

To,  
The Director,  
Ministry of Environment and Forest,  
Regional Office (Southern Zone) Kendriya Sadan, 4<sup>th</sup> Floor,  
17<sup>th</sup> Main Road, 2<sup>nd</sup> Block, Koramangala  
Bangalore.

26.11.2019

**Sub:-** 21<sup>st</sup> Six Monthly Compliance Report to the conditions of Environmental Clearance for Vedanta Ltd. (Formerly known as Sesa Sterlite Limited/Sesa Goa Limited) - Blast Furnace (0.9 MTPA), Sinter Plant (2MTPA), Coke Plant (0.6 MTPA) and Waste Heat Recovery Power Plant (60 MW) located at village Navelim, Taluka Bicholim in, North Goa District, Goa.

**Ref:**

1. F No.J-11011/946/2007-IA-II(I) dated June 03,2009.
2. Amendment in Environmental Clearance from MOEF vide letter dated 25/04/2012.

Sir,

With reference to the above, please find enclosed herewith:-

21<sup>st</sup> six monthly compliance report to Environmental Clearance [F No.J-11011/946/2007-IA-II(I)] for the period April 2019 to September 2019 for Vedanta Ltd (Formerly known as Sesa Sterlite Limited/Sesa Goa Limited) Blast Furnace(0.9 MTPA), Sinter Plant (2MTPA), Coke Plant (0.6 MTPA) and Waste Heat Recovery Power Plant (60 MW) located at village Navelim, Taluka Bicholim, North Goa District, Goa.

Thanking you,

Yours faithfully,

For Vedanta Ltd



N.L. Vhatse

Director :- Value Added Business-Vedanta Ltd.

Cc: Member Secretary, GSPCB, CPCB (SZO)

Enclosures:

- 21<sup>st</sup> six monthly compliance status report
- Tabulated Stack monitoring, Ambient Air Quality Monitoring and Water monitoring Reports for the period April 2019 to September 2019.

