

NIL/SAM/APCCF/235/2017/S

16.11.2017.

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 April-2017 to September-2017.

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 of Samri Bauxite Mine, Lease area - 2146.746 Ha, of Hindalco Industries Limited P.O- Kusmi, Dist- Balrampur- Ramanujganj, Chhattisgarh state, PIN-497224 from April-2017 to September-2017.

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

Agent of Mines
Samri Mines Division
Hindalco Industries Ltd

Encl:-

1. Half Yearly Status of compliance of Environment condition as annexure-I.
2. Copy of Diversion and extension of Revenue Forest Land enclosed as annexure -II.
3. Environment Status Report from July-2017 to September-2017, enclosed as annexure -III
4. Renewal copy of Consent to Operate from CECB enclosed as annexure -IV
5. Production report from April-2017 to September-2017 enclosed as annexure-V.
6. Status report of mined out, reclaimed and afforested land as annexure-VI.
7. Actual expenditure incurred in protection of environment from April-2017 to September-2017 as annexure-VII.

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Samri Mines Division, Baba Chowk,
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14.11.2017.

Status of Compliance from April-2017 to September-2017 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 in 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 Mine.
Encl. As Above

Samri Mines Division
Hindalco Industries Ltd.


Agent of Mines
Samri Mines Division
Mineralco 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>Dichanthium annulatum</i>	Grass	Poaceae
<i>Inpurta cylendrica</i>	Grass	Poaceae
<i>Themeda quadrivalvis</i>	Grass	Poaceae
<i>Aristida adscensionis</i>	Grass	Poaceae
<i>Eragrostis biferia</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>Hordium 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>Catharanthes pusillus</i>	Compositae	Therophyte
13	Cicer arletinum	Fabaceae	Hemicryptophyte
14	<i>Citrus lemon</i>	Ruataceae	Therophyte
15	<i>Colacasia esculenta</i>	Areaceae	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 lebbeck</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 campestris</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	Therophyte
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>Emilia 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 gibbosa</i>	Moraceae	Phanerophyte
131	<i>Gardenia latifolia</i>	Rubiaceae	Phanerophyte
132	<i>Gardenia lucida</i>	Rubiaceae	Phanerophyte
133	<i>Garuga pinnata</i>	Burseraceae	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 sallivifolia</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>Helitropium ovalifolium</i>	Rubiaceae	Hemicryptophyte
145	<i>Hemidesmus indicus</i>	Asclepiadaceae	Phanerophyte
146	<i>Hibiscus caesus</i>	Malvaceae	Hemicryptophyte
147	<i>Holarrhena antidysenterica</i>	Asclepiadaceae	Phanerophyte
148	<i>Holostemma annularia</i>	Asclepiadaceae	Phanerophyte
149	<i>Hygrophylla auriculata</i>	Acanthaceae	Hemicryptophyte
150	<i>Hyptis suavalens</i>	Labiatae	Therophyte
151	<i>Ichnocarpus frutens</i>	Poaceae	Hemicryptophyte
152	<i>Impatiens balasamania</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>Jasmimum 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 tridinatus</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 basilium</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	Therophyte
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 niruri</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>Scherebera sweitenoides</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>Tamarindus 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>Vivevera 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>	Rhamnaceae	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>Inpurta cylendrica</i>	Poaceae	Hemicryptophyte
284	<i>Sachharum spontanseum</i>	Poaceae	Hemicryptophyte
285	<i>Themeda quadrivalvis</i>	Poaceae	Hemicryptophyte
286	<i>Aristida adscensionis</i>	Poaceae	Hemicryptophyte
287	<i>Cenchrus ciliaris</i>	Poaceae	Therophyte
288	<i>Cenchrus setifgera</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>Nectarenia. 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 tigrana</i>	Common frog	Sch-IV
<i>Buto melanosticus</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>Bolga spp.</i>	Cat snake	Sch-III
<i>Bangarus spp.</i>	Krait	Sch-II
<i>Naja naja</i>	Indian cobra	Sch-III
<i>Vipera spp.</i>	Russels viper	Sch-III
<i>Phyton 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>Catopsilla sp.</i>	Emigrant	-
Mammals		
<i>Rattus sp.</i>	Rat	Sch-IV
<i>Lepus nigricollis</i>	Hare	Sch-IV
<i>Canis auries</i>	Jackal	Sch-III
<i>Presbytis entellus</i>	Langur	Sch-II
<i>Presbytis phayrel</i>	Monkey	Sch-I
<i>Funambulus spp.</i>	Squirrel	Sch-IV
<i>Funambulus palmarum</i>	Squirrel	Sch-IV
<i>Sus sucofa</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>Melurus ursinus</i>	Bear	Sch-III
<i>Hystrix indica</i>	Porcupine	Sch-IV
<i>Axis axis</i>	Spotted deer	Sch-III
<i>Canis lupaspallipes</i>	Indian wolf	Part-I of Sch-I
<i>Mellivora capensis</i>	Indian Ratel	Part-I of Sch-I
<i>Elephas maximas</i>	Indian Elephant	Part-I of Sch-I
<i>Felis chaus</i>	Jungle cat	Part-II of sch-II
<i>Parodoxurus 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

कार्यालय प्रधान मुख्य वन संरक्षक (वन्यप्राणी प्रबंधन एवं जैव विविधता
संरक्षण सह मुख्य वन्यप्राणी अभिरक्षक), छत्तीसगढ़
अरण्य भवन, मेडिकल कॉलेज रोड, रायपुर
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क्रमांक/व.प्रा./प्रबंध-12/13/2967

रायपुर दिनांक 07/10/2013

प्रति,

संचालक,
इन्वायरनमेंट क्लीयरेंस 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 बॉक्साईट
माईन्स, कुदाग बॉक्साईट माईन्स एवं टाटीझरिया बॉक्साईट माईन्स की क्षमता बढ़ाये हेतु
इन्वायरनमेंट क्लीयरेंस।

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

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

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

- 1.0 LPTA से बढ़ाकर 5.0 LPTA किया जाना वन्य प्राणी के लिए 0.4 LPTA से बढ़ाकर 0.6 LPTA किया जाना एवं टाटीसरिया के लिए 50,000 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 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 2.05.2013 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 लकड़बग्घे के कारण एक प्रकरण दर्ज किये गये हैं। इस प्रकार वन्य प्राणी (संरक्षण) अधिनियम के शेड्यूल 1 के उपरोक्त उल्लेखित वन्य प्राणियों के परियोजना क्षेत्र में आने जाने के प्रमाण पाये गये हैं। प्रस्तावित क्षेत्र से 6 से 7 कि.मी.की दूरी पर झारखंड राज्य में मेड़िया अभ्यारण्य 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 प्राणीओं के लिये आजीविका सृजन, टीकाकरण, जनजागृति कार्यक्रम जैसी गतिविधियों का

III

प्रस्तावक को 04 वर्षों के लिये राशि रुपये 160 लाख प्रावधानित की गयी है। जिसका क्रियान्वयन निम्नानुसार किया जायेगा। प्रस्ताव में प्रावधानित बजट का विवरण निम्नानुसार है :-

Sr No	Work 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	

Annex - XVII - A

✓ Annexure - II

Annexure - II

तार
Telegram : PARYAVARAN,
NEW DELHI

दूरभाष :
Telephone :
टेलिक्स (द्विभाषीय) :
Telex : (bi-lingual) : W-6678
FAX : 4350678

भारत सरकार
पर्यावरण एवं वन मंत्रालय
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS
पर्यावरण भवन, लोधी रोड, नई दिल्ली-110003
PARYAVARAN BHAWAN,
लोधी 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.

Sh
Sural 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.

(i) Reclamation of the mining area will be done in consultation with the State Forest Deptt. at the project cost as per plan prepared in this regard.

(ii) Demarcation of the mining area will be done on the ground at the project cost.

(iii) Forest land will not be used for construction of buildings etc. and any purpose other than those mentioned in the proposal.

(iv) Lease period shall remain coterminus with lease under MARD Act subject to maximum of 20 years.

(v) Free fuelwood will be provided to the labourers and staff working at the project site at the project cost.

(vi) Any other condition the State Govt. may impose.

(vii) 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:

The Principal Chief Conservator of Forests
Government of Madhya Pradesh, Bhopal.

Nodal Officer, Office of the Principal Chief Conservator
of Forests, Govt. of Madhya Pradesh, Bhopal.

The CCF (Central), Regional Office, Bhopal.

RO(HQ), New Delhi.

Guard file.

(R.K. CHAUDHRY)
AIGF.

APPROVED

कार्यालय वनमण्डलाधिकारी, बलरामपुर
वनमण्डल बलरामपुर (छत्तीसगढ़)

दूरभाष: 07831 273091, 273092 (Office), 273093 (Fax)

ई-मेल dfobalrampur@gmail.com

क्रमांक/माचि/2017/2444

बलरामपुर दिनांक/24/07/2017

प्रति

महाप्रबंधक

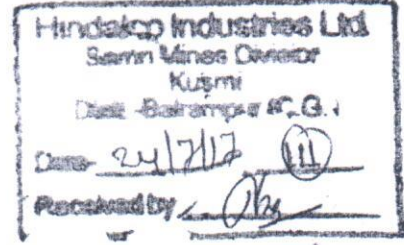
मेसर्स हिण्डाल्को इण्डस्ट्रीज लि

सामरी बाक्ससाइट खदान

बाबा चौक पोस्ट भुसरो पिन नं 497224

जिला बलरामपुर-रामानुजगंज छोगो

24.7.2017



विषय -

बलरामपुर-रामानुजगंज जिले के बलरामपुर वनमण्डल अंतर्गत मेसर्स हिण्डाल्को इण्डस्ट्रीज लिमिटेड के सामरी बाक्ससाइट खदान हेतु रकबा 798.827 हे वन भूमि में बाक्ससाइट खनिज उत्खनन के लीज अवधि के एम.एम.डी.आर अधिनियम 2015 के अनुरूप विस्तारीकरण बाबत।

संदर्भ -

- (1) छोगो शासन वन विभाग का पत्र क्रमांक / एफ 5-19/2017/10-2 दिनांक 07.07.2017
- (2) अपर प्रधान मुख्य वनसंरक्षक (भू-प्रबंध/व.स.अ.) छोगो का पत्र क्रमांक/भू-प्रबंध / खनिज / 331-220 / 2200 रायपुर 12.07.2017
- (3) मुख्य वनसंरक्षक रायगुजा जनक अम्बिकापुर का पत्र क्रमांक/माचि/नक्र-21 / 2017 / 2609 अम्बिकापुर दिनांक 20.07.2017
- (4) आपका पत्र क्रमांक / HIL/SBM/DFO/118/2017/S date 21-07-2017

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विषयगतगत छोगो शासन वन विभाग द्वारा हिण्डाल्को इण्डस्ट्रीज लिमिटेड के सामरी बाक्ससाइट खदान हेतु रकबा 798.827 हे वन भूमि में बाक्ससाइट खनिज उत्खनन हेतु वनसंरक्षण अधिनियम 1980 अंतर्गत गैर वानिकी कार्य की स्वीकृति माईनिंग लीज अवधि के समान्तर दिनांक 23.06.2048 तक अधिरोपित शर्तों के अधीन जारी की गई है। जिसके पालन में आपके द्वारा संदर्भित पत्र क्रमांक 04 से पालन प्रतिवेदन एवं कलेक्टर बलरामपुर का अनुबंध पत्र प्रस्तुत किया गया। बाक्ससाइट उत्खनन हेतु निम्नानुसार शर्तों के अधीन कार्य की अनुमति दी जाती है :-

1. भारत सरकार पर्यावरण वन एवं जलवायु परितंत्रन मंत्रालय द्वारा जारी पत्र क्रमांक / एफ नं 8 22/95 एफ सी दिनांक 12.03.1996 एवं पत्र क्रमांक/एफ नं 11-51/2015-एफ सी दिनांक 01.04.2015 व 01.05.2015 तथा खनिज साधन विभाग के छत्तीसगढ़ शासन के पत्र क्रमांक/एफ 7-9/2015/12 दिनांक 19.05.2015 में प्रलम्बित समस्त शर्तों का अखण्ड सतत पालन विशेष निदेश बंधनकारी होगा।
2. लीज क्षेत्र के खनन के कारणों से जो भी क्षेत्रों में खनिज उत्खनन के कारण वन नष्ट होना।
3. स्पष्टीकरण क्षेत्र के आउटर बॉण्ड में 4 फिट के आर से जो बाउण्ड्री पॉल्स को सफेद रंग से रंगाई कर हरे रंग से जी पी एस को ऑर्डिनेट एवं नम्बर अंकित करना होगा। एक पोल से दूसरे पोल में अंकित जी पी एस को ऑर्डिनेट एवं नम्बर स्पष्ट रूप से पठनीय होना चाहिए।

4. लीज क्षेत्र अंतर्गत आवश्यक जगहों पर भू-जल संरक्षण का कार्य करना होगा।
5. सफटी जमान में 1.5 एना बिगडे वन क्षेत्र रकबा 71.894 हे. में संपण हेतु वर्तमान नामस के अनुसार राशि रु 118 32 377 000 रु. को भी अद्ययावत जल वनमण्डलाधिकारी बलरामपुर के नाम से दय हो 45 दिवस के अंदर उय कार्यालय में प्रस्तुत करग प्रगथा कीस्थितो में उत्खनन कार्य बंद कर दिया जाएगा।
6. छोरामण्ट शासन वन विभाग द्वारा अतिरिक्त कई शर्त लागू की जाती हो ती मान्य करना होगा।


वनमण्डलाधिकारी

बलरामपुर वनमण्डल बलरामपुर
बलरामपुर, दिनांक 24/07-2017

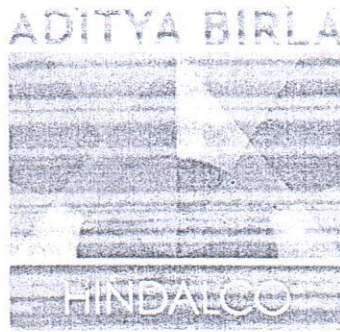
पृ. क्रमांक/मा.चि./ 2452

प्रतिलिपि -

1. अपर प्रधान मुख्य वनसंरक्षक (भू-प्रबंध/वसअ) छोरामण्ट रायपुर को अवलोकनार्थ सादर सम्प्रेषित।
2. मुख्य वनसंरक्षक सरगुज्जु वनवृत्त अम्बिकापुर को अवलोकनार्थ हेतु सादर सम्प्रेषित।
3. उपवनमण्डलाधिकारी बलरामपुर/राजपुर एवं परिक्षेत्राधिकारी चान्दो/ कुसमी को सूचनार्थ अग्रेषित कर निर्देशित है कि उपरोक्तानुसार अधिरोपित शर्तों का पालन कराया जाना सुनिश्चित करें तथा रकबा 798.827 हे बिगडे वन भूमि में संपण हेतु परियोजना प्रतिवदेन प्रस्तुत करें।


वनमण्डलाधिकारी

बलरामपुर वनमण्डल बलरामपुर



HIL/SBM/DFO/163/2017/S

Date: 4-9-2017

To,
Divisional Forest Officer
Balrampur-Ramanujgarj

Sub: Extension of validity of approval accorded under Forest (conservation) Act, 1980 for diversion of 798.827 Hect Revenue forest land for non-forest (Mining operation) purpose in respect of Samri Bauxite Mine of M/s Hindalco Industries Limited.

Ref: Your letter number cramank/ma.chi/2017/2449, dated 24/07/2017

With reference to Clause no.-5 of your above said letter, herewith we are depositing a sum of Rs.1,16,32,377.00 (One Crore Sixteen Lac Thirty two thousand Three hundred Seventy Seven Only) in favour of DFO, Balrampur, vide Cheque no 918131, Dated 04-09-2017 at your good office for the plantation to be carried out by yourselves in degraded forest land @ 1.5 times of safety zone of Samri Bauxite Mine .

Hope you find the above in order.

Kindly acknowledge the receipt.

Thanking You,

Yours Faithfully,

For Hindalco Industries Limited

M.K Nayak
(Agent of Mines)

- 04/09/2017
1. Addl PCCF, Aranya Bhawan, Raipur
 2. PCCF, Aranya Bhawan, Raipur
 3. CCF, Ambikapur
 4. Forest Ranger, Kusmi & Chando

SBM Mines Division, Baba Inowk
At & Post, Wason, P.M. 487 224,
Dist. E. Bastar, Ramanujgarj, C.G. INDIA
Telephone - 4 2221 2124
Fax - 4 221324

Century Bhawan, 3 - floor
Dr. Ambe Bhasani Road,
Wason, M.P. 487 224
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Unit SURAJA C.G. 19/222
Tel: 6959 750222 Fax: IFS Code: SBIN0005905 SWIFT:

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HINDALCO INDUSTRIES LTD.

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

Duration: July-August-September-2017

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.04/10/2016 valid up to 03.10.2018
Accredited under the QCI-NABET Scheme for EIA Consultant
BIS vide No.CL/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
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Ph.: (0712) 2242077, 9373287475 Fax: (0712) 2242077
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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 **July-2017 to September-2017** 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.**



Stawf

Authorized Signatory

Place : Nagpur

Date : September, 2017



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 (July, August & September-2017) 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° 23' 02"N to 23° 27' 05"N
3.	Longitude	83° 53' 50"E to 83° 57' 59"E
4.	Elevation	1140-m above Mean Sea Level
5.	Climatic Conditions (as per IMD, Ambikapur)	Annual maximum temperature : 30.3°C Annual minimum temperature : 17.7°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 the status of environment during mining operation. With the knowledge of baseline conditions, the monitoring program will serve as an indicator for any deterioration in 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 in the control of pollution since the efficiency of control measures can only be determined by 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 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(PM_{10}), SO_2 , NO_x and SPM, RSPM, SO_2 , 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 July-August-September-2017. 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 (PM_{10}), SO_2 , NO_x and SPM, RSPM, SO_2 , NO_x Pb, Hg, As and Cr, from July-August-September-2017 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 $1.0 - 1.3 \text{ m}^3/\text{m}$ 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- $\text{PM}_{2.5}$, 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**



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/ m³)
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

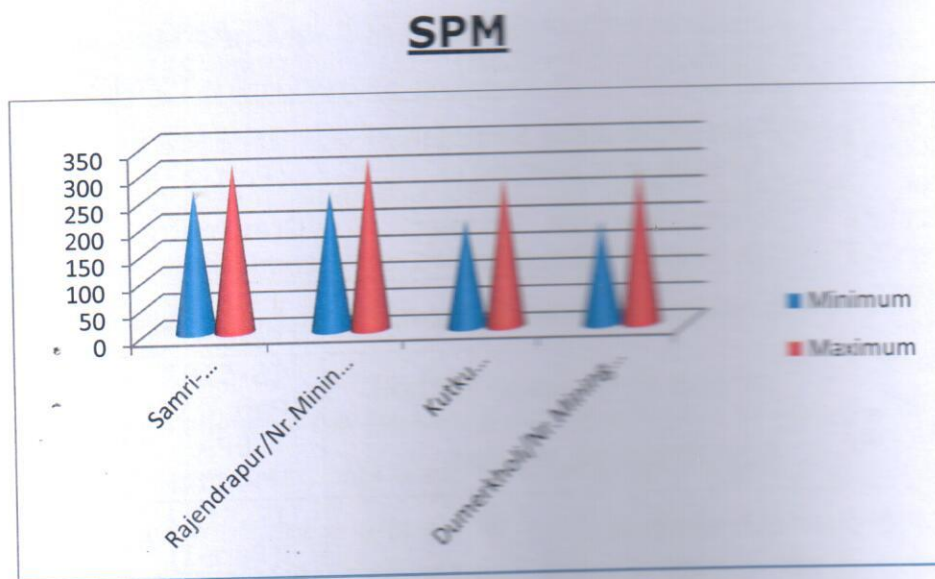
The summary of Fugitive Emission monitoring results for the month of July-August-September-2017 are presented in detail in **Table 6.0**. 98th percentile; maximum and minimum values etc have been computed from the collected raw data for all the Fugitive monitoring station. The data has been compared 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 189 $\mu\text{g}/\text{m}^3$ and 315 $\mu\text{g}/\text{m}^3$ respectively. The average concentrations were ranged between 202 to 293 $\mu\text{g}/\text{m}^3$. and 98th percentile values ranged between 229 to 314 $\mu\text{g}/\text{m}^3$ in the study area (**Table 6**).

