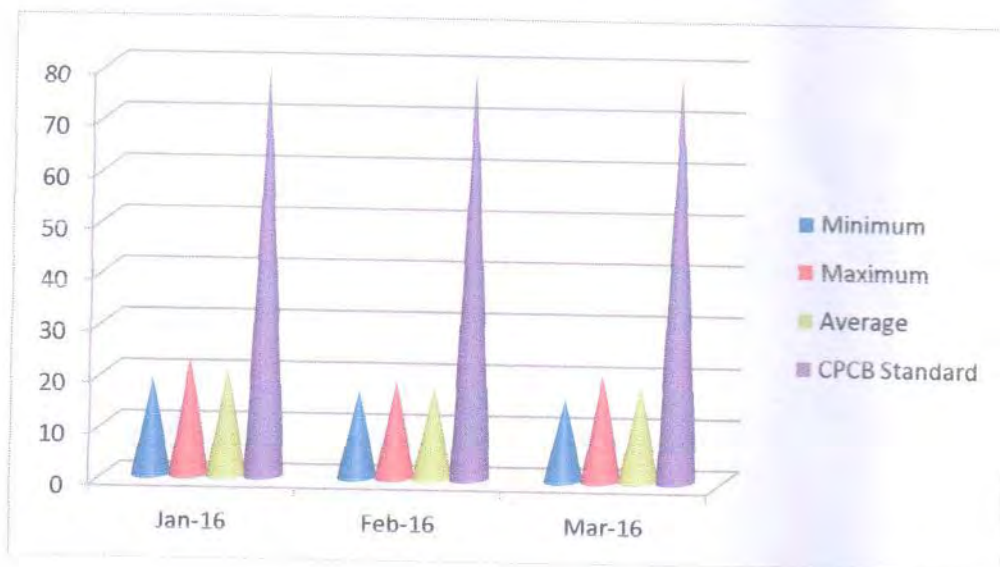




Table 11
Statistical Analysis of Pb

Unit: $\mu\text{g}/\text{m}^3$

Location	Month & Year	Min.	Max.	A.M.	G.M.	98%
Fugitive Emission (Core Zone):-						
Samri-Gopatu/ Nr.weigh bridge	January-2016	0.016	0.021	0.019	0.019	0.021
	February-2016	0.017	0.023	0.020	0.020	0.023
	March-2016	0.014	0.018	0.016	0.016	0.018
Rajendrapur/ Nr.Mining Area	January-2016	0.023	0.027	0.025	0.025	0.027
	February-2016	0.027	0.038	0.033	0.033	0.038
	March-2016	0.017	0.021	0.019	0.019	0.021
Kutku Village/ Nr.V.T. Center	January-2016	<0.005	<0.005	<0.005	<0.005	<0.005
	February-2016	<0.005	<0.005	<0.005	<0.005	<0.005
	March-2016	<0.005	<0.005	<0.005	<0.005	<0.005
Dumerkholi/ Nr.Mining Area	January-2016	0.016	0.019	0.018	0.018	0.019
	February-2016	0.018	0.024	0.021	0.021	0.024
	March-2016	0.019	0.026	0.023	0.023	0.026
CPCB Standard	1.0 (24 hrs)					

Location	Month & Year	Min.	Max.	A.M.	G.M.	98%
Buffer Zone :-						
Sairaidh Campus	January-2016	0.013	0.017	0.015	0.015	0.017
	February-2016	0.014	0.019	0.017	0.017	0.019
	March-2016	0.016	0.021	0.019	0.019	0.021
Jaljali Village	January-2016	<0.005	<0.005	<0.005	<0.005	<0.005
	February-2016	<0.005	<0.005	<0.005	<0.005	<0.005
	March-2016	<0.005	<0.005	<0.005	<0.005	<0.005
Tatijharia Village/ Nr. Weigh bridge	January-2016	<0.005	<0.005	<0.005	<0.005	<0.005
	February-2016	<0.005	<0.005	<0.005	<0.005	<0.005
	March-2016	<0.005	<0.005	<0.005	<0.005	<0.005
Piprapat/ Nr.Mining Area	January-2016	0.018	0.026	0.022	0.022	0.026
	February-2016	0.021	0.027	0.024	0.024	0.027
	March-2016	0.019	0.024	0.022	0.022	0.024
CPCB Standard	1.0 (24 hrs)					

Conclusion: A)

The Average Concentration of Pb within the Core Zone of Samri Lease during this period (January to March-2016) is $0.022 \mu\text{g}/\text{m}^3$ and it is within permissible limits as per CPCB Standard.

Conclusion: B)

The Average Concentration of Pb within the Buffer Zone of Samri Lease during this period (January to March-2016) is $0.022 \mu\text{g}/\text{m}^3$ and it is within permissible limits as per CPCB Standard.



