



रिफाइनरीज प्रभाग
Refineries Division

इंडियन ऑयल कॉर्पोरेशन लिमिटेड

बोंगाइगाँव रिफाइनरी

डाकघर : धालीगाँव

जिला : चिरांग (असम)

पिन : 783385

Indian Oil Corporation Limited

Bongaigaon Refinery

P.O. : Dhaligaon

Dist. : Chirang (Assam)

Pin : 783385

IOC/BGR/ENV/REP/MoEF/2015-16/02

Date: 21.06.2016

To

The Chief Conservator of Forests
Regional Office, North East Region
Ministry of Environment & Forests & Climate Change
Law-U-SIB, Lumbatngen, Near M.T.C. Workshop,
Shillong – 793021

Subject: Half Yearly Report for the period of (1st October, 2015 to 31st March, 2016) for "Refinery Expansion Project"

Dear Sir,

With reference to above, we are enclosing the Six Monthly Report for the period of **1st October, 2015 to 31st March, 2016** for your kind perusal.

The reports are being sent as per EIA Rules'2006 for the "Environmental Clearances" issued by MoEF to Bongaigaon Refinery, (BGR) for "Refinery Expansion" Project.

Thanking you,

Yours faithfully,

(Ramen Sarma)

Dy. General Manager (HSE)

Copy to:

1. Member Secretary, Pollution Control Board, Assam
Bamunimaidam, Guwahati - 781 021
2. Zonal Officer, Central Pollution Control Board
Eastern Zonal Office, 'TUM-SIR', Lower Motinagar,
Near Fire Brigade H.Q., Shillong – 793014

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Half Yearly Report for “Refinery Expansion Project”

Period : 1st October, 2015 to 31st March, 2016

Environmental Clearance for Refinery Expansion, De-bottlenecking of Reformer and LPG facility vide MoEF’s letter No. J.11011/24/90-IA-II dated 03/06/1991:

Plant Commissioning dates:

1. Crude Distillation Unit – II: 09.05.1995
2. Delayed Coker Unit – II: 06.03.1996

| Sl. No | Clearance Conditions | Status |
|--------|--|--------------------------|
| 1. | General conditions and Compliance status of Refinery Expansion Project | Annexure- I |
| 2. | Six monthly Effluent Quality (Point No.VIII) | Furnished in Appendix-A1 |
| 3. | Six monthly Ambient Air Quality/ Stack Monitoring Data | Furnished in Appendix-A2 |
| 4. | Tree Plantation Data | Furnished in Appendix-A3 |
| 5 | Special Information | Furnished in Appendix-A4 |