**VEDANTA LIMITED**

Value Added Business, Steel/Goa Division, Navelim, PO Sangalia, Bicholim, Goa-401 302  
Tel: +91-832-298 1300/1301/1302/1303/1304/1305/1306/1307/1308/1309/1310/1311/1312/1313/1314/1315/1316/1317/1318/1319/1320/1321/1322/1323/1324/1325/1326/1327/1328/1329/1330/1331/1332/1333/1334/1335/1336/1337/1338/1339/1340/1341/1342/1343/1344/1345/1346/1347/1348/1349/1350/1351/1352/1353/1354/1355/1356/1357/1358/1359/1360/1361/1362/1363/1364/1365/1366/1367/1368/1369/1370/1371/1372/1373/1374/1375/1376/1377/1378/1379/1380/1381/1382/1383/1384/1385/1386/1387/1388/1389/1390/1391/1392/1393/1394/1395/1396/1397/1398/1399/1400/1401/1402/1403/1404/1405/1406/1407/1408/1409/1410/1411/1412/1413/1414/1415/1416/1417/1418/1419/1420/1421/1422/1423/1424/1425/1426/1427/1428/1429/1430/1431/1432/1433/1434/1435/1436/1437/1438/1439/1440/1441/1442/1443/1444/1445/1446/1447/1448/1449/1450/1451/1452/1453/1454/1455/1456/1457/1458/1459/1460/1461/1462/1463/1464/1465/1466/1467/1468/1469/1470/1471/1472/1473/1474/1475/1476/1477/1478/1479/1480/1481/1482/1483/1484/1485/1486/1487/1488/1489/1490/1491/1492/1493/1494/1495/1496/1497/1498/1499/1500/1501/1502/1503/1504/1505/1506/1507/1508/1509/1510/1511/1512/1513/1514/1515/1516/1517/1518/1519/1520/1521/1522/1523/1524/1525/1526/1527/1528/1529/1530/1531/1532/1533/1534/1535/1536/1537/1538/1539/1540/1541/1542/1543/1544/1545/1546/1547/1548/1549/1550/1551/1552/1553/1554/1555/1556/1557/1558/1559/1560/1561/1562/1563/1564/1565/1566/1567/1568/1569/1570/1571/1572/1573/1574/1575/1576/1577/1578/1579/1580/1581/1582/1583/1584/1585/1586/1587/1588/1589/1590/1591/1592/1593/1594/1595/1596/1597/1598/1599/1600/1601/1602/1603/1604/1605/1606/1607/1608/1609/1610/1611/1612/1613/1614/1615/1616/1617/1618/1619/1620/1621/1622/1623/1624/1625/1626/1627/1628/1629/1630/1631/1632/1633/1634/1635/1636/1637/1638/1639/1640/1641/1642/1643/1644/1645/1646/1647/1648/1649/1650/1651/1652/1653/1654/1655/1656/1657/1658/1659/1660/1661/1662/1663/1664/1665/1666/1667/1668/1669/1670/1671/1672/1673/1674/1675/1676/1677/1678/1679/1680/1681/1682/1683/1684/1685/1686/1687/1688/1689/1690/1691/1692/1693/1694/1695/1696/1697/1698/1699/1700/1701/1702/1703/1704/1705/1706/1707/1708/1709/1710/1711/1712/1713/1714/1715/1716/1717/1718/1719/1720/1721/1722/1723/1724/1725/1726/1727/1728/1729/1730/1731/1732/1733/1734/1735/1736/1737/1738/1739/1740/1741/1742/1743/1744/1745/1746/1747/1748/1749/1750/1751/1752/1753/1754/1755/1756/1757/1758/1759/1760/1761/1762/1763/1764/1765/1766/1767/1768/1769/1770/1771/1772/1773/1774/1775/1776/1777/1778/1779/1780/1781/1782/1783/1784/1785/1786/1787/1788/1789/1790/1791/1792/1793/1794/1795/1796/1797/1798/1799/1800/1801/1802/1803/1804/1805/1806/1807/1808/1809/1810/1811/1812/1813/1814/1815/1816/1817/1818/1819/1820/1821/1822/1823/1824/1825/1826/1827/1828/1829/1830/1831/1832/1833/1834/1835/1836/1837/1838/1839/1840/1841/1842/1843/1844/1845/1846/1847/1848/1849/1850/1851/1852/1853/1854/1855/1856/1857/1858/1859/1860/1861/1862/1863/1864/1865/1866/1867/1868/1869/1870/1871/1872/1873/1874/1875/1876/1877/1878/1879/1880/1881/1882/1883/1884/1885/1886/1887/1888/1889/1890/1891/1892/1893/1894/1895/1896/1897/1898/1899/1900/1901/1902/1903/1904/1905/1906/1907/1908/1909/1910/1911/1912/1913/1914/1915/1916/1917/1918/1919/1920/1921/1922/1923/1924/1925/1926/1927/1928/1929/1930/1931/1932/1933/1934/1935/1936/1937/1938/1939/1940/1941/1942/1943/1944/1945/1946/1947/1948/1949/1950/1951/1952/1953/1954/1955/1956/1957/1958/1959/1960/1961/1962/1963/1964/1965/1966/1967/1968/1969/1970/1971/1972/1973/1974/1975/1976/1977/1978/1979/1980/1981/1982/1983/1984/1985/1986/1987/1988/1989/1990/1991/1992/1993/1994/1995/1996/1997/1998/1999/2000/2001/2002/2003/2004/2005/2006/2007/2008/2009/2010/2011/2012/2013/2014/2015/2016/2017/2018/2019/2020/2021/2022/2023/2024/2025/2026/2027/2028/2029/2030/2031/2032/2033/2034/2035/2036/2037/2038/2039/2040/2041/2042/2043/2044/2045/2046/2047/2048/2049/2050/2051/2052/2053/2054/2055/2056/2057/2058/2059/2060/2061/2062/2063/2064/2065/2066/2067/2068/2069/2070/2071/2072/2073/2074/2075/2076/2077/2078/2079/2080/2081/2082/2083/2084/2085/2086/2087/2088/2089/2090/2091/2092/2093/2094/2095/2096/2097/2098/2099/2100/2101/2102/2103/2104/2105/2106/2107/2108/2109/2110/2111/2112/2113/2114/2115/2116/2117/2118/2119/2120/2121/2122/2123/2124/2125/2126/2127/2128/2129/2130/2131/2132/2133/2134/2135/2136/2137/2138/2139/2140/2141/2142/2143/2144/2145/2146/2147/2148/2149/2150/2151/2152/2153/2154/2155/2156/2157/2158/2159/2160/2161/2162/2163/2164/2165/2166/2167/2168/2169/2170/2171/2172/2173/2174/2175/2176/2177/2178/2179/2180/2181/2182/2183/2184/2185/2186/2187/2188/2189/2190/2191/2192/2193/2194/2195/2196/2197/2198/2199/2200/2201/2202/2203/2204/2205/2206/2207/2208/2209/2210/2211/2212/2213/2214/2215/2216/2217/2218/2219/2220/2221/2222/2223/2224/2225/2226/2227/2228/2229/2230/2231/2232/2233/2234/2235/2236/2237/2238/2239/2240/2241/2242/2243/2244/2245/2246/2247/2248/2249/2250/2251/2252/2253/2254/2255/2256/2257/2258/2259/2260/2261/2262/2263/2264/2265/2266/2267/2268/2269/2270/2271/2272/2273/2274/2275/2276/2277/2278/2279/2280/2281/2282/2283/2284/2285/2286/2287/2288/2289/2290/2291/2292/2293/2294/2295/2296/2297/2298/2299/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3300/3301/3302/3303/3304/3305/3306/3307/3308/3309/3310/3311/3312/3313/3314/3315/3316/3317/3318/3319/3320/3321/3322/3323/3324/3325/3326/3327/3328/3329/3330/3331/3332/3333/3334/3335/3336/3337/3338/3339/3340/3341/3342/3343/3344/3345/3346/3347/3348/3349/3350/3351/3352/3353/3354/3355/3356/3357/3358/3359/3360/3361/3362/3363/3364/3365/3366/3367/3368/3369/3370/3371/3372/3373/3374/3375/3376/3377/3378/3379/3380/3381/3382/3383/3384/3385/3386/3387/3388/3389/3390/3391/3392/3393/3394/3395/3396/3397/3398/3399/3400/3401/3402/3403/3404/3405/3406/3407/3408/3409/3410/3411/3412/3413/3414/3415/3416/3417/3418/3419/3420/3421/3422/3423/3424/3425/3426/3427/3428/3429/3430/3431/3432/3433/3434/3435/3436/3437/3438/3439/3440/3441/3442/3443/3444/3445/3446/3447/3448/3449/3450/3451/3452/3453/3454/3455/3456/3457/3458/3459/3460/3461/3462/3463/3464/3465/3466/3467/3468/3469/3470/3471/3472/3473/3474/3475/3476/3477/3478/3479/3480/3481/3482/3483/3484/3485/3486/3487/3488/3489/3490/3491/3492/3493/3494/3495/3496/3497/3498/3499/3500/3501/3502/3503/3504/3505/3506/3507/3508/

## **21<sup>st</sup> Compliance Report to EC No: F. No. J-11011/946/2007-IA-II(I)**

(Period: April 2019 to September 2019)

**6 Monthly Compliance Report to Conditions Of Environmental Clearance Issued By MOEF, Govt. of India, for Blast Furnace (0.90MTPA), Sinter Plant (2MTPA), Coke Plant (0.6MTPA), Waste Heat Recovery Power Plant (60MW) by Vedanta Limited (earlier known as Sesa Sterlite Ltd./ Sesa Goa Limited) \***

### **A. Specific Conditions**

- I. Electrostatic precipitator (ESP) shall be provided to Sinter plant and WHRB based Power Plant to control gaseous emissions from all the vents/stacks within 100 mg/Nm<sup>3</sup>. Gas Cleaning Plant along with Ventury scrubber shall be provided to blast furnace. On-line stack monitoring facilities for all the stacks shall be provided to ensure particulate emissions below 100 mg/Nm<sup>3</sup> and data submitted to the Ministry's Regional Office at Bangalore, CPCB and Goa Pollution Control Board. Efforts shall be made to reduce RSPM levels in the ambient air and a time bound action plan should be submitted.**

Electrostatic Precipitator (ESP) provided to the Sinter Plant at Head End & Tail End of Sinter Machine. Dry Gas Cleaning Plant (GCP) with a dust catcher & bag filters, provided to Blast Furnace. Online stack monitoring facilities is installed for Sinter main stack, Sinter Tail end stack, WHRB-1&2 of Waste Heat Recovery Power plant and Hot Blast Stove of Blast Furnace. Continuous Real time data are connected to CPCB portal .Other conditions complied subject to letter dated 15 Sep 2009 addressed to MOEF, which clarifies areas of non-applicability of the conditions. Regular Stack Monitoring & Ambient Air Quality Monitoring is conducted and monthly reports are submitted to GSPCB (Currently uploaded on OCEMS system as per GSPCB Direction). Also half yearly reports are submitted to CPCB & MOEF.