Table 12

Statistical Analysis of Hg

Unit: $\mu\text{g}/\text{m}^3$

Location	Month & Year	Min.	Max.	A.M.	G.M.	98%ile
Fugitive Emission (Core Zone):-						
Samri-Gopatu/ Nr.weigh bridge	January-2016	0.014	0.016	0.015	0.015	0.016
	February-2016	0.016	0.019	0.018	0.018	0.019
	March-2016	0.013	0.017	0.015	0.015	0.017
Rajendrapur/ Nr.Mining Area	January-2016	0.017	0.021	0.019	0.019	0.021
	February-2016	0.018	0.023	0.021	0.021	0.023
	March-2016	0.017	0.021	0.019	0.019	0.021
Kutku Village/ Nr.V.T. Center	January-2016	<0.01	<0.01	<0.01	<0.01	<0.01
	February-2016	<0.01	<0.01	<0.01	<0.01	<0.01
	March-2016	<0.01	<0.01	<0.01	<0.01	<0.01
Dumerkholi/ Nr.Mining Area	January-2016	<0.01	<0.01	<0.01	<0.01	<0.01
	February-2016	<0.01	<0.01	<0.01	<0.01	<0.01
	March-2016	<0.01	<0.01	<0.01	<0.01	<0.01
Buffer Zone :-						
Sairaidh Campus	January-2016	<0.01	<0.01	<0.01	<0.01	<0.01
	February-2016	<0.01	<0.01	<0.01	<0.01	<0.01
	March-2016	<0.01	<0.01	<0.01	<0.01	<0.01
Jaljali Village	January-2016	<0.01	<0.01	<0.01	<0.01	<0.01
	February-2016	<0.01	<0.01	<0.01	<0.01	<0.01
	March-2016	<0.01	<0.01	<0.01	<0.01	<0.01
Tatijharia Village/ Nr. Weigh bridge	January-2016	<0.01	<0.01	<0.01	<0.01	<0.01
	February-2016	<0.01	<0.01	<0.01	<0.01	<0.01
	March-2016	<0.01	<0.01	<0.01	<0.01	<0.01
Piprapat/ Nr.Mining Area	January-2016	<0.01	<0.01	<0.01	<0.01	<0.01
	February-2016	<0.01	<0.01	<0.01	<0.01	<0.01
	March-2016	<0.01	<0.01	<0.01	<0.01	<0.01
CPCB Standard		----				

Conclusion: A)

The Average Concentration of Hg within the Core Zone of Samri Lease during this period (January to March-2016) is $0.018 \mu\text{g}/\text{m}^3$.

Conclusion: B)

The Average Concentration of Hg within the Buffer Zone of Samri Lease during this period (January to March-2016) is $< 0.01 \mu\text{g}/\text{m}^3$.



Table 13
Statistical Analysis of As

Unit: ng/m³

Location	Month & Year	Min.	Max.	A.M.	G.M.	98%
Fugitive Emission (Core Zone):-						
Samri-Gopatu/ Nr.weigh bridge	January-2016	0.11	0.14	0.13	0.13	0.14
	February-2016	0.16	0.19	0.18	0.18	0.19
	March-2016	0.13	0.16	0.15	0.15	0.16
Rajendrapur/ Nr.Mining Area	January-2016	0.18	0.21	0.20	0.20	0.21
	February-2016	0.21	0.24	0.23	0.23	0.24
	March-2016	0.13	0.17	0.15	0.15	0.17
Kutku Village/ Nr.V.T. Center	January-2016	<0.1	<0.1	<0.1	<0.1	<0.1
	February-2016	<0.1	<0.1	<0.1	<0.1	<0.1
	March-2016	<0.1	<0.1	<0.1	<0.1	<0.1
Dumerkholi/ Nr.Mining Area	January-2016	<0.1	<0.1	<0.1	<0.1	<0.1
	February-2016	<0.1	<0.1	<0.1	<0.1	<0.1
	March-2016	<0.1	<0.1	<0.1	<0.1	<0.1
CPCB Standard	06 (Annual)					

Location	Month & Year	Min.	Max.	A.M.	G.M.	98%
Buffer Zone :-						
Sairaidh Campus	January-2016	<0.1	<0.1	<0.1	<0.1	<0.1
	February-2016	<0.1	<0.1	<0.1	<0.1	<0.1
	March-2016	<0.1	<0.1	<0.1	<0.1	<0.1
Jaljali Village	January-2016	<0.1	<0.1	<0.1	<0.1	<0.1
	February-2016	<0.1	<0.1	<0.1	<0.1	<0.1
	March-2016	<0.1	<0.1	<0.1	<0.1	<0.1
Tatijharia Village/ Nr. Weigh bridge	January-2016	<0.1	<0.1	<0.1	<0.1	<0.1
	February-2016	<0.1	<0.1	<0.1	<0.1	<0.1
	March-2016	<0.1	<0.1	<0.1	<0.1	<0.1
Piprapat/ Nr.Mining Area	January-2016	<0.1	<0.1	<0.1	<0.1	<0.1
	February-2016	<0.1	<0.1	<0.1	<0.1	<0.1
	March-2016	<0.1	<0.1	<0.1	<0.1	<0.1
CPCB Standard	06 (Annual)					

Conclusion: A)

The Average Concentration of As within the Core Zone of Samri Lease during this period (January to March-2016) is 0.17 ng/m³ and it is within permissible limits as per CPCB Standard.

Conclusion: B)

The Average Concentration of As within the Buffer Zone of Samri Lease during this period (January to March-2016) is < 0.01 ng/m³ and it is within permissible limits as per CPCB Standard.



Free Silica :-

Sr. No.	Location	Measurement Unit	January-2016		February-2016		March-2016	
			SPM	RSPM	SPM	RSPM	SPM	RSPM
1.	Rajendrapur/ Near Mining Area	g/100gm	0.28	0.13	0.31	0.11	0.36	0.14

Table 14

Dust fall Rate

Sr. No.	Location	January-2016	February-2016	March-2016	Average
		Rate (MT/km ² /Month)			
1.	Rajendrapur/Nr.Mining Area	18.29	23.72	21.64	21.22
2.	Samri-Gopatu/Nr.Weigh Bridge	16.32	19.54	23.47	19.78



Table-15

Noise Level Monitoring

Unit: dB(A)

Sl. No.	Location	January-2016		February-2016		March-2016	
		Day	Night	Day	Night	Day	Night
Core Zone							
1.	Samri-Gopatu/Nr.Weigh Bridge	58	43	62	54	67	56
2.	Rajendrapur/Nr.Mining Area	63	52	59	48	61	53
3.	Kutku Village/Nr.V.T.Center	46	37	49	38	51	42
4.	Dumerkholi/Nr.Mining Area	64	56	57	49	62	54
Buffer Zone							
1.	Sairaidh Campus	48	41	47	38	51	42
2.	Jaljali Village	51	43	48	36	49	38
3.	Tatijharia Village/Nr.Weigh Bridge	53	41	51	42	46	37
4.	Piprapat/Near Mining Area	49	38	52	39	47	41

CPCB Standards for Residential Area : 55 (Day time) 45 (Night time)
Industrial Area : 75 (Day time) 70 (Night time)

Table 15-(A)

HEMM Spot Noise Level Monitoring

Sl. No.	Location	January-2016			February-2016			March-2016		
		Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.
1.	Rajendrapur/Nr. .Mining Area	68.3	76.1	72.2	64.9	73.8	69.4	67.3	79.4	73.4

Note:- All the Values are in CPCB Limit.