Graphical Presentation Of Fugitive Emission Monitoring

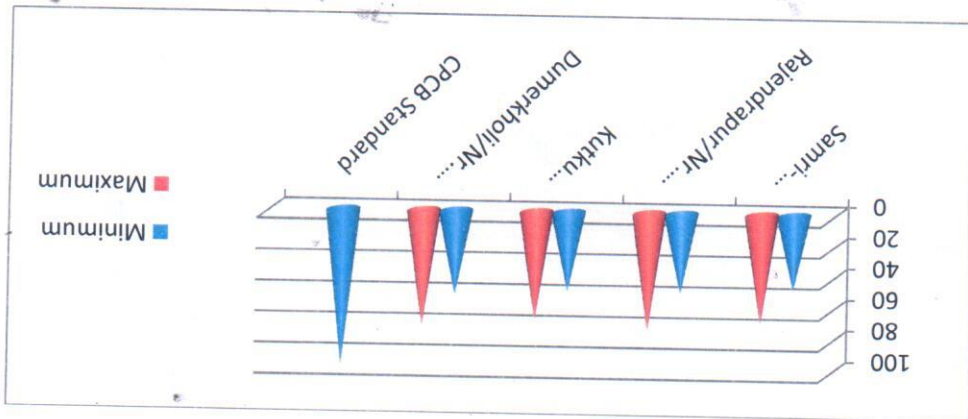




Respirable Suspended Particulate Matter – RSPM

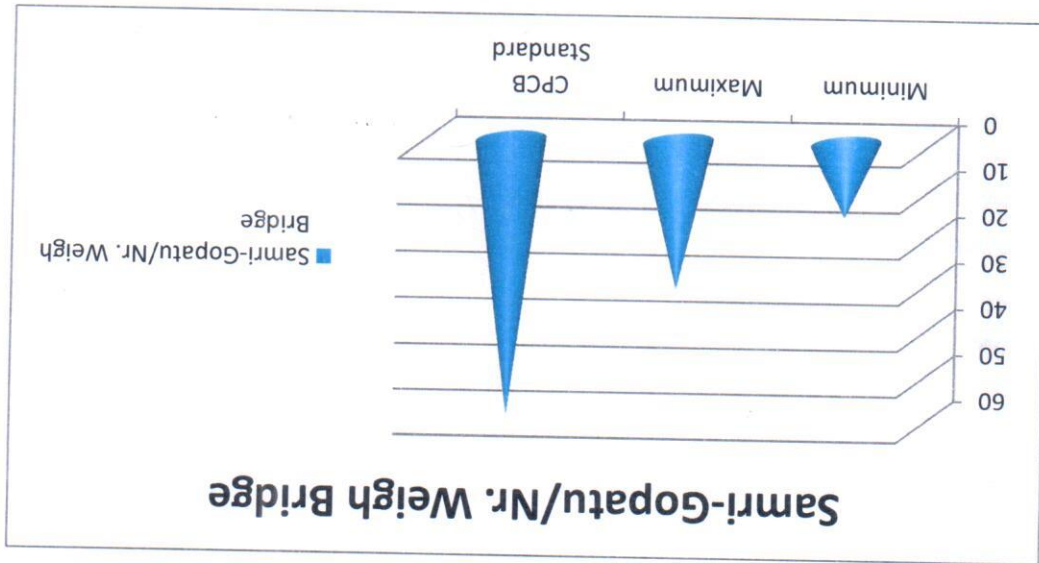
The minimum and maximum concentrations for RSPM were recorded as 45 $\mu\text{g}/\text{m}^3$ and 73 $\mu\text{g}/\text{m}^3$ respectively. The average values were observed to be in the range of 50 to 69 $\mu\text{g}/\text{m}^3$ and 98th percentile values ranged between 54 to 73 $\mu\text{g}/\text{m}^3$ in the study area (Table 7).

Graphical Presentation Of Fugitive Emission Monitoring RSPM



Particulate Matter - $\text{PM}_{2.5}$

The minimum and maximum values of $\text{PM}_{2.5}$ concentrations varied between 18 to 31 $\mu\text{g}/\text{m}^3$ respectively. The average values range between 21 to 27 $\mu\text{g}/\text{m}^3$ and 98th percentile values varied between 24 to 31 $\mu\text{g}/\text{m}^3$ (Table 8).

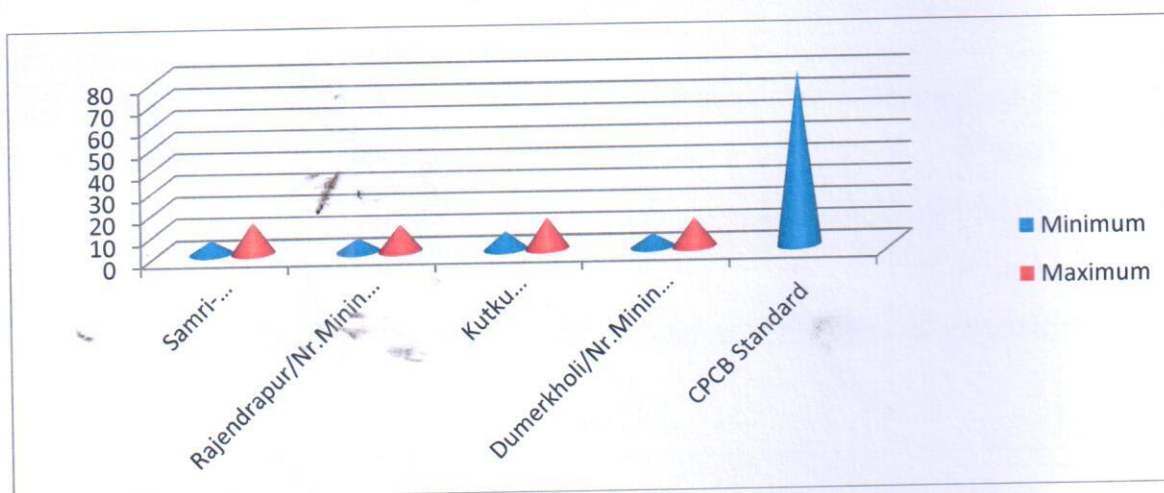


Sulphur Dioxide (SO₂)

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).

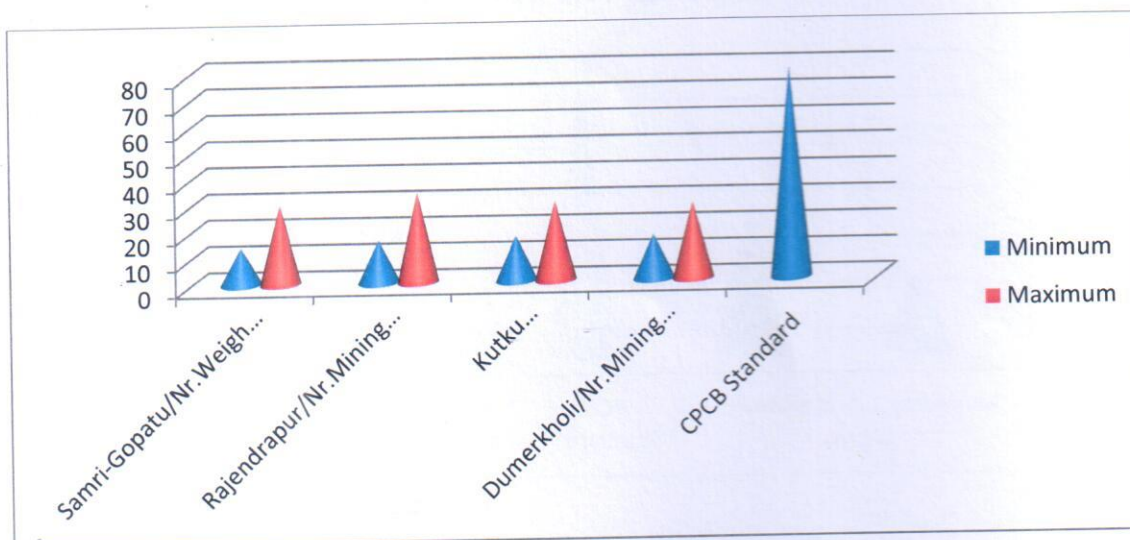
Graphical Presentation Of Fugitive Emission Monitoring

SO₂



Nitrogen Oxide (NO_x)

The minimum and maximum NO_x concentrations were recorded as 16 µg/m³ and 34 µg/m³ respectively. The average concentrations were ranged between 18 to 25 µg/m³ and 98th percentile values varied between 19 to 29 µg/m³ (Table 10).



RSPM Samples.

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

Chromium (Cr)

(Table 13).

RSPM Samples.

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

Arsenic (As)

(Table 12).

RSPM Samples.

Mercury was not detected at any of the locations in SPM samples as well as

Mercury (Hg)

study region. **(Table 11).**

The maximum concentrations of Lead varied $0.073 \mu\text{g}/\text{m}^3$ respectively. The average concentration varied $0.064 \mu\text{g}/\text{m}^3$ & 98th percentiles values varied $0.073 \mu\text{g}/\text{m}^3$ in the

Lead (Pb)



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1.7 Ambient Air Quality (Buffer Zone)

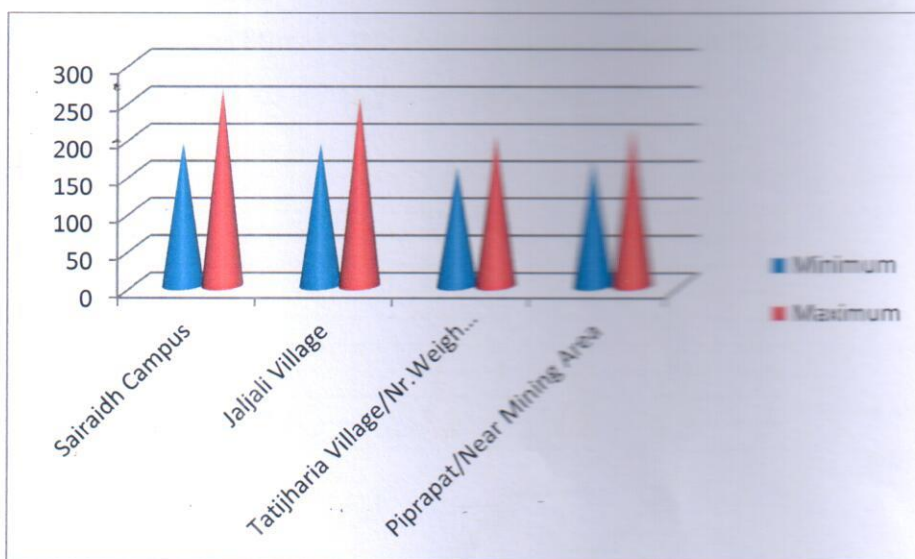
The background levels of SPM, RPM (PM_{10} , $PM_{2.5}$, SO_2 , NO_x , Pb, Hg, As and Cr measured are required to compute Ambient Air Quality. The sampling locations are selected at the above mentioned locations in downwind and upwind directions of the mine. The Minimum, Maximum concentration, Arithmetic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

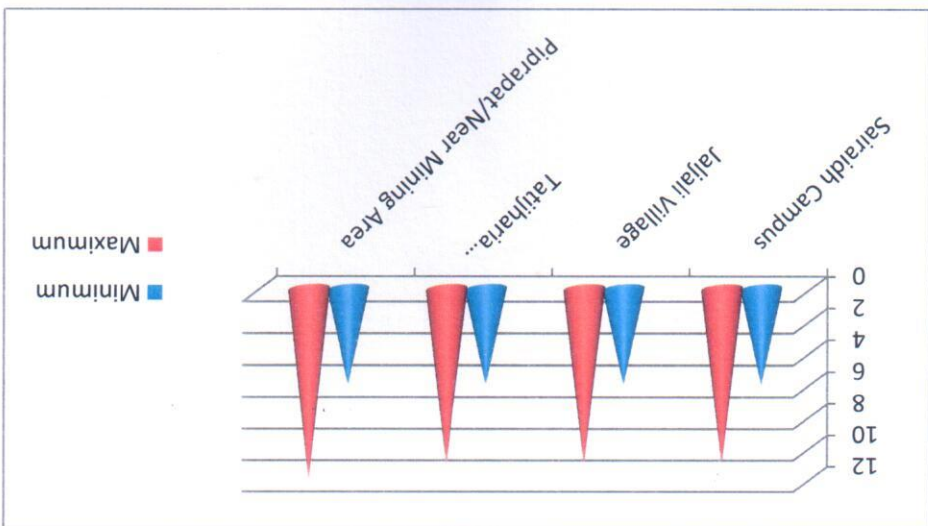
1.7.1 Presentation of Results.

The summary of Ambient Air Quality monitoring results for the month of July-August-September-2017 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 AAQ 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 149 to 255 $\mu\text{g}/\text{m}^3$ respectively during study period at all the 4 locations. The average values ranged between 159 to 243 $\mu\text{g}/\text{m}^3$ and 98 percentile values ranged between 169 to 255 $\mu\text{g}/\text{m}^3$ in the study area.

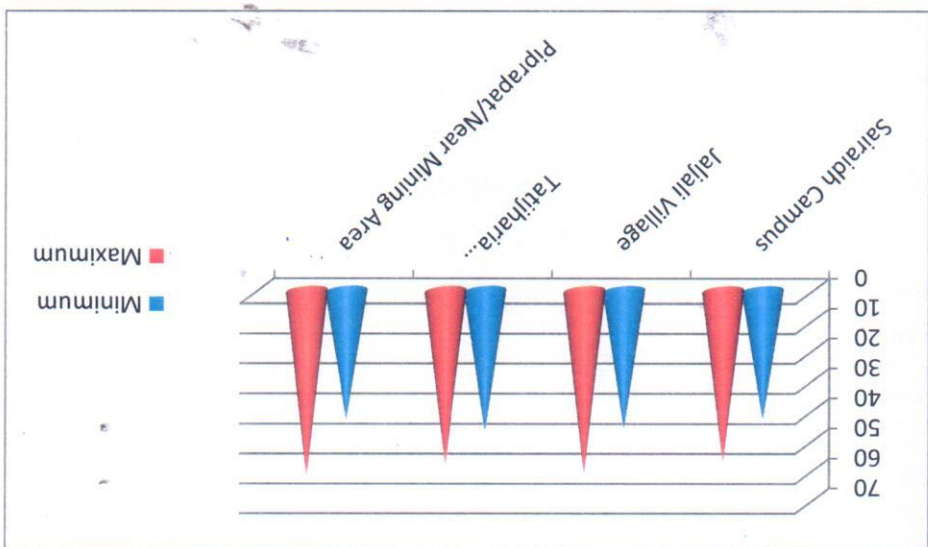




values varied between 7 to 10 µg/m³ (Table 9).

The minimum and maximum values of SO₂ concentrations varied between 5 to 10 µg/m³ respectively. The average values range from 6 to 9 µg/m³ and 98th percentile

Sulphur Dioxide (SO₂)



in the study area during the study period.

The minimum and maximum values of RSPM varied between 41 to 59 µg/m³ respectively (Table 7). The average values varied between 43 to 55 µg/m³. The 98th percentile values varied between 46 to 59 µg/m³ 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.

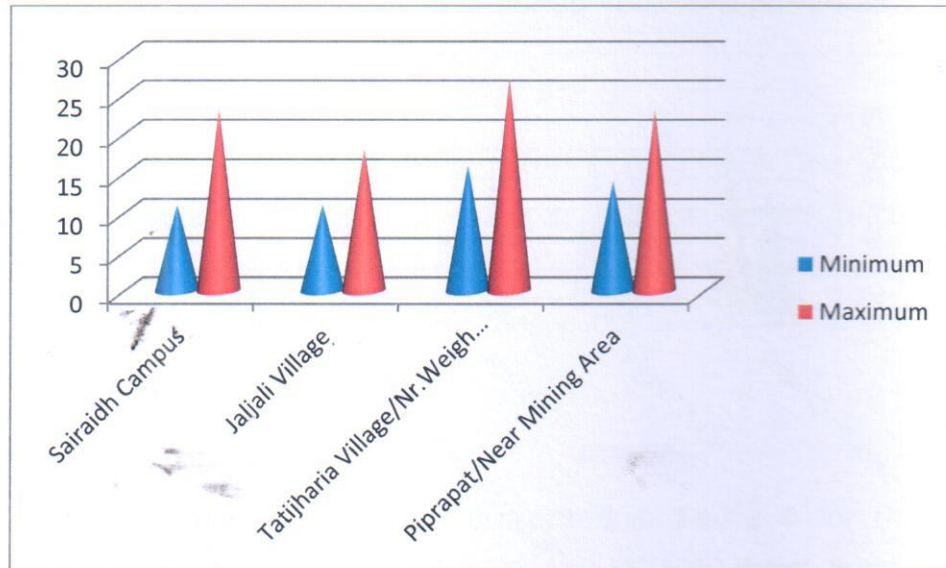
Particulate Matter-RSPM



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Nitrogen Oxide (NO_x)

The minimum and maximum values of NO_x concentrations varied between 9 to 24 µg/m³ respectively. The average values range between 13 to 21 µg/m³ and 98th percentile values varied between 16 to 24 µg/m³ (**Table 10**).



Lead (Pb)

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

(Table 11).

Mercury (Hg)

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

(Table 12).

area.

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

The dust fall rate was measured by exposing a jar during July-August-September-2017 in Rajendrapur/Nr.Mining Area and Samri-Gopatu/Nr.Weigh Bridge. The dust fall rate was observed to be 24.46 and 21.16 MT/km²/month respectively as given in (Table 14).

RSPM Samples.

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

Chromium (Cr)

(Table 13).

RSPM Samples.

