EOGEPL/ CBM-RG (E)/ HSE/2021/3592
Date 17th November 2021

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To
The Regional Director
Ministry of Environment, Forests and Climate Change
Integrated Regional Office
IB-194, Sector III, Salt Lake
Kolkata-700106
West Bengal

Sub: Submission Half-yearly Compliance Report of the Environmental Clearance (Phase-III) by Essar Oil Gas Exploration and Production Limited reg.

Ref: Environmental Clearance of Phase-III granted by MoEF vide letter no.J-11011/491/2011-IA II(I) dated 26th February, 2013; Transfer of EC from EOL to EOGEPL dated 27.11.2017

Dear Sir

We are enclosing herewith the half-yearly compliance report in respect of the stipulated prior environmental clearance terms and conditions for the Production and Development Phase (Phase-III) of CBM project activities for the period of April' 2021 to September' 2021.

Thank you for your continued support.

Warm Regards,
For Essar Oil and Gas Exploration and Production Limited

Kannan Rajendran
Chief Operating Officer
Raniganj East, CBM Project-Durgapur

Enclosed: Phase-III Compliance Report

Copy to:

1. The Environmental Engineer, Durgapur Regional Office, WBPCB, Durgapur-713216

Essar Oil and Gas Exploration and Production Limited

RG (East)-CBM-2001/1 (Phase-III) Half Yearly Environment Clearance Compliance Report
(April' 21 to September' 21)
Ref: Environmental Clearance F.No.J-11011/491/2011-IA II (I), dated 26th February, 2013

S. No	Condition	Compliance Status
A	**Specific Conditions**	
i.	Compliance to all the environmental conditions stipulated in the environmental clearance letter nos.J-11011/660/2007-IA-II(I) dated 6th May, 2008, J-11011/351/2009-IA-II(I) dated 23.09.2011 and its subsequent amendment shall be satisfactorily implemented.	Compliance to the environmental conditions of Phase- II & II (A) are being satisfactorily implemented and the compliance reports are regularly submitted to the Regional office of the MoEF.
ii.	Compensation for the land acquisition to the land oustees, if any, and also for standing crop shall be paid as per the National Resettlement and Rehabilitation Policy (NRRP) 2007 or State Government norms. It may be ensured that compensation provided shall not be less than the norms of the NRRP, 2007	Land acquisition is being directly done with the land owners and the compensation is paid as per the prevailing market rate. There is no involvement of Rehabilitation and Resettlement.
iii.	Prior permission from the Ministry of Defence shall be obtained regarding impact of proposed plant on Panagarh, if any.	Total three (3) nos. of GGS and One (1) no. of MCS flaring stack are constructed as per the NOC obtained from the MoD.
iv.	As proposed, no forest land shall be used for the proposed facilities	Forest land is not being used for construction of well pads or and surface facilities of the project.
v.	Ambient Air Quality shall be monitored near the closest human settlements as per the National Ambient Air Quality Emission Standards (NAAQES) issued by the Ministry vide G.S.R No. 826(E) dated 16th November, 2009 for PM10, PM2.5, SO2, NOx, CO, CH4, VOCs, HC, Non-Methane HC etc. Efforts shall be made to improve the ambient air quality of the area.	Ambient Air Quality Monitoring has been carried out at well sites near to the closest human settlements. As per the Ambient Air Quality Emission Standards (NAAQES) issued by the Ministry vide G.S.R No. 826(E) dated 16th November, 2009 for PM10, PM2.5, SO2, NOX, CO, CH4, VOCs, HC, Non-methane HC. Monitoring activity has been carried out from Aprt'21 to Sep'21 through a recognized laboratory based in Kolkata. Please find the ambient air quality monitoring results from Apr'21 to Sep' 21 attached with this report as **Annexure I.**