Table-15

Noise Level Monitoring

Unit: dB(A)

Sl. No.	Location	January-2016		February-2016		March-2016	
		Day	Night	Day	Night	Day	Night
Core Zone							
1.	Samri-Gopatu/Nr.Weigh Bridge	58	43	62	54	67	56
2.	Rajendrapur/Nr.Mining Area	63	52	59	48	61	53
3.	Kutku Village/Nr.V.T.Center	46	37	49	38	51	42
4.	Dumerkholi/Nr.Mining Area	64	56	57	49	62	54
Buffer Zone							
1.	Sairaidh Campus	48	41	47	38	51	42
2.	Jaljali Village	51	43	48	36	49	38
3.	Tatijharia Village/Nr.Weigh Bridge	53	41	51	42	46	37
4.	Piprapat/Near Mining Area	49	38	52	39	47	41

CPCB Standards for Residential Area : 55 (Day time) 45 (Night time)
Industrial Area : 75 (Day time) 70 (Night time)

Table 15-(A)

HEMM Spot Noise Level Monitoring

Sl. No.	Location	January-2016			February-2016			March-2016		
		Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.
1.	Rajendrapur/Nr .Mining Area	68.3	76.1	72.2	64.9	73.8	69.4	67.3	79.4	73.

Note:- All the Values are in CPCB Limit.



3.9 Ground Water Quality:- Most of the villages in the nearby plant area have hand pumps and wells. Most of the residents of these villages make use of this water for drinking and other domestic uses for

Table 16
Report on Chemical Examination of Ground Water
(Average of Three Months January-February-March-2016)

Location:	GW1) Rajendrapur / Near Mining Area
------------------	--

TEST RESULTS

Sr. No.	Test Parameter	Measurement Unit	Test Method	As per IS 10500 : 2012 (Drinking Water - Specification)		Test Result
				Acceptable Limit	*Permissible Limit	
1.	pH value	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.29 at 26°
2.	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.7
3.	Colour	Hazen units	IS 3025 (Part 4)	5	15	1
4.	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
5.	Taste	-	IS 3025 (Part 8)	Agreeable	Agreeable	Agreeable
6.	Iron (as Fe)	mg/l	IS 3025 (Part 2)	0.3	No relaxation	0.16
7.	Free residual chlorine	mg/l	IS 3025 (Part 26)	Min. 0.2	Min. 1	< 0.1
8.	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	329
9.	Fluoride (as F)	mg/l	IS 3025 (Part 60)	1.0	1.5	0.17
10.	Cyanide (as CN)	mg/l	IS 3025 (Part 27)	0.05	No relaxation	< 0.005
11.	Chloride (as Cl)	mg/l	IS 3025 (Part 32)	250	1000	112.7
12.	Total Alkalinity (as CaCO ₃)	mg/l	IS 3025 (Part 23)	200	600	143.9
13.	Total hardness (as CaCO ₃)	mg/l	IS 3025 (Part 21)	200	600	178.29
14.	Calcium (as Ca)	mg/l	IS 3025 (Part 40)	75	200	58.31
15.	Magnesium (as Mg)	mg/l	IS 3025 (Part 46)	30	100	7.92
16.	Sulphate (as SO ₄)	mg/l	IS 3025 (Part 24)	200	400	46.68
17.	Nitrate (as NO ₃)	mg/l	APHA Method	45	No relaxation	< 2
18.	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	< 0.03
19.	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	< 0.05
20.	Mercury (as Hg)	mg/l	IS 3025 (Part 2)	0.001	No relaxation	< 0.0005
21.	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	< 0.001
22.	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	< 0.001
23.	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	0.05	< 0.01
24.	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	< 0.005
25.	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	< 0.001
26.	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	0.16

'<' indicates detection limit of the laboratory.

Contd...



Hindalco Industries Limited
 Samri Mining Environmental Status
 Report for January-2016 To March-2016

Introduction

(Contd.....)

Sr. No	Test Parameter	Measurement Unit	Test Method	As per IS 10500 : 2012 (Drinking Water - Specification)		Test Result
				Acceptable Limit	*Permissible Limit	
27.	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	< 0.01
28.	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	< 0.03
29.	Barium (as Ba)	mg/l	Annexure F of IS 13428	0.7	No relaxation	< 0.01
30.	Ammonia (as N)	mg/l	IS 3025 (Part 34)	0.5	No relaxation	< 0.01
31.	Sulphide (as H ₂ S)	mg/l	IS 3025 (Part 29)	0.05	No relaxation	< 0.03
32.	Chloramines (as Cl ₂)	mg/l	APHA 4500-Cl ₂ G	4.0	No relaxation	< 0.01
33.	Molybdenum (as Mo)	mg/l	IS 3025 (Part 2)	0.07	No relaxation	< 0.001
34.	Silver (as Ag)	mg/l	Annexure J of IS 13428	0.1	No relaxation	< 0.001
35.	Polychlorinated Biphenyls (PCB)	mg/l	USEPA 508	0.5	No relaxation	< 0.03
36.	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	1.0	< 0.1
37.	Mineral Oil	mg/l	IS 3025 (Part 39)	0.5	No relaxation	< 0.001
38.	Tri Halo Methane					
	a. Bromoform			0.1	No relaxation	Absent
	b. Dibromochloromethane		APHA 6232	0.1	No relaxation	Absent
	c. Bromodichloromethane			0.06	No relaxation	Absent
	d. Chloroform			0.2	No relaxation	Absent
39.	Phenolic compounds (as C ₆ H ₅ OH)	mg/l	IS 3025 (Part 43) :1001	0.001	0.002	< 0.001
40.	Anionic detergents (as MBAS)	mg/l	IS 13428:2005 (Annex K)	0.2	1.0	< 0.001
41.	Polynuclear aromatic hydrocarbon (PAH)	mg/l	USEPA: 550	0.1	No relaxation	< 0.03
42.	Total coliform	MPN/100ml	IS 1822	---	---	< 2
43.	<i>Escherichia coli</i>	MPN/100ml	IS 1822	Absent	Absent	Absent

< indicates detection limit of the laboratory

Contd.....