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

Arsenic (As)



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1.8 Meteorology: Wind Pattern

The data of wind pattern collected during the study period (July-Aug-Sept-2017) indicates that the wind was blowing predominantly from (WSW and W) directions, during study period, for 0.14 % wind was found to be calm. The details of wind pattern in the form of wind frequency distribution are presented in **table 1**. The graphical illustration and wind rose diagram 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	0.000000	0.001361	0.000000	0.000000	0.000000	0.000000	0.001361
2	11.25 - 33.75	0.008163	0.009524	0.001361	0.000000	0.000000	0.000000	0.019048
3	33.75 - 56.25	0.004082	0.004082	0.001361	0.000000	0.000000	0.000000	0.009524
4	56.25 - 78.75	0.010884	0.002721	0.002721	0.000000	0.000000	0.000000	0.016327
5	78.75 - 101.25	0.004082	0.006803	0.002721	0.000000	0.000000	0.000000	0.013610
6	101.25 - 123.75	0.008163	0.004082	0.000000	0.000000	0.000000	0.000000	0.012247
7	123.75 - 146.25	0.004082	0.008163	0.000000	0.000000	0.000000	0.000000	0.012247
8	146.25 - 168.75	0.002721	0.008163	0.004082	0.000000	0.000000	0.000000	0.014960
9	168.75 - 191.25	0.005442	0.008163	0.002721	0.000000	0.000000	0.000000	0.016327
10	191.25 - 213.75	0.019048	0.017687	0.006803	0.000000	0.000000	0.000000	0.043537
11	213.75 - 236.25	0.029932	0.084354	0.062585	0.001361	0.001361	0.000000	0.179696
12	236.25 - 258.75	0.028571	0.133333	0.144218	0.043537	0.000000	0.000000	0.349767
13	258.75 - 281.25	0.028571	0.053061	0.099320	0.019048	0.000000	0.000000	0.200067
14	281.25 - 303.75	0.016327	0.019048	0.040816	0.000000	0.000000	0.000000	0.076191
15	303.75 - 326.25	0.020408	0.006803	0.000000	0.000000	0.000000	0.000000	0.027211
16	326.25 - 348.75	0.001361	0.005442	0.000000	0.000000	0.000000	0.000000	0.006803
	Sub-Total	0.191837	0.372789	0.368707	0.063946	0.001361	0.000000	0.998727
	Calms							0.001273
	Missing/Incomplete							0.001273
	Total							1.00

SUMMARY OF WIND PATTERN

Season	First Predominant Wind Direction	Second Predominant Wind Direction	Calm Condition
July-Aug-Sept-2017	WSW (34.97%)	W (20.00%)	0.14 %



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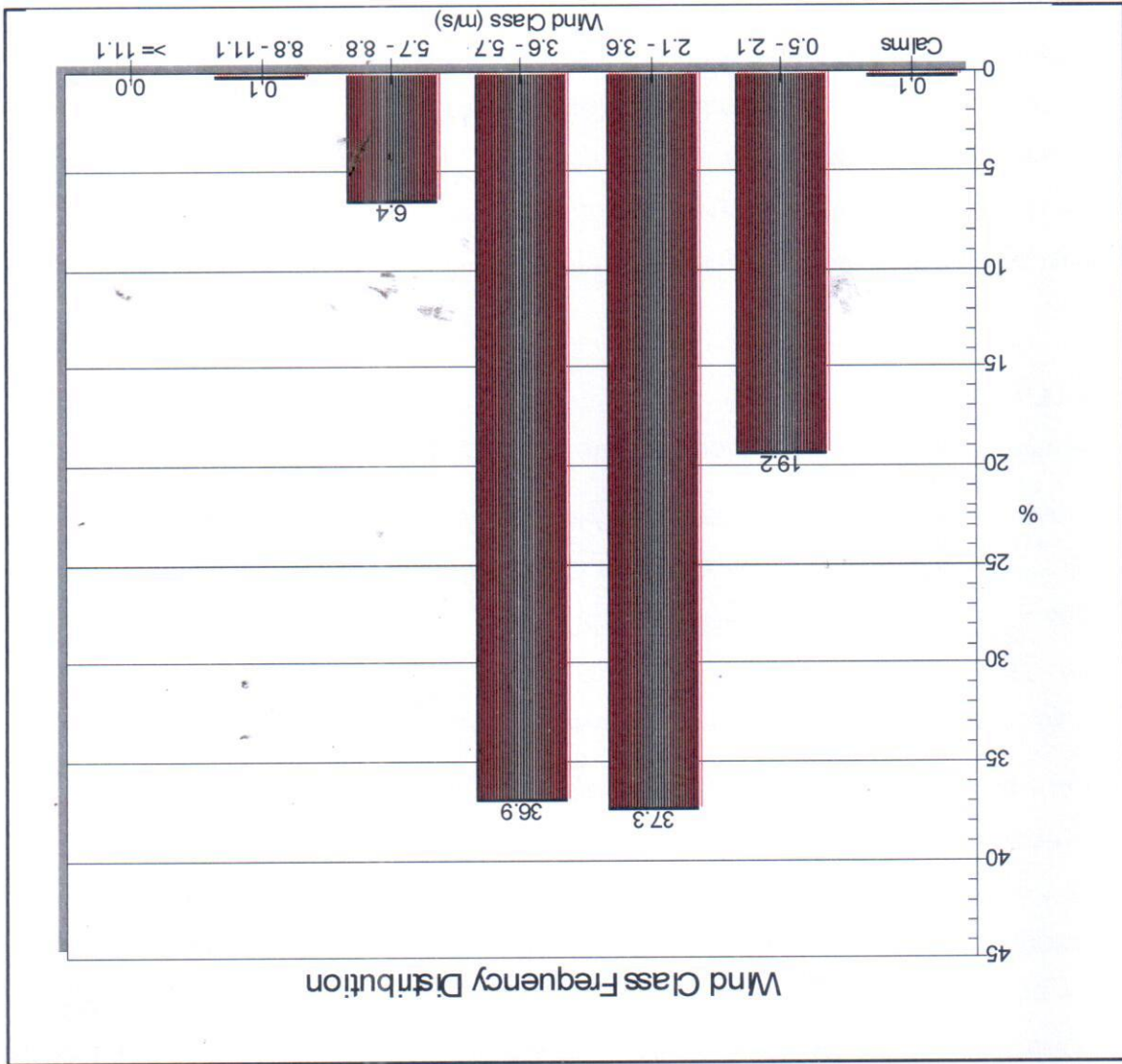


Figure.01: Wind Class Frequency Distribution
(July-Aug-Sept-2017)

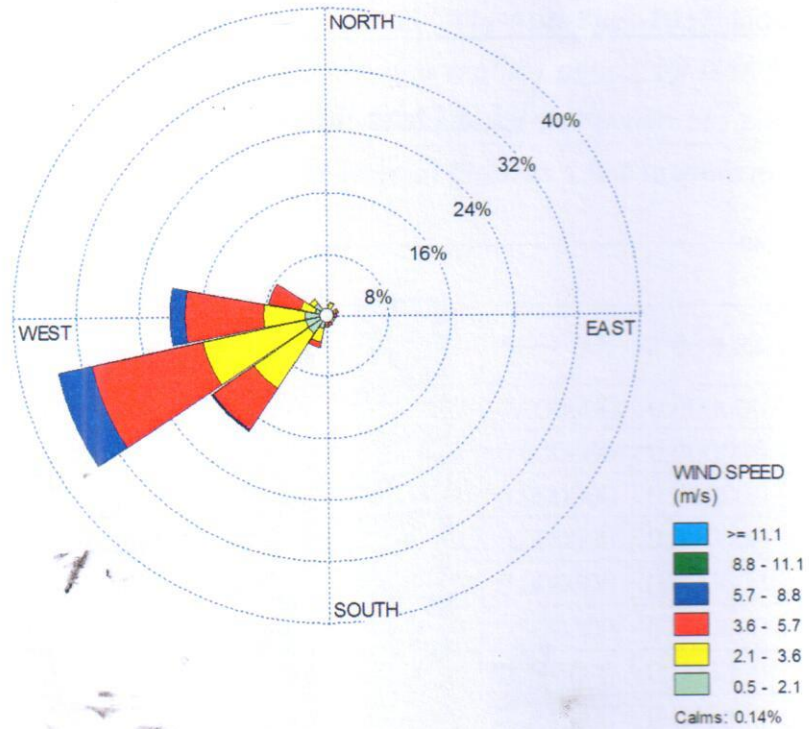


Figure.02: Wind Rose Diagram (July-Aug-Sept-2017)



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, 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 in 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 the Sound Pressure Level (SPL), L_{eq} .



Method of Monitoring

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 10-15 m 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, Kudra, Tatijhariya, Saraidih, Rajendrapur and surface water sample from Nallahs nearby Samri mine. 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.



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**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	July-2017	260	309	285	285	308
	August-2017	265	295	280	280	294
	September-2017	259	279	269	269	279
Rajendrapur/ Nr.Mining Area	July-2017	257	311	284	284	310
	August-2017	270	315	293	293	314
	September-2017	251	268	260	260	268
Kutku Village/ Nr.V.T. Center	July-2017	240	275	258	258	274
	August-2017	212	241	227	227	240
	September-2017	200	230	215	215	229
Dumerkholi/ Nr.Mining Area	July-2017	243	270	257	257	269
	August-2017	261	281	271	271	281
	September-2017	189	215	202	202	214

Location	Month & Year	Min.	Max.	A.M.	G.M.	98%ile
Buffer Zone :-						
Sairaidh Campus	July-2017	215	251	233	233	250
	August-2017	230	255	243	243	255
	September-2017	185	201	193	193	201
Jaljali Village	July-2017	194	217	206	206	217
	August-2017	210	239	225	225	238
	September-2017	185	199	192	192	199
Tatijharia Village/ Nr. Weigh bridge	July-2017	160	180	170	170	180
	August-2017	168	195	182	182	194
	September-2017	149	169	159	159	169
Piprapat/ Nr.Mining Area	July-2017	175	189	182	182	189
	August-2017	187	201	194	194	201
	September-2017	159	203	181	181	202

Conclusion-A:-

- 1) Samri-Gopatu/ Nr.weigh bridge Lease Area Core Zone: For the Months of July-Aug-Sept-2017 Average of SPM is $278 \mu\text{g}/\text{m}^3$.
- 2) Rajendrapur/Nr.Mining Lease Area Core Zone:- For the Months of July-Aug-Sept-2017 Average of SPM is $260 \mu\text{g}/\text{m}^3$.
- 3) Kutku Village / Nr.V.T. Center Lease Area Core Zone:- For the Months of July-Aug-Sept-2017 Average of SPM is $233 \mu\text{g}/\text{m}^3$.
- 4) Dumerkholi/ Nr.Mining Lease Area Core Zone:- For the Months of July-Aug-Sept-2017 Average of SPM is $243 \mu\text{g}/\text{m}^3$.

- The Average Concentration of SPM within the core zone of Samri Lease is $254 \mu\text{g}/\text{m}^3$.

Conclusion-B:-

- 1) Sairaidh Campus Lease Area Buffer zone:- For the Months of July-Aug-Sept-2017 Average of SPM is $223 \mu\text{g}/\text{m}^3$.
- 2) Jaljali Village Lease Area Buffer zone:- For the Months of July-Aug-Sept-2017 Average of SPM is $192 \mu\text{g}/\text{m}^3$.
- 3) Tatijharia Village/ Nr. Weigh bridge Buffer zone:- For the Months of July-Aug-Sept-2017 Average of SPM is $170 \mu\text{g}/\text{m}^3$.
- 4) Piprapat/ Nr.Mining Area Buffer zone:- For the Months of July-Aug-Sept-2017 Average of SPM is $186 \mu\text{g}/\text{m}^3$.

- The Average Concentration of SPM within the Buffer Zone of Samri Lease is $193 \mu\text{g}/\text{m}^3$.

Monthwise Summary of Statistical Analysis of SPM

3.0 Fugitive Emission (Core Zone):-

3.0.1 Presentation of Results.

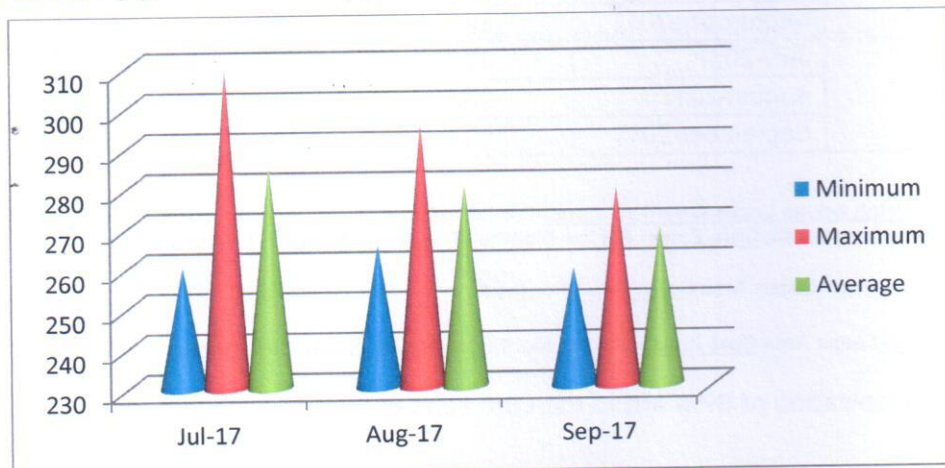
The summary of Statistical Analysis of SPM results for the month of July-August-September 2017 are presented in detail in **Table 6**. 98th percentile; maximum, minimum and average values etc have been computed from the collected raw data for all the Fugitive emission monitoring station.

Samri-Gopatu/ Nr.weigh bridge

For the month of July-2017 the minimum and maximum concentrations for SPM were recorded as 260 $\mu\text{g}/\text{m}^3$ and 309 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 285 $\mu\text{g}/\text{m}^3$.

For the month of August-2017 the minimum and maximum concentrations for SPM were recorded as 265 $\mu\text{g}/\text{m}^3$ and 295 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 280 $\mu\text{g}/\text{m}^3$.

For the month of September-2017 the minimum and maximum concentrations for SPM were recorded as 259 $\mu\text{g}/\text{m}^3$ and 279 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 269 $\mu\text{g}/\text{m}^3$.



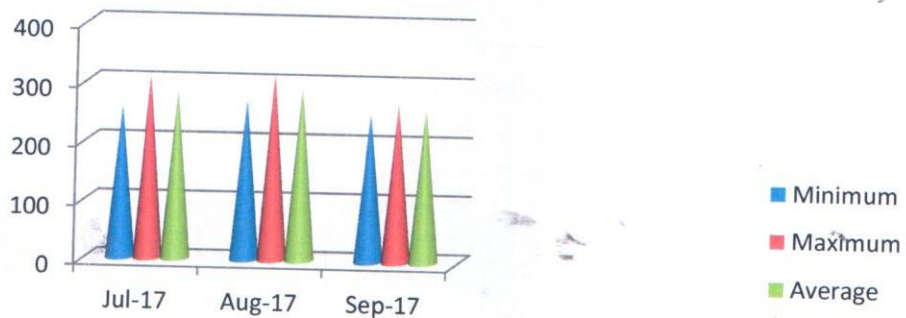
Graph :- Samri-Gopatu/ Nr.weigh bridge

Rajendrapur/ Nr.Mining Area

For the month of July-2017 the minimum and maximum concentrations for SPM were recorded as $257\mu\text{g}/\text{m}^3$ and $311\mu\text{g}/\text{m}^3$ respectively and average concentration of $284\mu\text{g}/\text{m}^3$.

For the month of August-2017 the minimum and maximum concentrations for SPM were recorded as $270\mu\text{g}/\text{m}^3$ and $315\mu\text{g}/\text{m}^3$ respectively and average concentration of $293\mu\text{g}/\text{m}^3$.

For the month of September-2017 the minimum and maximum concentrations for SPM were recorded as $251\mu\text{g}/\text{m}^3$ and $268\mu\text{g}/\text{m}^3$ respectively and average concentration of $260\mu\text{g}/\text{m}^3$.



Graph:- Rajendrapur/ Nr.Mining Area

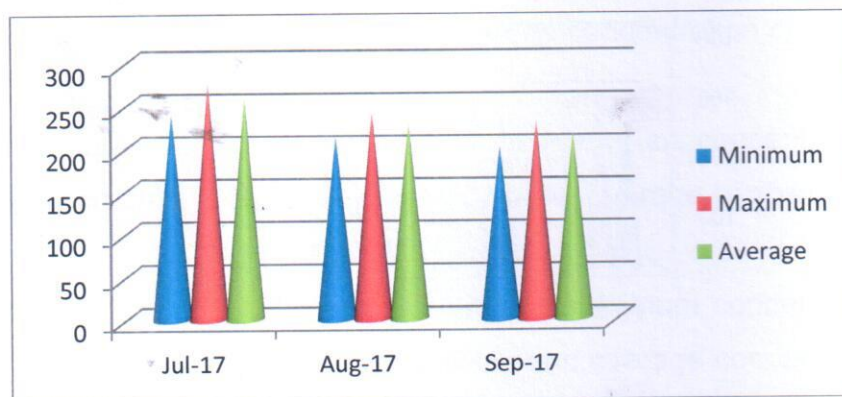


Kutku Village/ Nr.V.T. Center

For the month of July-2017 the minimum and maximum concentrations for SPM were recorded as $240\mu\text{g}/\text{m}^3$ and $275\mu\text{g}/\text{m}^3$ respectively and average concentration of $258\mu\text{g}/\text{m}^3$.

For the month of August-2017 the minimum and maximum concentrations for SPM were recorded as $212\mu\text{g}/\text{m}^3$ and $241\mu\text{g}/\text{m}^3$ respectively and average concentration of $227\mu\text{g}/\text{m}^3$.

For the month of September-2017 the minimum and maximum concentrations for SPM were recorded as $200\mu\text{g}/\text{m}^3$ and $230\mu\text{g}/\text{m}^3$ respectively and average concentration of $215\mu\text{g}/\text{m}^3$.



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



3.1 Fugitive Emission (Buffer Zone):-

3.1.1 Presentation of Results.

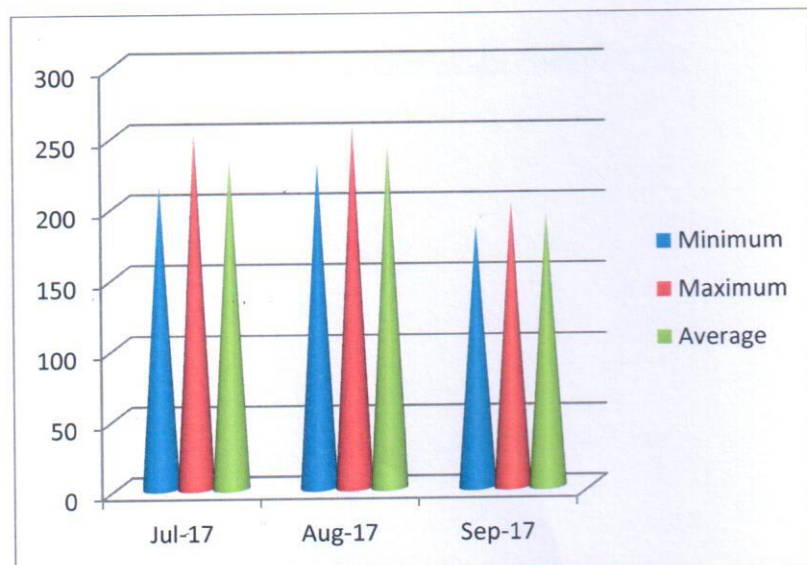
The summary of Statistical Analysis of SPM results for the month of July-August-September 2017 are presented in detail in **Table 6**. 98th percentile; maximum, minimum and average values etc have been computed from the collected raw data for all the Fugitive emission monitoring station.

Sairaidh Campus

For the month of July-2017 the minimum and maximum concentrations for SPM were recorded as 215 $\mu\text{g}/\text{m}^3$ and 251 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 233 $\mu\text{g}/\text{m}^3$.

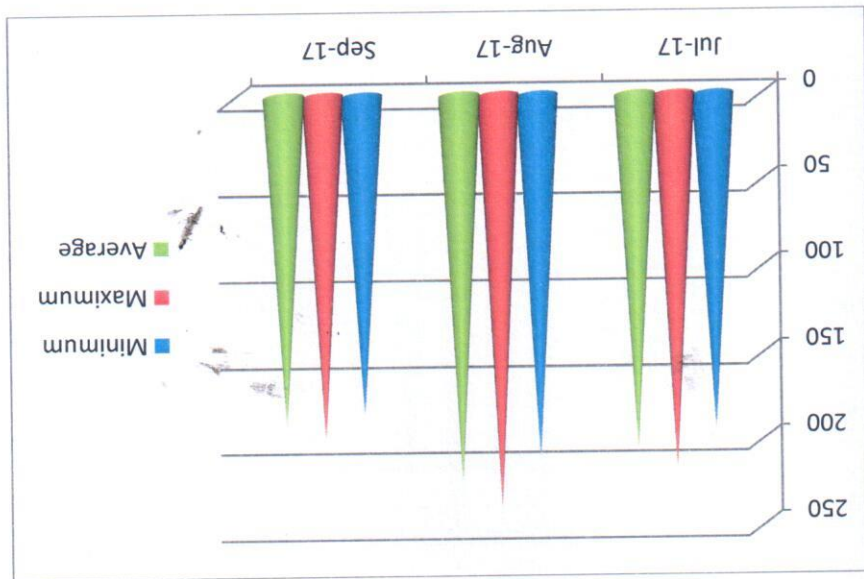
For the month of August-2017 the minimum and maximum concentrations for SPM recorded as 230 $\mu\text{g}/\text{m}^3$ and 255 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 243 $\mu\text{g}/\text{m}^3$.