ANNEXURE – I

| Sr. No | General Conditions | Compliance Status |
|--------|---|---|
| 1 | The project authority must strictly adhere to the stipulations made by Assam State Pollution Control Board and State Government and the comprehensive EIA will be submitted within 18 months. | <ol style="list-style-type: none"> 1. All stipulations by Pollution Control Board of Assam are strictly followed. 2. Copy of comprehensive EIA prepared for the Refinery Expansion was submitted to MOEF, New Delhi and also to MOEF Shillong vide our letter ENV/MIN/94/05 dated 15/06/94. |
| 2 | Any expansion of the plant, either with the existing product mix or new products can be taken up only with the prior approval of this Ministry. | <ol style="list-style-type: none"> 1. All proposals for expansion requiring Environmental Clearance from MOEF are sent to the Ministry for Environment Clearance by BGR. All expansion activities are dealt as per provision of the EP Act and other applicable acts. |
| 3 | The gases emission from the various process units should conform to the standard prescribed by the concern authorities, from time to time. At no time the emission level should go beyond the stipulated standards. | <ol style="list-style-type: none"> 2. The process units are designed to meet the prescribed standards. 3. Units would be put out of operation in the event of mal functioning of pollution control practice at BGR. |
| 4 | Adequate number of (a minimum of 5) of Air quality monitoring stations should be set up in the down wind direction as well as where maximum ground level concentration is anticipated. Also, stack emission should be monitored by setting of automatic stack monitoring unit. | <ol style="list-style-type: none"> 4. Six Ambient Air Quality Monitoring Stations are operating around the complex at BGR including one continuous analyzer set up for compilation of Ambient Air Quality Standards 5. All these stations are selected based on modeling exercise representing short-term maximum ground level concentration. 6. All major stacks in BGR are monitored with continuous analyzers installed for SO₂, & NO_x analysis. PM & CO Analyzers are installed in all stacks recently as per CPCB guidelines. |
| 5 | There should be no change in the stack design without the approval of State Pollution Control Board. Alternative Pollution Control system and design (steam injection system in the stack) should be provided to take care the excess emission due to failure in any system of the plant. | <ol style="list-style-type: none"> 1. No changes are made to the stack design. 2. Steam injection facility is provided in burners of the furnaces |
| 6 | The ambient Air Quality Data for winter season (November 1990 to January 1991) should be presented by June 1991. | These data were submitted as desired during 1991. |
| 7 | The project authority should recycle the waste to the maximum extent. Recycle plan should be submitted within one year. This should include use of recycled water for green belt development plan. | BGR has installed Tertiary Treatment Plant to facilitate reuse of treated effluent inside the complex as Cooling Water & Firewater Make up and unit housekeeping. Only nominal quantity of effluent is being discharged to Ecopark to outside the complex. |

| Sr. No | General Conditions | Compliance Status |
|--------|--|---|
| 8 | Adequate number of effluent quality monitoring stations must be set in consultation with State Pollution Control Board and the effluents monitored and should be statistically analysed and the report sent to this Ministry once in six month and State Pollution Control Board every three months. | <ol style="list-style-type: none"> 1. Three joint sampling points for effluent are fixed in and around BGR by Pollution Control Board, Assam (PCBA) to monitor the discharge effluent quality. Joint sampling by Pollution Control Board, Assam is conducted once a month. The samples are tested at PCBA Laboratory. 2. Beside samples are tested at BGR Laboratory as per consent condition and also on a daily basis to track effluent quality. 3. All samples conform to the prescribed MINAS Standards 2008. |
| 9 | The project authority should prepare a well-designed scheme for solid waste disposal generated during various process operations or in the treatment plant. The plan for disposal should be submitted to the ministry within six months. | <ol style="list-style-type: none"> 1. All solid waste generated during various process operations or in the treatment plant are handled and disposed off as per laid down procedures in ISO- 14001 in environmentally friendly manner. 2. All hazardous wastes are handled and disposed off as per provisions of the Hazardous Waste (Management, Handling & Trans boundary Movement) Rules, 2008 and as per directions of statutory agencies. 3. As a measure of Haz. Waste Management, M/s Balmer Lawrie & Co. Limited was awarded the contract of oily sludge processing along with bio-remediation of residual solids. The party already completed the processing of oily sludge from sludge lagoons. Bio- remediation process of the residual part of sludge also completed. 4. All statutory returns are sent to PCBA as per the provision of rule. |
| 10 | A detailed risk analysis of LPG storage facility should be carried out and a report be submitted to the ministry within six months. | Risk Analysis for LPG Storage was prepared and submitted to MOEF in 1992. |
| 11 | A detailed risk analysis based on maximum credible accident analysis should be done once the process design and layout frozen. Based on this a disaster management plan has to be prepared and after approval of the nodal agency, should be submitted to this ministry within 6 months. | <p>Detailed risk analysis was prepared and the report was submitted to MoEF.</p> <ol style="list-style-type: none"> a) On site emergency plan exists and mock drills are conducted time to time to verify effectiveness of the plan as per OISD guidelines. b) Off site emergency plan approved by District authorities exists. Mock drills are conducted time to time to verify effectiveness of the plan in co-ordination with district authorities. |