#### **Detail of average reading for all six locations.**

| Sr.No. | Location                      | Average from April 19 to September 19 |       |       |       |
|--------|-------------------------------|---------------------------------------|-------|-------|-------|
|        |                               | PM10                                  | PM2.5 | SO2   | NO2   |
| 1      | Amona Gate                    | 50.16                                 | 27.58 | 11.36 | 13.84 |
| 2      | Compound wall Towards Maina   | 47.64                                 | 26.67 | 11.90 | 14.69 |
| 3      | Opposite BSNL Exchange        | 48.57                                 | 26.31 | 11.27 | 19.57 |
| 4      | Near Dispatch Gate            | 49.84                                 | 25.90 | 11.64 | 15.01 |
| 5      | Compound wall Towards Navelim | 48.92                                 | 26.74 | 11.37 | 14.94 |

|   |                   |       |       |       |       |
|---|-------------------|-------|-------|-------|-------|
| 6 | Nr. Sateri Temple | 50.01 | 26.40 | 11.59 | 14.95 |
|---|-------------------|-------|-------|-------|-------|

**12 parameters monitoring as per National AAQ report is as follows**

**(Average from April 19 to September 19)**

| Sr.no | Parameters                                  | Amona Gate                              | Opp BSNL Exchange | Near dispatch gate | Comp. wall towards Navelim | Near Sateri temple | Comp. wall towards Maina |
|-------|---|---|-------------------|--------------------|----------------------------|--------------------|--------------------------|
| 1.    | <b>PM10</b>                                 | 50.16                                   | 48.57             | 49.84              | 48.92                      | 50.01              | 47.64                    |
|       |   | limit =100 µg/m3                        |                   |                    |                            |                    |                          |
| 2.    | <b>PM 2.5</b>                               | 27.58                                   | 26.31             | 25.90              | 26.74                      | 26.40              | 26.67                    |
|       |   | limit =60 µg/m3                         |                   |                    |                            |                    |                          |
| 3.    | <b>SO<sub>2</sub></b>                       | 11.36                                   | 11.27             | 11.64              | 11.37                      | 11.59              | 11.90                    |
|       |   | limit =80 µg/m3                         |                   |                    |                            |                    |                          |
| 4.    | <b>NO<sub>2</sub></b>                       | 13.84                                   | 19.57             | 15.01              | 14.94                      | 14.95              | 14.69                    |
|       |   | limit =80 µg/m3                         |                   |                    |                            |                    |                          |
| 5.    | <b>Ozone</b>                                | 16.64                                   | 15.23             | 17.20              | 16.40                      | 17.50              | 18.11                    |
|       |   | Limit =180 µg/m3                        |                   |                    |                            |                    |                          |
| 6.    | <b>Lead (pb)</b>                            | ND                                      | ND                | ND                 | ND                         | ND                 | ND                       |
|       |   | limit =1 ( detection limit 0.005 µg/m3) |                   |                    |                            |                    |                          |
| 7.    | <b>Ammonia (NH<sub>3</sub>)</b>             | 18.78                                   | 19.37             | 19.20              | 18.66                      | 18.26              | 19.75                    |
|       |   | Limit=400 µg/m3                         |                   |                    |                            |                    |                          |
| 8.    | <b>Carbon Monoxide (mg/m3) (CO)</b>         | ND                                      | ND                | ND                 | ND                         | ND                 | ND                       |
|       |   | Limit = 4 ( detection limit 1 µg/m3)    |                   |                    |                            |                    |                          |
| 9.    | <b>Benzene (C<sub>6</sub>H<sub>6</sub>)</b> | ND                                      | ND                | ND                 | ND                         | ND                 | ND                       |

|     |  |    |    |    |    |    |    |
|-----|--|----|----|----|----|----|----|
|     | Limit= 5 ( detection limit 0.5 µg/m3)  |    |    |    |    |    |    |
| 10. | <b>Benzo Pyrene (BaP)</b>              | ND | ND | ND | ND | ND | ND |
|     | Limit = 1 ( detection limit 0.5 ng/m3) |    |    |    |    |    |    |
| 11. | <b>Arsenic (As)</b>                    | ND | ND | ND | ND | ND | ND |
|     | Limit= 6 (detection limit 0.5 ng/m3)   |    |    |    |    |    |    |
| 12. | <b>Nickel (Ni)</b>                     | ND | ND | ND | ND | ND | ND |
|     | Limit= 20(detection limit 0.5 ng/m3)   |    |    |    |    |    |    |

**II. Pulse jet bag filters shall be provided to coal crusher, product house, raw material handling areas. Transfer point etc. Bag filters shall be provided at the crusher. Screening and transfer points. The Coke Oven gases shall be fully utilized for power generation. Water sprinkling system and dry fog system shall be provided to control fugitive emissions at the coal handling area and work zone.**

Pulse jet bag filters are provided for coal crusher house, coke screening towers, transfer points, raw material handling sections, etc. Also rain gun sprinklers are provided at raw material yard. Coal is stored in the closed shed. Wind screens are installed along the raw material storage yard. Bag house de-dusting system is provided for proportioning bin, sinter screening building, flux and fuel crushing and small de-dusting units for various transfer stations. Additionally fog/mist cannons have been brought for dust suppression from process activities at the source. Coke Oven Flue Gas (COFG) is fully utilized for Clean Power Generation.

**III. Data on ambient air quality stack emission and fugitive emissions shall be uploaded on the company's website and also regularly submitted online to Ministry's Regional office at Bangalore, Goa State Pollution Control Board (GPCB) and Central Pollution Control Board as well as hard copy once in six months. Data on SPM, SO2 and NOx shall also be displayed prominently outside the premises at the appropriate place for the general public.**

Ambient Air quality & source emission data is submitted on regular basis to GSPCB. Also six monthly data on stack emission & ambient air quality is submitted to GSPCB, CPCB, MOEF & in hard copy and through e-mail and also uploaded on company website :-  
<http://sesagoairnore.com/sustainability/hse/environment-reports/>

Display of PM10, PM2.5, and SO2 & NO2 is done prominently outside the premises for the general public. Please refer to table in (i) of Specific Conditions. Ambient Air Quality Reports and Stack

Monitoring Reports are submitted regularly to MOEF, CPCB & GSPCB along with six monthly compliance reports. All the values are within limits.