Contd.....



(Contd.....)

Sr. No.	Test Parameter	Measurement Unit	Test Method	As per IS 10500 : 2012 (Drinking Water - Specification)	Test Result
44.	Pesticides residues				
i.	Alpha-HCH	µg/l	USEPA 508	0.01	< 0.01
ii.	Beta HCH	µg/l	USEPA 508	0.04	< 0.03
iii.	Delta- HCH	µg/l	USEPA 508	0.04	< 0.03
iv.	Alachlor	µg/l	USEPA 508	20	< 0.03
v.	Aldrin / Dieldrin	µg/l	USEPA 508	0.03	< 0.03
vi.	Atrazine	µg/l	USEPA 1657	2	< 0.03
vii.	Butachlor	µg/l	USEPA 508	125	< 0.03
viii.	Chlorpyrifos	µg/l	USEPA 1657	30	< 0.03
ix.	DDT and its Isomers	µg/l	USEPA 508	1	< 0.03
x.	Gamma - HCH (Lindane)	µg/l	USEPA 508	2	< 0.03
xi.	2,4-Dichlorophenoxyacetic acid	µg/l	USEPA 1657	30	< 0.03
xii.	Endosulphan	µg/l	USEPA 508	0.4	< 0.03
xiii.	Ethion	µg/l	USEPA 1657	3	< 0.03
xiv.	Isoproturon	µg/l	USEPA 1657	9	< 0.03
xv.	Malathion	µg/l	USEPA 1657	190	< 0.03
xvi.	Methyl Parathion	µg/l	USEPA 1657	0.3	< 0.03
xvii.	Monocrotophos	µg/l	USEPA 1657	1	< 0.03
xviii.	Phorate	µg/l	USEPA 1657	2	< 0.03

Note: 1. Results relate to tested sample only. 2. Test report should not be reproduced partially. 3. *Permissible limit in the absence of alternate source. 4. 'mg/l' is equivalent to 'ppm' 5. 'µg/l' is equivalent to 'ppb' 6. '<' indicates detection limit of the laboratory. 7. MPN-Most probable number. 8. Results for test no. 7 are not applicable.

REMARKS: Based upon request of the party, sample was tested for above mentioned parameters only. Sample complies with IS:10500:2012, for tests conducted, indicating that it is fit for drinking purpose with respect to tested parameters.



Table 17

Monthly Report on Chemical Examination of Surface Water

(Nallahs Near by Rajendrapur/Near Mining Area)

(Average of Three Months January-February-March-2016)

Sr. No.	Test Parameter	Measurement Unit	Test Method	As per IS 10500 : 2012 (Drinking Water - Specification)		Test Result
				Acceptable Limit	*Permissible Limit	
1.	pH value	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	6.68 at 26°C
2.	Turbidity	NTU	IS 3025 (Part 10)	1	5	2.9
3.	Colour	Hazen units	IS 3025 (Part 4)	5	15	7
4.	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
5.	Taste	-	IS 3025 (Part 8)	Agreeable	Agreeable	Agreeable
6.	Iron (as Fe)	mg/l	IS 3025 (Part 2)	0.3	No relaxation	0.24
7.	Free residual chlorine	mg/l	IS 3025 (Part 26)	Min. 0.2	Min. 1	< 0.1
8.	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	351
9.	Fluoride (as F)	mg/l	IS 3025 (Part 60)	1.0	1.5	0.21
10.	Cyanide (as CN)	mg/l	IS 3025 (Part 27)	0.05	No relaxation	< 0.005
11.	Chloride (as Cl)	mg/l	IS 3025 (Part 32)	250	1000	153.72
12.	Total Alkalinity (as CaCO ₃)	mg/l	IS 3025 (Part 23)	200	600	163.91
13.	Total hardness (as CaCO ₃)	mg/l	IS 3025 (Part 21)	200	600	250.31
14.	Calcium (as Ca)	mg/l	IS 3025 (Part 40)	75	200	81.57
15.	Magnesium (as Mg)	mg/l	IS 3025 (Part 46)	30	100	11.3
16.	Sulphate (as SO ₄)	mg/l	IS 3025 (Part 24)	200	400	112.8
17.	Nitrate (as NO ₃)	mg/l	APHA Method	45	No relaxation	8.4
18.	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	< 0.03
19.	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	< 0.05
20.	Mercury (as Hg)	mg/l	IS 3025 (Part 2)	0.001	No relaxation	< 0.0005
21.	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	< 0.001
22.	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	< 0.001
23.	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	0.05	< 0.01
24.	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	< 0.005
25.	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	< 0.001
26.	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	0.27

'<' indicates detection limit of the laboratory.

Contd.....



**Hindalco Industries Limited
Samri Mining Environmental Status
Report for January-2016 To March-2016**

Introduction

(Contd.....)