| Sr. No | General Conditions | Compliance Status |
|--------|--|--|
| 12 | Detailed green belt development plan should be submitted within a year. | Green belt development plan was a part of the comprehensive EIA and the same is already submitted to MOEF. The plan was implemented. |
| 13 | A report on occupational health of the workers with the incidents of diseases in the past five years as per record available with the BRPL and their correlation with type of occupational health problem the environment may cause may be submitted within six months. | The report is already submitted as desired. |
| 14 | The project must setup a laboratory facility for collection and analysis sampling under the supervision of competent technical personal that will directly report to chief executive. | A well-equipped Laboratory exists in the complex. Environment Laboratory of BGR is accredited by NABL |
| 15 | A separate environmental management cell with full-fledged laboratory facilities to carry out various management and monitoring functions should be set up under the control of Senior Executive. | BGR is already having a separate environmental management cell and full fledged laboratory to carry-out environmental management and monitoring functions. |
| 16 | The funds earmarked for the environmental protection measures should not be diverted for any other purpose and year-wise expenditure should be reported to this Ministry and SPCB. | The funds earmarked for the environmental projects are used for this purpose only and not diverted or spent for other purposes. |
| 17 | The Ministry or any competent authority may stipulate any further condition(s) on receiving reports from the project authorities. | -- |
| 18 | The Ministry may revoke or suspend the clearance if implementation of any of the above conditions is not satisfactory. | -- |
| 19 | The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules. | -- |

APPENDIX – A1

Effluent Discharged (Figure in M³/Hr)

(1st October, 2015 to 31st March, 2016)

| | | |
|---|--|--------------------|
| A | Industrial Effluent M ³ /Hr | 154.9 |
| B | Domestic Effluent from BGR Township M ³ /Hr | 56.8 |
| C | Total Effluent Treated (A + B) M ³ /Hr | 211.7 |
| D | Treated Effluent Reused M ³ /Hr | 206.5 |
| E | Effluent Discharged M ³ /Hr | 5.2 |
| F | M ³ of Effluent discharged for 1000 tons of Crude processed | 17.9 (Std. 400) |

EFFLUENT QUALITY

A. Treated Effluent Quality

(1st October, 2015 to 31st March, 2016)

| Sl. No | Parameter | MINAS,2008 | Min | Avg. | Max |
|--------|--|------------|-------|-------|-------|
| 1 | p ^H value | 6.0 - 8.5 | 6.5 | 7.3 | 8.0 |
| 2 | Oil and Grease, mg/l | 5.0 | 1.0 | 1.3 | 2.0 |
| 3 | Bio-Chemical Oxygen Demand (3 Day at 27°C), mg/l | 15.0 | 3.6 | 7.8 | 13.0 |
| 4 | Chemical Oxygen Demand (COD), mg/l | 125.0 | 38.0 | 73.3 | 107.0 |
| 5 | Suspended solids, mg/l | 20.0 | 4.0 | 7.4 | 14.0 |
| 6 | Phenolic compounds (as C ₆ H ₅ OH), mg/l | 0.35 | 0.010 | 0.023 | 0.080 |
| 7 | Sulphide (as S), mg/l | 0.50 | 0.08 | 0.23 | 0.46 |
| 8 | CN mg/l | 0.20 | BDL | BDL | BDL |
| 9 | Ammonia as N, mg/l | 15.0 | 0.78 | 0.80 | 0.82 |
| 10 | TKN, mg/l | 40.0 | 1.00 | 1.03 | 1.10 |
| 11 | P, mg/l | 3.0 | 0.70 | 0.73 | 0.76 |
| 12 | Cr (Hexavalent), mg/l | 0.10 | | BDL | |
| 13 | Cr (Total), mg/l | 2.0 | | BDL | |
| 14 | Pb, mg/l | 0.10 | | BDL | |
| 15 | Hg, mg/l | 0.01 | | BDL | |
| 16 | Zn, mg/l | 5.0 | | BDL | |
| 17 | Ni, mg/l | 1.0 | | BDL | |
| 18 | Cu, mg/l | 1.0 | | BDL | |
| 19 | V, mg/l | 0.20 | | BDL | |
| 20 | Benzene, mg/l | 0.10 | | BDL | |
| 21 | Benzo (a) pyrene, mg/l | 0.20 | | BDL | |