Stack emission data is provided in (iii) of GC below.

**IV. Secondary fugitive emissions from all the sources including Blast Furnace, Coke Oven and Sinter Plant shall be controlled within the latest permissible limits issued by the Ministry and regularly monitored. Guidelines/Code of Practice issued by the CPCB shall be followed.**

There are no specific permissible limits, - guidelines/code of practice issued by CPCB/MOEF for Non-Recovery Coke Oven Plants. Rain guns have been installed at raw material yard for dust suppression. Bag filter de-dusting systems are used to control dust. Wind screen/wind shields are installed at prominent locations as per the instructions of GSPCB. The monitoring is done regularly. Also as an additional improvement initiative we have procured Fog/Mist canons and Road sweeping machine of Dulevu make for fugitive dust suppression and control.

**V. Total water requirement shall not exceed 16632 m<sup>3</sup>/day. The effluent from generated utilities shall be treated in the effluent treatment plant and recycled and reused in the process in blast furnace, sinter plant, dust suppression. Ash moistening, firefighting and green belt development etc. No effluent shall be discharged outside the premises and 'zero' discharge shall be followed.**

All Process water from Coke, Blast Furnace, and Sinter Plant is recycled and reused. After appropriate treatment Blow down from Cooling Tower of Power Plant is let out into Mondovi River after temperature & pH monitoring as per Consent conditions from Goa State Pollution Control Board (GSPCB).

The present Water Consumption is on an avg. 5241.8 m<sup>3</sup>/day (including water for cooling as well as process water) blow down water from Power Plant is around average 189.92 m<sup>3</sup>/day.

**VI. Regular monitoring of influent and effluent water shall be ensured and treated wastewater shall meet the norms prescribed by the Goa State Pollution Control Board or described under the E(P) Act whichever are more stringent and reports shall be submitted six monthly to the Ministry's Regional Office at Bangalore, GSPCB and CPCB.**

Blow down from Cooling Tower of Power Plant is let out into Mandovi river after temperature & pH adjustment. Monthly monitoring is carried out as per Consent conditions. Reports are submitted to GSPCB every month and to MOEF (RO), CPCB, and every six monthly as six monthly compliance reports. Blast Furnace, Sinter Plant and Coke Oven Plant operate on zero discharge. Only non-contact type of condenser cooling water is disposed back into Mandovi river as per Consent conditions from Goa State Pollution Control Board (GSPCB) .As per CTO condition max. 3600 m<sup>3</sup>/day blow down water can be disposed, however last six month avg. was around 189.92 m<sup>3</sup>/day. Temperature & pH is around avg. 28.05°C and 7.01 respectively.

**VII. All the blast furnace slag shall be granulated and provided to cement manufacturers for further utilization. All the dust from the air pollution control equipments shall be recycled and reused in the Sinter plant. All the other solid wastes shall be disposed off in the environment-friendly manner or provided to authorized recyclers/ re-processors. Used oil shall also be provided to authorized recyclers only. An action plan for the disposal of fly ash and granulated BF & SMS slag shall be submitted to the Ministry and its Regional Office at Bangalore within 3 months.**

Granulated BF slag is disposed to cement industries. Dust from air pollution control equipment is recycled & reused in Sinter Plant. Used oil is disposed off to the authorized recyclers only. Disposal of Fly Ash & SMS slag is not applicable as the facility is limited to iron making through blast furnace and there is no steel making provision and the power plant is based on waste heat hence thermal coal is not used for power generation. The non-applicability of fly ash & SMS slag is mentioned in letter to MoEF dated 15 September 2009.

**VIII. All the fly ash shall be utilized as per Fly Ash Notification, 1999 and amended in 2003.**

Not Applicable as thermal coal is not used. The power plant is run on BF gas and Coke Oven Flue Gas.

**IX. Vehicular pollution due to transportation of raw material and finished product shall be controlled. Proper arrangements shall also be made to control dust emissions during loading and unloading of the raw material and finished product.**

Vehicular pollution due to transportation of raw materials and finished product is controlled. Rain Guns (Sprinkling system) have been installed in the raw material yard and water tankers are used for dust suppression. Sprinklers for dust suppression has been installed at Pig Iron Dispatch yard. Pollution under Check certificates of all vehicles entering premises is checked.

**X. Green belt shall be developed in 33 % area within and around the plant premises as per the CPCB guidelines in consultation with DFO.**

Green belt is developed in phases with plantation drives during the Monsoons. Total land area is 104 Ha. 21Ha is reserved for future usage and 33Ha is earmarked as greenbelt area. Plantation was carried out in consultation of Goa Forest Development Corporation (GFDC) as well as in-house guidance from company expert team.

**XI. All the recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for the Steel Sector shall be strictly implemented.**

The Project is not an Integrated Iron & Steel Plant and hence the CREP guidelines of steel sector are not applicable however, whatever CREP conditions are applicable for blast furnace and non-recovery coke plant have been complied, proactively.

**XII. The company shall provide housing for construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche etc. The housing may be in the form of temporary structures to be removed' after the completion of the project.**

All temporary housing structures have been decommissioned after the project is operational.

## **B. GENERAL CONDITIONS**

**1. The project authorities must strictly adhere to the stipulations made by the Goa Pollution Control Board (GPCB) and the State Government.**

Stipulations made by GSPCB are strictly adhered to. Reports are either sent to Goa State Pollution Control Board (GSPCB) or uploaded on GSPCB Website. Regular site visits are made by GSPCB personnel to check the compliance status.

**2. No further expansion or modifications in the plant should be carried out without prior approval of the Ministry of Environment and Forests.**

No expansion or modification in the plant is carried out without prior approval of MoEFCC. We have got Environment Clearance and Consent to operate for hot metal expansion from existing Blast furnace for production enhancement of 0.45 MTPA to 0.54 MTPA. We have applied for Environment clearance for setting up of Ductile Iron plant, Ferro Silicon Plant and additional Oxygen plant in the existing Pig Iron Expansion Plant premises near existing mini blast furnace.

