

## COMPLIANCE OF CONDITIONS IN ENVIRONMENTAL CLEARANCE

### (COMPLIANCE REPORT)

Environmental Clearance J-11011/431/2011-IA II(I), dt: 25.06.2014

Well Nos.:GGAL

Drilling Status: Drilled

Sl.No.	Conditions	Compliance status as on 01.07.2016
1	This EC is only for Exploratory Drilling. In case Development drilling is to be done in future, prior clearance must be obtained from the Ministry.	<b>Complied.</b> This EC and conditions prescribed therein are only for drilling exploratory wells whereas for drilling development wells separate EC will be taken.
2	Ambient air quality shall be monitored near the closest human settlements as per the National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No.826(E) dated 16th November, 2009 for PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>x</sub> , CO, methane & Non-methane HC etc.	<b>Complied.</b> Ambient air quality was monitored through 3rd party for PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>x</sub> , CO, methane & Non-methane HC, within and upto the premises of drill site. Henceforth, monitoring of AAQM shall also be carried out near the closest human settlement. It is evident from the monitoring reports placed as Annexure - I, that the concentration of all parameters are within prescribed limits.
3	Mercury shall also be analyzed in air, water and drill cuttings twice during drilling period.	<b>Complied.</b> Mercury was analysed in waste water & drill cuttings during drilling period. For Testing of mercury in air the program is underway. Report placed as Annexure - II
4	Approach road shall be made pucca to minimise generation of suspended dust.	<b>Complied.</b> Approach road to drill site are made of metalls to minimise generation of suspended dust during transportation of rig equipment, etc.. In case of this well approach road of dimension 450 m x 4.0 m was constructed.
5	The company shall make the arrangement for control of noise from the drilling activity Acoustic enclosure shall be provided to DG Sets and proper stake height shall be provided as per CPCB guidelines.	<b>Complied.</b> Acoustic enclosure have been provided to DG sets to reduce noise within permissible limits (Noise level monitoring divulge the efficiency of the acoustic enclosures when the noise levels were monitored within the perimeters of the drill site. However, the noise levels are slightly higher near the engine house and mud pump area and personnel working in these areas are always using ear muff/plug, pl refer reports placed as Annexure-III). The height of Stack of 3 nos. of DG sets ranges from 7-8-ft. Though as per formula referred by CPCB guidelines the stack height of gen sets should be approx. 5 metre. However, the GLC of various parameters prescribed in NAAQM are within the permissible limit which qualifies the spirit under which stack height standards has been set by CPCB. Please refer to AAQM report placed at Annexure - IV. It is notable that the increase in the present height of stacks of DG sets, shall reduce the efficiency of DG sets, as assessed internally. In light of this present stack height of the DG sets should be considered as appropriate.
6	Total water requirement shall not exceed 27 M3/day and prior permission shall be obtained from the competent authority.	<b>Complied.</b> During the drilling activity the water consumption was approx. 27 m3 per day on an average.
7	The Company shall construct the garland drain all around the drilling site to prevent run off any oil containing waste it to the nearby water bodies. Separate drainage system shall be created for oil contaminated and non-oil contaminated. Effluent shall be properly treated and treated waste water should confirmed to CPCB standards.	The garland drains are not constructed to prevent run off any oil contaminating waste as all the vulnerable processes like diesel storage tank, POL shed have their dedicated containment whereas Drains are constructed through out the drill site near mud pumps, cellar pit, mud tanks which drain waste water in HDPE lined waste pit. No garland drains are constructed around drill sites as these are not required since the waste pits have enough volume to accumulate waste water and prevent any run off. The drilled cuttings and other wastes are collected in HDPE lined waste pits and solar dried. It is notable that Gujarat is rain deficient area and chance of run off from drill site area is very remote. As the drill site effluent is a soft effluent, the suspended particles like bentonitic clay are settled leaving clear supernatant water which at times is recycled for washing purpose. Please refer to Annexure-II. In view of this the condition may be considered as <b>Complied</b> .