Sr. No	Test Parameter	Measurement Unit	Test Method	As per IS 10500 : 2012 (Drinking Water - Specification)		Test Result
				Acceptable Limit	*Permissible Limit	
27.	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	< 0.01
28.	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	< 0.03
29.	Barium (as Ba)	mg/l	Annexure F of IS 13428	0.7	No relaxation	< 0.01
30.	Ammonia (as N)	mg/l	IS 3025 (Part 34)	0.5	No relaxation	< 0.01
31.	Sulphide (as H ₂ S)	mg/l	IS 3025 (Part 29)	0.05	No relaxation	< 0.03
32.	Chloramines (as Cl ₂)	mg/l	APHA 4500-Cl ₂ G	4.0	No relaxation	< 0.01
33.	Molybdenum (as Mo)	mg/l	IS 3025 (Part 2)	0.07	No relaxation	< 0.001
34.	Silver (as Ag)	mg/l	Annexure J of IS 13428	0.1	No relaxation	< 0.001
35.	Polychlorinated Biphenyls (PCB)	µg/l	USEPA 508	0.5	No relaxation	< 0.03
36.	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	1.0	0.18
37.	Mineral Oil	mg/l	IS 3025 (Part 39)	0.5	No relaxation	< 0.001
38.	Tri Halo Methane					
	a. Bromoform	mg/l	APHA 6232	0.1	No relaxation	Absent
	b. Dibromochloromethane			0.1	No relaxation	Absent
	c. Bromodichloromethane			0.06	No relaxation	Absent
	d. Chloroform			0.2	No relaxation	Absent
39.	Phenolic compounds (as C ₆ H ₅ OH)	mg/l	IS 3025 (Part 43) :1001	0.001	0.002	< 0.001
40.	Anionic detergents (as MBAS)	mg/l	IS 13428:2005 (Annex K)	0.2	1.0	< 0.001
41.	Polynuclear aromatic hydrocarbon (PAH)	µg/l	USEPA : 550	0.1	No relaxation	< 0.03
42.	Total coliform	MPN/100 ml	IS 1622	—	—	1600
43.	<i>Escherichia coli</i>	Per100 ml	IS 1622	Absent	Absent	Present

'<' indicates detection limit of the laboratory.

Contd.....



Hindalco Industries Limited
Samri Mining Environmental Status
Report for January-2016 To March-2016

Introduction

(Contd.....)

Sr. No.	Test Parameter	Measurement Unit	Test Method	As per IS 10500 : 2012 (Drinking Water - Specification)	Test Result
44. Pesticides residues					
i	Alpha-HCH	µg/l	USEPA 508	0.01	< 0.01
	Beta HCH	µg/l	USEPA 508	0.04	< 0.03
	Delta- HCH	µg/l	USEPA 508	0.04	< 0.03
	Alachlor	µg/l	USEPA 508	20	< 0.03
	Aldrin / Dieldrin	µg/l	USEPA 508	0.03	< 0.03
	Atrazine	µg/l	USEPA 1657	2	< 0.03
	Butachlor	µg/l	USEPA 508	125	< 0.03
	Chlorpyrifos	µg/l	USEPA 1657	30	< 0.03
	DDT and its Isomers	µg/l	USEPA 508	1	< 0.03
	Gamma - HCH (Lindane)	µg/l	USEPA 508	2	< 0.03
	2,4-Dichlorophenoxyacetic acid	µg/l	USEPA 1657	30	< 0.03
	Endosulphan	µg/l	USEPA 508	0.4	< 0.03
	Ethion	µg/l	USEPA 1657	3	< 0.03
	Isoproturon	µg/l	USEPA 1657	9	< 0.03
	Malathion	µg/l	USEPA 1657	190	< 0.03
	Methyl Parathion	µg/l	USEPA 1657	0.3	< 0.03
	Monocrotophos	µg/l	USEPA 1657	1	< 0.03
	Phorate	µg/l	USEPA 1657	2	< 0.03

Note: 1. Results relate to tested sample only. 2. Test report should not be reproduced partially. 3. *Permissible limit in the absence of alternate source. 4. 'mg/l' is equivalent to 'ppm' 5. 'µg/l' is equivalent to 'ppb' 6. '<' indicates detection limit of the laboratory. 7. MPN-Most probable number. 8. Results for test no. 7 are not applicable.

REMARKS: Based upon request of the party, sample was tested for above mentioned parameters only.



Table 18

Soil Analysis Report

Date of collection: March-2016

Sr. No	Test Parameters	Measurement Unit	Results
			Rajendrapur/Nr.Mining Area
1	pH	-	6.92 at 26°C
2	Electrical Conductivity at 25°C	µS/cm	291
3	Texture	-	Silty clay
4	Sand	%	38.1
5	Silt	%	27.4
6	Clay	%	34.5
7	Bulk Density	g/cc	1.21
8	Porosity	%	24
9	Water Holding Capacity	%	46
10	Exchangeable Calcium as Ca	mg/kg	23.9
11	Exchangeable Magnesium as Mg	mg/kg	6.8
12	Exchangeable Sodium as Na	mg/kg	32.3
13	Available Potassium as K	kg/ha.	47.9
14	Available Phosphorous as P	kg/ha.	71.8
15	Available Nitrogen as N	kg/ha.	237.3
16	Organic Matter	%	0.18
17	Organic Carbon	%	0.11
18	Water Soluble Chloride as Cl ⁺	mg/kg	24.8
19	Water Soluble Sulphate as SO ₄	mg/kg	6.2
20	Sodium Absorption Ratio	-	7.16
21	CEC	meq/100 gm	13.7
22	Total Iron	%	6.1
23	Available Manganese	mg/kg	0.08
24	Available Zinc	mg/kg	0.021
25	Available Boron	mg/kg	0.006

Method of sampling and analysis: IS: 2720 and methods of soil analysis, part I, 2nd Ed, 1986 of (American society for Agronomy and soil science society of America)

Note: 1. Results relate to tested sample only. 2. Test report should not be reproduced partially. 3. 'mg/Kg' is equivalent to 'ppm'. 4. 'g/100g' is equivalent to '%w/w'. 5. All parameters are in 1:5 water extract.

REMARKS: Based upon request of party, sample was tested for above mentioned parameters only.