**3. The gaseous emissions from various process units shall conform to the load/mass based standards notified by this Ministry on 19th May, 1993 and standards prescribed from time to time. The state Board may specify more stringent standards for the relevant parameters keeping in view the nature of the industry and its size and location. At no time, the emission level shall go beyond the prescribed standards. On-line continuous monitoring system shall be installed in stacks to monitor SPM and interlocking facilities shall be provided so that process can be automatically stopped in case emission level exceeds the limit. NOX burners shall be installed to control NOX levels.**

Online stack monitoring instrument is installed for main stacks of Sinter plant (At Head End and Tail End), Hot Blast Stove and both WHRB stacks of Power Plant to track TPM and gases. Real time data are continuously going to CPCB portal. Interlock is provided for Sinter Machine, to ensure automatically stopping of the process when emission exceeds the limits.

**The stack heights of stacks and latest data is as follows- (From April-19 to September-19)**

| Plant         | Stack connected to                           | Height of stack | Particulate Matter in mg/Nm <sup>3</sup> (Avg.) | S0 <sub>2</sub> in mg/Nm <sup>3</sup> (Avg.)  | NO <sub>2</sub> in mg/Nm <sup>3</sup> (Avg.) |
|---------------|--|-----------------|---|---|--|
| Sinter Plant  | Main ESP                                     | 100m            | 47.71   | 4.7   | NA   |
|               | Discharge end ESP                            | 30m             | 44.04   | Not Applicable as these are de-dusting stacks |  |
|               | Sinter Screening & Product bunker Bag Filter | 30m             | 44.23   |   |  |
|               | Proportioning bin bag filter                 | 30m             | 42.55   |   |  |
|               | Flux & Fuel Area bag filter                  | 30m             | 44.25   |   |  |
| Blast Furnace | Cast House De-dusting                        | 30m             | 45.84   | Not Applicable as these are de-dusting stacks |  |
|               | Stock House De-dusting                       | 30m             | 45.34   |   |  |
|               | Hot Blast Stoves (HBS)                       | 60m             | 44.68   | 17.27   | 33.56  |
| Power Plant   | Waste Heat Recovery Boiler-1                 | 50m             | 40.2  | 42.9  | 40.03  |
|               | Waste Heat Recovery Boiler-2                 | 50m             | 41.15   | 43.89   | 41.56  |

**\*99% of the time (on an avg.) stacks connected to coke oven batteries are closed from top and coke oven flue gases with temperature of almost 1100°C are diverted to waste heat recovery boiler for clean power generation. As per latest consent granted by Goa State Pollution Control, the unit should carry out emission monitoring from the stacks of Waste Heat recovery boiler chimney attached to coke oven plant once in three month, which is carried out regularly and reports are sent/uploaded to GSPCB.**

- 4. At least four ambient air quality-monitoring stations shall be established in the downward direction as well as where maximum ground level concentration of SPM, S0<sub>2</sub> and N0<sub>2</sub>. are anticipated in consultation with the GPCB. Data on ambient air quality and stack emission shall be regularly submitted to this Ministry including its Regional Office at Bangalore I GPCB I CPCB once in six months.**

AAQM locations are approved by GSPCB and the monthly reports are submitted to GSPCB. Two Continuous Ambient Air Quality Stations have been set up. Data on Air Quality, Stack emissions is submitted once in six months to MOEF (RO) .Monthly AAQM reports are submitted to GSPCB. All 12 parameters as per NAAQM are monitored; other parameters are Below Detection Limits. Ozone and Ammonia are found in traces. Table is attached in (i) above Ambient Air Quality Reports and



Stack Monitoring Reports are submitted regularly to MOEF, CPCB & GSPCB along with six monthly compliance report. All the values are within limits.

- 5. In-plant control measures for checking fugitive emissions from all the vulnerable sources like Sinter plant, Blast Furnace area etc. shall be adopted. Further, specific measures like water sprinkling shall be carried out at the stock piles of raw material, stacker, reclaimer, transfer points etc. Dust extraction system and bag filters shall be provided to the sinter plant, stock house and blast furnace. Centralized de-dusting system i.e. collection of fugitive emissions through suction hood and subsequent treatment through bag filter or any other device and finally emitted through a stack of appropriately designed shall be provided. Fugitive emissions shall be controlled, regularly monitored and records maintained.**

Individual Pulse Jet Bag Filters are provided for Cast House, Stock House of Blast Furnace and Flux & Fuel House, Proportioning House, Sinter Screening House of Sinter Plant. These Pulse jet bag filters cover various capture points such as screening, transfer stations, etc. Electrostatic precipitators (ESPs) are provided at Head & Tail end of Sinter Machine of the Sinter Plant. Rain gun sprinklers are provided & operated at the Raw material yard of the Sinter Plant & Blast Furnace. Windscreens are also installed along the raw material boundary wall. Windshields are installed at the Pig Iron dispatch yard. All the stacks are of adequate height as per the design. Fugitive emissions are controlled, monitored & records maintained. Dust suppression system installed at raw material hoppers.

- 6. Industrial wastewater shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December, 1993 or as amended form time to time. The treated wastewater shall be utilized for plantation purpose.**

All Process water from Coke, Blast Furnace, and Sinter Plant is recycled and reused after appropriate treatment. Blow down from Cooling Tower of Power Plant is let out into Mandovi river after temperature & pH adjustment as per GSPCB. Cooling tower blow down is monitored every month before disposal into river.

- 7. The overall noise levels in and around the plant area shall be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, Silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (daytime) and 70 dBA (night time).**

Overall noise levels in and around the plant area is on an average less than 85dB (A). Enclosures, acoustic hoods, silencers, etc. are provided wherever necessary. The ambient noise levels conforms to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (daytime) and 70 dBA (nighttime) at the boundary of the plant.

- 8. The company shall develop surface water harvesting structures to harvest the rain water for utilization in the lean season besides recharging the ground water table.**

Surface rain water harvesting and ground water recharging are in vogue as per the advise of Sr. hydro geologist from Water Resource Department (WRD) of Goa. Roof top rain water is directed to

tanks and reused. Around 300000 m<sup>3</sup> rain water (from mid-June- mid October) is collected in excavated pits. The stored water is used for process in blast furnace, shell cooling and slag granulation. Also, water which is drawn from the Napoli (mining) pit and is used for the process is obtained by Rain Water Harvesting.

**9. Occupational Health Surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.**

Occupational Health Surveillance of the workers is carried out on a regular basis and records maintained as per the Factories Act. An Occupational Health Centre with an ambulance and Occupational physician (Company employee) and Para-medicos are available.

**10. The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA / EMP report. Further, the company shall undertake socio-economic development activities in the surrounding villages like community development programmes, educational programmes, drinking water supply and health care etc.**

There are three villages around the units. We have done the need assessment of the area and working towards the overall development of the villages in various thrust areas like Health, Education, livelihood creation & creation of social infrastructure. There is continuous engagement with all the concerned stakeholders to understand the concerns and finding solutions through consultation process.