8	Drilling waste water including drill cuttings wash water shall be collected in disposal pit lined with HDPE lining evaporated or treated and shall comply with the notified standards for on-shore disposal. The membership of common TSDF shall be obtained for the disposal of drill cuttings and hazardous waste. Otherwise secured land fill shall be created at the site as per design approved by the CPCB and obtain Authorization from the SPCB. Copy of authorization or membership of TSDF should be submitted to Ministry's Regional Office at Bhopal.	<b>Complied.</b> Drilling waste water including drill cuttings wash water is collected in disposal pit lined with HDPE lining and solar dried. Drill cuttings from water based mud have been removed from the category of hazardous waste [Schedule I - rule 3 (1) (17) (i) of MOEFCC notification dt: 14.04.2016]. ONGC Ahmedabad is member of TSDF at Bharuch Enviro Infrastructure Limited.
9	Good sanitation facility shall be provided at the drilling sites. Domestic sewage shall be disposed of through septic tank/soak pit.	<b>Complied.</b> Domestic sewage is disposed through adequate septic tanks and soak pits
10	Oil spillage prevention scheme shall be prepared. In case of oil spillage/contamination, action plan shall be prepared to clean the site by adopting proven technology. The recyclable waste(oily sludge) and spent oil shall be disposed of to the authorized recycler.	<b>Complied.</b> Oil spillage prevention plan like containments of diesel storage tank, POL shed and testing tank(during production testing) and drainage leading to waste pit are in place. However, in case of oil spill and contamination of soil thereof, ONGC is equipped with the technology of bio remediation to address such eventualities. It is notable that ONGC has a step down company M/S ONGC TERI BIO REMEDIATION LIMITED (OTBL) which has developed a consortium of bacteria capable of digesting entire range of hydrocarbon. Recyclable hazardous waste like Spent oil, POL barrels etc. are recycled centrally through authorised re-cyclers.
11	The company shall comply with the guidelines for disposal of solid waste, drill cutting and drilling fluids for onshore drilling operation notified vide GSR.546(E) dated 30 <sup>th</sup> August, 2005.	<b>Complied.</b> Solid waste like drill cuttings and left over drilling fluids are collected in HDPE lined waste pits which is eventually back filled and covered with local soil after the drilling operations are over. Other solid wastes like oil contaminated hand gloves, cotton waste, filters, chemical sack, etc. are deposited at TSDF site.
12	The company shall take necessary measures to prevent fire hazards, containing oil spill and soil remediation as needed. Possibility of using ground flare shall be explored. At the place of ground flaring, the overhead flaring stack with knockout drums shall be installed to minimize gaseous emissions during operation.	<b>Complied.</b> Each drilling rig in ONGC has fixed fire fighting system and portable extinguishers in accordance to OISD 189. All personnel posted at Drill site are trained in fire fighting. Hot jobs are controlled through a permit system i.e. "Hot Work Permit" system. As mentioned above in point 12, in case of oil spill and contamination of soil thereof, ONGC is equipped with the technology of bio remediation to address such eventualities. It is notable that ONGC has a step down company M/S ONGC TERI BIO REMEDIATION LIMITED (OTBL) which has developed a consortium of bacteria capable of digesting entire range of hydrocarbon. All the quantity of gas come across testing is flared through elevated flare equipped with separator and knock out drum. No ground flaring is resorted to.

13	The company shall develop a contingency plan for H2S release including all necessary aspects from evacuation to resumption of normal operations. The workers shall be provided with personal H2S detectors in locations of high risk of exposure along with self containing breathing apparatus.	<b>Complied.</b> Emergency response plans for H2S release is available. H2S detector are available at drilling rigs. However, it is pertinent to mention that H2S is usually not encountered during drilling operations in oil fields of Bharuch district.
14	On completion of drilling, the company shall plug the drill wells safely and obtain certificate from the environment safety angle from the concerned authority.	<b>Complied.</b> On completion of drilling the well is equipped with a christmas tree which safely regulates the flow of oil & gas. However, if any well is abandoned, it is plugged with a cement column as prescribed in OMR 1984 and the same is communicated to DGMS.
15	Blow Out Preventor(BOP) system shall be installed to prevent well blowouts during drilling operations. BOP measures during drilling shall focus on maintaining well bore hydrostatic pressure by proper pre-well planning and drilling fluid logging etc.	<b>Complied.</b> Appropriate Blow Out Preventor(BOP) systems having a set of Annular and RAM BOPs is installed to prevent well blowouts during drilling operations. Function test of BOPs are carried out frequently and care is taken to maintain proper hydrostatic pressure in the well bore during drilling, logging and other well operations by maintaining mud weight.
16	Emergency response plan(ERP) shall be based on the guidelines prepared by OISD, DGMS and Government of India	<b>Complied.</b> ONGC has Site Specific Emergency Plan (ERP) and Contingency Plans and Disaster management Plan (DMP) based on relevant and realistic emergency scenarios. ERP and contingency plan are duly approved by DGMS whereas offsite DMP is approved by local district authorities. (copy enclosed )
17	The company shall take measures after completion of drilling process by well plugging and secured enclosures, decommissioning of rig upon abandonment of the well and drilling site shall be restored to original condition. In the event that no economic quantity of hydrocarbon is found a full abandonment plan shall be implemented for the drilling site in accordance with the applicable Indian Petroleum Regulations.	<b>Complied.</b> ONGC has formulated a well defined and plausible abandonment and restoration procedure which is being followed in the event of decision taken to abandon the well. The procedure is Annexed as V.
18	Abandoned well inventory and remediation plan shall be submitted within six months from the date of issue of letter.	<b>Complied.</b> Remediation plan is already addressed at point no 12 above. This well has been abandoned and restoration of land by inviting tender and as per SOP for restoration, is in progress.
19	Occupational health surveillance of the workers shall be carried out as per the prevailing Acts and Rules.	<b>Complied.</b> PME of all employees is carried out as per company policy (Annexure-VI).
20	In case commercial viability of the project is established, the company shall prepare a detailed plan for development of oil and gas fields and obtain fresh environmental clearance from the Ministry.	<b>Complied.</b> In case of commercial viability of oil/gas, fresh EC is obtained for the entire block.
21	Restoration of the project site shall be carried out satisfactorily and report shall be sent to Ministry's Regional Office at Bhopal.	<b>Complied.</b> After the restoration job in this well is over, the report shall be sent to Ministry's regional office Bhopal.
22	Oil content in the drill cuttings shall be monitored by some Authorised agency and report shall be sent to the Ministry's Regional Office at Bhopal.	<b>Complied.</b> Cuttings are analysed for oil content through a reputed laboratory in the area. The analysis shows that the parameters are within permissible limits(Copy of Monitoring Report enclosed - Annexure-II)..
23	Under Enterprise Social Commitment (ESC), sufficient budgetary provision shall be made for health improvement, education, water and electricity supply etc. in and around the project.	<b>Complied.</b> 2% of average net profit of ONGC is earmarked for CSR(Corporate Social Responsibility) projects which includes components of health, education, water, solar lights, ecological development in an around operational area, as directed by GOI
24	An audit shall be done to ensure that the Environment Management Plan is implemented in totality and report shall be submitted to Ministry's Regional Office	<b>Complied.</b> An annual environment audit is carried out through schedule auditors and the reports are submitted to Gujarat Pollution control Board, apart from its annual internal audit and surveillance audit of Environment Management system is carried out in accordance to the protocol of ISO 14001. It is notable that all drilling rigs are maintaining 3rd party certified EMS based on ISO 14001.

