



**REF: IOC/BGR/ENV/MS Max/MoEF&CC/2017-18/02**

**Date: 12.06.2018**

**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 1<sup>st</sup> October 2017 to 31<sup>st</sup> March 2018, for**  
**“MS Maximisation Project”.**

Dear Sir,

With reference to above, we are enclosing the Six Monthly Report for the period of **1<sup>st</sup> October 2017 to 31<sup>st</sup> March 2018** for your kind perusal.

The reports are being sent as per EIA Rules'2006 on the “Environmental Clearances” issued by MoEF&CC to Bongaigaon Refinery, (BGR) for “MS Maximisation Project”.

Thanking you,

Yours faithfully,

(A.Basumatary)  
DGM (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

# Half yearly Report for MS Maximisation Project

(1<sup>st</sup> October 2017 to 31<sup>st</sup> March 2018)



**Submitted by:**

**Indian Oil Corporation Limited**

**Bongaigaon Refinery**

**PO: Dhaligaon. District: Chirang. Assam**

## **Status of MS Maximisation Project**

**(1<sup>st</sup> October 2017 to 31<sup>st</sup> March 2018)**

Environmental Clearance for “Expansion of Pretreater & Reformer from 107,000 TPA to 160,000 TPA of Naphtha for Motor Spirit (MS) Maximisation Project” at Dhaligaon, Chirang, Assam by M/s Bongaigaon Refinery & Petrochemicals Ltd. vide MoEF’s letter No.J.11011/375/2006-IA-II (I) dated 22/03/2007;

**Project was commissioned on 31.01.2009**

<b>Sl. No</b>	<b>Conditions</b>	<b>Status</b>
1.	General & specific conditions and Compliance status of MS Maximisation Project.	Annexure- A
2.	Six monthly Stack Monitoring/ Air Quality Data	Furnished in Appendix-A1
3.	Six monthly effluent discharged quantity, Quality	Furnished in Appendix-A2
4.	Tree Plantation Data	Furnished in Appendix-A3
5.	Additional Information	Furnished in Appendix-A4
6.	Fugitive Emission Data	Furnished in Appendix-A5
7.	Annual return of hazardous waste	Furnished in Appendix-A6(a)
8.	Authorization from PCBA under Hazardous Waste, Management , Handling and Transboundary Movement Rules 2008	Furnished in Appendix-A6(b)
9.	Details of Waste water treatment and disposal system	Furnished in Appendix-A7
10.	Quarterly Noise Survey Report.	Furnished in Appendix-A8
11.	Status of Rainwater Harvesting	Furnished in Appendix-A9
12.	Screen Shot of IOCL Website upload of report	Furnished in Appendix-A10
13.	Organogram of hse Department	Furnished in Appendix-A11
14.	Gazette Notification of BGR Quality Control laboratory (QC Lab) approval under Environment (Protection) Act 1986.	Furnished in Appendix-A12
15.	Employees Occupational Health Check up Status	Furnished in Appendix-A13
16.	Flare system.	Furnished in Appendix-A14

## Annexure-A

Sr. No.	Specific Conditions	Compliance Status
(i)	The gaseous emissions (SO <sub>2</sub> , NO <sub>x</sub> , HC, VOC and Benzene) from various process units shall conform to the standards prescribed by the concerned State Pollution Control Board. All the measures detailed in the EMP and response to the Public Hearing shall be taken to control the point/stack and fugitive gaseous emissions from the proposed facilities, process plants and storage units etc. for ensuring that the ambient air quality around the Refinery due to the expansion is maintained at the predicted 24 hourly average maximum concentration.	Complied  The gaseous emission is within limits, the HC detectors give continuous reading of the emissions at various locations. Emission data attached as appendix-A1
(ii)	There will be no increase in the pollution load for any parameter, except the waste water and solid waste generation, due to the expansion project.	No increase in emission pollutant load.
(iii)	No additional stack is envisaged for the revamp of Pretreater and Reformer.	No new stack in the project
(iv)	The emission levels of the other pollutants shall remain within the existing levels.	The emission levels of the other pollutants are within the existing levels
(v)	Low Sulphur internal fuel oil & fuel gas will be fired in process heaters and boilers.	Low sulphur fuel oil & low sulphur fuel gas is only burnt in the system.
(vi)	Quarterly monitoring of fugitive emissions will be carried out by Fugitive Emission Detectors (GMI Leak Surveyor). Guidelines of CPCB will be followed for monitoring fugitive emissions.	Quarterly fugitive emissions Survey is being carried out regularly.  The quarterly reports for the period of <b>1<sup>st</sup> October 2017 to 31<sup>st</sup> March 2018</b> are attached as <b>Annexure –A5</b>
(vii)	For control of fugitive emissions, all unsaturated hydrocarbons will be routed to the flare system. The flare system shall be designed for smokeless burning.	There is no open vent. All process systems are routed to the Flare Gas Recovery System (FGRS).
(viii)	Flare Gas Recovery System will be installed for reduction of Hydrocarbon loss and emissions of VOCs, NO <sub>x</sub> , SO <sub>2</sub> & CO <sub>2</sub> to the environment.	FGRS was commissioned on 2 <sup>nd</sup> August, 2009.
(ix)	Regular Ambient Air Quality Monitoring shall be carried out. The location and results of existing monitoring stations will be reviewed in consultation with the concerned State Pollution Control Board based on the occurrence of maximum ground level concentration and downwind direction of wind. Additional stations shall be set up, if required. It will be ensured that at least one monitoring station is set up in up-wind & in down-wind direction along with those in other directions.	Regular Ambient Air Quality Monitoring is being carried out. The locations of ambient station are decided on the basis of the highest ground level concentration of pollutants based on dispersion modeling in consultation with PCBA.  Since there is no increase in emission of stack pollutants, review for relocation/ additional station is not envisaged.