For the month of September-2017 the minimum and maximum concentrations for SPM recorded as 185 $\mu\text{g}/\text{m}^3$ and 201 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 193 $\mu\text{g}/\text{m}^3$.



Graph:- Sairaidh Campus

Graph:- Jallali Village



For the month of July-2017 the minimum and maximum concentrations for SPM were recorded as 194 µg/m³ and 217 µg/m³ respectively and average concentration of 206 µg/m³.

For the month of August-2017 the minimum and maximum concentrations for SPM were recorded as 210 µg/m³ and 239 µg/m³ respectively and average concentration of 225 µg/m³.

For the month of September-2017 the minimum and maximum concentrations for SPM were recorded as 185 µg/m³ and 199 µg/m³ respectively and average concentration of 192 µg/m³.

Jallali Village

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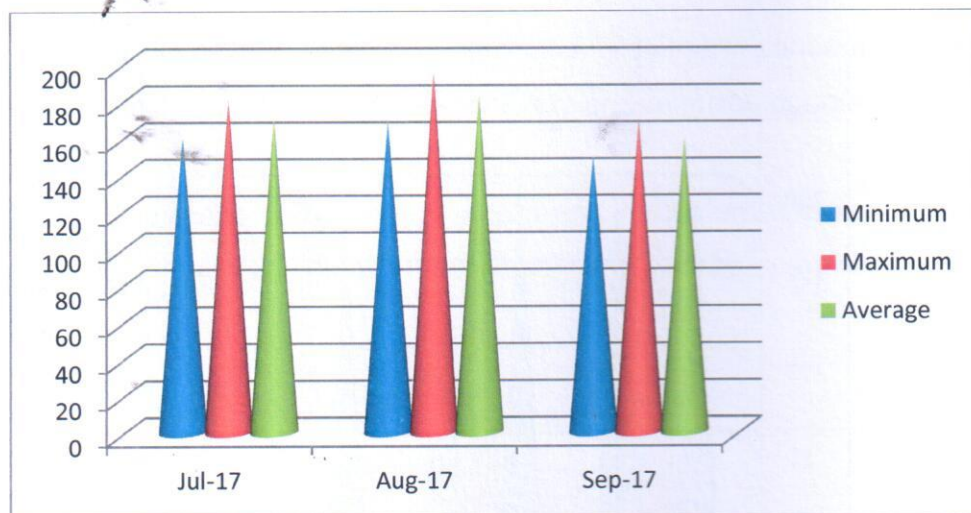


Tatijharia Village/Nr.Weigh Bridge

For the month of July-2017 the minimum and maximum concentrations for SPM were recorded as $160 \mu\text{g}/\text{m}^3$ and $180 \mu\text{g}/\text{m}^3$ respectively and average concentration of $170 \mu\text{g}/\text{m}^3$.

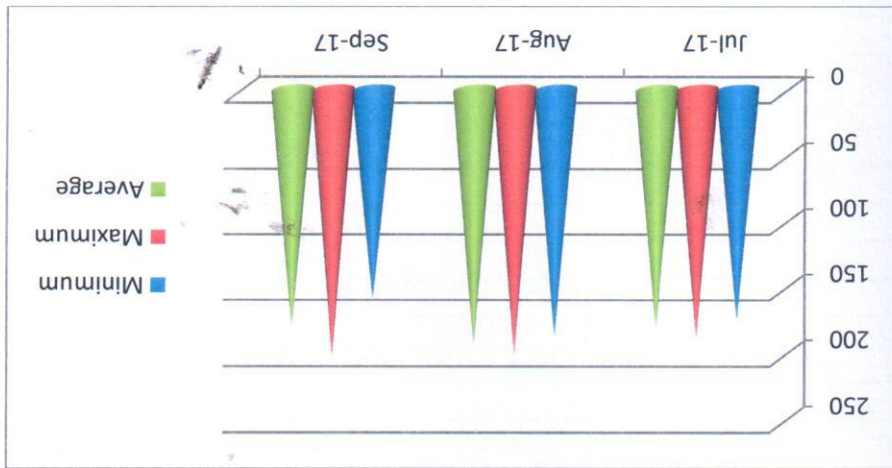
For the month of August-2017 the minimum and maximum concentrations for SPM were recorded as $168 \mu\text{g}/\text{m}^3$ and $195 \mu\text{g}/\text{m}^3$ respectively and average concentration of $182 \mu\text{g}/\text{m}^3$.

For the month of September-2017 the minimum and maximum concentrations for SPM were recorded as $149 \mu\text{g}/\text{m}^3$ and $169 \mu\text{g}/\text{m}^3$ respectively and average concentration of $159 \mu\text{g}/\text{m}^3$.



Graph:- Tatijharia Village/Nr.Weigh Bridge

Graph:- Piprapat/Nr.Mining Area




For the month of July-2017 the minimum and maximum concentrations for SPM were recorded as 175 µg/m³ and 189 µg/m³ respectively and average concentration of 182 µg/m³.

For the month of August-2017 the minimum and maximum concentrations for SPM were recorded as 187 µg/m³ and 201 µg/m³ respectively and average concentration of 194 µg/m³.

For the month of September-2017 the minimum and maximum concentrations for SPM were recorded as 159 µg/m³ and 203 µg/m³ respectively and average concentration of 181 µg/m³.

Piprapat/Nr.Mining Area

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**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):-							
Samri-Gopatu/ Nr.weigh bridge	July-2017	55	69	62	62	69	
	August-2017	57	65	61	61	65	
	September-2017	45	54	50	50	54	
Rajendrapur/ Nr.Mining Area	July-2017	55	62	59	59	62	
	August-2017	64	73	69	69	73	
	September-2017	49	63	56	56	63	
Kutku Village/ Nr.V.T. Center	July-2017	59	67	63	63	67	
	August-2017	55	62	59	59	62	
	September-2017	48	56	52	52	56	
Dumerkholi/ Nr.Mining Area	July-2017	65	73	69	69	73	
	August-2017	58	71	65	65	71	
	September-2017	54	63	59	59	63	
CPCB Standard		100 (24 hrs)					

Location	Month & Year	Min.	Max.	A.M.	G.M.	98%ile	
Buffer Zone :-							
Sairaidh Campus	July-2017	38	47	43	43	47	
	August-2017	41	52	47	47	52	
	September-2017	46	57	52	52	57	
Jaljali Village	July-2017	46	52	49	49	52	
	August-2017	50	59	55	55	59	
	September-2017	44	53	49	49	53	
Tatijharia Village/ Nr. Weigh bridge	July-2017	48	57	53	53	57	
	August-2017	45	56	51	51	56	
	September-2017	49	57	53	53	57	
Piprapat/ Nr.Mining Area	July-2017	39	46	43	43	46	
	August-2017	42	53	48	48	53	
	September-2017	46	57	52	52	57	
CPCB Standard		100 (24 hrs)					

Conclusion: A)

- 1) **Samri-Gopatu/ Nr.weigh bridge Lease Area Core Zone:** For the Months of July-Aug-Sept-2017 Average of RSPM is $58 \mu\text{g}/\text{m}^3$
- 2) **Rajendrapur/Nr.Mining Area Lease Area Core Zone:-** For the Months of July-Aug-Sept-2017 Average of RSPM is $56 \mu\text{g}/\text{m}^3$
- 3) **Kutku Village / Nr.V.T. Center Lease Area Core Zone:-** For the Months of July-Aug-Sept-2017 Average of RSPM is $58 \mu\text{g}/\text{m}^3$
- 4) **Dumerkholi/ Nr.Mining Area Lease Area Core Zone:-** For the Months of July-Aug-Sept-2017 Average of RSPM is $64 \mu\text{g}/\text{m}^3$

- The Average Concentration of RSPM within the Core Zone of Samri Lease is $59 \mu\text{g}/\text{m}^3$ and it is within permissible limit as per CPCB Standard

• **Conclusion (B)**

- 1) **Sairaidh Campus Lease Area Buffer Zone:-** For the Months of July-Aug-Sept-2017 Average of RSPM is $47 \mu\text{g}/\text{m}^3$.
- 2) **Jaljali Village Lease Area Buffer Zone:-** For the Months of July-Aug-Sept-2017 Average of RSPM is $49 \mu\text{g}/\text{m}^3$.
- 3) **Tatijharia Village/ Nr. Weigh bridge Buffer Zone:-** For the Months of July-Aug-Sept-2017 Average of RSPM is $52 \mu\text{g}/\text{m}^3$.
- 4) **Piprapat/ Nr.Mining Area Buffer Zone:-** For the Months of July-Aug-Sept-2017 Average of RSPM is $48 \mu\text{g}/\text{m}^3$.

- 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 limit as per CPCB Standard.



Monthwise Summary of Statistical Analysis of RSPM

3.2 Fugitive Emission (Core Zone):-

3.2.1 Presentation of Results.

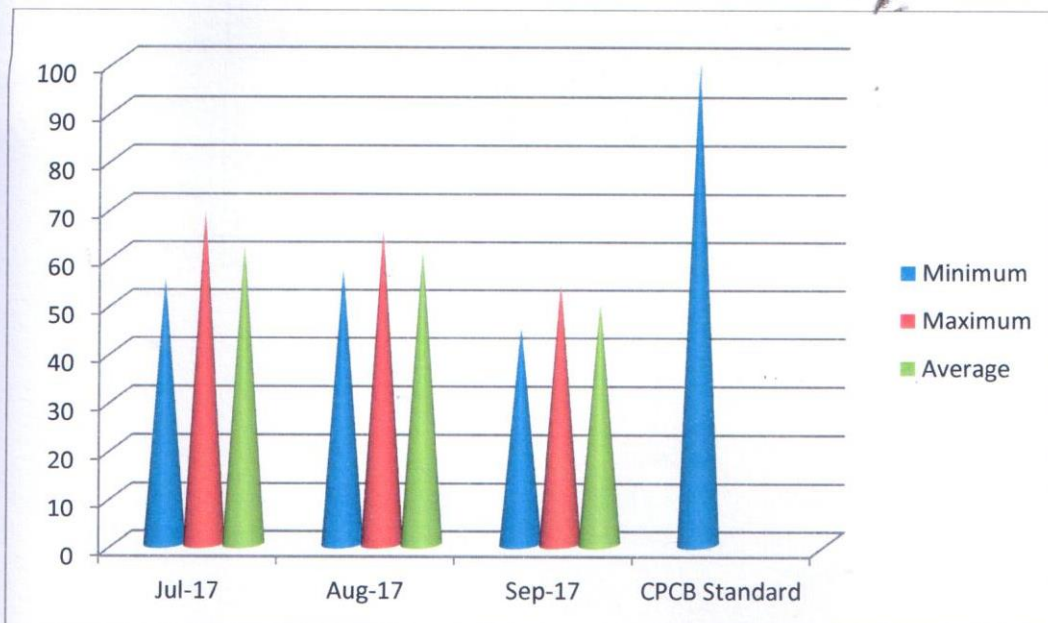
The summary of Statistical Analysis of RSPM results for the month of July-August-September-2017 are presented in detail in **Table 7**. 98th percentile; maximum, minimum and average values etc have been computed from the collected raw data for all the Fugitive emission monitoring station.

Samri-Gopatu/ Nr.weigh bridge

For the month of July-2017 the minimum and maximum concentrations for RSPM were recorded as 55 $\mu\text{g}/\text{m}^3$ and 69 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 62 $\mu\text{g}/\text{m}^3$.

For the month of August-2017 the minimum and maximum concentrations for RSPM were recorded as 57 $\mu\text{g}/\text{m}^3$ and 65 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 61 $\mu\text{g}/\text{m}^3$.

For the month of September-2017 the minimum and maximum concentrations for RSPM were recorded as 45 $\mu\text{g}/\text{m}^3$ and 54 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 50 $\mu\text{g}/\text{m}^3$.



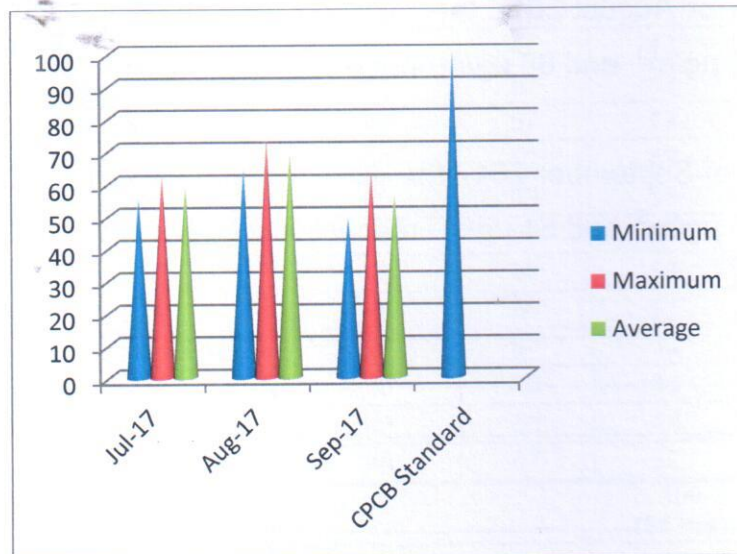


Rajendrapur/Nr.Mining Area

For the month of July-2017 the minimum and maximum concentrations for RSPM were recorded as $55 \mu\text{g}/\text{m}^3$ and $62 \mu\text{g}/\text{m}^3$ respectively and average concentration of $59 \mu\text{g}/\text{m}^3$.

For the month of August-2017 the minimum and maximum concentrations for RSPM were recorded as $64 \mu\text{g}/\text{m}^3$ and $73 \mu\text{g}/\text{m}^3$ respectively and average concentration of $69 \mu\text{g}/\text{m}^3$.

For the month of September-2017 the minimum and maximum concentrations for RSPM were recorded as $49 \mu\text{g}/\text{m}^3$ and $63 \mu\text{g}/\text{m}^3$ respectively and average concentration of $56 \mu\text{g}/\text{m}^3$.



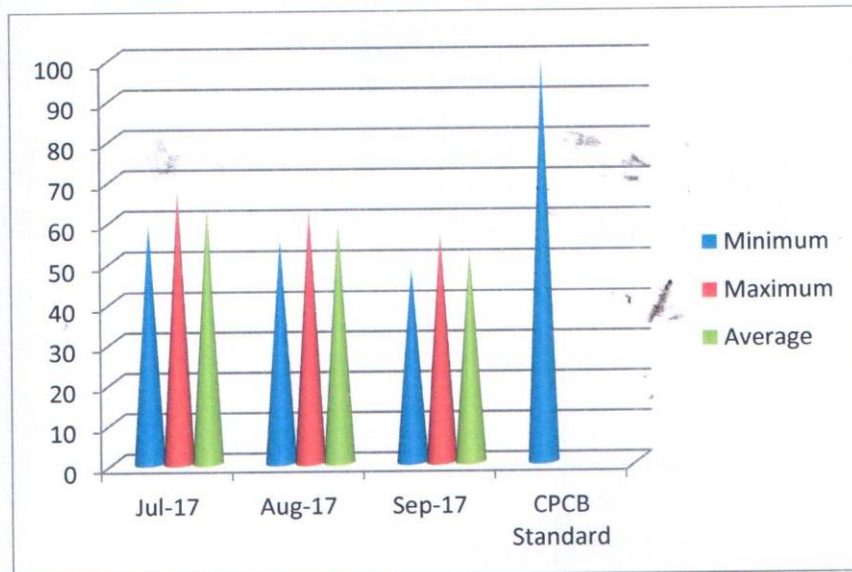


Kutku Village/Nr.V.T. Center

For the month of July-2017 the minimum and maximum concentrations for RSPM were recorded as $59 \mu\text{g}/\text{m}^3$ and $67 \mu\text{g}/\text{m}^3$ respectively and average concentration of $63 \mu\text{g}/\text{m}^3$.

For the month of August-2017 the minimum and maximum concentrations for RSPM were recorded as $55 \mu\text{g}/\text{m}^3$ and $62 \mu\text{g}/\text{m}^3$ respectively and average concentration of $59 \mu\text{g}/\text{m}^3$.

For the month of September-2017 the minimum and maximum concentrations for RSPM were recorded as $48 \mu\text{g}/\text{m}^3$ and $56 \mu\text{g}/\text{m}^3$ respectively and average concentration of $52 \mu\text{g}/\text{m}^3$.



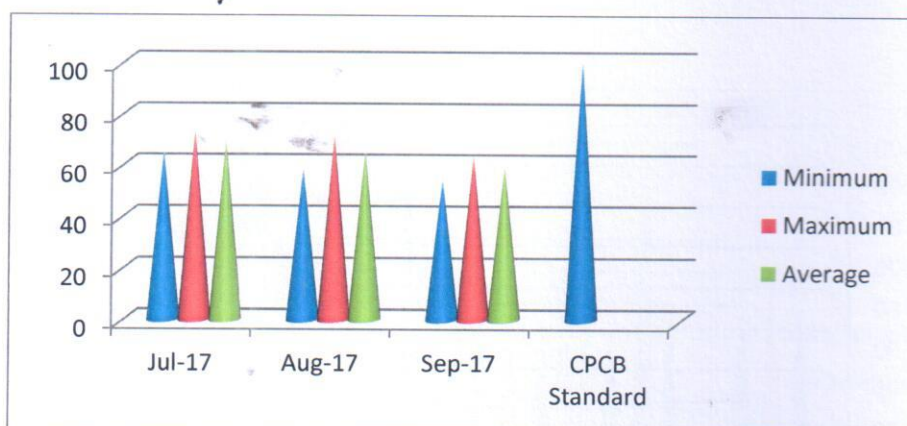


Dumerkholi/Nr.Mining Area

For the month of July-2017 the minimum and maximum concentrations for RSPM were recorded as $65 \mu\text{g}/\text{m}^3$ and $73 \mu\text{g}/\text{m}^3$ respectively and average concentration of $69 \mu\text{g}/\text{m}^3$.

For the month of August-2017 the minimum and maximum concentrations for RSPM were recorded as $58 \mu\text{g}/\text{m}^3$ and $71 \mu\text{g}/\text{m}^3$ respectively and average concentration of $65 \mu\text{g}/\text{m}^3$.

For the month of September-2017 the minimum and maximum concentrations for RSPM were recorded as $54 \mu\text{g}/\text{m}^3$ and $63 \mu\text{g}/\text{m}^3$ respectively and average concentration of $59 \mu\text{g}/\text{m}^3$.