25	All the commitment made regarding issues raised during the public hearing/consultation meeting held on 12th November,2013 and 13th November,2013 and shall be satisfactorily implemented.	<b>Complied.</b> In the Public Hearing conducted at Surat on 12.11.2013, the mostly points raised by the villagers were about the welfare measure such as construction/repair of roads and also about the drilling mud used, it was told that the water base mud is being used by ONGC and it is non hazardous. During the Public Hearing held on 13.11.2013 at village Itola the farmer told about the late payments by ONGC towards the crop compensation. The same was resolved.
26	All personnel including those of contractors shall be trained and made fully aware of the hazards,risks and controls in place.	<b>Complied.</b> MVT(Mines Vocational Training) are imparted to all contractual workers before deployment at site. MVT trainings are specially designed to develop competence and skill of employees including contractual employees w .r.t risk management
27	Company shall have own Environment Management Cell having qualified persons with proper background.	<b>Complied.</b> EM Cell is atCorporate HSE of ONGC, New Delhi. HSE set up at unit level are also having qualified safety & environment officers.
28	Company shall prepare operating manual in respect of all activities.It shall cover all safety & environment related issues and system.Measures to be taken for protection.One set of environment manual shall be made available at the drilling site/project site.Awareness shall be created at each level of the management.All the schedules and results of environment monitoring shall be available at the project site office.	<b>Complied.</b> Standard Operating Procedures for drilling operations covering safety and environmental aspects of operations and management thereof, have been given to supervisors and concerned persons at all drilling rigs. Safe Work Practices is also made available at all rigs. Regular safety and environment training is being provided to the employees by our various in- house training institutes like IPSHEM Goa,IDT and ONGC Academy, Dehradun and RTI Vadodara etc. Ambient/stack, noise level and potable water report is available at rigs.
29	Company should prepare operating manual in respect of all activities.It shall cover all safety & environment related issues and system.Measures to be taken for protection.One set of environment manual shall be made available at the drilling site/project site.Awareness shall be created at each level of the management.All the schedules and results of environment monitoring shall be available at the project site office.	<b>Complied.</b> Standard Operating Procedures for drilling operations covering safety and environmental aspects of operations and management thereof, have been given to supervisors and concerned persons at all drilling rigs. Safe Work Practices is also made available at all rigs. Regular safety and environment training is being provided to the employees by our various in- house training institutes like IPSHEM Goa,IDT and ONGC Academy, Dehradun and RTI Vadodara etc. Ambient/stack, noise level and potable water report is available at rigs.