Sr. No.	Specific Conditions	Compliance Status
(x)	Online data for air emission shall be transferred to the CPCB and SPCB regularly. The instruments used for ambient air quality monitoring shall be calibrated regularly. The monitoring protocol shall ensure continuous monitoring of all the parameters.	All the stacks emission (on-line) data are being submitted to statutory agencies at regular intervals. The instruments used for stacks/ ambient air monitoring are being regularly calibrated and monitoring is being done as per new "Effluent & Emission Rules, 2008". Pl. refer to appendix-A1
(xi)	The practice of acoustic plant design shall be adopted to limit noise exposure for personnel to an 8 hr time weighted average of 90 db (A).	Taken care during implementation of the project. Quarterly Noise Survey is being carried out regularly. Quarterly Reports for the period of <b>1<sup>st</sup> October 2017 to 31<sup>st</sup> March 2018 are attached as ANNEXURE –A8.</b>
(xii)	All the Pumps and other equipment's where there is a likelihood of HC leakages shall be provided with LEL indicators and hydrocarbon detectors. Provision for immediate isolation of equipments, in case of a leakage will also be made. The company shall adopt Leak Detection and Repair (LDAR) programme for quantification and control of fugitive emissions.	Complied  Additional 2 HC, 2 H <sub>2</sub> & 1 H <sub>2</sub> S detectors have been installed in addition to earlier installed 3 H <sub>2</sub> & 6 HC detectors  LDAR program is being conducted quarterly in accordance with New Effluent & Emission Standards, 2008.
(xiii)	The product loading gantry shall be connected to the product sphere in closed circuit through the vapor arm connected to the tanker. Data on fugitive emission shall be regularly monitored and records will be maintained.	Not Applicable to this project Quarterly monitoring of fugitive emissions shall be carried out.  The quarterly reports for the period <b>1<sup>st</sup> October 2017 to 31<sup>st</sup> March 2018 are attached as Annexure –A5</b>
(xiv)	The company shall ensure that no halogenate organic is sent to the flares. If any stream of the halogenated organic are present, then the respective streams may be incinerated. If there are no technically feasible or economically viable reduction/recovery options. Any stream containing organic carbon, other than halogenated shall be connected to proper flaring system, if not to a recovery device or an incinerator.	There is no halogenated organic component in the streams of this project.

(xv)	All new standards/norms that are being proposed by the CPCB for Petrochemical Plants and Refineries shall be applicable for the proposed expansion unit. The company shall conform to the process vent standards for organic chemicals including non-VOCs and all possible VOCs i.e. TOCs standards and process vent standards for top priority chemicals. Regular monitoring will be carried out for VOC and HC and On-line monitors for VOC measurements may be installed.	New Emission & Effluent Standards'2008 are being complied
(xvi)	No additional fresh water will be required for the expansion project. The total requirement of 197 m <sup>3</sup> /hr of fresh water will be met from the existing water withdrawal permissions.	Ensured. No additional fresh water is being consumed in this project.
(xvii)	Waste water generation after the expansion project will be around 0.015 m <sup>3</sup> /hr which will be treated in the existing ETP. Part of the treated effluent shall be recycled and remaining shall be disposed into the Tunia Nala through closed pipeline.	Complied Detail of WWTP is attached as appendix-A7

Sr. No.	Specific Conditions	Compliance Status
(xviii)	Regular monitoring of relevant parameters for the under ground water in the surrounding areas will be undertaken and the results will be submitted to the relevant States Pollution Control Board.	Complied. Ground water sample from seven different location in the surrounding areas were collected and testes in the Month of Jan'2018. Report of the same was submitted to MoEF&CC, Shillong on 11/01/2018.
(xix)	Solid waste generated as Pretreater and Reformer Catalysts, Sulphur guard absorbent and Alumina Balls will be disposed off as per the authorisation from State Pollution Control Board.	Complied. Please Refer Appendix-A6(a)
(xx)	Oily sludge shall be sent to melting pit treatment for recovery of oil. The recovered oil shall be recycled into the refinery system. The residual sludge will be stored in HDPE lined pit for disposal after treatment. The sludge will be incinerated in the premises only.	Being complied. A confined bio reactor was commissioned in <b>July 2017</b> in association with IOCL R&D to treat residual oily sludge. Till March'2018 370 MT of oily sludge has been processed in the bio-reactor.

(xxi)	Green belt shall be provided to mitigate the effects of fugitive emissions all around the plant in a minimum of 33% of the plant area in consultation with DFO as per CPCB guidelines.	Greenbelt is already existed. More than 33% of plant area is having green cover. Tree Census has been carried out through DFO Chirang District in 2013 where 84545 nos of grown up trees were enumerated. The company is planting around 2000 nos of tree every year as a part of its corporate MOU. <b>In the year 2017-18, till 31<sup>st</sup> March'18 BGR has planted 29600 nos. of trees</b>
(xxii)	The company shall strictly follow all the recommendations mentioned in the Charter on Corporate Responsibility for Environmental Protection (CREP).	The company followed all the recommendation mentioned in the charter on Corporate Responsibility for Environmental Protection (CREP) prior to coming of the Revised Standards applicable to refinery for Environment Protection.
(xxiii)	The Company shall harvest surface as well as rainwater from rooftops of the buildings proposed in the expansion project and storm water drains to recharge the ground water and use the same water for the various activities of the project to conserve fresh water.	16 nos of Rooftop Rainwater Harvesting Projects has been implemented covering roof area of <b>17440 SQM having potential volume of rainwater harvesting 46727M<sup>3</sup></b> . The harvested rainwater for ground water recharge is through recharge pits and recharge trench on the basis of technical details and guidelines from Central Ground Water Board; North Eastern Region, Guwahati. <b>Details attached as ANNEXURE –A9</b>
(xxiv)	Occupational Health Surveillance of the workers should be done on a regular basis and records maintained as per the Factories Act.	Complied <b>Details attached as Appendix-A13</b>
(xxv)	The Company shall implement all the recommendations made in the EIA /EMP report and risk assessment report.	All recommendation has been complied
(xxvi)	The company will undertake all relevant measures, as indicated during the Public Hearing for improving the Socio-economic conditions of the surrounding area.	Complied. Taking care under CSR Program.