3.3 Fugitive Emission (Buffer Zone):-

3.3.1 Presentation of Results.

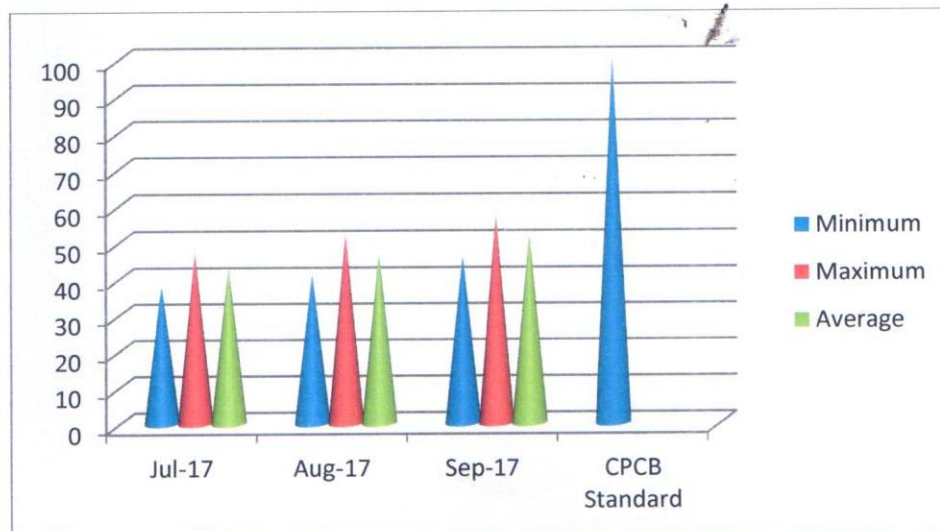
The summary of Statistical Analysis of RSPM results for the month of July-August-September-2017 are presented in detail in **Table 6**. 98th percentile; maximum, minimum and average values etc have been computed from the collected raw data for all the Fugitive emission monitoring station.

Sairaidh Campus

For the month of July-2017 the minimum and maximum concentrations for RSPM were recorded as 38 $\mu\text{g}/\text{m}^3$ and 47 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 43 $\mu\text{g}/\text{m}^3$.

For the month of August-2017 the minimum and maximum concentrations for RSPM were recorded as 41 $\mu\text{g}/\text{m}^3$ and 52 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 47 $\mu\text{g}/\text{m}^3$.

For the month of September-2017 the minimum and maximum concentrations for RSPM were recorded as 46 $\mu\text{g}/\text{m}^3$ and 57 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 52 $\mu\text{g}/\text{m}^3$.



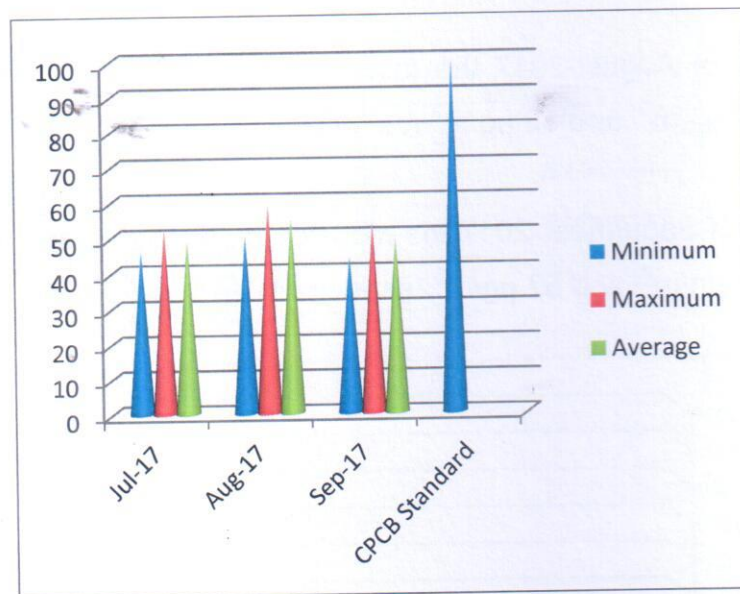


Jaljali Village

For the month of July-2017 the minimum and maximum concentrations for RSPM were recorded as $46 \mu\text{g}/\text{m}^3$ and $52 \mu\text{g}/\text{m}^3$ respectively and average concentration of $49 \mu\text{g}/\text{m}^3$.

For the month of August-2017 the minimum and maximum concentrations for RSPM were recorded as $50 \mu\text{g}/\text{m}^3$ and $59 \mu\text{g}/\text{m}^3$ respectively and average concentration of $55 \mu\text{g}/\text{m}^3$.

For the month of September-2017 the minimum and maximum concentrations for RSPM were recorded as $44 \mu\text{g}/\text{m}^3$ and $53 \mu\text{g}/\text{m}^3$ respectively and average concentration of $49 \mu\text{g}/\text{m}^3$.



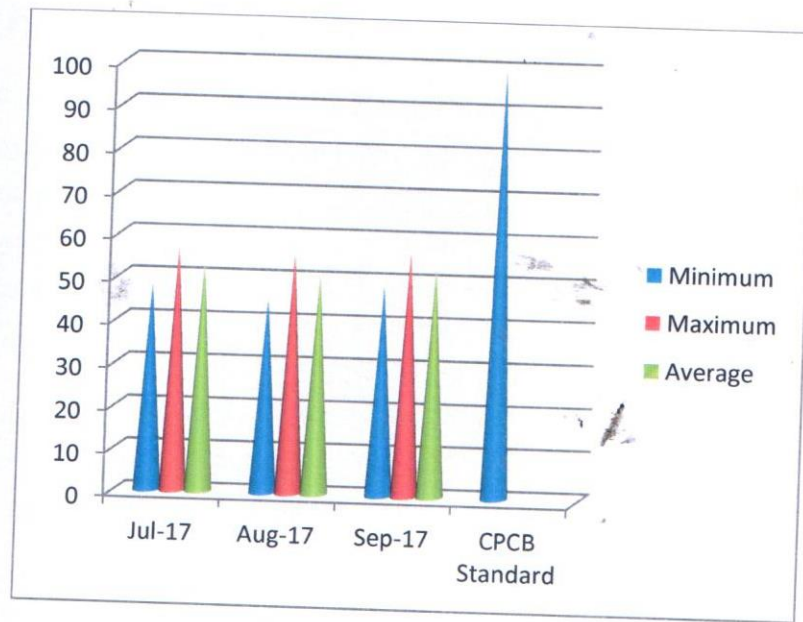


Tatijharia Village

For the month of July-2017 the minimum and maximum concentrations for RSPM were recorded as $48 \mu\text{g}/\text{m}^3$ and $57 \mu\text{g}/\text{m}^3$ respectively and average concentration of $53 \mu\text{g}/\text{m}^3$.

For the month of August-2017 the minimum and maximum concentrations for RSPM were recorded as $45 \mu\text{g}/\text{m}^3$ and $56 \mu\text{g}/\text{m}^3$ respectively and average concentration of $51 \mu\text{g}/\text{m}^3$.

For the month of September-2017 the minimum and maximum concentrations for RSPM were recorded as $49 \mu\text{g}/\text{m}^3$ and $57 \mu\text{g}/\text{m}^3$ respectively and average concentration of $53 \mu\text{g}/\text{m}^3$.





Piprapat/Nr.Mining Area

For the month of July-2017 the minimum and maximum concentrations for RSPM were recorded as $39 \mu\text{g}/\text{m}^3$ and $46 \mu\text{g}/\text{m}^3$ respectively and average concentration of $43 \mu\text{g}/\text{m}^3$.

For the month of August-2017 the minimum and maximum concentrations for RSPM were recorded as $42 \mu\text{g}/\text{m}^3$ and $53 \mu\text{g}/\text{m}^3$ respectively and average concentration of $48 \mu\text{g}/\text{m}^3$.

For the month of September-2017 the minimum and maximum concentrations for RSPM were recorded as $46 \mu\text{g}/\text{m}^3$ and $57 \mu\text{g}/\text{m}^3$ respectively and average concentration of $52 \mu\text{g}/\text{m}^3$.

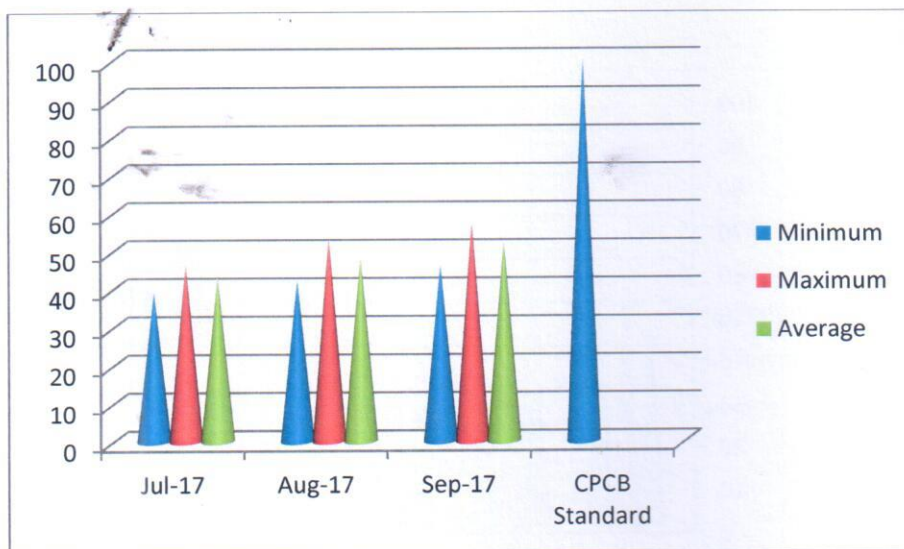




Table 8

Statistical Analysis of PM 2.5

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

Location	Month & Year	Min.	Max.	A.M.	G.M.	98%	
Samri-Gopatu/ Near Weigh bridge	July-2017	18	24	21	21	24	
	August-2017	24	27	26	26	27	
	September-2017	23	31	27	27	31	
CPCB Standard		60 (24 hrs)					

Conclusion :- The Average Concentration of $\text{PM}_{2.5}$ within Samri Lease during this period (July-August-September-2017) is $25 \mu\text{g}/\text{m}^3$ and it is within permissible limits as per CPCB Standard.

3.4 Statistical Analysis of PM 2.5:-

3.4.1 Presentation of Results.

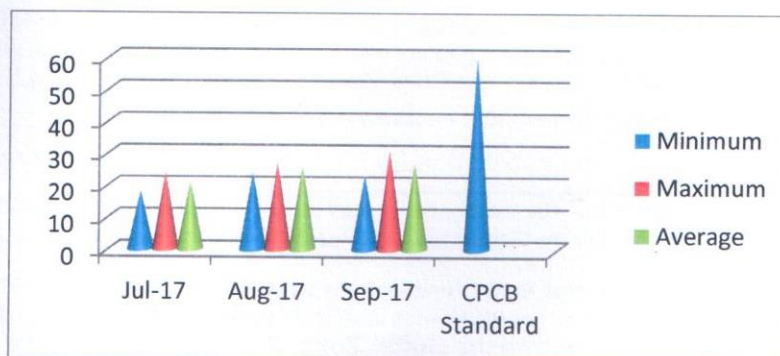
The summary of Statistical Analysis of $\text{PM}_{2.5}$ results for the month of July-August-September-2017 are presented in detail in Table 8. 98th percentile; maximum, minimum and average values etc have been computed from the collected raw data for all the Fugitive emission monitoring station.

Samri-Gopatu/Near Weigh Bridge

For the month of July-2017 the minimum and maximum concentrations for $\text{PM}_{2.5}$ 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 August-2017 the minimum and maximum concentrations for $\text{PM}_{2.5}$ were recorded as $24 \mu\text{g}/\text{m}^3$ and $27 \mu\text{g}/\text{m}^3$ respectively and average concentration of $26 \mu\text{g}/\text{m}^3$.

For the month of September-2017 the minimum and maximum concentrations for $\text{PM}_{2.5}$ were recorded as $23 \mu\text{g}/\text{m}^3$ and $31 \mu\text{g}/\text{m}^3$ respectively and average concentration of $27 \mu\text{g}/\text{m}^3$.





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**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	July-2017	6	9	8	8	9
	August-2017	9	12	11	11	12
	September-2017	7	10	9	9	10
Rajendrapur/ Nr.Mining Area	July-2017	7	11	9	9	11
	August-2017	8	12	10	10	12
	September-2017	7	11	9	9	11
Kutku Village/ Nr.V.T. Center	July-2017	7	14	11	11	14
	August-2017	8	13	11	11	13
	September-2017	9	14	12	12	14
Dumerkholi/ Nr.Mining Area	July-2017	8	13	11	11	13
	August-2017	8	12	10	10	12
	September-2017	7	11	9	9	11
CPCB Standard		80 (24 hrs)				

Location	Month & Year	Min.	Max.	A.M.	G.M.	98%
Buffer Zone :-						
Sairaidh Campus	July-2017	5	7	6	6	7
	August-2017	6	9	8	8	9
	September-2017	5	7	6	6	7
Jaljali Village	July-2017	7	10	9	9	10
	August-2017	7	9	8	8	9
	September-2017	6	8	7	7	8
Tatijharia Village/ Nr. Weigh bridge	July-2017	6	9	8	8	9
	August-2017	5	9	7	7	9
	September-2017	7	10	9	9	10
Piprapat/ Nr.Mining Area	July-2017	6	9	8	8	9
	August-2017	6	8	7	7	8
	September-2017	7	9	8	8	9
CPCB Standard		80 (24 hrs)				

Conclusion:- A)

- 1) Samri-Gopatu/ Nr.weigh bridge Lease Area Core Zone: For the Months of July-Aug-Sept-2017 Average of SO₂ is 9 $\mu\text{g}/\text{m}^3$.
 - 2) Rajendrapur/Nr.Mining Area Lease Area Core Zone:- For the Months of July-Aug-Sept-2017 Average of SO₂ is 9 $\mu\text{g}/\text{m}^3$.
 - 3) Kutku Village / Nr.V.T. Center Lease Area Core Zone:- For the Months of July-Aug-Sept-2017 Average of SO₂ is 11 $\mu\text{g}/\text{m}^3$.
 - 4) Dumerkholi/ Nr.Mining Area Core Zone:- For the Months of July-Aug-Sept-2017 Average of SO₂ is 10 $\mu\text{g}/\text{m}^3$.
- The Average Concentration of SO₂ within the Core Zone of Samri Lease during this period (July-Aug-Sept-2017) 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 July-Aug-Sept-2017 Average of SO₂ is 7 $\mu\text{g}/\text{m}^3$.
 - 2) Jaljali Village Lease Area Buffer Zone:- For the Months of July-Aug-Sept-2017 Average of SO₂ is 7 $\mu\text{g}/\text{m}^3$.
 - 3) Tatijharia Village/ Nr. Weigh bridge Lease Area Buffer Zone:- For the Months of July-Aug-Sept-2017 Average of SO₂ is 8 $\mu\text{g}/\text{m}^3$.
 - 4) Piprapat/ Nr.Mining Lease Area Buffer Zone:- For the Months of July-Aug-Sept-2017 Average of SO₂ is 8 $\mu\text{g}/\text{m}^3$.
- The Average Concentration of SO₂ within the Buffer Zone of Samri Lease during this period (July-Aug-Sept-2017) is 7 $\mu\text{g}/\text{m}^3$ 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.

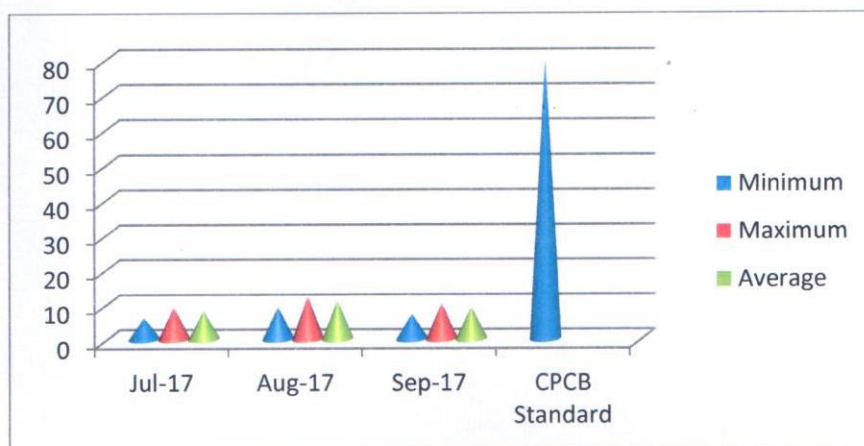
The summary of Statistical Analysis of SO₂ results for the month of July-August-September-2017 are presented in detail in **Table 7**. 98th percentile; maximum, minimum and average values etc have been computed from the collected raw data for all the Fugitive emission monitoring station.

Samri-Gopatu/ Nr.weigh bridge

For the month of July-2017 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.

For the month of August-2017 the minimum and maximum concentrations for SO₂ were recorded as 9 µg/m³ and 12 µg/m³ respectively and average concentration of 11 µg/m³.

For the month of September-2017 the minimum and maximum concentrations for SO₂ were recorded as 7 µg/m³ and 10 µg/m³ respectively and average concentration of 9 µg/m³.



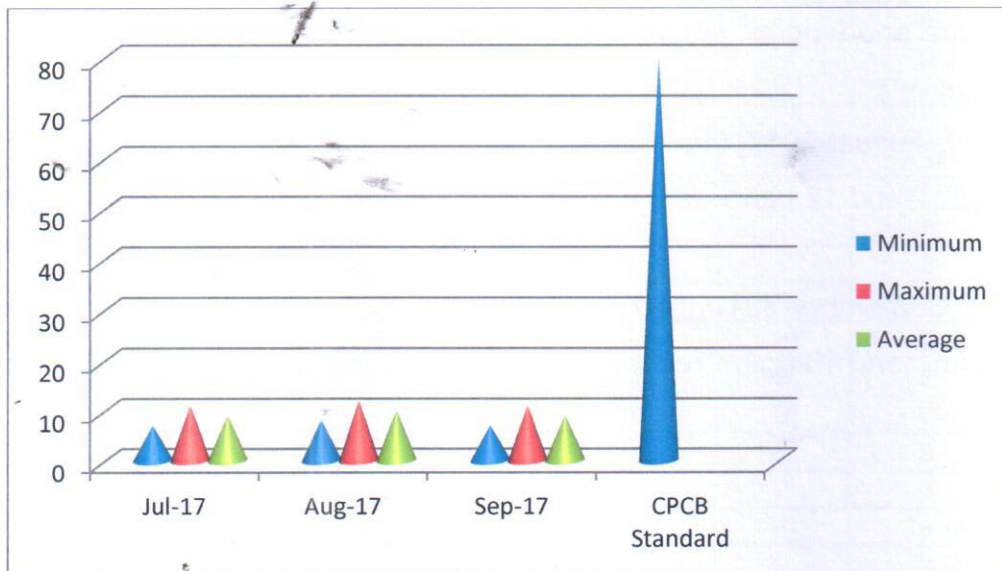


Rajendrapur/Nr.Mining Area

For the month of July-2017 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 August-2017 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 September-2017 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.



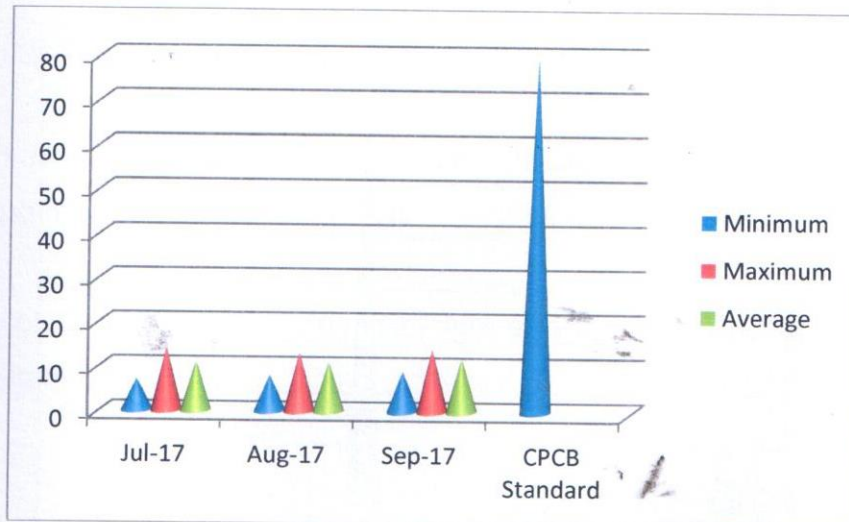


Kutku Village/Nr.V.T. Center

For the month of July-2017 the minimum and maximum concentrations for SO₂ were recorded as 7 µg/m³ and 14 µg/m³ respectively and average concentration of 11 µg/m³.