B	GENERAL CONDITIONS	
i	The project authorities must strictly adhere to the stipulations made by the Gujarat State Pollution Control Board (GPCB) State Government and any other statutory authority.	<b>Complied.</b> Consent to Establish (CTE) for exploratory drilling is taken from Gujarat Pollution Control Board prior to commencement of drilling. Conditions stipulated in CTE are complied to. Apart from it all the oil and gas processing installations wherein the oil and gas produced during exploratory and development drilling is processed are operating under consolidated consent and authorisation (CCA) from GPCB. Monthly and annual returns are filed online on XGN site as per the conditions stipulated in CCA
ii	No further expansion or modification in the project shall be carried out without prior approval of the Ministry of Environment & Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, afresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	<b>Complied.</b> So far no expansion or modification in the project has been carried out. In future if any expansion and modification happens the stipulated condition shall be complied.
iii	The project authorities must strictly comply with the rules and regulations under Manufacture, Storage and import of Hazardous chemicals Rules, 2000 as amended subsequently. Prior approvals from Chief Inspectorate of Factories, Chief Controller of Explosives, Fire Safety Inspectorate etc. must be obtained, wherever applicable.	<b>Complied.</b> During drilling water base mud is used and no hazardous /toxic chemicals are used. All the mud systems got tested through National Institute of Oceanography (NIO), Goa and found non-hazardous and non-toxic. Hence this point is not applicable. However as precautionary measure MSDS of chemicals are displayed at site. Permission for storage ,transportation and use of explosives for perforation of well are taken from controller of explosive.
iv	The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (daytime) and 70 dBA (nighttime).	<b>Complied.</b> The overall noise levels in and around the rig area is kept well within the standards by keeping provision of aquostic enclosures and regular condition monitoring of equipment. The ambient noise levels are monitored during day and night time (Recent monitoring reports are annexed) which reveals that the ambient noise level is with in prescribed standards.
v	A separate Environmental Management Cell equipped with full fledged laboratory facilities must be set up to carry out the environmental management and monitoring functions.	<b>Complied.</b> Environment Management cell is functional under Head HSE which is responsible for environment management, monitoring and compliance to regularity bodies.
vi	A copy of clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parishad/Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the web site of the company by the proponent.	<b>Complied.</b> The communication of the environmental clearance has been made to all the relevant stake holders by way of publishing the same in the leading news papers. The EC is also posted on the Web Site of ONGC as well as communicated to concerned panchayat and local authorities
vii	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MOEF, the respective Zonal Office of CPCB and the GPCB. The criteria pollutant levels namely; PM10, SO2, NOx, HC (Methane & Non-methane), VOCs (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain	<b>Complied.</b> The compliance of the stipulated environment clearance conditions, including results of monitored data are uploaded on our website ( link - <a href="http://www.ongcindia.com/wps/wcm/connect/ongcindia/Home/Initiatives/HSE/Environmental_Clearance/">http://www.ongcindia.com/wps/wcm/connect/ongcindia/Home/Initiatives/HSE/Environmental_Clearance/</a> ) and updated periodically. It is sent to the Regional Office of the MOEF. The criteria pollutant levels namely; PM10, SO2, NOx, HC (Methane & Non-methane), indicated for the projects are monitored and displayed at the main gate of the rig.

viii	The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MOEF, the respective Zonal Office of CPCB and GPCB. The Regional Office of the this Ministry/CPCB/GPCB shall monitor the stipulated conditions. Environment Clearance and six monthly compliance status reports shall be posted on the website of the company.	<b>Complied.</b> The compliance of the stipulated environment clearance conditions, including results of monitored data are uploaded on our website ( link - <a href="http://www.ongcindia.com/wps/wcm/connect/ongcindia/Home/Initiatives/HSE/Environmental_Clearance/">http://www.ongcindia.com/wps/wcm/connect/ongcindia/Home/Initiatives/HSE/Environmental_Clearance/</a> ) and updated periodically. It is sent to the Regional Office of the MOEF. The criteria pollutant levels namely; PM10, SO2, NOx, HC (Methane & Non-methane), indicated for the projects are monitored and displayed at the main gate of the rig.
ix	The environment statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company alongwith the status of compliance of environment conditions and shall also be sent to the respective Regional Offices of the MOEF by e-mail.	<b>Complied.</b> After completion of exploratory drilling and if any oil and gas produced through it is subjected to the nearby production installation for processing and thus becomes part of that installation. All the Installations are operating under CCA from GPCB and accordingly environmental statement as per prescribed form-V is filed annually. If no oil is found the well is abandoned and land restored as per company policy.
x	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 <a href="http://www.envfor.nic.in">http://www.envfor.nic.in</a> . 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.	<b>Complied.</b> Information regarding grant EC for the project was passed on to all stake holders and the same was advertised in two newspapers.
xi	The 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.	<b>Complied.</b> The details prescribed in condition regarding commencement of exploratory drilling are furnished in six monthly compliance to Regional Office MOEFCC, Bhopal.