EFFLUENT QUALITY

B. Final Outlet (From the Complex) Effluent Quality

(1st October, 2015 to 31st March, 2016)

| Sl. No. | Parameter | MINAS | Min | Avg. | Max |
|---------|--|-----------|------|-------|-------|
| 1 | p ^H value | 6.0 - 8.5 | 6.5 | 7.5 | 8.0 |
| 2 | Oil and Grease, mg/l | 5.0 | 1.0 | 1.4 | 2.0 |
| 3 | Bio-Chemical Oxygen Demand (3 Days at 27° C), mg/l | 15.0 | 4.4 | 7.4 | 14.0 |
| 4 | Chemical Oxygen Demand (COD), mg/l | 125.0 | 40.0 | 72.7 | 119.0 |
| 5 | Suspended Solids, mg/l | 20.0 | 4.0 | 7.5 | 9.0 |
| 6 | Phenolic compounds (as C ₆ H ₅ OH), mg/l | 0.35 | 0.01 | 0.021 | 0.05 |
| 7 | Sulphide (as S), mg/l | 0.50 | 0.08 | 0.235 | 0.46 |
| 8 | CN, mg/l | 0.20 | BDL | BDL | BDL |
| 9 | Ammonia as N , mg/l | 15.0 | | 0.90 | |
| 10 | TKN, mg/l | 40.0 | | 1.12 | |
| 11 | P, mg/l | 3.0 | | 0.72 | |
| 12 | Cr (Hexavalent), mg/l | 0.10 | | BDL | |
| 13 | Cr (Total), mg/l | 2.0 | | BDL | |
| 14 | Pb, mg/l | 0.10 | | BDL | |
| 15 | Hg, mg/l | 0.01 | | BDL | |
| 16 | Zn, mg/l | 5.0 | | BDL | |
| 17 | Ni, mg/l | 1.0 | | BDL | |
| 18 | Cu, mg/l | 1.0 | | BDL | |
| 19 | V, mg/l | 0.20 | | BDL | |
| 20 | Benzene, mg/l | 0.10 | | BDL | |
| 21 | Benzo (a) pyrene, mg/l | 0.20 | | BDL | |

STACK MONITORING DATA
(1st October, 2015 to 31st March, 2016)

A. SO₂ Emission (mg/Nm³):

| Stacks | Emission Std. | Observed value | | |
|---------------|----------------------------------|----------------|------|-----|
| | | Min | Avg. | Max |
| CDU-I | For F.O. = 1700 For F.G. = 50 | 44 | 249 | 923 |
| CDU-II | | 31 | 217 | 992 |
| DCU-I | | 26 | 255 | 732 |
| DCU-II | | 37 | 259 | 994 |
| CPP | | 14 | 133 | 732 |
| Reformer | | 12 | 28 | 92 |
| HO-1 | | 13 | 29 | 182 |
| Isomerisation | | 12 | 20 | 79 |
| DHDT | | 8 | 83 | 609 |
| HGU | | 13 | 56 | 223 |
| SRU | | 21 | 301 | 910 |
| GTG | | 32 | 36 | 40 |

B. NO_x Emission (mg/Nm³):

| Stacks | Emission Std. | Observed value | | |
|---------------|----------------------------------|----------------|------|-----|
| | | Min | Avg. | Max |
| CDU-I | For F.O. = 450 For F.G. = 350 | 33 | 156 | 322 |
| CDU-II | | 53 | 135 | 168 |
| DCU-I | | 25 | 52 | 139 |
| DCU-II | | 40 | 149 | 299 |
| CPP | | 19 | 37 | 76 |
| Reformer | | 6 | 21 | 75 |
| HO-1 | | 6 | 55 | 152 |
| Isomerisation | | 5 | 28 | 325 |
| DHDT | | 16 | 24 | 68 |
| HGU | | 6 | 92 | 375 |
| SRU | | No Analyser | | |
| GTG | | 5 | 27 | 214 |