### C. GENERAL CONDITIONS

Sr. No.	General Conditions	Compliance status
(i)	The project authorities must strictly adhere to the stipulations made by the concerned State Pollution Control Board (SPCB) and the State Government.	Complied

(ii)	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests.	EC was granted by MoEF&CC to BGR for IndMax & BS-VI projects vide letter F. no.J11011/48/2016-IA-II (I), Dated 19 <sup>th</sup> Apr'2017.  <b>The project aims to enhance expansion of Crude processing from 2.35 to 2.7 MMTP, DHDT capacity from 1.2 to 1.8 MMTP, HGU from 25 KTPA to 30 KTPA, CRU-MSQ revamp and SDS unit.</b>
(iii)	At no time, the emissions should go beyond the prescribed standards. In the event of failure of any pollution control system adopted by the units, the respective unit should be immediately put out of operation and should not be restarted until the desired efficiency has been achieved.	Complied  Provision for emergency shutdown of unit is provided
(iv)	Adequate number of influent and effluent quality monitoring stations shall be set up in consultation with the SPCB. Regular monitoring shall be carried out for relevant parameters for both surface and ground water.	Complied all the stipulations made in the NOC issued by PCBA. Regular monitoring of all relevant parameters is being carried out and reports are being regularly submitted.
(v)	Industrial wastewater shall be properly collected and treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May 1993 and 31st December, 1993 or as amended from time to time. The treated wastewater shall be utilized for plantation purpose.	Waste water disposal system designed to conform to this norm. Detail of Waste water treatment and disposal system is attached as APPENDIX-A7. Treated Effluent and discharge water quality from refinery is attached as Appendix-A1
(vi)	The overall noise levels in and around the plant area shall be limited within the prescribed 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 (day time) and 70 dBA (night time).	Taken care during implementation of the project. Quarterly Noise Survey is being carried out regularly. Quarterly Reports for the period of <b>1<sup>st</sup> October 2017 to 31<sup>st</sup> March 2018</b> are attached as Appendix –A8.
(vii)	The project authorities must strictly comply with the provisions made in Manufacture, Storage and Import of Hazardous Chemicals Rules 1989 as amended in 2008 for handling of hazardous chemicals etc. Necessary approvals from Chief Controller of Explosives must be obtained before commission of the expansion project. Requisite On-site and Off-site Disaster Management Plans will be prepared and implemented.	Complied
(viii)	Authorization from the State Pollution Control Board must be obtained for collections/ treatment/ storage/ disposal of hazardous wastes.	Complied Authorization under Hazardous Waste ( Management , Handling and Transboundary Movement Rules 2008) obtained from PCBA and valid upto 28 <sup>th</sup> February 2019. <b>Copy attached as Appendix –A6(b)</b>



(ix)	The project authorities will provide adequate funds both recurring and non-recurring to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided should not be diverted for any other purposes.	Funds were made available for implementing all recommendations  Expenditure for the financial year 2017-18 was Rs.534.43 Lacs and budget estimate for 2018-19 is Rs 600 Lacs.
(x)	The stipulated conditions will be monitored by the concerned Regional Office of this Ministry /Central Pollution Control Board/State Pollution Control Board. A six monthly compliance report and the monitored data should be submitted to them regularly. It will also be displayed on the Website of the Company.	Complied
(xi)	The Project Proponent should inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the State Pollution Control Board/ Committee and may also be seen at Website of the Ministry of Environment and Forests at <a href="http://www.envfor.nic.in">http://www.envfor.nic.in</a> . This should 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 should be forwarded to the concerned Regional office of this Ministry.	Complied
(xii)	The date of Financial Closure and final approval of the project by the concerned authorities and the date of commencing the land development work as well as the commissioning of the project will be informed to the Ministry and its Regional Office.	<ul style="list-style-type: none"> <li>• Project commissioned on: 31.01.2009</li> <li>• Financial Closure: 29.07.2010</li> <li>• No land development activity was there in this project</li> </ul>
(xiii)	Proper House keeping and adequate occupational health Programmes shall be taken up. Regular Occupational Health Surveillance Programme for the relevant diseases shall be carried out and the records shall be maintained properly for at least 30-40 years. Sufficient preventive measures shall be adopted to avoid direct exposure to emission and other Hydrocarbons etc.	BGR has already implemented TPM across the refinery. Regular housekeeping is an integral part of the system. Regular health check-up is carried out for the employees and records are maintained. All necessary precautions/ preventive measures are taken to avoid direct exposure to emission and other Hydrocarbons etc.
(xiv)	A separate environment management cell with full fledge laboratory facilities to carry out various management and monitoring functions shall be set up under the control of a Senior Executive.	BGR is already having a separate environmental management cell and full fledged laboratory to carry-out environment management and monitoring functions. Organogram of HSE Department is attached as Appendix-A12. BGR Environment Laboratory is accredited by NABL and recognized by <b>C.P.C.B.</b> as under Section 12&13 of Environment (Protection) Act 1986 and notified in the Govt. of India Gazette no. 272 dated July 4, 2016 vide notification number Legal 42(3)/ 87 dated 7th March 2016. <b>(Copy attached as Appendix-A12)</b>

## APPENDIX –A1

STACK MONITORING DATA: (1<sup>st</sup> October 2017 to 31<sup>st</sup> March 2018)

### A. SO<sub>2</sub> Emission (mg/Nm<sup>3</sup>):

Stacks	Emission Std.	Observed value		
		Min	Avg.	Max
CDU-I	For F.O. = 1700 For F.G. = 50	22	200	854
CDU-II		9	192	423
DCU-I		9	123	367
DCU-II		8	230	531
CPP		20	249	714
Reformer		9	12	14
HO-1		10	13	16
Isomerisation		9	13	15
DHDT		14	15	18
HGU		1	4	48
SRU		85	427	995
GTG		3	25	169