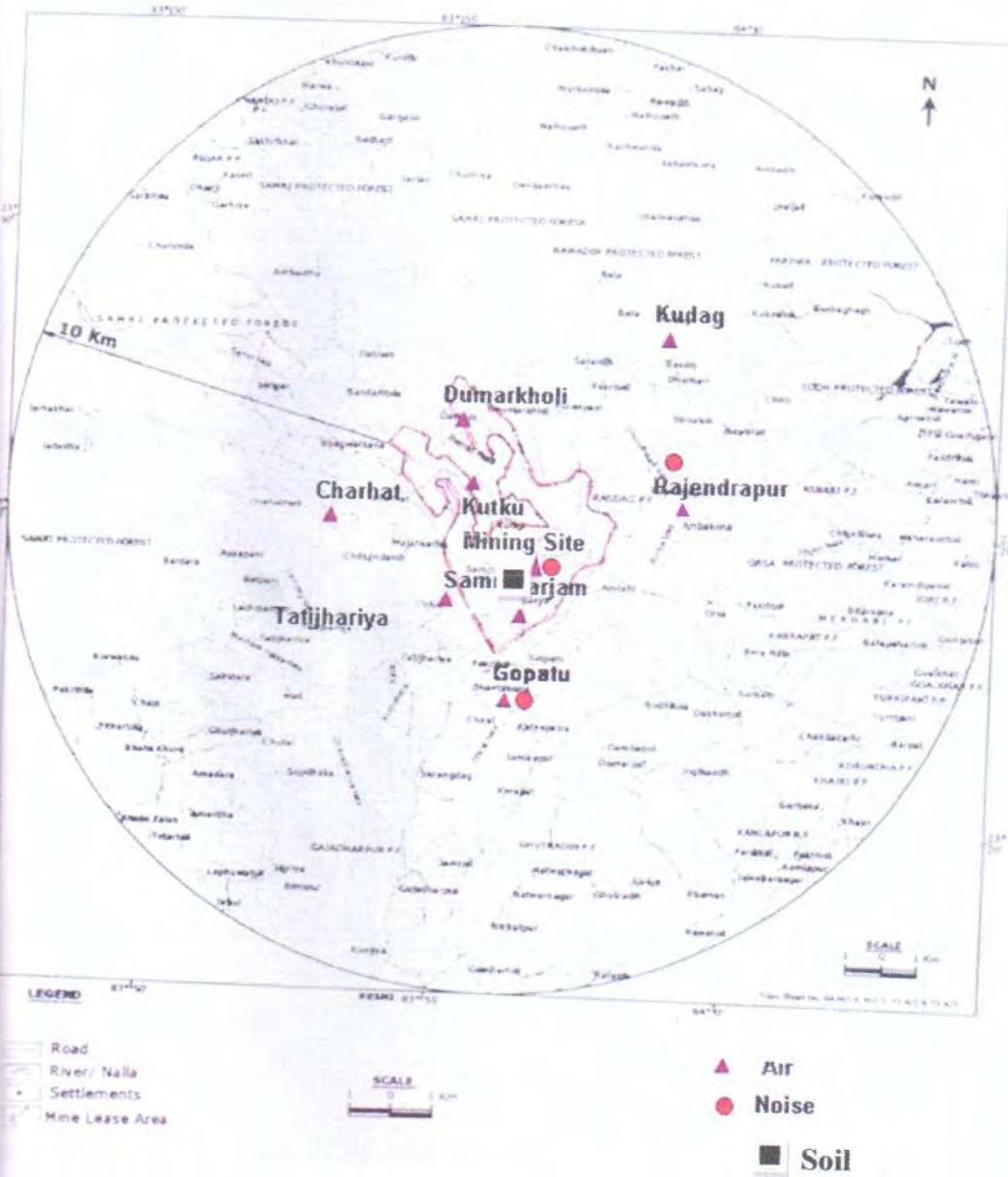


Fig 3: Sampling Locations for Air, Noise

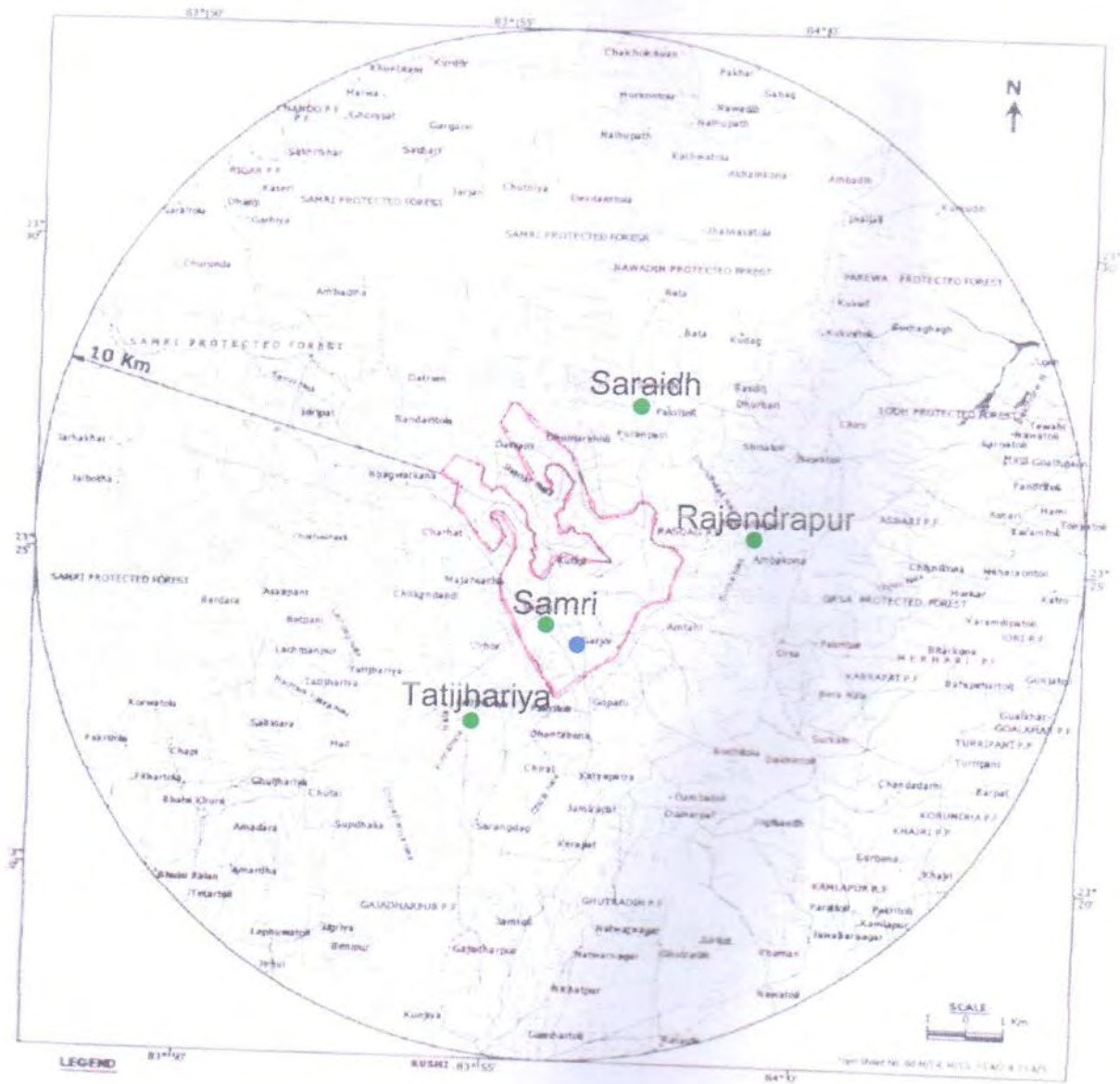


Fig 04: Sampling Locations for Water



CHHATTISGARH ENVIRONMENT CONSERVATION BOARD
Commercial Complex, Chhattisgarh Housing Board Colony,
Kabir Nagar, Raipur (C.G.) 492 099

No. 6426 TS/CECB/2015Raipur, dated: 31/1 /2015

To,

M/s Hindalco Industries Limited,
 Samri Bauxite Mine,
 Village-Samri, Gopatu & Dumerkholi,
 Tehsil-Samri,
District- Surquja (C.G.)

Recd

 15.1.15

Sub: Renewal of consent of the Board for Bauxite Ore Mine under section 21 of the Air (Prevention and Control of Pollution) Act, 1981.

- Ref: 1. Consent of the Board for Bauxite Ore Mine issued under section 21 of the Air (Prevention and Control of Pollution) Act, 1981 vide letter no. 6878/TS/CECB/2007 Raipur, dated: 24/12/2007.
2. Last renewal of the Board for Bauxite Ore Mine issued under section 21 of the Air (Prevention and Control of Pollution) Act, 1981 vide letter no. 5643/TS/CECB/2014 Raipur, dated: 05/03/2014.
3. Your letter no. HIL/SAM/CECB/422/2014/05, dated: 23/07/2014 and subsequent correspondence ending letter dated: 23/09/2014

--: 00 :--

With reference to your above application consent is hereby renewed for a period of two years i.e. from 01/12/2014 to 30/11/2016, subject to the fulfillment of the terms and conditions incorporated in the consent letter No. 6878/TS/CECB/2007 Raipur, dated: 24/12/2007, subsequent renewals of consent issued by the Board and additional conditions mentioned below.

This renewal of consent is valid for production capacity of:-

Name	Production Capacity
Mining of bauxite ore	5.0 Lakhs Tonne per Annum [Five Lakhs Tonne per Annum]

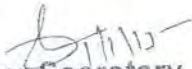
Additional Conditions

1. Industry shall operate and maintain the air pollution control system effectively and regularly. Effective steps shall be taken to control fugitive dust emission. Fixed type automatic water sprinkling system shall be installed at haul road / 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. Industry shall maintain the ambient air quality within prescribed limit in and around the mine area all the time. Chhattisgarh Environment Conservation Board may further stipulate stringent particulate matter emission limit depending upon environmental conditions.