For the month of August-2017 the minimum and maximum concentrations for SO₂ were recorded as 8 µg/m³ and 13 µg/m³ respectively and average concentration of 11 µg/m³.

For the month of September-2017 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.



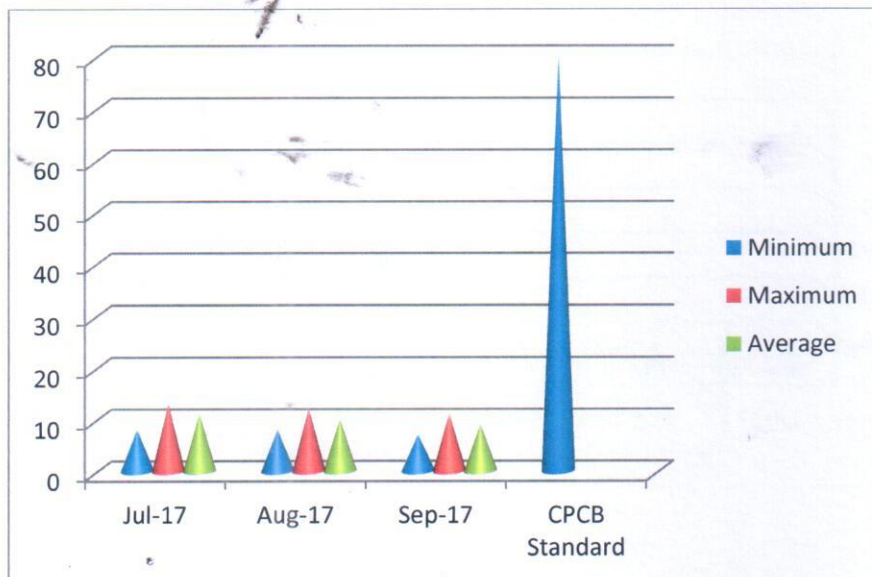


Dumerkholi/Nr.Mining Area

For the month of July-2017 the minimum and maximum concentrations for SO₂ were recorded as 8 µg/m³ and 13 µg/m³ respectively and average concentration of 11 µg/m³.

For the month of August-2017 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 September-2017 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.





3.6 Fugitive Emission (Buffer Zone):-

3.6.1 Presentation of Results.

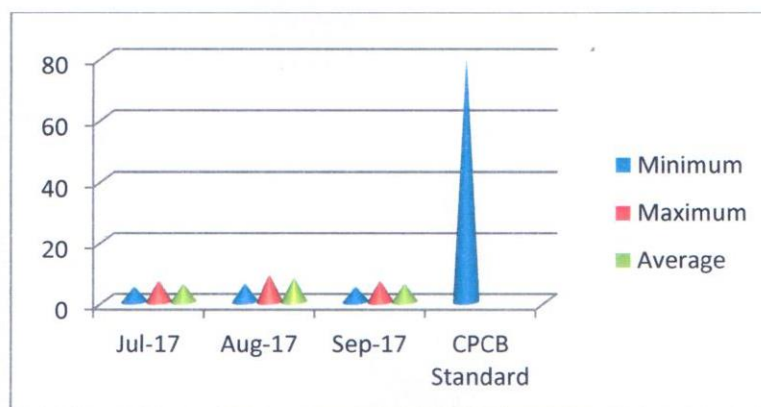
The summary of Statistical Analysis of SO_x results for the month of July-August-September-2017 are presented in detail in **Table 9**. 98th percentile; maximum, minimum and average values etc have been computed from the collected raw data for all the Fugitive emission monitoring station.

Sairaidh Campus

For the month of July-2017 the minimum and maximum concentrations for SO₂ were recorded as 5 µg/m³ and 7 µg/m³ respectively and average concentration of 6 µg/m³.

For the month of August-2017 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.

For the month of September-2017 the minimum and maximum concentrations for SO₂ were recorded as 5 µg/m³ and 7 µg/m³ respectively and average concentration of 6 µg/m³.



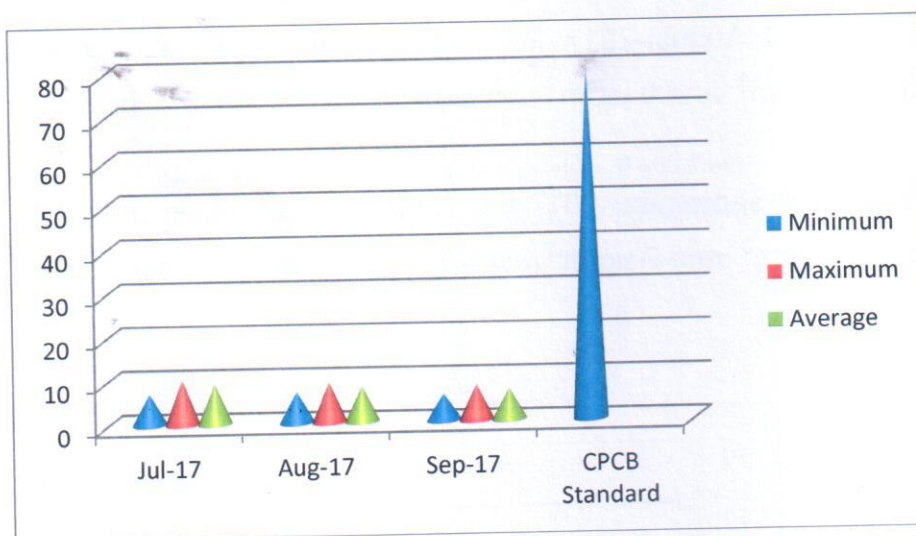


Jaljali Village

For the month of July-2017 the minimum and maximum concentrations for SO₂ were recorded as 7 µg/m³ and 10 µg/m³ respectively and average concentration of 9 µg/m³.

For the month of August-2017 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 September-2017 the minimum and maximum concentrations for SO₂ were recorded as 6 µg/m³ and 8 µg/m³ respectively and average concentration of 7 µg/m³.



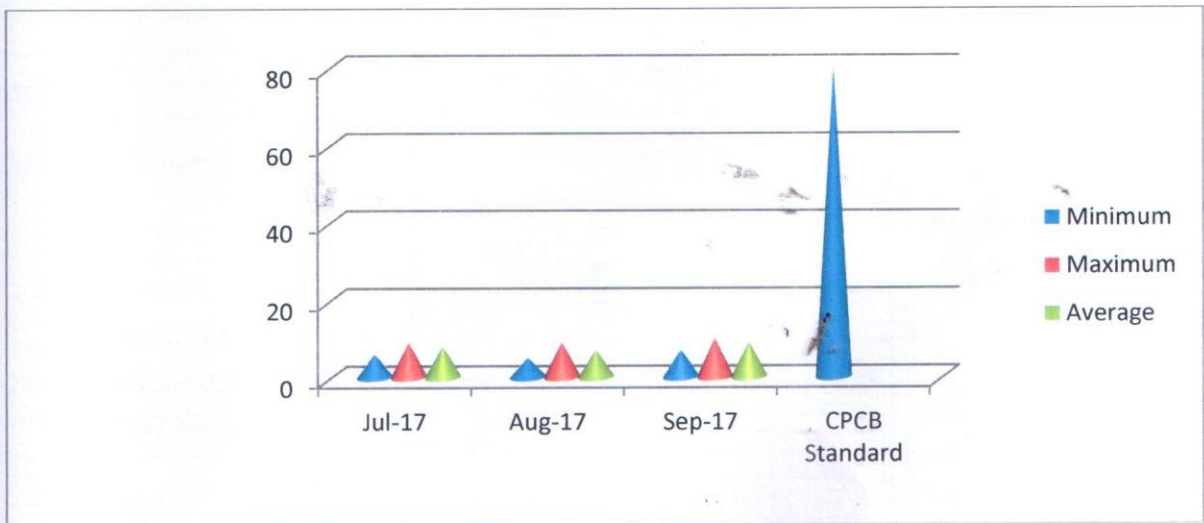


Tatijharia Village/Nr.Weigh Bridge

For the month of July-2017 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.

For the month of August-2017 the minimum and maximum concentrations for SO₂ were recorded as 5 µg/m³ and 9 µg/m³ respectively and average concentration of 7 µg/m³.

For the month of September-2017 the minimum and maximum concentrations for SO₂ were recorded as 7 µg/m³ and 10 µg/m³ respectively and average concentration of 9 µg/m³.





Piprapat/Nr.Mining Area

For the month of July-2017 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.

For the month of August-2017 the minimum and maximum concentrations for SO₂ were recorded as 6 µg/m³ and 8 µg/m³ respectively and average concentration of 7 µg/m³.

For the month of September-2017 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.

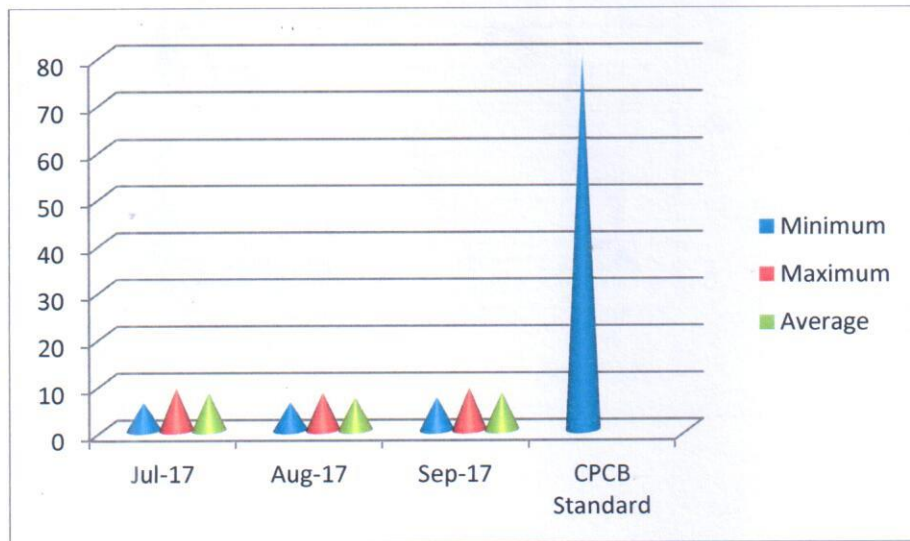




Table 10
Statistical Analysis of NO_x

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	July-2017	16	19	18	18	19
	August-2017	18	24	21	21	24
	September-2017	16	21	19	19	21
Rajendrapur/ Nr.Mining Area	July-2017	18	27	23	23	27
	August-2017	21	28	25	25	28
	September-2017	19	21	20	20	21
Kutku Village/ Nr.V.T. Center	July-2017	16	19	18	18	19
	August-2017	21	26	24	24	26
	September-2017	18	24	21	21	24
Dumerkholi/ Nr.Mining Area	July-2017	16	23	20	20	23
	August-2017	21	27	24	24	27
	September-2017	17	29	23	23	29
CPCB Standard		80 (24 hrs)				

Location	Month & Year	Min.	Max.	A.M.	G.M.	98%
Buffer Zone :-						
Sairaidh Campus	July-2017	14	19	17	17	19
	August-2017	16	20	18	18	20
	September-2017	12	18	15	15	18
Jaljali Village	July-2017	9	16	13	13	16
	August-2017	11	18	15	15	18
	September-2017	13	21	17	17	21
Tatijharia Village/ Nr. Weigh bridge	July-2017	17	24	21	21	24
	August-2017	16	21	19	19	21
	September-2017	18	23	21	21	23
Piprapat/ Nr.Mining Area	July-2017	14	19	17	17	19
	August-2017	13	21	17	17	21
	September-2017	14	23	19	19	23
CPCB Standard		80 (24 hrs)				

Conclusion: A)

- 1) Samri-Gopatu/ Nr.weigh bridge Lease Area Core Zone: For the Months of July-Aug-Sept-2017 Average of NO_x is 19 $\mu\text{g}/\text{m}^3$.
- 2) Rajendrapur/Nr.Mining Lease Area Core Zone:- For the Months of July-Aug-Sept-2017 Average of NO_x is 20 $\mu\text{g}/\text{m}^3$.
- 3) Kutku Village / Nr.V.T. Center Lease Area Core Zone:- For the Months of July-Aug-Sept-2017 Average of NO_x is 21 $\mu\text{g}/\text{m}^3$.
- 4) Dumerkholi/ Nr.Mining Lease Area Core Zone:- For the Months of July-Aug-Sept-2017 of NO_x is 22 $\mu\text{g}/\text{m}^3$.

• The Average Concentration of NO_x within the Core Zone of Samri Lease during this period (July-Aug-Sept-2017) is 21 $\mu\text{g}/\text{m}^3$ and it is within permissible limits as per CPCB Standard.

Conclusion: B)

- 1) Sairaidh Campus Lease Area Buffer Zone:- For the Months of July-Aug-Sept-2017 Average of NO_x is 17 $\mu\text{g}/\text{m}^3$.
- 2) Jaljali Village Lease Area Buffer Zone:- For the Months of July-Aug-Sept-2017 Average of NO_x is 17 $\mu\text{g}/\text{m}^3$.
- 3) Tatijharia Village/ Nr. Weigh bridge Lease Area Buffer Zone:- For the Months of July-Aug-Sept-2017 Average of NO_x is 20 $\mu\text{g}/\text{m}^3$.
- 4) Piprapat/ Nr.Mining Lease Area Buffer Zone:- For the Months of July-Aug-Sept-2017 Average of NO_x is 18 $\mu\text{g}/\text{m}^3$.

• The Average Concentration of NO_x within the Buffer Zone of Samri Lease during this period (July-Aug-Sept-2017) is 18 $\mu\text{g}/\text{m}^3$ and it is within permissible limits as per CPCB Standard.



Monthwise Summary of Statistical Analysis of NO_x

3.7 Fugitive Emission (Core Zone):-

3.7.1 Presentation of Results.

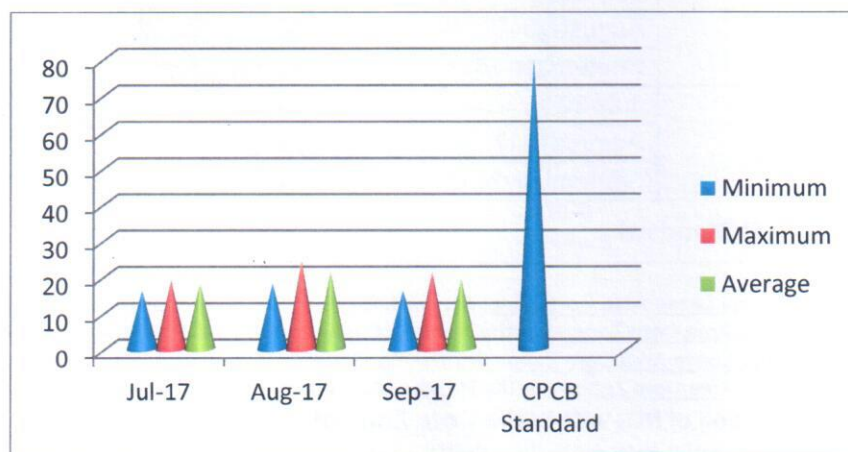
The summary of Statistical Analysis of NO_x results for the month of July-August-September 2017 are presented in detail in **Table 10**. 98th percentile; maximum, minimum and average values etc have been computed from the collected raw data for all the Fugitive emission monitoring station.

Samri-Gopatu/ Nr.weigh bridge

For the month of July-2017 the minimum and maximum concentrations for NO_x were recorded as 16 µg/m³ and 19 µg/m³ respectively and average concentration of 18 µg/m³.

For the month of August-2017 the minimum and maximum concentrations for NO_x were recorded as 18 µg/m³ and 24 µg/m³ respectively and average concentration of 21 µg/m³.

For the month of September-2017 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.



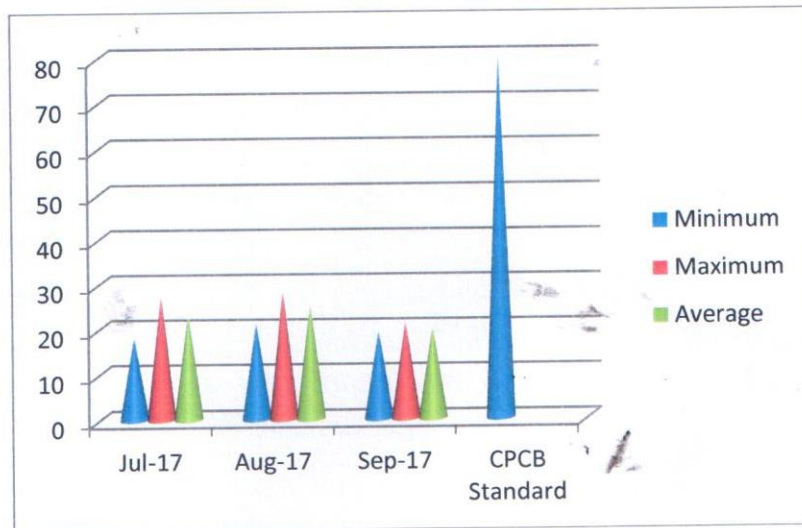


Rajendrapur/Nr.Mining Area

For the month of July-2017 the minimum and maximum concentrations for NO_x were recorded as 18 µg/m³ and 27 µg/m³ respectively and average concentration of 23 µg/m³.

For the month of August-2017 the minimum and maximum concentrations for NO_x were recorded as 21 µg/m³ and 28 µg/m³ respectively and average concentration of 25 µg/m³.

For the month of September-2017 the minimum and maximum concentrations for NO_x were recorded as 19 µg/m³ and 21 µg/m³ respectively and average concentration of 20 µg/m³.

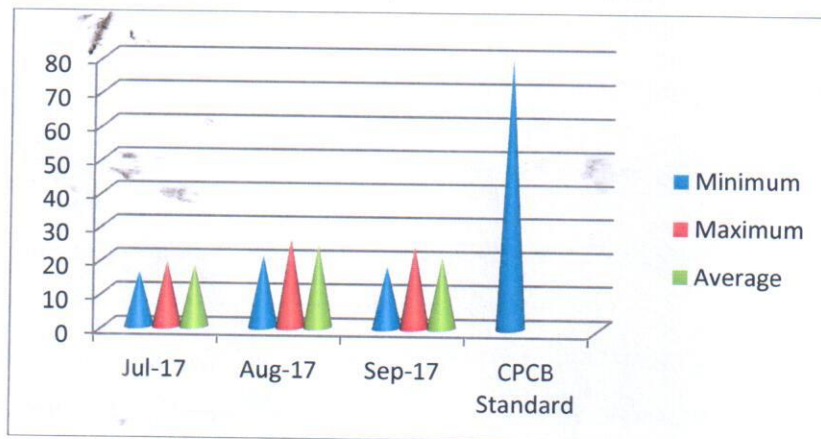


Kutku Village/Nr.V.T. Center

For the month of July-2017 the minimum and maximum concentrations for NO_x were recorded as 16 µg/m³ and 19 µg/m³ respectively and average concentration of 18 µg/m³.