### B. NO<sub>x</sub> Emission (mg/Nm<sup>3</sup>):

Stacks	Emission Std.	Observed value		
		Min	Avg.	Max
CDU-I	For F.O. = 450 For F.G. = 350	20	46	92
CDU-II		31	32	36
DCU-I		3	41	58
DCU-II		7	87	114
CPP		166	257	827
Reformer		57	100	110
HO-1		58	76	126
Isomerisation		54	69	78
DHDT		13	85	239
HGU		3	23	134
SRU		No Analyser		
GTG		12	30	85

### C. PM Emission (mg/Nm<sup>3</sup>)

Stacks	Emission Std.	Observed value		
		Min	Avg.	Max
CDU-I	For F.O. = 100 For F.G. = 10	1.1	5.2	12.5
CDU-II		0.1	4.8	13.7
DCU-I		2.4	7.5	10.0
DCU-II		0.8	2.3	35.6
CPP		1.1	2.7	7.9
Reformer		1.2	1.2	1.3
HO-1/2		4.5	5.3	6.4
Isomerisation		0.2	0.8	2.5
DHDT		0.9	2.1	2.9
HGU		0.2	0.7	8.0
SRU		16.6	24.2	96.8

**STACK MONITORING DATA : ( 1<sup>st</sup> October 2017 to 31<sup>st</sup> March 2018)**  
**D. CO Emission (mg/Nm<sup>3</sup>)**

Stacks	Emission Std.	Observed value		
		Min	Avg.	Max
CDU-I	For F.O. = 200 For F.G. = 150	3.5	21.0	106.2
CDU-II		0.8	37.4	118.1
DCU-I		9.0	22.2	34.4
DCU-II		1.0	77.1	135.7
CPP		23.4	34.4	107.0
Reformer		17.6	18.7	20.6
HO-1/2		16.4	18.7	32.2
ISOMERISATION		17.6	18.7	20.6
DHDT		7.2	34.8	136.0
HGU		4.0	17.6	20.0
SRU		2.5	20.8	29.1

**E. Ni + V Emission (mg/Nm<sup>3</sup>):**

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)  
(1<sup>st</sup> October 2017 to 31<sup>st</sup> March 2018)

	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
<b>1</b>	<b>SO<sub>2</sub> (Std. 50/80 µg/m<sup>3</sup>)</b>						
	Min	1.28	4.2	4.5	4.5	4.5	4.2
	Average	9.88	5.9	6.3	6.9	6.8	5.7
	Max	22.27	7.8	8.2	8.8	8.5	6.8
	No. of observation	Continuous	52	52	52	52	52
<b>2</b>	<b>NO<sub>2</sub> (Std. 40/80 µg/m<sup>3</sup>)</b>						
	Min	9.0	9.0	9.5	9.2	9.2	9.2
	Average	9.5	11.0	11.3	11.9	11.3	10.3
	Max	10.3	13.5	13.8	14.8	13.5	11.8
	No. of observation	Continuous	52	52	52	52	52
<b>3</b>	<b>PM-10 (Std. 60/100 µg/m<sup>3</sup>)</b>						
	Min	29.0	32.0	36.0	42.0	45.0	35.0
	Average	30.1	49.5	52.2	60.1	57.8	49.1
	Max	35.2	68.0	68.0	76.0	74.0	60.0
	No. of observation	Continuous	52	52	52	52	52
<b>4</b>	<b>PM-2.5 (Std. 40/60 µg/m<sup>3</sup>)</b>						
	Min	1.3	17.0	17.0	20.0	22.0	15.0
	Average	7.9	25.9	26.9	30.9	29.3	24.3
	Max	32.4	36.0	35.0	39.0	38.0	32.0
	No. of observation	Continuous	52	52	52	52	52
<b>5</b>	<b>Ammonia (Std. 100/400 µg/m<sup>3</sup>)</b>						
	Min	4.1	6.5	6.5	6.8	6.5	6.2
	Average	4.7	9.1	9.4	10.5	10.1	8.0
	Max	5.5	12.2	12.5	13.2	13.5	11.5
	No. of observation	Continuous	52	52	52	52	52
<b>6</b>	<b>Pb (Std. 0.5/1.0 µg/m<sup>3</sup>)</b>						
	Min		BDL	BDL	BDL	BDL	BDL
	Average		BDL	BDL	BDL	BDL	BDL
	Max		BDL	BDL	BDL	BDL	BDL
	No. of observation		52	52	52	52	52

<b>7</b>	<b>Arsenic (As) (Std. 6 ng/m<sup>3</sup>)</b>						
	Min		BDL	BDL	BDL	BDL	BDL
	Average		BDL	BDL	BDL	BDL	BDL
	Max		BDL	BDL	BDL	BDL	BDL
	No. of observation		52	52	52	52	52

<b>8</b>	<b>Ni (Std. 20 ng/m<sup>3</sup>)</b>						
	Min		BDL	1.2	1.2	1.5	BDL
	Average		BDL	1.2	2.0	2.1	BDL
	Max		BDL	1.2	2.8	2.6	BDL
	No. of observation		52	52	52	52	52
<b>9</b>	<b>CO (Std. 2/4 mg/m<sup>3</sup>)</b>						
	Min	0.01	BDL	0.1	0.2	0.1	BDL
	Average	1.1	BDL	0.1	0.2	0.2	BDL
	Max	3.9	BDL	0.1	0.3	0.3	BDL
	No. of observation	Continuous	52	52	52	52	52
<b>10</b>	<b>Ozone (Std.100/180 µg/m<sup>3</sup> for 8 hrs/1 hr)</b>						
	Min	18.4	8.0	8.0	6.0	8.0	6.0
	Average	35.8	14.0	14.1	14.1	13.0	12.1
	Max	49.0	25.0	25.0	25.0	24.0	22.0
	No. of observation	Continuous	52	52	52	52	52
<b>11</b>	<b>Benzene (Std. 5 µg/m<sup>3</sup>)</b>						
	Min	0.01	BDL	0.2	BDL	BDL	BDL
	Average	0.25	BDL	0.2	BDL	BDL	BDL
	Max	2.23	BDL	0.2	BDL	BDL	BDL
	No. of observation	Continuous	52	52	52	52	52
<b>12</b>	<b>Benzo (a) Pyrene (Std. 1 ng/m<sup>3</sup>)</b>						
	Min		BDL	BDL	BDL	BDL	BDL
	Average		BDL	BDL	BDL	BDL	BDL
	Max		BDL	BDL	BDL	BDL	BDL
	No. of observation		52	52	52	52	52