2. Regular monitoring for the measurement of air pollutants level in ambient shall be carried out. Industry shall submit ambient air quality monitoring reports to the Board regularly every month.
3. Industry shall ensure safe and scientific arrangement for disposal of all solid wastes.
4. All internal roads shall be maintained properly. Dust muck and sludge generated due to transportation on the roads shall be cleaned and disposed off properly. Industry shall improve housekeeping 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 far as possible maximum area of open spaces shall be utilized for plantation purposes. Extensive tree plantation shall be carried out in this year including plantation in over burden area.
7. Industry shall submit Environment Statement to this Board as per provision of Environment (Protection) amendment Rule, 1993 for the previous year ending 31st March on or before 30th September every year.

Please acknowledge the receipt of this letter.

For & on behalf of
Chhattisgarh Environment Conservation Board Raipur (C.G.)


Member Secretary

Chhattisgarh Environment Conservation Board
Raipur (C.G.)

Endt. No.
Copy to: -

/TS/CECB/2015

Raipur, dated: ___ / ___ /2015

Regional Officer, Regional Office, Chhattisgarh Environment Conservation Board, Ambikapur (C.G.). Please ensure compliance and report, if any condition/conditions are violated by the industry.


Member Secretary

Chhattisgarh Environment Conservation Board
Raipur (C.G.)



CHHATTISGARH ENVIRONMENT CONSERVATION BOARD
Commercial Complex, Chhattisgarh Housing Board Colony,
Kabir Nagar, Raipur (C.G.) 492 099

No. 642A/ITS/CECB/2015

Raipur, dated: 31/1 /2015

To,

M/s Hindalco Industries Limited,
Samri Bauxite Mine,
Village-Samri, Gopatu & Dumerkholi,
Tehsil-Samri,
District- Surguja (C.G.)

Recd.
15.1.15.

Sub: Renewal of consent of the Board under section 25/26 of the Water (Prevention and Control of Pollution) Act, 1974.