S. No	Condition	Compliance Status
vi.	Mercury shall also be analysed in air, water and drill cuttings twice during drilling period	The Drilling has been temporarily suspended from April' 17 till date.
vii.	The flare system shall be designed as per good oil field practices and Oil Industry Safety Directorate (OISD) guidelines. The company shall take necessary measures to prevent fire hazards and soil remediation as needed. At the place of ground flaring, the flare pit shall be lined with refractory bricks and efficient burning system. In case of overhead flare stacks, the stack height shall be provided as per the regulatory requirements and emission from stacks shall meet the MoEF/CPCB guidelines.	Elevated flare system is designed as per OISD guidelines. Measures delineated in the EIA/EMP have been taken to prevent fire hazards. The overhead flaring is installed at a height of 30 m. The following measures have been implemented to prevent fire hazard: ▪ Installation of electrical equipment as per approved hazardous zone classification as communicated to DGMS ▪ Dry chemical fire extinguishers are available at all well-sites & facilities. ▪ Portable methane gas analyzers (CH4) are available. ▪ Flame proof type lighting fixtures, push buttons and switches in the drill site facilities are used.
viii.	The company shall make the arrangement for control of noise from the drilling activity, compressor station and DG sets by providing necessary mitigation measures such as proper acoustic enclosures to DG sets and meet the norms notified by the MoEF. Height of all the stacks/vents shall be as per the CPCB guidelines.	Only CPCB approved models of silent generator sets have been installed with acoustic enclosures. Once the gas production starts at the well site, the Diesel Generator (DG) sets are replaced with Gas Generator (GG) sets. In operational wells gas generator sets are operational. Noise monitoring has been carried out in the surrounding habitats and major activity area. Please find the noise monitoring reports attached with report as **Annexure II**.
ix.	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€ dated 30th August, 2005.	The drilling is temporarily suspended from April, 2017 till date.
x.	Total fresh water requirement should not exceed 125m3 for each well during drilling phase 1 m3/day for GGS/MCS. Prior	The drilling was temporarily suspended from April 2007 to till date.

S. No	Condition	Compliance Status
	permission shall be obtained from the Competent Authority and a copy submitted to the Ministry's Regional Office at Bhubaneswar	
xi.	During well drilling, wastewater should be segregated into waste drilling fluid and drill cuttings. Drill cutting should be stored onsite impervious HDPE lined pit for solar evaporation and drying. Effluent should be properly treated and treated effluent should conform to CPCB standards. As proposed, produced water should be treated by reverse osmosis and reuse in drilling of new wells, fire hydrant system and other beneficial purposes. Domestic effluent should be disposed-off through septic tank followed by soak pit.	The drilling is temporarily suspended from April' 2017 till date. Produced water is treated through Reverse Osmosis (RO) system. The treated produced water is reused in other operations. Please find the RO water analysis results attached with this report as **Annexure III.** Monitoring activity has been carried out from Oct'20 to Mar'21 through a recognized laboratory based in Kolkata. However due to COVID pandemic the water sampling is not carried out for the month of May 2021. Domestic effluent is disposed of through septic tank to soak pit.
xii.	Ground water quality monitoring should be done to assess if produced water storage or disposal has any effect.	The ground water monitoring carried out in Post-Monsoon (November) month. The Ground water Analysis reports attached with report as **Annexure IV**.
xiii.	Drilling wastewater 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 on land. Proper toxicological analysis shall be done to ensure there is no hazardous material. Copy of toxicological analysis shall be submitted to Ministry's Regional Office at Bhubaneswar.	Drilling is temporarily suspended from April' 2017 till date.
xiv.	Water base drilling mud or synthetic based mud shall be used	Water based mud was used in the drilling.
xv.	The company shall take necessary measures to prevent fire hazards, containing oil spill and soil remediation as needed. At place of ground flaring, the overhead flaring stack with knockout drums shall be installed to minimize gaseous emissions during operation.	All the precautionary measures is implemented to prevent fire hazards & Oil Spills. Elevated flaring is carried out. No ground flaring is done.

S. No	Condition	Compliance Status
xvi.	The company shall take necessary measures to prevent fire hazards and soil remediation as needed. The stacks of adequate height shall be provided to flare the gas, if required, to minimize gaseous emissions and heat load during flaring	Gas detectors & sensors available to prevent the fire hazards. Flare stack height of 30m is maintained at Gas Gathering Stations (GGS) and 50 m at Main Compressor Stations (MCS).
xvii.	To prevent underground coal fire, preventive measures shall be taken for ingress of ambient air during withdrawal inside the coal seams by adopting technologies including vacuum suction. Gas detectors for the detection of CH4 and H2S shall be provided.	Gas detectors for Methane, H2S and other gases are provided at the Gas Gathering Station and production sites. There is not any ingress of ambient air since the well is arrested at the head with drive head and progressive cavity pump.
xviii.	The design, material of construction, assembly, inspection, testing and safety aspects of operations and maintenance of pipeline and transporting the natural gas/oil shall be governed by ASME/ANSI B 31.8/B31.4 and OISD standard 141. Pipeline wall thickness and minimum depth of burial at river crossing and casings at rails, major road crossings should be in conformity with ANSI/ASME requirements.	All the surface facilities are installed as per the applicable practise and standards.
xix.	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.	H_2S is not present as per the analysis of gas tapped from the test wells & pilot wells. However all the necessary safety measures are taken as per the Emergency Response Plan. Gas detectors are kept at the Gas Gathering Station and production sites to check any presence of gases which are beyond threshold values. All workers are provided with standard PPEs according to job requirement.
xx.	Adequate well protection system shall be provided like Blow Out Preventor (BOP) or diverter systems as required based on the geological formation of the blocks.	CBM well hydrostatic pressures are found to be less than 2psi. However considering the hydrostatic pressures and sensitivity of well, Blow Out Preventers or diverter systems are provided at the well head during drilling along with other well control measures such as proper pre-well planning and drilling fluid