Average of Six Stations												
Parameter	SO <sub>2</sub>	NO <sub>2</sub>	PM-10	PM-2.5	NH <sub>3</sub>	Pb	As	Ni	Benzo (a) Pyrene	CO	C <sub>6</sub> H <sub>6</sub>	O <sub>3</sub>
Unit	µg/m <sup>3</sup>					ng/m <sup>3</sup>			mg/m <sub>3</sub>	µg/m <sup>3</sup>		
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	1.3	9.0	29.0	1.3	4.1	BDL	BDL	1.2	BDL	0.01	0.01	6.0
Average	6.9	10.9	49.8	24.2	8.6	BDL	BDL	1.8	BDL	0.4	0.20	17.2
Max	22.3	14.8	76.0	39.0	13.5	BDL	BDL	2.8	BDL	3.9	2.23	49.0

## 4.0

## APPENDIX-A2

**Effluent Discharged (Figure in M<sup>3</sup>/Hr): (1<sup>st</sup> October 2017 to 31<sup>st</sup> March 2018)**

<b>A</b>	<b>Industrial Effluent M<sup>3</sup>/Hr</b>	<b>164.53</b>
<b>B</b>	<b>Domestic Effluent from BGR Township M<sup>3</sup>/Hr</b>	<b>46.47</b>
<b>C</b>	<b>Total Effluent Treated (A + B) M<sup>3</sup>/Hr</b>	<b>211.0</b>
<b>D</b>	<b>Treated Effluent Reused M<sup>3</sup>/Hr</b>	<b>207.19</b>
<b>E</b>	<b>Effluent Discharged M<sup>3</sup>/Hr</b>	<b>3.81</b>
<b>F</b>	<b>M<sup>3</sup> of Effluent discharged for 1000 tons of Crude processed</b>	<b>13.58</b>

**1. Treated Effluent Quality****(1<sup>st</sup> October 2017 to 31<sup>st</sup> March 2018)**

<b>Sl. No</b>	<b>Parameter</b>	<b>Std ,2008</b>	<b>Min</b>	<b>Avg.</b>	<b>Max</b>
1	p <sup>H</sup> value	6.0 - 8.5	6.5	7.4	8.5
2	Oil and Grease, mg/l	5.0	1.0	1.1	1.5
3	Bio-Chemical Oxygen Demand (3 Days at 27°C), mg/l	15.0	4.0	8.6	14.8
4	Chemical Oxygen Demand (COD), mg/l	125.0	40.0	67.8	121.0
5	Suspended solids, mg/l	20.0	4.0	12.3	19.5
6	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH), mg/l	0.35	0.010	0.037	0.330
7	Sulphide (as S), mg/l	0.50	0.08	0.16	0.42
8	CN mg/l	0.20	BDL	BDL	BDL
9	Ammonia as N, mg/l	15.0	1.05	1.15	1.24
10	TKN, mg/l	40.0	4.20	4.68	5.20
11	P, mg/l	3.0	0.26	0.27	0.28
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	0.18	0.225	0.280
17	Ni, mg/l	1.0	-	BDL	-
18	Cu, mg/l	1.0	0.03	0.035	0.040
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

### 2. Final Outlet (From the Complex) Effluent Quality

(1<sup>st</sup> October 2017 to 31<sup>st</sup> March 2018)

Sl. No.	Parameter	Std 2008	Min	Avg.	Max
1	p <sup>H</sup> value	6.0 - 8.5	6.5	7.3	9.0
2	Oil and Grease, mg/l	5.0	1.0	1.5	2.2
3	Bio-Chemical Oxygen Demand (3 Days at 27° C), mg/l	15.0	3.6	8.2	15.0
4	Chemical Oxygen Demand (COD), mg/l	125.0	45.0	64.0	91.0
5	Suspended Solids, mg/l	20.0	4.0	10.2	19.0
6	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH), mg/l	0.35	0.02	0.08	0.30
7	Sulphide (as S), mg/l	0.50	0.1	0.3	0.5
8	CN, mg/l	0.20	BDL	BDL	BDL
9	Ammonia as N , mg/l	15.0	2.10	2.48	2.80
10	TKN, mg/l	40.0	4.80	5.25	5.60
11	P, mg/l	3.0	0.24	0.26	0.28
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	0.3	0.283	0.3
17	Ni, mg/l	1.0	-	BDL	-
18	Cu, mg/l	1.0	0.04	0.045	0.05
19	V, mg/l	0.20	-	BDL	-
20	Benzene, mg/l	0.10	-	BDL	-
21	Benzo (a) pyrene, mg/l	0.20	-	BDL	-



**APPENDIX - A3****Tree Plantation  
(1<sup>st</sup> October 2017 to 31<sup>st</sup> March 2018)**

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, 1<sup>st</sup> April 2017 to 31<sup>st</sup> March 2018 BGR has planted 29600 nos. of trees.**



**WITHIN THE COMPLEX AN OLD DEBRIS YARD DEVELOPED INTO GREEN BELT**



**IOCL, BGR TOWNSHIP PLANTATION**



**IOCL, BGR TOWNSHIP PLANTATION**



**BIRHANGAON GOVT. STATE DISPENSAR PLANTATION**

## **APPENDIX – A 4**

### **Additional Information (1<sup>st</sup> October 2017 to 31<sup>st</sup> March 2018)**

Effluent reused during the period was around **98.19 %** 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 **1<sup>st</sup> October 2017 to 31<sup>st</sup> March 2018**, **23519** potential leaky points checked and **165** Leaky points detected and rectified. By following LDAR programme in true spirit, the company could not only avoid potential loss of **50.29** 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 **1<sup>st</sup> October 2017 to 31<sup>st</sup> March 2018**, Noise Survey for two quarters of 2017 -18 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 mechanized treatment of tank bottom sludge. Melting pit facility is available for recovering oil from oily sludge.