For the month of August-2017 the minimum and maximum concentrations for NO_x were recorded as 21 µg/m³ and 26 µg/m³ respectively and average concentration of 24 µg/m³.

For the month of September-2017 the minimum and maximum concentrations for NO_x were recorded as 18 µg/m³ and 24 µg/m³ respectively and average concentration of 21 µg/m³.



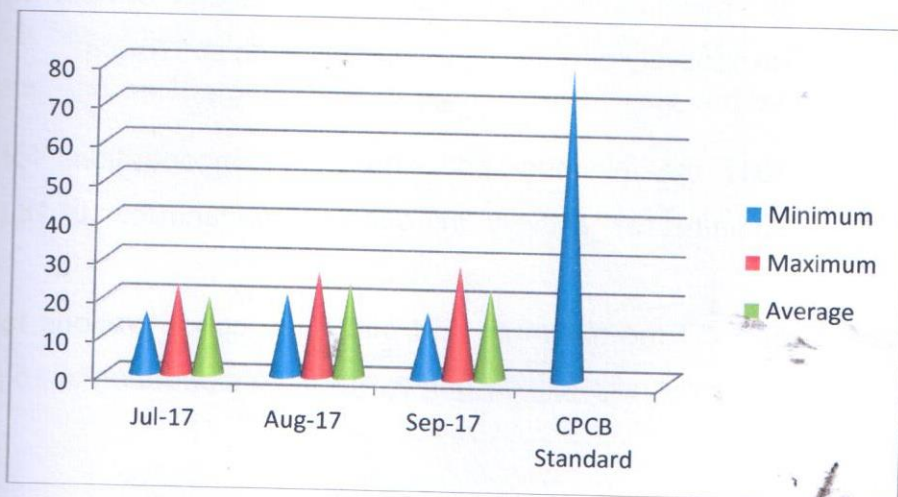


Dumerkholi/Nr.Mining Area

For the month of July-2017 the minimum and maximum concentrations for NO_x were recorded as 16 µg/m³ and 23 µg/m³ respectively and average concentration of 20 µg/m³.

For the month of August-2017 the minimum and maximum concentrations for NO_x were recorded as 21 µg/m³ and 27 µg/m³ respectively and average concentration of 24 µg/m³.

For the month of September-2017 the minimum and maximum concentrations for NO_x were recorded as 17 µg/m³ and 29 µg/m³ respectively and average concentration of 23 µg/m³.





3.8 Fugitive Emission (Buffer Zone):-

3.8.1 Presentation of Results.

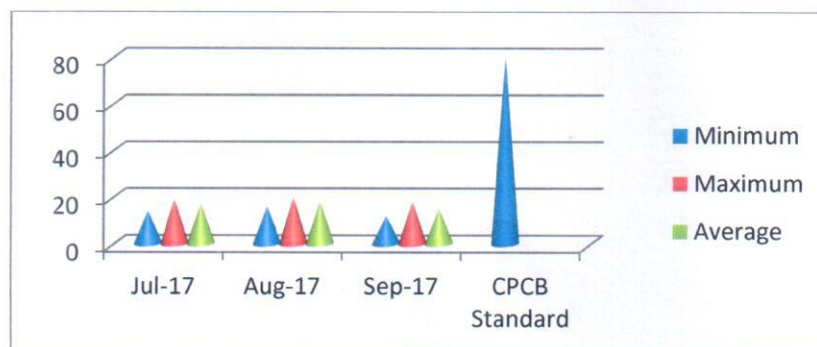
The summary of Statistical Analysis of NO_x results for the month of July-August-September 2017 are presented in detail in **Table 10**. 98th percentile; maximum, minimum and average values etc have been computed from the collected raw data for all the Fugitive emission monitoring station.

Sairaidh Campus

For the month of July-2017 the minimum and maximum concentrations for NO_x were recorded as 14 µg/m³ and 19 µg/m³ respectively and average concentration of 17 µg/m³.

For the month of August-2017 the minimum and maximum concentrations for NO_x were recorded as 16 µg/m³ and 20 µg/m³ respectively and average concentration of 18 µg/m³.

For the month of September-2017 the minimum and maximum concentrations for NO_x were recorded as 12 µg/m³ and 18 µg/m³ respectively and average concentration of 15 µg/m³.



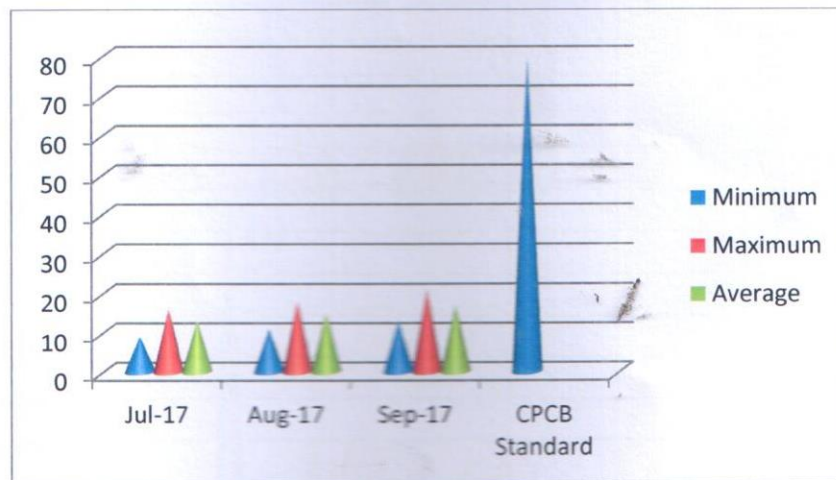


Jaljali Village

For the month of July-2017 the minimum and maximum concentrations for NO_x were recorded as 9 µg/m³ and 16 µg/m³ respectively and average concentration of 13 µg/m³.

For the month of August-2017 the minimum and maximum concentrations for NO_x were recorded as 11 µg/m³ and 18 µg/m³ respectively and average concentration of 15 µg/m³.

For the month of September-2017 the minimum and maximum concentrations for NO_x were recorded as 13 µg/m³ and 21 µg/m³ respectively and average concentration of 17 µg/m³.



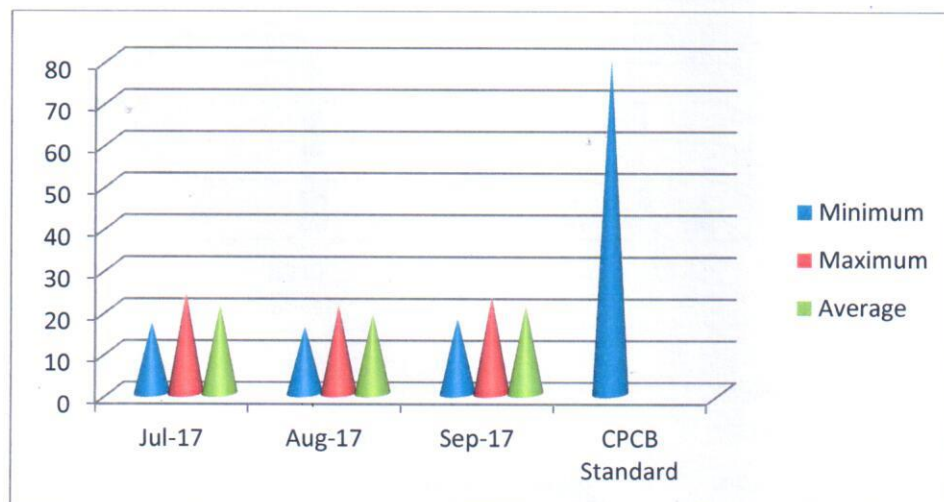


Tatijharia Village/Nr.Weigh Bridge

For the month of July-2017 the minimum and maximum concentrations for NO_x were recorded as 17 µg/m³ and 24 µg/m³ respectively and average concentration of 21 µg/m³.

For the month of August-2017 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.

For the month of September-2017 the minimum and maximum concentrations for NO_x were recorded as 18 µg/m³ and 23 µg/m³ respectively and average concentration of 21 µg/m³.



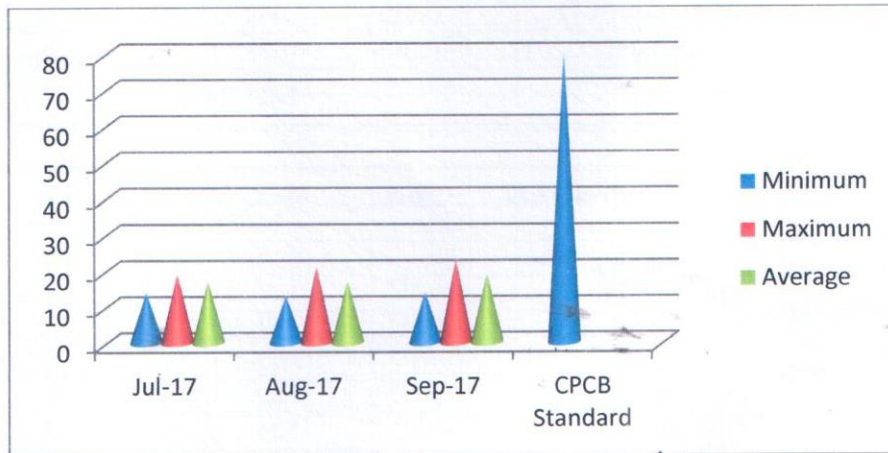


Piprapat/Nr.Mining Area

For the month of July-2017 the minimum and maximum concentrations for NOx were recorded as 14 $\mu\text{g}/\text{m}^3$ and 19 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 17 $\mu\text{g}/\text{m}^3$.

For the month of August-2017 the minimum and maximum concentrations for NOx were recorded as 13 $\mu\text{g}/\text{m}^3$ and 21 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 17 $\mu\text{g}/\text{m}^3$.

For the month of September-2017 the minimum and maximum concentrations for NOx were recorded as 14 $\mu\text{g}/\text{m}^3$ and 23 $\mu\text{g}/\text{m}^3$ respectively and average concentration of 19 $\mu\text{g}/\text{m}^3$.





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**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	July-2017	0.045	0.058	0.052	0.052	0.058
	August-2017	0.048	0.065	0.057	0.057	0.065
	September-2017	0.039	0.049	0.044	0.044	0.049
Rajendrapur/ Nr.Mining Area	July-2017	0.055	0.073	0.064	0.064	0.073
	August-2017	0.051	0.069	0.060	0.060	0.069
	September-2017	0.043	0.063	0.053	0.053	0.063
Kutku Village/ Nr.V.T. Center	July-2017	0.039	0.048	0.044	0.044	0.048
	August-2017	0.033	0.044	0.039	0.039	0.044
	September-2017	0.041	0.052	0.047	0.047	0.052
Dumerkholi/ Nr.Mining Area	July-2017	0.048	0.059	0.054	0.054	0.059
	August-2017	0.055	0.063	0.059	0.059	0.063
	September-2017	0.048	0.055	0.052	0.052	0.055
CPCB Standard	1.0 (24 hrs)					

Location	Month & Year	Min.	Max.	A.M.	G.M.	98%
Buffer Zone :-						
Sairaidh Campus	July-2017	ND	ND	ND	ND	ND
	August-2017	ND	ND	ND	ND	ND
	September-2017	ND	ND	ND	ND	ND
Jaljali Village	July-2017	ND	ND	ND	ND	ND
	August-2017	ND	ND	ND	ND	ND
	September-2017	ND	ND	ND	ND	ND
Tatiharia Village/ Nr. Weigh bridge	July-2017	ND	ND	ND	ND	ND
	August-2017	ND	ND	ND	ND	ND
	September-2017	ND	ND	ND	ND	ND
Piprapat/ Nr.Mining Area	July-2017	ND	ND	ND	ND	ND
	August-2017	ND	ND	ND	ND	ND
	September-2017	ND	ND	ND	ND	ND
CPCB Standard	1.0 (24 hrs)					

Conclusion: A)

The Average Concentration of Pb within the Core Zone of Samri Lease during this period (July To September-2017) is $0.051 \mu\text{g}/\text{m}^3$ 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 (July To September-2017) is Not detected.



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	July-2017	ND	ND	ND	ND	ND
	August-2017	ND	ND	ND	ND	ND
	September-2017	ND	ND	ND	ND	ND
Rajendrapur/ Nr.Mining Area	July-2017	ND	ND	ND	ND	ND
	August-2017	ND	ND	ND	ND	ND
	September-2017	ND	ND	ND	ND	ND
Kutku Village/ Nr.V.T. Center	July-2017	ND	ND	ND	ND	ND
	August-2017	ND	ND	ND	ND	ND
	September-2017	ND	ND	ND	ND	ND
Dumerkholi/ Nr.Mining Area	July-2017	ND	ND	ND	ND	ND
	August-2017	ND	ND	ND	ND	ND
	September-2017	ND	ND	ND	ND	ND

Buffer Zone :-

Sairaidh Campus	July-2017	ND	ND	ND	ND	ND
	August-2017	ND	ND	ND	ND	ND
	September-2017	ND	ND	ND	ND	ND
Jaljali Village	July-2017	ND	ND	ND	ND	ND
	August-2017	ND	ND	ND	ND	ND
	September-2017	ND	ND	ND	ND	ND
Tatijharia Village/ Nr. Weigh bridge	July-2017	ND	ND	ND	ND	ND
	August-2017	ND	ND	ND	ND	ND
	September-2017	ND	ND	ND	ND	ND
Piprapat/ Nr.Mining Area	July-2017	ND	ND	ND	ND	ND
	August-2017	ND	ND	ND	ND	ND
	September-2017	ND	ND	ND	ND	ND
CPCB Standard		----				

ND-Not Detected.

Conclusion: A)

The Average Concentration of Hg within the Core Zone of Samri Lease during this period (July To September-2017) is Not Detected.

Conclusion: B)

The Average Concentration of Hg within the Buffer Zone of Samri Lease during this period (July To September-2017) is Not Detected.



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**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	July-2017	ND	ND	ND	ND	ND
	August-2017	ND	ND	ND	ND	ND
	September-2017	ND	ND	ND	ND	ND
Rajendrapur/ Nr.Mining Area	July-2017	ND	ND	ND	ND	ND
	August-2017	ND	ND	ND	ND	ND
	September-2017	ND	ND	ND	ND	ND
Kutku Village/ Nr.V.T. Center	July-2017	ND	ND	ND	ND	ND
	August-2017	ND	ND	ND	ND	ND
	September-2017	ND	ND	ND	ND	ND
Dumerkholi/ Nr.Mining Area	July-2017	ND	ND	ND	ND	ND
	August-2017	ND	ND	ND	ND	ND
	September-2017	ND	ND	ND	ND	ND
CPCB Standard	06 (Annual)					

Location	Month & Year	Min.	Max.	A.M.	G.M.	98%
Buffer Zone :-						
Sairaidh Campus	July-2017	ND	ND	ND	ND	ND
	August-2017	ND	ND	ND	ND	ND
	September-2017	ND	ND	ND	ND	ND
Jaljali Village	July-2017	ND	ND	ND	ND	ND
	August-2017	ND	ND	ND	ND	ND
	September-2017	ND	ND	ND	ND	ND
Tatijharia Village/ Nr. Weigh bridge	July-2017	ND	ND	ND	ND	ND
	August-2017	ND	ND	ND	ND	ND
	September-2017	ND	ND	ND	ND	ND
Piprapat/ Nr.Mining Area	July-2017	ND	ND	ND	ND	ND
	August-2017	ND	ND	ND	ND	ND
	September-2017	ND	ND	ND	ND	ND
CPCB Standard	06 (Annual)					

- ND-Not Detected.

Conclusion: A)

The Average Concentration of As within the Core Zone of Samri Lease during this period (July To September-2017) is Not Detected.

Conclusion: B)

The Average Concentration of As within the Buffer Zone of Samri Lease during this period (July To September-2017) is Not Detected.



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Free Silica :-

Sr. No.	Location	Measurement Unit	July-2017		August-2017		September-2017	
			SPM	RSPM	SPM	RSPM	SPM	RSPM
1.	Rajendrapur/ Near Mining Area	g/100gm	0.27	0.14	0.32	0.19	0.26	0.17

**Table 14
Dust fall Rate**

Sr. No.	Location	July-2017	August-2017	September-2017	Average
		Rate (MT/km ² /Month)			
1	Rajendrapur/Nr.Mining Area	19.27	27.94	26.18	24.46
2	Samri-Gopatu/Nr.Weigh Bridge	17.52	24.58	21.39	21.16



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Table-15

Noise Level Monitoring

Unit: dB(A)

Sl. No.	Location	July-2017		August-2017		September-2017	
		Day	Night	Day	Night	Day	Night
Core Zone							
1.	Samri-Gopatu/Nr. Weigh Bridge	57	43	62	51	67	54
2.	Rajendrapur/Nr. Mining Area	64	52	59	48	61	43
3.	Kutku Village/Nr. V.T. Center	61	47	68	52	57	38
4.	Dumerkholi/Nr. Mining Area	59	48	61	47	63	51
Buffer Zone							
1.	Sairaidh Campus	51	38	47	39	48	37
2.	Jaljali Village	48	37	52	41	51	41
3.	Tatijharia Village/Nr. Weigh Bridge	46	36	51	42	52	43
4.	Piprapat/Near Mining Area	53	42	49	38	47	36

**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	July-2017			August-2017			September-2017		
		Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.
1.	Rajendrapur/Nr. Mining Area	67.1	73.8	70.5	68.1	76.1	72.1	64.7	71.9	68.1

Note:- All the Values are in CPCB Limit.



Hindalco Industries Limited
Samri Mining Environmental Status
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3.9 Ground Water Quality:- Most of the villages in the nearby plant area have hand pumps and wells, and 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 July-August-September-2017)

Location:

GW1) Rajendrapur / Near Mining Area

TEST RESULTS

Sl. 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	6.92 at 25°C
2	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.6
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)	1.0	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	271
9	Fluoride (as F)	mg/l	IS 3025 (Part 60)	1.0	1.5	0.18
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	121.39
12	Total Alkalinity (as CaCO ₃)	mg/l	IS 3025 (Part 23)	200	600	118.54
13	Total hardness (as CaCO ₃)	mg/l	IS 3025 (Part 21)	200	600	190.88
14	Calcium (as Ca)	mg/l	IS 3025 (Part 40)	75	200	61.29
15	Magnesium (as Mg)	mg/l	IS 3025 (Part 46)	30	100	9.17
16	Sulphate (as SO ₄)	mg/l	IS 3025 (Part 24)	200	400	36.26
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	No relaxation	< 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	< 0.1

< indicates detection limit of the laboratory.