**11. The project authorities shall earmark adequate capital cost and recurring cost/annum for environment pollution control measures and utilize judiciously to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government. An implementation schedule for implementing all the conditions stipulated herein shall be submitted to the Ministry's Regional Office at Bangalore. The funds so provided shall not be diverted for any other purpose**

HSE department with competent employees looks after Environmental Management with Management support. An earmarked budget has been allotted with adequate provisions for implantation, operation and maintenance of Environment Pollution Control Measures

**12. The Regional Office of this Ministry at Bangalore/CPCB/GPCB will monitor the stipulated conditions. A six monthly compliance report and the monitored data along with statistical interpretation shall be submitted to them regularly.**

6 monthly compliance report & monitored data is submitted to MoEF, CPCB & GSPCB regularly on six monthly basis. The report & data uploaded on to company website: - <http://sesagoairnore.com/sustainability/hse/environment-reports/>

13. **The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the GPCB and may also be seen at Website of the Ministry of Environment and Forests at <http://envfor.nic.in>. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the Regional office.**

The information about grant of Environmental Clearance was published in 2 local newspapers as per the condition of EC. English Daily "Navhind Times" dated 12/06/2009 & Marathi Daily "Tarun Bharat" dated 12/06/2009.

14. **Project authorities shall inform the Regional Office as well as the Ministry. the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work**

The first Consent to Operate was granted for following units in below mentioned years:-

|              |            |
|--------------|------------|
| Coke Plant   | 08/9/2011  |
| WHRPP        | 22/12/2011 |
| BF           | 08/06/2012 |
| Sinter Plant | 09/11/2012 |

**Additional Recommendations on 25/4/12, when amendment in EC was granted**

1. **The NAAQS issued by the Ministry vide GSR No 826 (E) dated 16th November 2009 shall be followed.**

12 parameters as mentioned in NAAQS are monitored at AAQ stations and reports are submitted to GSPCB.

2. **The Project Proponent shall also submit 6 monthly reports on the status of the compliance of stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to respective RO of MOEF, respective ZO of CPCB & SPCB. RO of MOEF at Bangalore/CPCB/GSPCB shall monitor the conditions.**

Complied. Six monthly compliance reports submitted to RO of MOEF at Bangalore with cc to CPCB & GSPCB. Also monitored parameters are submitted to the authorities as mentioned in above clauses.

**3. Environmental Statement for each financial year ending 31st March in Form V as is mandated to be submitted by project proponent to GSPCB as prescribed under EPR 1986 shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to respective ROs of MOEF by e-mail.**

Complied. The Environmental Statements for all units, viz, Coke Plant, Power Plant, Blast furnace and Sinter Plant for year 2017-18 are submitted on 20<sup>th</sup> May 2019.

**4. The Company shall submit within 3 months their policy towards Corporate Environment Responsibility which should inter-alia address (i) SOP to bring into focus any Infringent/deviation/violation of EC conditions (ii) Hierarchical system or Administrative order of the company to deal with environmental issues and ensuring compliance to EC conditions (iii) System of reporting of noncompliance/violation environmental norms to Board of Directors of the company or/and stakeholders or shareholders.**

Corporate Environment Responsibility Policy Action Plan was submitted to MOEF, CPCB and GSPCB on 20/11/12 along with 7th Six Monthly EC Compliance. If any changes are incorporated in CER, same will be intimated to the authorities. Environmental issues are discussed periodically in Vedanta Sustainability Committee Meeting. This Sustainability Committee reports to the Board of Directors, which reviews performance on 6 monthly basis.

*\* Vedanta Limited (earlier known as Sesa Sterlite Ltd./Sesa Goa Ltd. ) has implemented Blast Furnace (0.45MTPA), Sinter Plant (1MTPA), Coke Plant (0.3MTPA), Waste Heat Recovery Power Plant (30MW) vis-a-vis 50% of Environmental Clearance Capacity, as Phase1.*

*With respect to Letter dated 25/4/12 from MOEF, name of Project Proponent has been changed from Sesa Industries Ltd. to Sesa Goa Ltd. And further to Vedanta Ltd. Also an amendment in EC has been issued by MOEF with respect to change in plant configuration with changes in stack dimensions.*

- Vedanta Ltd. has got Environment Clearance and Consent To Operate for hot metal expansion from existing Blast furnace for production enhancement of 0.45 MTPA to 0.54 MTPA.
- We have applied for Environment clearance for setting up of 0.3 MTPA Capacity Ductile Iron plant, 0.005MTPA Capacity Ferro Silicon Plant, Increasing capacity of Existing plant from 0.54 MTPA to 0.65 MTPA through technology up-gradation and Oxygen Plant in the existing Pig Iron Expansion Plant premises near existing mini blast furnace.

**ANNEXURE-I****Ambient Air Monitoring data from April-19 to September-19**

| <b>1 NEAR AMONA GATE</b> |                         |                          |                                    |                                     |
|--------------------------|-------------------------|--------------------------|------------------------------------|-------------------------------------|
| Date                     | Particular Matter PM 10 | Particular Matter PM 2.5 | Sulphur Dioxide (SO <sub>2</sub> ) | Nitrogen Dioxide (NO <sub>2</sub> ) |
| 02-04-2019               | 82.33                   | 42.17                    | 13.17                              | 13.17                               |
| 05-04-2019               | 80.92                   | 44.41                    | 11.09                              | 11.09                               |
| 09-04-2019               | 84.46                   | 46.66                    | 12.57                              | 12.57                               |
| 12-04-2019               | 77.18                   | 41.13                    | 13.17                              | 13.17                               |
| 16-04-2019               | 78.39                   | 37.47                    | 11.16                              | 11.16                               |
| 19-04-2019               | 81.76                   | 43.21                    | 12.5                               | 12.5                                |
| 23-04-2019               | 83.05                   | 46.74                    | 14.04                              | 14.04                               |
| 26-04-2019               | 76.61                   | 41.79                    | 11.67                              | 11.67                               |
| 30-04-2019               | 81.35                   | 41.67                    | 12.85                              | 12.67                               |
| 03-05-2019               | 78.18                   | 46.16                    | 13.48                              | 17.13                               |
| 07-05-2019               | 71.4                    | 39.8                     | 11.2                               | 14.64                               |
| 10-05-2019               | 69.37                   | 38.8                     | 10.41                              | 15.74                               |
| 14-05-2019               | 74.45                   | 42.54                    | 10.96                              | 16.58                               |
| 17-05-2019               | 78.29                   | 41.54                    | 11.12                              | 15.46                               |
| 21-05-2019               | 81.98                   | 42.04                    | 12.22                              | 17.95                               |
| 24-05-2019               | 71.41                   | 37.88                    | 13.8                               | 16.48                               |
| 28-05-2019               | 74.53                   | 40.17                    | 10.41                              | 13.27                               |
| 31-05-2019               | 78.34                   | 42.91                    | 12.14                              | 15.89                               |