*M. A. Haseeb*  
18/7/2016

एम.ए. हसीब / M.A. HASEEB  
महाप्रबंधक (भूभौतिकी)-प्रखंड प्रबंधक-1  
GM (Geol.) - BM - I

- G.P.C.B. Recognized Environmental Auditor (Schedule II)
- Evaluation of Environmental Management System (EMS) And Certification For Adequacy
- Treatability Studies



# Shubh Enviro Research Lab

## TEST REPORT

REPORT NO. : SERL/ONGC/E-760-V/AAQM/MARCH/2016/01

Date of issue : 30-03-2016

Client	M/S. OIL AND NATURAL GAS CORPORATION LTD.
Address	Drilling Services, Ankleshwer Asset, Ankleshwer-393 010, Gujarat.
Work Order No. & Date	ANK/DS/P&C-Mech/Contracts/04/2014-15 & 26-02-2015

### AMBIENT AIR QUALITY MONITORING REPORT

Sr. No.	DESCRIPTION	DATA			
	Particulars of Sample	Station 1			
1	Sample ID	366-AQ-04			
2	No. of samples	1			
3	Date and time of start of sampling	22-03-2016 & 15:50 hrs			
4	Date and time of completion of sampling	23-03-2016 & 15:50 hrs			
5	Duration of Sampling in hrs	24:00			
6	Approx. ht. of sampling point in meter	~ 3.5			
7	Sampled by	Mr. Vikram			
8	Date of Analysis	25-03-2016			
Sampling Procedure : As per IS : 5182 (Part V) - 1975 reaffirmed 2003, IS : 5182 (Part 23) - 2006 and CPCB guidelines					
Details of Sampling Station					
1	Location	E-760-V (Masar Road)			
2	Distance from plant site, km	Inside plant			
3	Wind direction	SW-NE			
4	Average wind speed, Kmph	6.2			
	Parameters Analysed	Unit	Test Method	Permissible Limits as per NAAQS 2009 (24 hrs)	Results
1.	PM10	µg/m3	IS 5182 ( part 23) 2006	100	71
2.	PM2.5	µg/m3	EPA method- Gravimetric Method	60	33
3.	SO2	µg/m3	IS 5182 ( part II ) : 2001	80	15
4.	NOx	µg/m3	IS 5182 (part VI 2006)	80	21

Abbreviations: BDL-Below Detection Limit, µg-Microgram,

Chemist :

For SHUBH ENVIRO RESEARCH LAB



- Note : 1. This result listed refer only to the tested samples and applicable parameters.  
 2. Permissible limits are given by customer and included in the report upon request by customer  
 3. The opinions and interpretations contained in this report are based upon material and information supplied by customer  
 4. Perishable samples will be destroyed after testing, others after 7 days from the date of issue of the report, unless otherwise agreed with the customer or as required by applicable regulations  
 5. This report shall not be used as evidence in the court of law and cannot be used in part or full in any media without prior permission.

\*\*\* End of Report \*\*\*

Page 1 of 1

✓ " Grow More "

"Kamal Arcade", Shop No. 3 & 4, Comm. Plot No. C-3/3, Near State Bank of India, G.I.D.C., Ankleshwar - 393 002.  
 Dist. Bharuch, Gujarat, India ☎ 02646-224805 Website www.siddhigreen.com

- G.P.C.B. Recognized Environmental Auditor (Schedule II)
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# Shubh Enviro Research Lab

## TEST REPORT

REPORT NO. : SERL/ONGC/E-760-V/NL/MARCH/2016/02

Date of Issue :30-03-2016

Client	M/s. OIL AND NATURAL GAS CORPORATION LTD.
Address	Drilling Services, Ankleshwer Asset, Ankleshwer-393 010,Gujarat.
Work Order No. & Date	ANK/DS/P&C-Mech/Contracts/04/2014-15 & 26-02-2015

Sample ID	366-NL-04
Location	E - 760 - V (Masar Road)
Date & Time of Monitoring	23/03/2016, & 10:30 to 10:50hrs.
Measuring Instrument	Lutron make Noise Level Meter (Model No. SL4001) Frequency Weighing - A Time Weighing - Slow
Measured By	Vikram

Procedure:As per Work Instruction of Instrument and as per IS-9989(1981)RA-2001

SR. NO.	LOCATION	Noise Level, db(A)	
		Permissible Limit Day (6 am to 10 pm)( Note-2)	Day Results (avg.)
1	Near Main Gate	75	59
2	Near D.G. SET Operation (From 3 meter Distance)	75	80
3	Near mud pump Area	75	78
4	Near upper prowler	75	69
5	Near shale shaker	75	67

Chemist :

For SHUBH ENVIRO RESEARCH LAB



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Page 1 of 1

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- G.P.C.B. Recognized Environmental Auditor (Schedule II)
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# Shubh Enviro Research Lab