S. No	Condition	Compliance Status
		logging to maintain the hydrostatic pressure.
xxi.	The top soil removed shall be stacked separately for reuse during restoration process.	The top soil being spread out in designated area for green belt development at project area.
xxii.	Emergency Response Plan shall be based on the guidelines prepared by OISD, DGMS and Govt. of India. Recommendations mentioned in the Risk Assessment & Consequence Analysis and Disaster Management Plan shall be strictly followed.	Emergency Response plan has been prepared as per the OISD & DGMS guidelines and sent for the DGMS approval and has been certified. The certificate has already attached with previous compliance report.
xxiii.	Project proponent shall comply with the environment protection measures and safeguards recommended in the EIA/EMP/risk analysis report/disaster management plan	Environmental protection measures and safeguards recommended in EMP/risk analysis report/disaster management plan are implemented.
xxiv.	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 in original condition. In the event that no economic quantity of hydrocarbon is found a full abandonment shall be implemented for the drilling site in accordance with the applicable Indian Petroleum Regulations.	Wells will be abandoned and restored to natural position if found not suitable for hydrocarbon extraction. Wells will be fully abandoned in compliance with Indian Petroleum Regulations in the event of no economic quality of hydrocarbon is found.
xxv.	Occupational health surveillance of the workers shall be carried out as per the prevailing Acts and Rules.	Occupational health surveillance of the workers has been carried out as per the Mines Act 1952. Periodical Occupational Health Surveillance records are being maintained.
xxvi.	Company shall adopt Corporate Environment Policy as per the Ministry's O.M.No.J-11013/41/2006-IA.II(I) dated 26th April, 2011 and implemented.	Company has framed Corporate Environment Policy which is duly implemented.
xxvii.	All the commitments made to the public during the Public Hearing/Public Consultation	Commitments given in the public hearing are strictly implemented. A separate budget has already been

S. No	Condition	Compliance Status
	meeting held on 24th May, 2012 shall be satisfactorily implemented and a separate budget for implementing the same shall be allocated and information submitted to the Ministry's Regional Office at Bhubaneswar.	provided for the FY 2021-2022 as part of pervious phases of the project for the welfare of surrounding villages in thrust areas like Health, Education & Empowerment etc. under CSR budget.
xxviii.	At least 5% of the total cost of the project should be earmarked towards the enterprise social commitment and item-wise details along with time bound action plan shall be prepared and submitted to the Ministry's Regional Office at Bhubaneswar. Implementation of such program shall be ensured after the completion of the project.	The expenditure towards enterprise social commitment only **INR 16, 76,553/-** and beneficiary is only 4006 nos. The details showing as **Annexure V.** The budgetary allocation has been made for the FY 2021-22 for the CBM Project which is about INR 35 Lacs. The fund is being utilized judicially for the development of villages and people in the vicinity of the project area.
B	**General Conditions**	
i.	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board (SPCB), State Government and any other statutory authority.	We comply with the stipulations made by the State Pollution Control Board (SPCB), State Government and all other statutory bodies.
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, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	We restrict to the project configuration that is described in the Environmental Clearance. For any further expansion and modification in project configuration, we would approach MoEF for the prior Environmental Clearance.
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	We comply with the rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 2000 as amended subsequently. Prior approvals will be obtained from appropriate authority.

S. No	Condition	Compliance Status
	applicable.	
iv.	The project authorities must strictly comply with the rules and regulation with regarding to handling and disposal of Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 wherever applicable. Authorization from the State Pollution Control Board must be obtained for collections/treatment/storage/ disposal of hazardous wastes.	We comply with the rules and regulations with regard to handling and disposal of Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008. Authorization from the West Bengal Pollution Control Board has been obtained with regard to storage, treatment and disposal of hazardous waste, valid till 31st October, 2023.
v.	The overall noise levels in and around the plant area shall be kept 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. 75dBA (daytime) and 70 dBA (night time)	Acoustic hoods, silencers, enclosures are provided to high noise generating equipment. Noise levels will be restricted to the standards prescribed under EPA Rules, 1989. Personal Protective Equipment (earmuffs and plugs) have been provided to the working personnel.
vi.	A separate Environmental Management Cell equipped with full-fledged laboratory facilities must be set up to carry out the environmental management and monitoring functions.	A dedicated environment management cell is currently in operation and functioning for implementation of environment management plan at large. The sampling and analysis of environmental parameters is been carried out by Scientific Research Laboratory (MoEF recognized).
vii.	As proposed, Rs.2.80 Crore earmarked for environment pollution control measures shall be used to implement the conditions	Rs.2.80 Crore earmarked for environment pollution control measures has been judicially utilised. The former expenditure towards environmental protection has been submitted with previous compliance reports of EC Phase II (Environment Clearance no. F. No. J-11011/351/2009- IA II (I) dated 23.09.2011) & EC Phase III (F.No.J-11011/491/2011-IA II (I), dated 26th February, 2013) The environmental protection expenditure from April' 21 to September' 21 is attached with this report as **Annexure VI**.