|            |       |       |       |       |
|------------|-------|-------|-------|-------|
| 04-06-2019 | 67.33 | 37.34 | 12.77 | 16.58 |
| 07-06-2019 | 72.11 | 41.08 | 13.96 | 17.13 |
| 11-06-2019 | 44.49 | 23.87 | 12.3  | 14.09 |
| 14-06-2019 | 34.6  | 22.5  | 9.86  | 13    |
| 18-06-2019 | 19.12 | 11.14 | 10.65 | 14.91 |
| 21-06-2019 | 24.45 | 10.85 | 8.83  | 11.25 |
| 26-06-2019 | 27.3  | 11.02 | 9.54  | 12.1  |
| 28-06-2019 | 24.4  | 10.94 | 11.99 | 12.97 |
| 02-07-2019 | 28.55 | 14.55 | 10.33 | 13.1  |
| 05-07-2019 | 28.61 | 14.97 | 10.8  | 13.17 |
| 09-07-2019 | 30    | 17.3  | 11.12 | 13.35 |
| 12-07-2019 | 30.99 | 17.05 | 10.96 | 13.49 |
| 16-07-2019 | 27.19 | 13.72 | 10.49 | 12.67 |
| 19-07-2019 | 28.01 | 14.97 | 10.33 | 13.37 |
| 23-07-2019 | 28.77 | 16.22 | 10.41 | 13.82 |
| 26-07-2019 | 30.28 | 17.46 | 10.65 | 13.54 |
| 30-07-2019 | 31.92 | 17.87 | 10.97 | 13.37 |
| 02.08.2019 | 33.62 | 17.87 | 10.41 | 13.71 |
| 06.08.2019 | 33.58 | 18.29 | 10.79 | 13.48 |
| 09.08.2019 | 33.69 | 19.54 | 10.97 | 13.65 |
| 13.08.2019 | 32.6  | 18.29 | 11.22 | 14.05 |
| 16.08.2019 | 28.3  | 17.04 | 10.65 | 13.76 |
| 20.08.2019 | 31.08 | 17.87 | 10.97 | 14.05 |
| 23.08.2019 | 32.66 | 18.29 | 11.22 | 13.82 |
| 27.08.2019 | 34.1  | 17.87 | 10.41 | 13.25 |
| 30.08.2019 | 31.45 | 20.79 | 10.57 | 13.48 |
| 3.09.2019  | 31.76 | 33.7  | 10.65 | 13.59 |
| 06.09.2019 | 33.7  | 17.04 | 10.97 | 13.37 |
| 10.09.2019 | 34.48 | 19.54 | 11.14 | 13.54 |
| 13.09.2019 | 34.75 | 17.87 | 11.7  | 13.71 |

**ANNEXURE-II**

**STACK MONITORING DETAILS FROM April 2019 TO September 2019**

**SINTER PLANT**

| Sr. No. | Month                 | Parameter                     | Stack Details |              |                             |                        |                          |
|---------|-----------------------|-------------------------------|---------------|--------------|-----------------------------|------------------------|--------------------------|
|         |                       |                               | Head End ESP  | Tail End ESP | Proportionin<br>g Dedusting | Screening<br>Dedusting | Flux & Fuel<br>Dedusting |
| 1       | April '19<br>-June'19 | Particulate<br>Matter(Mg/Nm3) | 47.12         | 43.18        | 41.78                       | 42.38                  | 43.12                    |

|  |   |                   |                            |       |       |       |       |       |
|--|---|-------------------|----------------------------|-------|-------|-------|-------|-------|
|  |   | SO2(Kg/Hr.)       | 4.27                       | NA    | NA    | NA    | NA    |       |
|  | 2 | July'19 - Sept'19 | Particulate Matter(Mg/Nm3) | 48.01 | 44.91 | 43.32 | 46.09 | 45.39 |
|  |   |                   | SO2(Kg/Hr.)                | 5.2   | NA    | NA    | NA    | NA    |

**BLAST FURNACE 3**

| Sr.No | Month                  | Parameter                  | Stack Details   |                          |                       |                           |
|-------|------------------------|----------------------------|-----------------|--------------------------|-----------------------|---------------------------|
|       |                        |                            | Hot Blast Stove | PCM Cast House Dedusting | Stock House Dedusting | Pulverised Coal Injection |
| 1     | April '19 -June'19     | Particulate Matter(Mg/Nm3) | 44.3            | 46.27                    | 47.08                 | 52.65                     |
|       |                        | SO2 (Mg/Nm3)               | 18.18           | NA                       | NA                    | NA                        |
|       |                        | Nox(Mg/Nm3)                | 37.05           | NA                       | NA                    | NA                        |
| 2     | July'19 - September'19 | Particulate Matter(Mg/Nm3) | 45.06           | 45.42                    | 43.6                  | 40.21                     |
|       |                        | SO2 (Mg/Nm3)               | 16.36           | NA                       | NA                    | NA                        |
|       |                        | Nox(Mg/Nm3)                | 30.08           | NA                       | NA                    | NA                        |

**WASTE HEAT RECOVERY POWER PLANT- II**

| Sr.No | Month                  | Parameter                   | Stack Details                   |                                 |
|-------|------------------------|-----------------------------|---------------------------------|---------------------------------|
|       |                        |                             | Waste Heat Recovery Boiler No 1 | Waste Heat Recovery Boiler No 2 |
| 1     | April '19 -June'19     | Particulate Matter(PM)      | 42.06                           | 41.1                            |
|       |                        | Sulphur Dioxide(SO2 )       | 40.21                           | 40.12                           |
|       |                        | Oxides of Nitrogen as (NO2) | 37.56                           | 39.26                           |
| 2     | July'19 - September'19 | Particulate Matter(PM)      | 38.23                           | 41.2                            |
|       |                        | Sulphur Dioxide(SO2 )       | 45.6                            | 47.67                           |
|       |                        | Oxides of Nitrogen as (NO2) | 42.51                           | 43.87                           |