C. PM Emission (mg/Nm³)

| Stacks | Emission Std. | Observed value | | |
|---------------|---------------------------------|----------------|------|-----|
| | | Min | Avg. | Max |
| CDU-I | For F.O. = 100 For F.G. = 10 | 43 | 43 | 44 |
| CDU-II | | 21 | 23 | 27 |
| DCU-I | | 13 | 15 | 17 |
| DCU-II | | 19 | 22 | 27 |
| CPP | | 17 | 20 | 22 |
| Reformer | | BDL | BDL | BDL |
| HO-1/2 | | BDL | BDL | BDL |
| Isomerisation | | 8 | 9 | 10 |
| DHDT | | 19 | 22 | 27 |
| HGU | | BDL | BDL | BDL |
| SRU | | 13 | 14 | 14 |

STACK MONITORING DATA
(1st October, 2015 to 31st March, 2016)

D. CO Emission (mg/Nm³)

| Stacks | Emission Std. | Observed value | | |
|---------------|----------------------------------|----------------|------|-----|
| | | Min | Avg. | Max |
| CDU-I | For F.O. = 200 For F.G. = 150 | 20 | 24 | 30 |
| CDU-II | | 23 | 26 | 30 |
| DCU-I | | 20 | 24 | 27 |
| DCU-II | | 18 | 21 | 23 |
| CPP | | 26 | 27 | 29 |
| Reformer | | 6 | 9 | 11 |
| HO-1/2 | | 5 | 7 | 9 |
| ISOMERISATION | | 2 | 5 | 8 |
| DHDT | | 6 | 8 | 9 |
| HGU | | 10 | 11 | 13 |
| SRU | | 11 | 11 | 11 |

E. Ni + V Emission (mg/Nm³):

| Stacks | Emission Std. | Observed value | | |
|---------------|---------------|----------------|------|-----|
| | | Min | Avg. | Max |
| CDU-I | For F.O. = 5 | BDL | BDL | BDL |
| CDU-II | | BDL | BDL | BDL |
| DCU-I | | BDL | BDL | BDL |
| DCU-II | | BDL | BDL | BDL |
| CPP | | BDL | BDL | BDL |
| Reformer | | BDL | BDL | BDL |
| HO-1/2 | | BDL | BDL | BDL |
| ISOMERISATION | | BDL | BDL | BDL |
| DHDT | | BDL | BDL | BDL |
| HGU | | BDL | BDL | BDL |
| SRU | | BDL | BDL | BDL |

**AMBIENT AIR QUALITY AROUND BGR COMPLEX
(Average of monthly sample Schedule – VII)
(1st October, 2015 to 31st March, 2016)**