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	<p align="center">Hindalco Industries Limited Samri Mining Environmental Status Report for July-2017 To September-2017</p>	<p align="center">Introduction</p>
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Table-15

Noise Level Monitoring

Unit: dB(A)

Sl. No.	Location	July-2017		August-2017		September-2017	
		Day	Night	Day	Night	Day	Night
Core Zone							
1.	Samri-Gopatu/Nr.Weigh Bridge	57	43	62	51	67	54
2.	Rajendrapur/Nr.Mining Area	64	52	59	48	61	43
3.	Kutku Village/Nr.V.T.Center	61	47	68	52	57	38
4.	Dumerkholi/Nr.Mining Area	59	48	61	47	63	51
Buffer Zone							
1.	Sairaidh Campus	51	38	47	39	48	37
2.	Jaljali Village	48	37	52	41	51	41
3.	Tatijharia Village/Nr.Weigh Bridge	46	36	51	42	52	43
4.	Piprapat/Near Mining Area	53	42	49	38	47	36

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	July-2017			August-2017			September-2017		
		Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.
1.	Rajendrapur/Nr .Mining Area	67.1	73.8	70.5	68.1	76.1	72.1	64.7	71.9	68.1

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 July-August-September-2017)

Location:	GW1) Rajendrapur / Near Mining Area
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TEST RESULTS

Sl. No.	Test Parameter	Measurement Unit	Test Method	As per IS 10500 : 2012 (Drinking Water - Specification)		Test Result
				Acceptable Limit	*Permissible Limit	
38	pH value	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	6.92 at 25°C
43	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.6
37	Colour	Hazen units	IS 3025 (Part 4)	5	15	1
41	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
51	Taste	-	IS 3025 (Part 8)	Agreeable	Agreeable	Agreeable
43	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.16
36	Free residual chlorine	mg/l	IS 3025 (Part 26)	Min. 0.2	Min. 1	< 0.1
37	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	271
38	Fluoride (as F)	mg/l	IS 3025 (Part 60)	1.0	1.5	0.18
39	Cyanide (as CN)	mg/l	IS 3025 (Part 27)	0.05	No relaxation	< 0.005
40	Chloride (as Cl)	mg/l	IS 3025 (Part 32)	250	1000	121.39
41	Total Alkalinity (as CaCO ₃)	mg/l	IS 3025 (Part 23)	200	600	118.54
42	Total hardness (as CaCO ₃)	mg/l	IS 3025 (Part 21)	200	600	190.88
43	Calcium (as Ca)	mg/l	IS 3025 (Part 40)	75	200	61.29
44	Magnesium (as Mg)	mg/l	IS 3025 (Part 46)	30	100	9.17
45	Sulphate (as SO ₄)	mg/l	IS 3025 (Part 24)	200	400	36.26
46	Nitrate (as NO ₃)	mg/l	APHA Method	45	No relaxation	< 2
47	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	< 0.03
48	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	< 0.05
49	Mercury (as Hg)	mg/l	IS 3025 (Part 2)	0.001	No relaxation	< 0.0005
50	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	< 0.001
51	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	< 0.001
52	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	< 0.01
53	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	< 0.005
54	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	< 0.001
55	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	< 0.1

< indicates detection limit of the laboratory.

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(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	< 0.02
28.	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	< 0.05
29.	Barium (as Ba)	mg/l	Annexure F of IS 13428	0.7	No relaxation	< 0.07
30.	Ammonia (as N)	mg/l	IS 3025 (Part 34)	0.5	No relaxation	< 0.05
31.	Sulphide (as H ₂ S)	mg/l	IS 3025 (Part 29)	0.05	No relaxation	< 0.05
32.	Chloramines (as Cl ₂)	mg/l	APHA 4500-Cl ₂ G	4.0	No relaxation	< 0.04
33.	Molybdenum (as Mo)	mg/l	IS 3025 (Part 2)	0.07	No relaxation	< 0.07
34.	Silver (as Ag)	mg/l	Annexure J of IS 13428	0.1	No relaxation	< 0.01
35.	Polychlorinated Biphenyls (PCB)	µg/l	USEPA 508	0.5	No relaxation	< 0.05
36.	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	1.0	< 0.5
37.	Mineral Oil	mg/l	IS 3025 (Part 39)	0.5	No relaxation	< 0.05
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	< 0.02
41.	Polynuclear aromatic hydrocarbon (PAH)	µg/l	USEPA : 550	0.1	No relaxation	< 0.03
42.	Total coliform *	MPN/100 ml	IS 1622	---	---	< 2
43.	<i>Escherichia coli</i>	Per100 ml	IS 1622	Absent	Absent	Absent

*'<' indicates detection limit of the laboratory.

Contd.



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(Contd.....)

Sr. No.	Test Parameter	Measurement Unit	Test Method	As per IS 10500 : 2012 (Drinking Water - Specification)	Test Result
44. Pesticides residues					
	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. 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 July-August-September-2017)

Sr. No.	Test Parameter	Measurement Unit	Test Method	As per IS 10500 : 2012 (Drinking Water - Specification)		Test Res
				Acceptable Limit	*Permissible Limit	
1.	pH value	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	6.79 at 25
2.	Turbidity	NTU	IS 3025 (Part 10)	1	5	11.6
3.	Colour	Hazen units	IS 3025 (Part 4)	5	15	14
4.	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreea
5.	Taste	-	IS 3025 (Part 8)	Agreeable	Agreeable	Agreea
6.	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.27
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	391
9.	Fluoride (as F)	mg/l	IS 3025 (Part 60)	1.0	1.5	0.64
10.	Cyanide (as CN)	mg/l	IS 3025 (Part 27)	0.05	No relaxation	< 0.00
11.	Chloride (as Cl)	mg/l	IS 3025 (Part 32)	250	1000	171.6
12.	Total Alkalinity (as CaCO ₃)	mg/l	IS 3025 (Part 23)	200	600	121.5
13.	Total hardness (as CaCO ₃)	mg/l	IS 3025 (Part 21)	200	600	209.5
14.	Calcium (as Ca)	mg/l	IS 3025 (Part 40)	75	200	64.8
15.	Magnesium (as Mg)	mg/l	IS 3025 (Part 46)	30	100	11.5
16.	Sulphate (as SO ₄)	mg/l	IS 3025 (Part 24)	200	400	121.3
17.	Nitrate (as NO ₃)	mg/l	APHA Method	45	No relaxation	7.91
18.	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	< 0.0
19.	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	< 0.0
20.	Mercury (as Hg)	mg/l	IS 3025 (Part 2)	0.001	No relaxation	< 0.00
21.	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	< 0.0
22.	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	< 0.0
23.	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	< 0.0
24.	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	< 0.0
25.	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	< 0.0
26.	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	< 0.

'<' indicates detection limit of the laboratory.

Cont



Hindalco Industries Limited
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(Contd.....)

Sl. 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	0.13
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
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(Contd.....)

Sr. No.	Test Parameter	Measurement Unit	Test Method	As per IS 10500 : 2012 (Drinking Water - Specification)	Test Res
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 absence of alternate source. 4. 'mg/l' is equivalent to 'ppm' 5. 'µg/l' is equivalent to 'ppb' 6. '<' indicates detection limit of 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

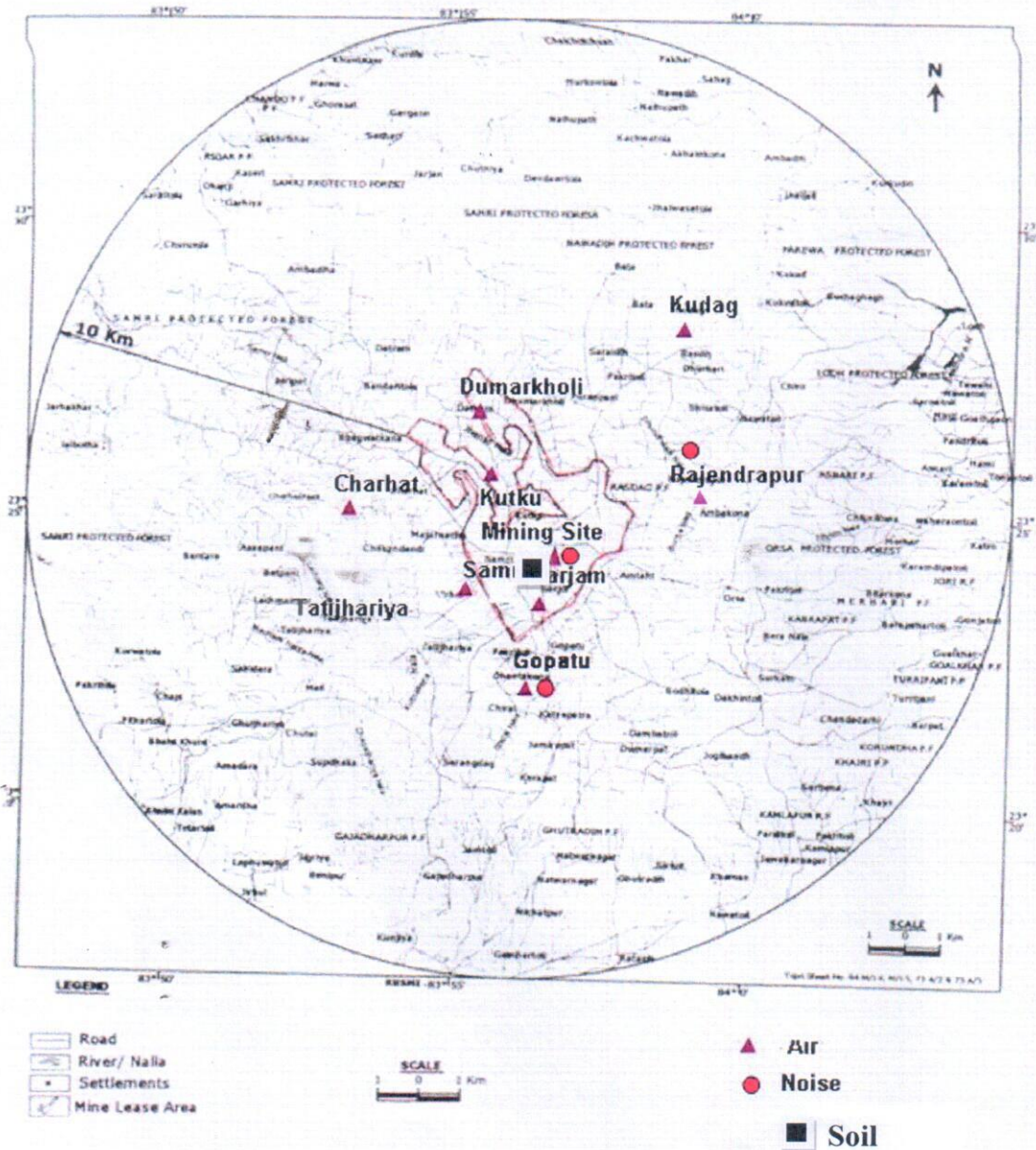
Date of collection: September-2017

Sr. No	Test Parameters	Measurement Unit	Results
			Rajendrapur/Nr.Mining Area
1	pH	-	6.81 at 25°C
2	Electrical Conductivity at 25°C	µS/cm	403
3	Texture	-	Silty clay
4	Sand	%	41.9
5	Silt	%	34.6
6	Clay	%	23.5
7	Bulk Density	g/cc	1.21
8	Porosity	%	28
9	Water Holding Capacity	%	53
10	Exchangeable Calcium as Ca	mg/kg	23.58
11	Exchangeable Magnesium as Mg	mg/kg	6.94
12	Exchangeable Sodium as Na	mg/kg	26.58
13	Available Potassium as K	kg/ha.	34.29
14	Available Phosphorous as P	kg/ha.	52.73
15	Available Nitrogen as N	kg/ha.	228.68
16	Organic Matter	%	0.17
17	Organic Carbon	%	0.13
18	Water Soluble Chloride as Cl ⁺	mg/kg	23.8
19	Water Soluble Sulphate as SO ₄	mg/kg	9.7
20	Sodium Absorption Ratio	-	8.16
21	CEC	meq/100 gm	11.6
22	Total Iron	%	6.8
23	Available Manganese	mg/kg	0.07
24	Available Zinc	mg/kg	0.016
25	Available Boron	mg/kg	0.009

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'.

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





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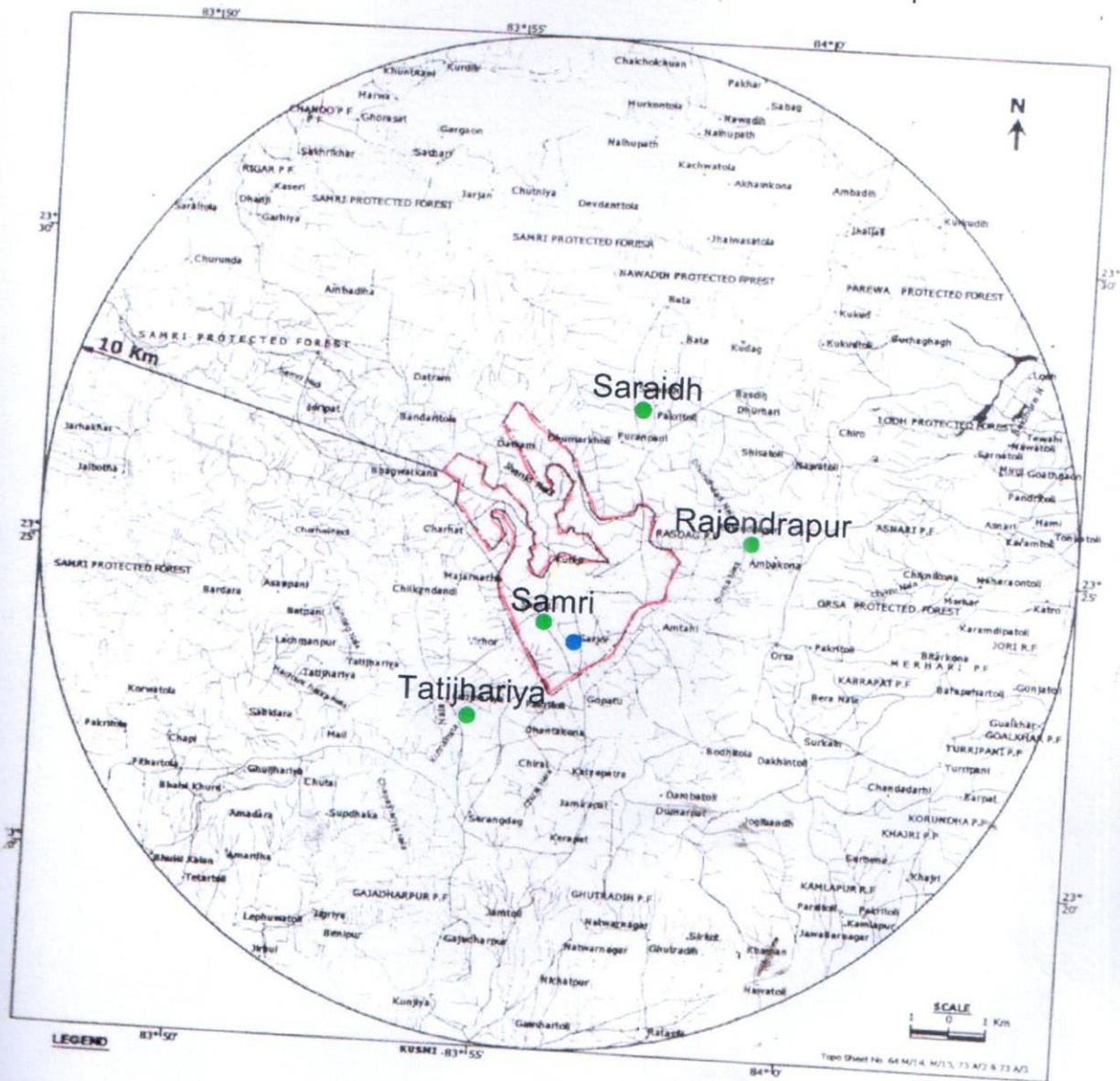


Fig 04: Sampling Locations for Water

Apur/water/R/Nov. 2016/1066/02/11/2016



Annexure - IV

REGIONAL OFFICE

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

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

No. 980/RO/TS/CECB/2016

Ambikapur, Dt. 02/11/2016

To,

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

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

Ref. : Your letter No. HIL/SAM/CECB/119/2016/S dated 18/07/2016 and subsequent correspondence letter ending dated 23/09/2016.

With reference to your above, application consent and license are hereby renewed for a period from **01/12/2016 to 19/05/2018** with the terms and conditions incorporated in the consent issued by Board Office letter No. 6876/TS/CECB/2007, Raipur, dated 24/12/2007, subsequent renewal of consent issued by Board and additional condition mentioned below:-

NAME	PRODUCTION CAPACITY
Mining of Bauxite Ore	5.0 Lakhs Tonnes per Annum (Five Lakhs Tonnes Per Annum)

Additional Conditions:

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

Please acknowledge the receipt of this letter.

For and on behalf of
CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

Regional Officer

Chhattisgarh Environment Conservation Board,
Ambikapur

Hindalco Industries Ltd
Samri Mine Division
Kusm
Dist-Balrampur (C.G.)
Date 3/11/16 (56)
Received by [Signature]

Apur/A/R/Nov 2016/1066/02/11/2016



REGIONAL OFFICE

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

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

No. 381/RO/TS/CECB/2016
To,

Ambikapur, Dt. 02/11/2016

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

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

Ref. : Your letter No. HIL/SAM/CECB/119/2016/S dated 18/07/2016 and subsequent correspondence letter ending dated 23/09/2016.

With reference to your above, application consent and license are hereby renewed for a period from **01/12/2016 to 19/05/2018** with the terms and conditions incorporated in the consent issued by Board Office letter No. 6878/TS/CECB/2007, Raipur, dated 24/12/2007, subsequent renewal of consent issued by Board and additional condition mentioned below:-

NAME	PRODUCTION CAPACITY
Mining of Bauxite Ore	5.0 Lakhs Tonnes per Annum (Five Lakhs Tonnes Per Annum)

Additional Conditions:

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

Please acknowledge the receipt of this letter.

For and on behalf of
CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

Regional Officer,

Chhattisgarh Environment Conservation Board,
Ambikapur

Hindalco Industries Ltd
Samri Mines Division
Krupa
Distt-Balrampur
Date- 31/11/16 (57)
Received by

Lease wise Production 2017-18 (Up to September 2017)

Lease	Production (MT)
Samri	211170.000
Kudag	28910.000
Tatijharia	159525.000
Total	399605.000


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


Lease wise Details 2017-18 (Up to September 2017)

Lease	Mined Out Area (Hact.)	Reclaimed Area (Hact.)	Nos. of Sapling	Area of Sapling (Hact.)
Samri	7.859	0.462	11681	4.970
Kudag	1.402	0.000	2960	1.220
Tatijharia	6.301	1.167	8868	3.540
Total	15.562	1.629	23509	9.730


Agent of Mines
Samri Mines Division
Hindalco Industries Ltd

Year wise /Lease wise Details of Afforestation

Year	Kudag Bauxite Mines		Samri Bauxite Mines		Tatjaria 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
2016-17	4390	2.800	9110	3.700	5950	2.400	19450	8.900
2017-18	2960	1.220	11681	4.970	8868	3.540	23509	9.730
Total	120530	51.2	178892	73.124	87793	35.600	387215	159.924


Agent of Mines
Samri Mines Division
Hindalco Industries Ltd.

Actual Expenditure incurred in Environment Management Plan:-

Total cost incurred for protection of environment in Samri, Tatijharia & Kudag Bauxite Mine of Hindalco Industries Ltd. of Chhattisgarh state during the second half period of F.Y. 2017-18 (April-17 - September'17).

SI No-	Environment Protection Measures	Actual Cost (Lac) (F.Y. 2017-18) (Apr17- Sep 17))
1	Pollution Control	1.78
2	Environment Monitoring	1.25
3	Green Belt	6.64
4.	Occupational Health monitoring	0.64
5.	Conducting blast vibration survey by IIT Khadagpur	10.00
6.	Purchased Environment monitoring instrument (Peizo meter, blast vibration monitoring instrument, Weather station and Gas detector)	17.87
7.	Reclamation/Rehabilitation of mined out area (Samri - 0.462 Ha. Tatijharia-0.971 Ha. Kudag- 0.196 Ha. Total – 1.629 Ha.)	48.87
	Total	87.05

- Environment monitoring jobs has been out sourced to Annacon Lab, recognized by MoEF (GOI) & NABL etc.
- One centralized nursery has been established at Samri mines for, Samri, Tatijharia & Kudag lease.
- Reclamation of mined out land has been out sourced along with production. Average cost of reclamation considered @ Rs. 30.0 Lac per Ha.


 Agent of Mines
 Samri Mines Division
 Hindalco Industries Ltd