One old slurry thickener from Petrochemical section was converted to confined space bio-remediation reactor to treat oily sludge with help from IOCL-R&D. The process of bio-remediation started from July 2017 and at present per batch approximately 35 m3 of oily sludge is being processed.



**BIO-REMEDICATION FACILITY OF BGR**

Further two more Rain Water Harvesting (Ground Water Recharging) schemes in BGR Township have been implemented during 2016-17.

6.0

## APPENDIX –A5

### Quarterly Fugitive emission Data (1<sup>st</sup> October 2017 to 31<sup>st</sup> March 2018)



FUG EMISSION DATA  
3RD QTR 17-18.docx



FUG EMISSION DATA  
4TH QTR 17-18.docx

8.0

APPENDIX-A6 (a)



Haz Waste Return  
FORM-4 (2016-17).dc

**9.0**

**Annexure –A6 (b)**

**Authorization from PCBA for Hazardous Waste (Management,  
Handling and Transboundary Movement Rules 2008)**



**Consent under HW  
Rules 2008.pdf**

**10.0**

**APPENDIX-A7**

**Detail of Waste water treatment and disposal system.**



**ETP Description.pdf**

11.0

**ANNEXURE-A8**

**Quarterly Noise Survey Data**  
(1<sup>st</sup> October 2017 to 31<sup>st</sup> March 2018)

**HSE (ENVIRONMENT) DEPARTMENT**



**NOISE SURVEY DATA  
3RD QTR 17-18.docx**



**NOISE SURVEY DATA  
4TH QTR 17-18.docx**



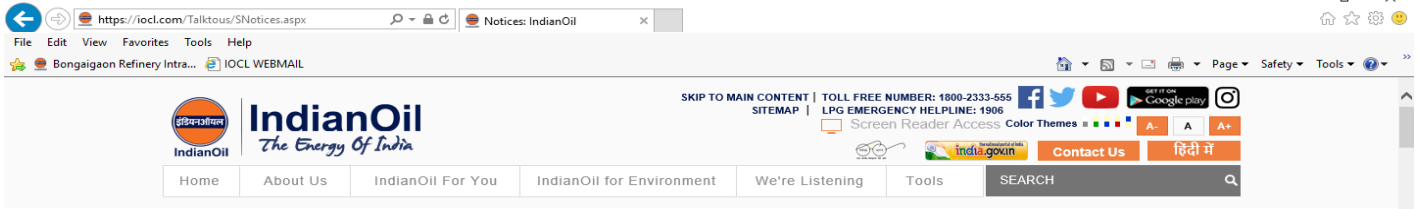
## 12.0

### ANNEXURE-A9

#### Rain Water Harvesting Data

<b>Status of Rainwater Harvesting</b>				
<b>Sl. No</b>	<b>Location</b>	<b>Rooftop Area In M<sup>2</sup></b>	<b>Volume of Rainwater harvesting potential (CUM)</b>	<b>Year of implementation</b>
	<b>Implemented</b>			
1	Rainwater Harvesting at Manjeera Guest House	677	1733	2008-09
2	Rainwater Harvesting at Deoshri Guest House	581	1487	2008-09
3	Mandir Complex	833	2132	2011-13
4	MANAS GUEST HOUSE	639	1636	2011-13
5	BRPL VIDYALAYA	1361	3484	2011-13
6	DPS BLOCK-I	704	1802	2011-13
7	DPS BLOCK-II	1810	4634	2011-13
8	Artificial Recharge thru' TW # 3 Roof Top water from Canteen, Cycle/Scooter Shades, CISF bldg. etc.	3134	8023	2011-13
9	Rainwater Harvesting from roof top area of Champa Club	1080	3100	2013-14
10	Rainwater Harvesting from roof top area of Refinery Club Cum Community Centre	2833	8132	2013-14
11	Rain Water Harvesting at CISF ADM Building	825	2368	2014-15
12	Rain Water Harvesting at BGREU Office	275	789	2014-15
13	CISF Barrack	1050	3013	2015-16
14	BGR Community Hall	650	1865	2015-16
15	Gallery of Football Stadium (BGR Township)	988	2529	2016-17
16	Gallery of Volleyball Stadium (BGR Township)			
	<b>Total</b>	<b>17440</b>	<b>46727</b>	