| | Station | Continuous Monitoring Station | Near Tube Well No.14 | Near LPG Bottling plant | Rural Health Centre | Bartala Rail Gate | Near TW No.7 in Township |
|----------|---|-------------------------------|----------------------|-------------------------|---------------------|-------------------|--------------------------|
| 1 | SO₂ (Std. 50/80 µg/m³) | | | | | | |
| | Min | 3.4 | BDL | BDL | BDL | BDL | BDL |
| | Average | 12.1 | BDL | BDL | BDL | BDL | BDL |
| | Max | 24.7 | BDL | BDL | BDL | BDL | BDL |
| | No. of observation | Continuous | 49 | 49 | 49 | 49 | 49 |
| 2 | NO₂ (Std. 40/80 µg/m³) | | | | | | |
| | Min | 3.3 | 6.0 | 6.2 | 7.0 | 8.2 | 6.0 |
| | Average | 12.6 | 11.8 | 11.5 | 12.6 | 13.1 | 11.7 |
| | Max | 42.2 | 16.0 | 15.0 | 17.0 | 17.0 | 17.0 |
| | No. of observation | Continuous | 49 | 49 | 49 | 49 | 49 |
| 3 | PM-10 (Std. 60/100 µg/m³) | | | | | | |
| | Min | 14.4 | 20.0 | 20.0 | 21.0 | 20.0 | 18.0 |
| | Average | 42.7 | 40.8 | 41.8 | 43.8 | 44.8 | 43.3 |
| | Max | 97.0 | 79.0 | 88.0 | 88.0 | 96.0 | 97.0 |
| | No. of observation | Continuous | 49 | 49 | 49 | 49 | 49 |
| 4 | PM-2.5 (Std. 40/60 µg/m³) | | | | | | |
| | Min | 1.2 | 10.0 | 10.0 | 12.0 | 10.0 | 10.0 |
| | Average | 21.8 | 24.2 | 24.7 | 26.1 | 26.2 | 24.9 |
| | Max | 58.0 | 51.0 | 51.0 | 50.0 | 56.0 | 58.0 |
| | No. of observation | Continuous | 49 | 49 | 49 | 49 | 49 |
| 5 | Ammonia (Std. 100/400 µg/m³) | | | | | | |
| | Min | 3.4 | BDL | BDL | BDL | BDL | BDL |
| | Average | 40.2 | BDL | BDL | BDL | BDL | BDL |
| | Max | 81.4 | BDL | BDL | BDL | BDL | BDL |
| | No. of observation | Continuous | 49 | 49 | 49 | 49 | 49 |
| 6 | Pb (Std. 0.5/1.0 µg/m³) | | | | | | |
| | Min | | BDL | BDL | BDL | BDL | BDL |
| | Average | | BDL | BDL | BDL | BDL | BDL |
| | Max | | BDL | BDL | BDL | BDL | BDL |
| | No. of observation | | 49 | 49 | 49 | 49 | 49 |
| | | | | | | | |
| 7 | Arsenic (As) (Std. 6 ng/m³) | | | | | | |
| | Min | | BDL | BDL | BDL | BDL | BDL |
| | Average | | BDL | BDL | BDL | BDL | BDL |

| | | | | | | | |
|----|--|------------|-----|-----|-----|-----|-----|
| | Max | | BDL | BDL | BDL | BDL | BDL |
| | No. of observation | | 49 | 49 | 49 | 49 | 49 |
| 8 | Ni (Std. 20 ng/m ³) | | | | | | |
| | Min | | BDL | BDL | BDL | BDL | BDL |
| | Average | | BDL | BDL | BDL | BDL | BDL |
| | Max | | BDL | BDL | BDL | BDL | BDL |
| | No. of observation | | 49 | 49 | 49 | 49 | 49 |
| 9 | CO (Std. 2/4 mg/m ³) | | | | | | |
| | Min | 0.10 | | | | | |
| | Average | 0.42 | | | | | |
| | Max | 0.95 | | | | | |
| | No. of observation | Continuous | | | | | |
| 10 | Ozone (Std.100/180 µg/m ³ for 8 hrs/1 hr) | | | | | | |
| | Min | 8.2 | BDL | BDL | BDL | BDL | BDL |
| | Average | 10.0 | BDL | BDL | BDL | BDL | BDL |
| | Max | 18.5 | BDL | BDL | BDL | BDL | BDL |
| | No. of observation | Continuous | 49 | 49 | 49 | 49 | 49 |
| 11 | Benzene (Std. 5 µg/m ³) | | | | | | |
| | Min | 0.01 | BDL | BDL | BDL | 0.8 | BDL |
| | Average | 0.77 | BDL | 0.4 | BDL | 1.2 | BDL |
| | Max | 2.20 | BDL | 0.7 | BDL | 2.1 | BDL |
| | No. of observation | Continuous | 49 | 49 | 49 | 49 | 49 |
| 12 | Benzo (a) Pyrene (Std. 1 ng/m ³) | | | | | | |
| | Min | | BDL | BDL | BDL | BDL | BDL |
| | Average | | BDL | BDL | BDL | BDL | BDL |
| | Max | | BDL | BDL | BDL | BDL | BDL |
| | No. of observation | | 49 | 49 | 49 | 49 | 49 |