## TEST REPORT

REPORT NO. : SERL/ONGC/E-760-V/ST/MARCH/2016/03

Date of Issue: 30-03-2016

Client	M/s. OIL AND NATURAL GAS CORPORATION LTD.		
Address	Drilling Services, Ankleshwer Asset, Ankleshwer-393 010,Gujarat.		
Work Order No. & Date	ANK/DS/P&C-Mech/Contracts/04/2014-15 & 26-02-2015		
Sr. No.	DESCRIPTION	FLUE GAS STACK EMISSION ANALYSIS	
	Monitoring Location	E - 760 - V (Masar Road)	
	Particulars of Sample	Stack 1	Stack 2
1	Sample ID No.	366-FS-16	366-FS-17
2	Stack attached to	Cater Piller Engine -1 (Power pack Gen Set-1)	Cater Piller Engine - 2 (Power pack-2)
3	Detail of APCM	-	-
4	Diesel Generator Capacity	-	-
5	Date & Time of sampling	23-03-2016, &10:10 hrs	23-03-2016,&10:50 hrs
6	Date of Receipt	24-03-2016	24-03-2016
7	Date of Analysis start	25-03-2016	25-03-2016
8	Date of Completion	25-03-2016	25-03-2016

Sampling Procedure : As per IS : 11255 (Part I) - 1985 reaffirmed 2003, IS : 11255 (Part 3) - 2008 and CPCB guidelines

Details of Stack			
1	Stack Height	15 feet	15 feet
2	Stack Diameter	15 Inch	15 Inch
3	Temperature of Flue gas	112 °C	102 °C
4	Velocity of Flue gas	8.9 m/sec	8.3 m/sec

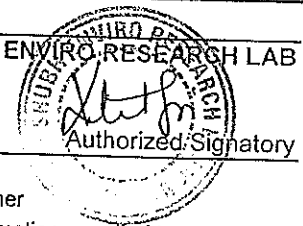
Details of flue gas			
1	Type of Fuel	Diesel	Diesel
2	Rate of Consumption	80-100 Ltr/h	80-100 Ltr/h

Parameters Analysed	UNIT	TEST METHOD	Permissible Limit (Note2)	Results	Results	
1	PM	mg/Nm3	IS 11255(Part-1)-1985 (Gravimetric)	150	71	86
2	SO <sub>2</sub>	ppm	IS 11255(Part-2)-1985	100	23	24
3	NO <sub>x</sub>	ppm	IS : 11255 (Part 7) - 2005	50	18	19
4	HC (as CH <sub>4</sub> )	ppm	IS Method	15	9	12
5	CO	ppm	IS Method	23	11	13
6	H <sub>2</sub> S	ppm	IS Method	100	BDL	BDL

Abbreviation: BDL-Below Detection Limit.

Chemist :

For SHUBH ENVIRO. RESEARCH LAB



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Page 1 of 1

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"Kamal Arcade", Shop No. 3 & 4. Comm. Plot No. C-3/3. Near State Bank of India, G.I.D.C., Ankleshwar - 393 002.  
 Dist. Bharuch, Gujarat, India. ☎ 02646-224805 Website: www.siddhigreen.com

- G.P.C.B. Recognized Environmental Auditor (Schedule II)
- Evaluation of Environmental Management System (EMS) And Certification For Adequacy
- Treatability Studies



# Shubh Enviro Research Lab

## TEST REPORT

REPORT NO. : SERL/ONGC/E-760-V/ST/MARCH/2016/04

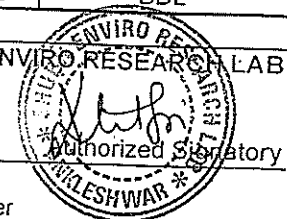
Date of Issue: 30-03-2016

Client		M/s. OIL AND NATURAL GAS CORPORATION LTD.				
Address		Drilling Services, Ankleshwar Asset, Ankleshwar-393 010, Gujarat.				
Work Order No. & Date		ANK/DS/P&C-Mech/Contracts/04/2014-15 & 26-02-2015				
Sr. No.	DESCRIPTION	FLUE GAS STACK EMISSION ANALYSIS				
	Monitoring Location	E - 760 - V (Masar Road)				
	Particulars of Sample	Stack 3		Stack 4		
1	Sample ID No.	366-FS-18		366-FS-19		
2	Stack attached to	Cater Piller Engine- 3 (Power Pack - 3)		GEN SET (250 KVA)		
3	Detail of APCM	-				
4	Diesel Generator Capacity	-				
5	Date & Time of sampling	23-03-2016, & 11:30 hrs		23-03-2016, & 12:10 hrs		
6	Date of Receipt	24-03-2016		24-03-2016		
7	Date of Analysis start	25-03-2016		25-03-2016		
8	Date of Completion	25-03-2016		25-03-2016		
Sampling Procedure : As per IS : 11255 (Part I) - 1985 reaffirmed 2003, IS : 11255 (Part 3) - 2008 and CPCB guidelines						
Details of Stack						
1	Stack Height	15 feet		15 feet		
2	Stack Diameter	15 Inch		15 Inch		
3	Temperature of Flue gas	98 °C		102 °C		
4	Velocity of Flue gas	8.5 m/sec		8.8 m/sec		
Details of flue gas						
1	Type of Fuel	Diesel		Diesel		
2	Rate of Consumption	80-100 Ltr/h		40-50 Ltr/h		
Parameters Analysed	UNIT	TEST METHOD	Permissible Limit (Note2)	Results	Results	
1	PM	mg/Nm <sup>3</sup>	IS 11255(Part-1)-1985 (Gravimetric)	150	88	69
2	SO <sub>2</sub>	ppm	IS 11255(Part-2)-1985	100	25	23
3	NO <sub>x</sub>	ppm	IS : 11255 (Part 7) - 2005	50	28	21
4	HC (as CH <sub>4</sub> )	ppm	IS Method	15	9	8
5	CO	ppm	IS Method	23	13	11
6	H <sub>2</sub> S	ppm	IS Method	100	BDL	BDL

Abbreviation: BDL-Below Detection Limit.