- Ref: 1. Consent of the Board issued under section 25/26 of the Water (Prevention and Control of Pollution) Act, 1974 vide letter no. 6876/TS/CECB/2007 Raipur, dated: 24/12/2007.
2. Last renewal of the Board issued under section 25/26 of the Water (Prevention and Control of Pollution) Act, 1974 vide letter no. 5641/TS/CECB/2014 Raipur, dated: 05/03/2014.
3. Your letter no. HIL/SAM/CECB/422/2014/05, dated: 23/07/2014 and subsequent correspondence ending letter dated: 23/09/2014.

--: 00 :--

With reference to your above application consent is hereby renewed for a period of two years i.e. from 01/12/2014 to 30/11/2016, subject to the fulfillment of the terms and conditions incorporated in the schedule of the consent letter no. 6876/TS/CECB/2007 Raipur, dated: 24/12/2007, subsequent renewals of consent issued by the Board and additional conditions mentioned below.

This renewal of consent is valid for production capacity of: -

Name	Production Capacity
Mining of bauxite ore	5.0 Lakhs Tonne per Annum [Five Lakhs Tonne 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 in to the river or any 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.
3. All internal roads shall be maintained properly. Dust muck and sludge generated due to transportation on the roads shall be cleaned and disposed off properly. Industry shall improve housekeeping 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 adopt rainwater-harvesting technique in the project area and residential area (if any) for recharge of ground water.
6. Garland drains with appropriate check dams shall be provided all along the raw ore storage areas, over burden storage area etc. to avoid any possibility of erosion during rain.
7. Industry shall submit monitoring report of effluent regularly.
8. Wide green belt of broad leaf local species shall be developed along the mine lease area. As far as possible maximum area of open spaces shall be utilized for plantation purposes. Extensive tree plantation shall be carried out in this year including plantation in over burden area.
9. Industry shall submit Environment Statement to this Board as per provision of Environment (Protection) amendment Rule, 1993 for the previous year ending 31st March on or before 30th September every year.

Please acknowledge the receipt of this letter.

For & on behalf of
Chhattisgarh Environment Conservation Board Raipur (C.G.)


Member Secretary


Chhattisgarh Environment Conservation Board
Raipur (C.G.)

Endt. No. /TS/CECB/2015

Raipur, dated: ___ / ___ /2015

Copy to: -

- 1- Regional Officer, Regional Office, Chhattisgarh Environment Conservation Board, Ambikapur (C.G.). Please ensure compliance and report, if any condition/conditions are violated by the industry.
- 2- Cess Section, Chhattisgarh Environment Conservation Board, Raipur (C.G.)


Member Secretary

Chhattisgarh Environment Conservation Board
Raipur (C.G.)

Hindalco Industries Ltd.
Mines Division, Samri

Lease wise Production 2015-16

Lease	Production (MT)
Samri	411399.000
Kudag	49372.000
Tatijharia	365945.000
Total	826716.000


**Agent of Mines
Samri Mines Division
Hindalco Industries Ltd**

Hindalco Industries Ltd.
Mines Division, Samri

Lease wise Details 2015-16

Lease	Mined Out Area (Hact.)	Reclaimed Area (Hact.)	Nos. of Sapling	Area of Sapling (Hact.)
Samri	10.999	15.453	10139	4.050
Kudag	4.452	4.084	4000	1.600
Tatijharia	9.302	7.844	7500	3.000
Total	24.753	27.381	21639	8.650


**Agent of Mines
Samri Mines Division
Hindalco Industries Ltd.**

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.
1998-99	900	0.1	0	0	0	0	900	0.1
1999-00	7000	2.58	0	0	0	0	7000	2.58
2000-01	7500	3.21	0	0	0	0	7500	3.21
2001-02	10000	5.01	0	0	0	0	10000	5.01
2002-03	4000	1.56	3800	2.44	0	0	7800	4
2003-04	4200	2.57	5500	2.81	0	0	9700	5.38
2004-05	6750	2.9	8222	2.8	2000	1	16972	6.7
2005-06	800	0.5	11100	3.8	8700	3.4	20600	7.7
2006-07	4940	2	16510	6.884	8190	3.3	29640	12.184
2007-08	2950	1.3	18880	7.75	6390	2.5	28220	11.55
2008-09	32200	12.72	5000	2.47	3000	1.5	40200	16.69
2009-10	15700	6.20	15100	6.00	7850	3.20	38650	15.40
2010-11	1500	0.600	18325	7.200	8750	3.400	28575	11.200
2011-12	3015	1.200	11575	4.600	3370	1.360	17960	7.160
2012-13	1200	0.500	12400	5.000	4600	1.900	18200	7.400
2013-14	950	0.400	8700	3.500	4875	2.000	14525	5.900
2014-15	5575	2.230	12850	5.150	7750	3.100	26175	10.480
2015-16	4000	1.600	10139	4.050	7500	3.000	21639	8.650
Total	113180	47.18	158101	64.454	72975	29.660	344256	141.294

Actual Expenditure incurred in Environment Management Plan:-

Total cost for protection of environment in Samri, Tatijharia & Kudag Bauxite Mine of Hindalco Industries Ltd. of Chhattisgarh state during the second half period of F.Y. 2015-16 (October15-March16).

SI No-	Environment Protection Measures	Actual Cost (Lac) (F.Y. 2015-16) (Oct15-Mar16))
1	Pollution Control	9.75
2	Environment Monitoring	1.51
3	Occupational Health	7.5
4	Green Belt	7.80
5	Reclamation/Rehabilitation of mined out area (Samri -2.944 Ha. Tatijharia-1.202 Ha. Kudag- 0.364 Ha. Total – 4.510 Ha.)	22.55
6	Total	49.11

- 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 among three leases viz, Samri, Tatijharia & Kudag.
- Reclamation of mined out land has been out sourced along with production. Average cost of reclamation considered @ 5.0 Lac per Ha.


**Agent of Mines
 Samri Mines Division
 Hindalco Industries Ltd**