**Screen Shot of IOCL Website upload of report**  
**Link: <https://iocl.com/Talktous/SNotices.aspx>**



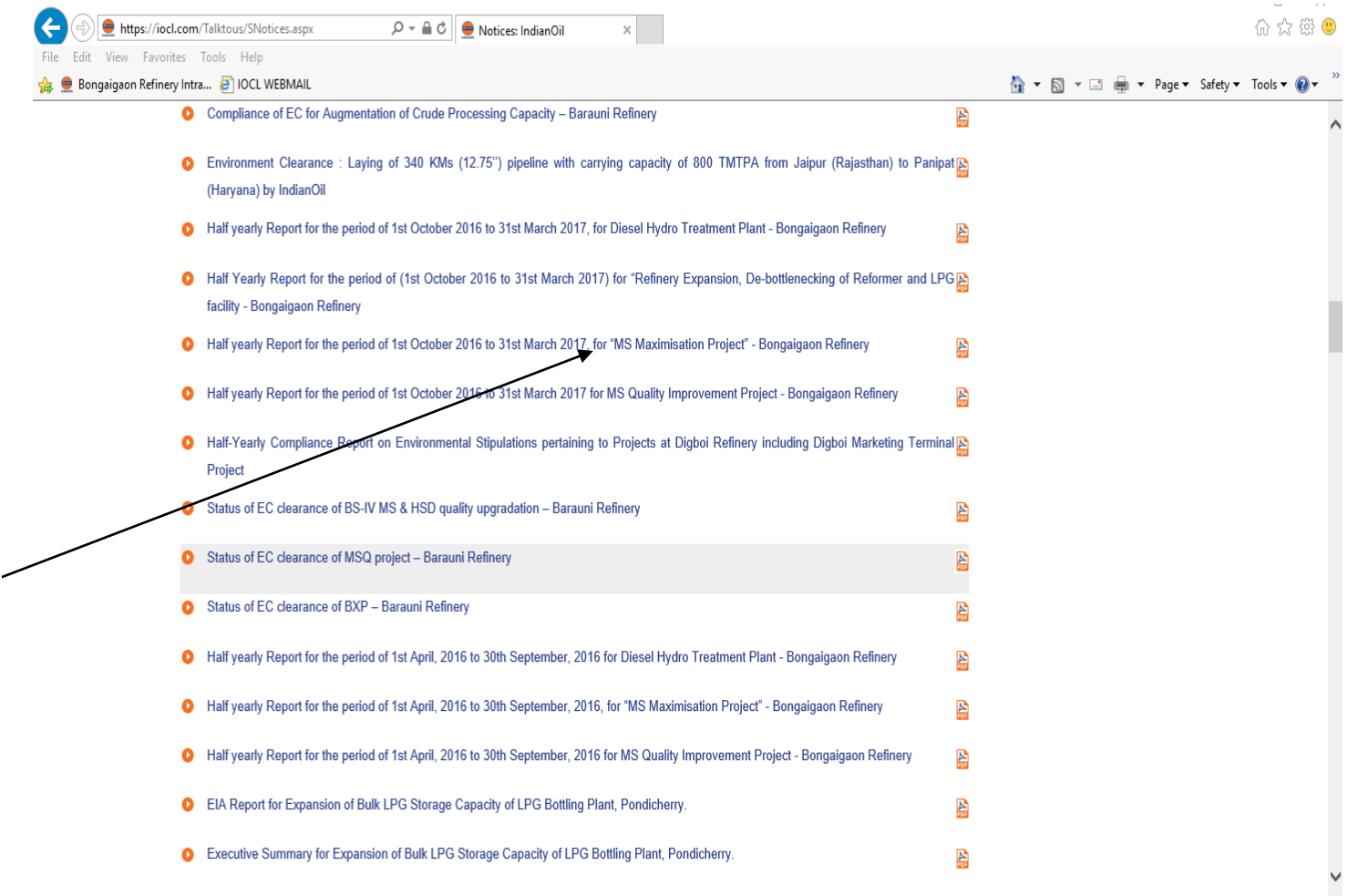
> We are Listening > Statutory Notices

**Statutory Notices**

- Compliance Report on Terms & Conditions of Environmental Clearance for POL Depot at Imphal, Malom Manipur ▲new!
- Compliance of EC for MSQ project (Oct'17-Mar'18) – Barauni Refinery
- Compliance of EC for Augmentation of Crude Processing Capacity (Oct'17 - Mar'18) – Barauni Refinery
- Compliance of EC for BS-IV MS & HSD quality upgradation (Oct'17- Mar'18) – Barauni Refinery
- Compliance of EC for BXP (Oct'17- Mar'18) – Barauni Refinery
- Compliance of EC for CRU project (Oct'17-Mar'18) – Barauni Refinery