Average of Six Stations

| Parameter | SO ₂ | NO ₂ | PM-10 | PM-2.5 | NH ₃ | Pb | As | Ni | Benzo (a) Pyrene | CO | C ₆ H ₆ | O ₃ |
|----------------|-------------------|-----------------|--------|--------|-----------------|-------------------|-------|--------|------------------|-------------------|-------------------------------|----------------|
| Unit | µg/m ³ | | | | | ng/m ³ | | | | mg/m ³ | µg/m ³ | |
| NAAQ Std. 2009 | 50/80 | 40/80 | 60/100 | 40/60 | 100/400 | 0.5/1.0 | Max 6 | Max 20 | Max 1 | 2/4 | Max 5 | 100/180 |
| Min | 3.80 | 2.9 | 12.1 | 2.5 | 0.2 | BDL | BDL | BDL | BDL | 0.01 | 0.01 | 1.0 |
| Average | 12.45 | 16.4 | 56.4 | 28.2 | 12.7 | BDL | BDL | BDL | BDL | 0.51 | 0.75 | 8.4 |
| Max | 33.12 | 69.5 | 91.1 | 49.0 | 117.9 | BDL | BDL | BDL | BDL | 3.59 | 2.50 | 10.1 |

Appendix - A3

**Tree Plantation
(1st October, 2015 to 31st March, 2016)**

The entire area inside BGR covers with Greenery through massive plantation activities. Through massive plantation work and by giving protection to natural forest growth in side BGR premises, the entire area has become green. The entire plant area where processing plant facilities do not exist has a green cover. This helps in reduction of noise and air pollution level in one hand while on the other hand provides protection to ecological features of the area. The refinery has an excellent quality environment around its complex. Natural greenery can be seen all around the complex and in all seasons of the year.

Tree Census was done by Divisional Forest Office, Chirang. As per census, 84545 numbers of plants which include trees including shrubs, ocular estimated 33000 numbers bamboos in 1150 no. bamboo culms and also trees planted by BGR during 2003 to 2012.

During 1st October, 2015 to 31st March, 2016, BGR has planted 150 no. of trees.

Appendix – A 4

**Additional Information
(1st October, 2015 to 31st March, 2016)**

Effluent reused during the period was around **97.7%** of the total effluent treated which includes plant effluent as well as BGR Township sewer.

Under the Leak Detection and Repair programme (LDAR), BGR is conducting quarterly Fugitive Emission Survey. During the period from 1st October, 2015 to 31st March, 2016, **23448** potential leaky points checked and **174** Leaky points detected and rectified. By following LDAR programme in true spirit, the company could not only avoid potential loss of **33.99** MTA (approx.) of light Hydrocarbon to the atmosphere through fugitive sources but also able to keep healthy work environment in the plants.

To ensure work area quality and health of equipments, quarterly noise survey was conducted covering all the operating plants, control rooms and ambient surrounding the BGR. During **1st October, 2015 to 31st March, 2016**, Noise Survey for two quarters of 2015 -16 has been completed and no abnormality was reported.

As a measure of Hazardous Waste Management, M/s Balmer Lawrie & Co. Limited was awarded the contract of oily sludge processing along with bio-remediation of residual solids. The party has already completed the processing of oily sludge from sludge lagoons. Bio- remediation process of the residual part of sludge was completed.

Further two more Rain Water Harvesting (Ground Water Recharging) schemes in BGR Township have been implemented during the period.