Chemist :

For SHUBH ENVIRO RESEARCH LAB



- Note :
1. This result listed refer only to the tested samples and applicable parameters.
  2. Permissible limits are given by customer and included in the report upon request by customer
  3. The opinions and interpretations contained in this report are based upon material and information supplied by customer
  4. Perishable samples will be destroyed after testing, others after 7 days from the date of issue of the report, unless otherwise agreed with the customer or as required by applicable regulations
  5. This report shall not be used as evidence in the court of law and cannot be used in part or full in any media without prior permission.

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# Shubh Enviro Research Lab

## TEST REPORT

REPORT NO. : SERL/ONGC/E-760-V/ST/MARCH/2016/05

Date of Issue: 30-03-2016

Client	M/s. OIL AND NATURAL GAS CORPORATION LTD.		
Address	Drilling Services, Ankleshwer Asset, Ankleshwer-393 010, Gujarat.		
Work Order No. & Date	ANK/DS/P&C-Mech/Contracts/04/2014-15 & 26-02-2015		
Sr. No.	DESCRIPTION	FLUE GAS STACK EMISSION ANALYSIS	
	Monitoring Location	E - 760 - V (Masar Road)	
	Particulars of Sample	Stack 5	Stack 6
1	Sample ID No.	366-FS-20	366-FS-21
2	Stack attached to	Mobile Compressor	Welding Set
3	Detail of APCM	-	-
4	Diesel Generator Capacity	-	-
5	Date & Time of sampling	23-03-2016, & 12:50 hrs	23-03-2016, & 13:30 hrs
6	Date of Receipt	24-03-2016	24-03-2016
7	Date of Analysis start	25-03-2016	25-03-2016
8	Date of Completion	25-03-2016	25-03-2016

Sampling Procedure : As per IS : 11255 (Part 1) - 1985 reaffirmed 2003, IS : 11255 (Part 3) - 2008 and CPCB guidelines

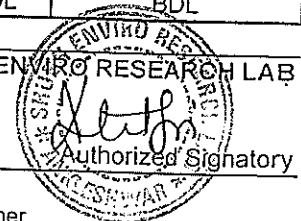
Details of Stack			
1	Stack Height	8 feet	8 feet
2	Stack Diameter	3 Inch	3 Inch
3	Temperature of Flue gas	105 °C	112 °C
4	Velocity of Flue gas	7.8 m/sec	8.2 m/sec
Details of flue gas			
1	Type of Fuel	Diesel	Diesel
2	Rate of Consumption	20-30 Ltr/h	10-15 Ltr/h

Parameters Analysed	UNIT	TEST METHOD	Permissible Limit (Note2)	Results	Results	
1	PM	mg/Nm3	IS 11255(Part-1)-1985 (Gravimetric)	150	66	56
2	SO <sub>2</sub>	ppm	IS 11255(Part-2)-1985	100	22	21
3	NO <sub>x</sub>	ppm	IS : 11255 (Part 7) - 2005	50	24	25
4	HC (as CH <sub>4</sub> )	ppm	IS Method	15	8	7
5	CO	ppm	IS Method	23	11	10
6	H <sub>2</sub> S	ppm	IS Method	100	BDL	BDL

Abbreviation: BDL-Below Detection Limit.

Chemist :

For SHUBH ENVIRO RESEARCH LAB



- Note :
1. This result listed refer only to the tested samples and applicable parameters.
  2. Permissible limits are given by customer and included in the report upon request by customer
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# S.N. HIRPARA POLLUTION CONSULTANTS & ENGINEERS (P) LTD. (LABORATORY DIVISION)

Regd. Office & Lab.: 706/A, 406/B, Center Point Building, New Civil Hospital Char Rasta,  
Ring Road, Surat – 395 002. Gujarat, India. Email : sureshhirpara@yahoo.co.in  
Tele fax : 0261 – 2460493-0261 – 2721401 M.: 98251 28836