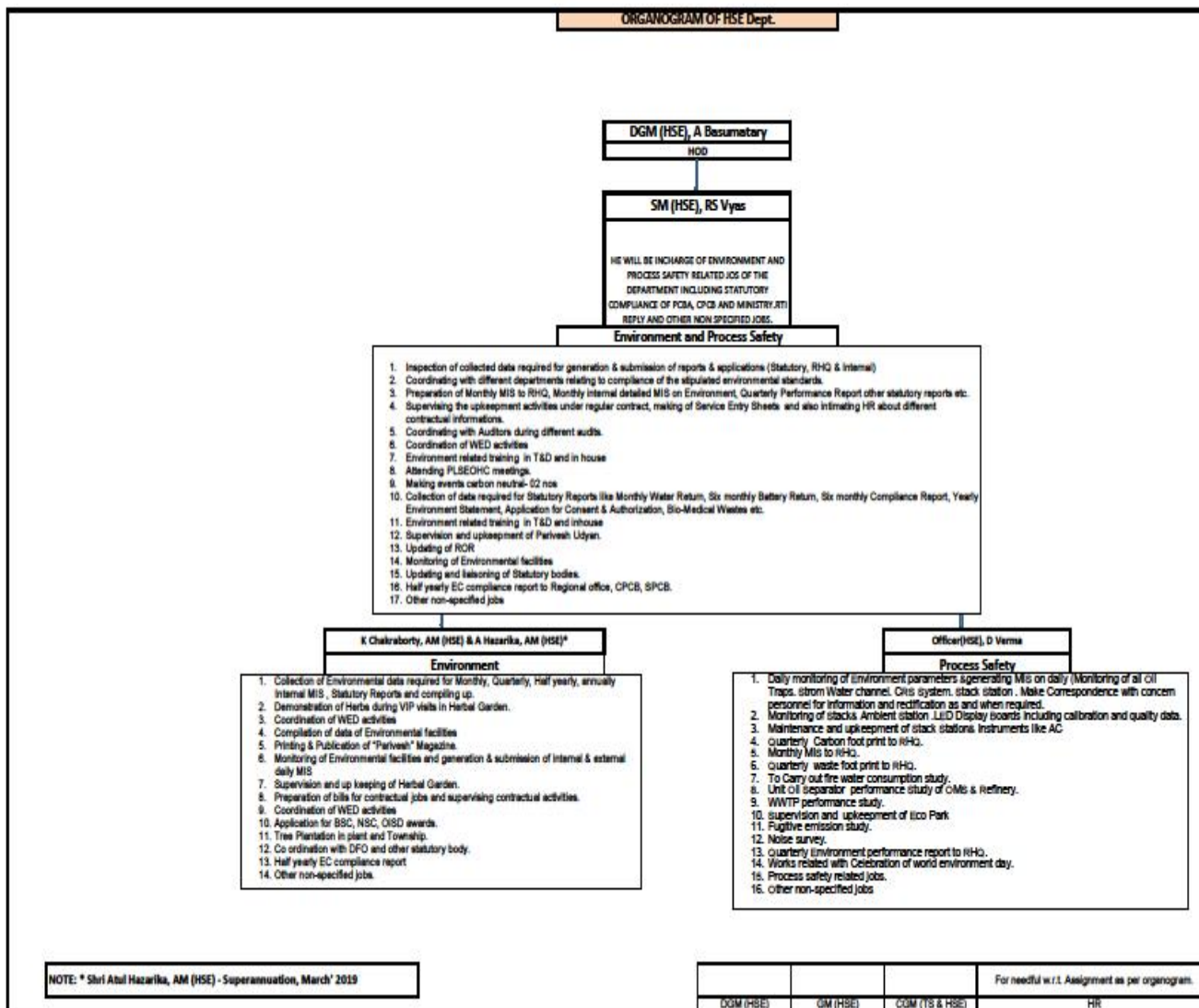
**We are Listening**

- > Help
- > PaHal-Related Queries
- > Other LPG Queries
- > Queries on Fuel Stations



APPENDIX-A11

HSE Organogram of IOCL-BGR

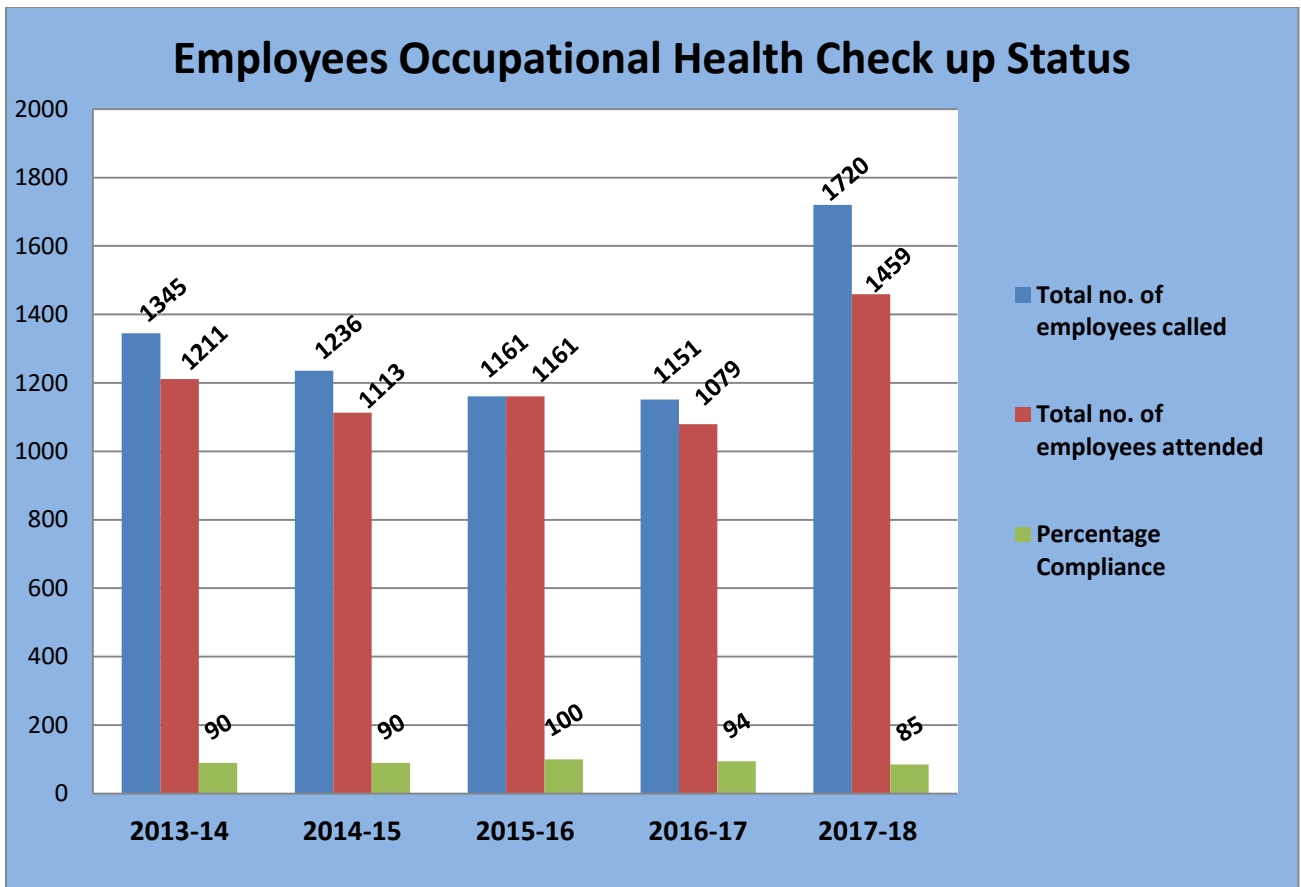




16.0

### Appendix-A13

#### Employees Occupational Health Check up Status



# Appendix-A14