**ANNEXURE-III**

**Water Analysis data of Power Plant – April'2019 to September'2019**

**Water Analysis data of Power Plant – April 2019 to September 2019**

| <b>Sr.No</b> | <b>Month</b> | <b>Parameter</b>         | <b>CT Blowdown Discharge Before Treatment</b> | <b>CT Blowdown Discharge after Treatment</b> |
|--------------|--------------|--------------------------|---|--|
| 1            | April-19     | PH                       | 6.89  | 6.94   |
|              |              | Temperature (Deg. Cel.)  | 29.3  | 29.0   |
|              |              | Suspended Solid(mg/Lit)  | 71  | 68   |
|              |              | Oil & Grease (mg/Lit)    | Less than 5                                   | Less than 5                                  |
|              |              | Free Chlorine (mg/Lit)   | Nil   | NIL  |
|              |              | Phosphates as P          | Less than 1                                   | Less than 1                                  |
|              |              | Copper as Cu (mg/Lit)    | 0.24  | 0.21   |
|              |              | Chromium as Cr (mg/Lit)  | Not Detected                                  | Not Detected                                 |
|              |              | Iron as Fe (mg/Lit)      | 0.17  | 0.16   |
|              |              | Zinc as Zn (mg/Lit)      | 0.15  | 0.13   |
| 2            | May-19       | PH                       | 6.92  | 6.71   |
|              |              | Temperature (Deg. Cel.)  | 29.8  | 29.5   |
|              |              | Suspended Solid(mg/Lit)  | 66  | 62   |
|              |              | Oil & Grease (mg/Lit)    | Less than 5                                   | Less than 5                                  |
|              |              | Free Chlorine (mg/Lit)   | NIL   | NIL  |
|              |              | Phosphates as P (mg/Lit) | Less Than 1                                   | Less Than 1                                  |
|              |              | Copper as Cu (mg/Lit)    | 0.26  | 0.21   |
|              |              | Chromium as Cr (mg/Lit)  | Not Detected                                  | Not Detected                                 |
|              |              | Iron as Fe (mg/Lit)      | 0.19  | 0.15   |
|              |              | Zinc as Zn (mg/Lit)      | 0.17  | 0.14   |
| 3            | June-19      | PH                       | 7.11  | 7.32   |
|              |              | Temperature (Deg. Cel.)  | 28.7  | 28.5   |
|              |              | Suspended Solid(mg/Lit)  | 57  | 54   |
|              |              | Oil & Grease (mg/Lit)    | Less than 5                                   | Less than 5                                  |
|              |              | Free Chlorine (mg/Lit)   | NIL   | NIL  |
|              |              | Phosphates as P (mg/Lit) | Less than 1.0                                 | Less than 1                                  |
|              |              | Copper as Cu (mg/Lit)    | 0.28  | 0.25   |
|              |              | Chromium as Cr (mg/Lit)  | Not Detected                                  | Not Detected                                 |
|              |              | Iron as Fe (mg/Lit)      | 0.20  | 0.18   |
|              |              | Zinc as Zn (mg/Lit)      | 0.21  | 0.16   |
| 4            | July-19      | PH                       | 6.87  | 6.91   |
|              |              | Temperature (Deg. Cel.)  | 28.1  | 28.3   |
|              |              | Suspended Solid(mg/Lit)  | 59  | 56   |
|              |              | Oil & Grease (mg/Lit)    | Less than 5                                   | Less than 5                                  |
|              |              | Free Chlorine (mg/Lit)   | NIL   | NIL  |
|              |              | Phosphates as P (mg/Lit) | Less than 1.0                                 | Less than 1.0                                |
|              |              | Copper as Cu (mg/Lit)    | 0.29  | 0.27   |
|              |              | Chromium as Cr (mg/Lit)  | Not detected                                  | Not detected                                 |
|              |              | Iron as Fe (mg/Lit)      | 0.26  | 0.24   |
|              |              | Zinc as Zn (mg/Lit)      | 0.22  | 0.20   |
|              |              | PH                       | 6.71  | 7.2  |
|              |              | Temperature (Deg. Cel.)  | 23  | 27.6   |



|   |              |                          |              |              |
|---|--------------|--------------------------|--------------|--------------|
| 5 | August-19    | Suspended Solid(mg/Lit)  | 49           | 51           |
|   |              | Oil & Grease (mg/Lit)    | Less than 5  | Less than 5  |
|   |              | Free Chlorine (mg/Lit)   | NIL          | NIL          |
|   |              | Phosphates as P (mg/Lit) | Less than 1  | Less than 1  |
|   |              | Copper as Cu (mg/Lit)    | 0.26         | 0.25         |
|   |              | Chromium as Cr (mg/Lit)  | Not Detected | Not detected |
|   |              | Iron as Fe (mg/Lit)      | Less than 1  | Less than 1  |
|   |              | Zinc as Zn (mg/Lit)      | 0.25         | 0.23         |
| 6 | September-19 | PH                       | 6.84         | 6.96         |
|   |              | Temperatur (Deg. Cel.)   | 25.8         | 25.4         |
|   |              | Suspended Solid(mg/Lit)  | 58           | 55           |
|   |              | Oil & Grease (mg/Lit)    | Less than 5  | Less than 5  |
|   |              | Free Chlorine (mg/Lit)   | Nil          | NIL          |
|   |              | Phosphates as P (mg/Lit) | Less than 1  | Less than 1  |
|   |              | Copper as Cu (mg/Lit)    | 0.26         | 0.26         |
|   |              | Chromium as Cr (mg/Lit)  | Not detected | Not detected |
|   |              | Iron as Fe (mg/Lit)      | 0.19         | 0.18         |
|   |              | Zinc as Zn (mg/Lit)      | 0.17         | 0.16         |

| Parameters              | Limits (For After treatment water) |
|-------------------------|------------------------------------|
| pH                      | 6.5-8.5                            |
| Suspended Solid(mg/Lit) | 100                                |
| Oil & Grease (mg/Lit)   | 20                                 |
| Free Chlorine (mg/Lit)  | 0.5                                |
| Phosphates as P(mg/Lit) | 5                                  |
| Copper as Cu (mg/Lit)   | 1                                  |
| Chromium as Cr (mg/Lit) | 0.2                                |
| Iron as Fe(mg/Lit)      | 1                                  |
| Zinc as Zn(mg/Lit)      | 1                                  |