REF#SNH/LAB/ANALYSIS/ONGC-ANK/02/16

11/02/2016

## ANALYSIS REPORT

Name & Address of Industry : Oil & Natural Gas Corporation Ltd.,  
Ankleshwar Asset, Ankleshwar, Bharuch, Gujarat.  
Analytical Report of : Waste Water Sample of Well No. #GGAL, Rig No. E-760-V &  
Drill Cutting Sample of Well No. #GGAL, Rig No. E-760-V  
Date/ Time of Sample Collection : 07/01/2016  
Location of Collection : Well No. #GGAL, Rig No. E-760-V  
Sample Collected by : S.N.Hirpara  
Date of Receipt of Sample : 08/02/2016

### : TEST RESULTS:

Sr.No.	Parameters	GPCB Limit	Unit	Wastewater Sample Of	Drill Cutting Sample Of
				Well No. #GGAL, Rig No. E-760-V Gandhar	Well No. #GGAL, Rig No. E-760-V Gandhar
Date Of Sample Collection				07/01/2016	07/01/2016
				Results	Results
1.	Temperature	40	°C	28	28
2.	pH	5.5-9.0	--	7.6	7.8
3.	Total Dissolved solid	2100	mg./L	1989	2125
4.	Suspended Solid	100	mg./L	98	102
5.	BOD <sub>3</sub> 27 °C	30	mg./L	21	20
6.	COD	100	mg./L	94	96
7.	Oil & Grease	10	mg./L	5.7	4.9
8.	Phenolic Compounds	1.2	mg./L	ND	ND
9.	Sulphides	2.0	mg./L	0.5	0.2
10.	Sulphate	1000	mg./L	946	891
11.	Cr <sup>+6</sup>	0.1	mg./L	BDL	BDL
12.	Total Chromium	1.0	mg./L	0.04	ND
13.	Chlorides	600	mg./L	59	604
14.	% Sodium	60	mg./L	55	50
15.	Zinc	2.00	mg./L	BDL	BDL
16.	Copper	0.2	mg./L	BDL	BDL
17.	Fluorides	1.5	mg./L	0.01	0.02
18.	Mercury	0.01	mg./L	ND	Nil
19.	Cyanides	0.2	mg./L	BDL	BDL
20.	Lead	0.1	mg./L	BDL	BDL
21.	Nickel	0.3	mg./L	BDL	BDL

Note: ND = Not Detected, BDL= Below Detectable Limit.

For S. N. Hirpara Pollution Consultants & Engineers Pvt. Ltd.

Sr. Chemist

Arti Singh

Env. Engineer

Suresh Hirpara

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## (LABORATORY DIVISION)

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REF#SNH/LAB/ANALYSIS/ONGC-ANK/02/16

11/02/2016

### ANALYSIS REPORT

Name & Address of Industry : Oil & Natural Gas Corporation Ltd.,  
Ankleshwar Asset, Ankleshwar, Bharuch, Gujarat.

Analytical Report of : Waste Water Sample of Well No. #GGAL, Rig No. E-760-V  
Drill Cutting Sample of Well No. #GGAL, Rig No. E-760-V

Date/ Time of Sample Collection : 21/01/2016

Location of Collection : Well No. # GGAL, Rig No. E-760-V

Sample Collected by : S.N.Hirpara

Date of Receipt of Sample : 08/02/2016

### :TEST RESULTS:

Sr.No.	Parameters	GPCB Limit	Unit	Wastewater Sample Of	Drill Cutting Sample Of
				Well No. #GGAL, Rig. No. E-760-V Gandhar	Well No. #GGAL, Rig. No. E-760-V Gandhar
				Date Of Sample Collection	21/01/2016
				Results	Results
1.	Temperature	40	°C	27	28
2.	pH	5.5-9.0	--	7.5	7.7
3.	Total Dissolved solid	2100	mg./L	1998	1991
4.	Suspended Solid	100	mg./L	95	92
5.	BOD <sub>3</sub> 27 °C	30	mg./L	25	29
6.	COD	100	mg./L	97	85
7.	Oil & Grease	10	mg./L	4	3.5
8.	Phenolic Compounds	1.2	mg./L	ND	ND
9.	Sulphides	2.0	mg./L	1.1	1.4
10.	Sulphate	1000	mg./L	996	991
11.	Cr <sup>+6</sup>	0.1	mg./L	BDL	BDL
12.	Total Chromium	1.0	mg./L	0.04	ND
13.	Chlorides	600	mg./L	556	497
14.	% Sodium	60	mg./L	52	55
15.	Zinc	2.00	mg./L	BDL	BDL
16.	Copper	0.2	mg./L	BDL	BDL
17.	Fluorides	1.5	mg./L	0.03	0.02
18.	Mercury	0.01	mg./L	ND	Nil
19.	Cyanides	0.2	mg./L	BDL	BDL
20.	Lead	0.1	mg./L	BDL	BDL
21.	Nickel	0.3	mg./L	BDL	BDL

Note: ND = Not Detected, BDL= Below Detectable Limit.

For S. N. Hirpara Pollution Consultants & Engineers Pvt. Ltd.

Sr.Chemist

Arti Singh



Env. Engineer

Suresh Hirpara