S. No	Condition	Compliance Status
viii.	The Regional Office of this Ministry/Central Pollution Control Board/State Pollution Control Board will monitor the stipulated conditions. A six monthly compliance report and the monitored data along with statistical interpretation shall be submitted to them regularly.	Support is being extended to the Regional office of this Ministry/Central Pollution Control Board/State Pollution Control Board for monitoring the stipulated conditions. Six Monthly Compliance Reports will be regularly be submitted to MoEF Regional Office.
ix.	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.	A copy of Clearance letter has been uploaded on the company's website. The notice of obtaining environmental clearance has been published two new papers. Also a copy of clearance has been circulated to major administrative offices.
x.	The project proponent shall upload the status of compliance for 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 WBPCB. The criteria pollutant levels namely; PM10, PM2.5, 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.	Compliance reports have been uploaded on company's website (www.essar.com) & sent to Regional Office of the MOEF, the respective Zonal Office of CPCB and the WBPCB. The Ambient air quality monitoring is already being carried out in the nearest settlements as per revised NAAQM criteria. The criteria pollutant levels namely; SPM, RSPM, S02, NOx, HC (Methane & Non-methane), VOCs are being monitored periodically and displayed at the main entrance of the existing Gas Gathering Stations.
xi.	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 the WBPCB. The	We are submitting the six monthly compliance reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (via e-mail) to the Regional Office of MOEF, the respective Zonal Office of CPCB and the WBPCB.

S. No	Condition	Compliance Status
	Regional Office of this Ministry/CPCB/WBPCB shall monitor the stipulated conditions.	
xii.	The environmental 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 along with the status of compliance of environmental conditions and shall also be sent to the respective Regional Offices of the MoEF by e-mail	The environmental statement for each financial year ending 31st March in Form-V as is being regularly submitted to West Bengal Pollution Control Board and the same is been uploaded on the company's website along with the status of compliance report. The Copy of the latest Form V (FY 2020-21) enclosed as **Annexure VII.**
xiii.	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 WBPCB and may also be seen at Website of the Ministry of Environment and Forests at http:/envfor.nic.in. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the Regional Office.	The advertisement regarding the grant of environmental clearance has been published in two newspapers viz The Statesman (English) and Anand Bazaar Pathrika (Bengali/Vernacular) on 28th February, 2013. A copy of the advertisement is already submitted with Half yearly compliance of Oct 12 – Mar 13 period
xiv.	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.	We are currently working with financial institutions regarding funding for the phase-III project activities. The date of financial closure will be informed to the MoEF (Eastern Regional Office) as and when achieved. The approval from concerned authorities and the commencement of the activities will also be informed to your kind office.

ANNEXURE I

Name of Location			MCS						GGS- 01					
Date			Apr'21	May'21	Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21	Jun'21	Jul'21	Aug'21	Sep'21
Parameter	UoM	NAAQS LIMIT												
PM 2.5	µg/m^3	60	39.01	39.84	23.84	19.96	25.46	22.89	45.81	34.07	20.30	21.73	19.96	23.27
PM 10	µg/m^3	100	75.56	73.93	62.61	59.34	82.89	73.12	84.94	68.58	66.18	72.54	65.02	71.41
Nitrogen Dioxide	µg/m^3	80	40.53	39.95	38.97	38.85	39.12	35.04	44.91	39.90	35.86	39.03	36.41	36.03
Sulphur Dioxide	µg/m^3	80	6.17	5.97	5.92	6.07	6.10	5.15	6.30	6.04	5.88	5.93	5.55	5.65
Carbon Monoxide	mg/m^3	2	0.56	0.50	0.42	0.40	0.43	0.47	0.53	0.49	0.42	0.43	0.40	0.44
Hydrocarbon	mg/m^3	NIL	1.86	1.56	1.60	1.48	1.86	1.60	1.88	1.88	1.64	1.62	1.69	1.51
Mercury	mg/m^3			< 0.002				< 0.002		< 0.002				< 0.002
Hydrocarbon as Non Methane	mg/m^3	NIL	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
VOC's	µg/m^3			2.26				2.76		2.52				2.63
Benzo(a)Pyrene	ng/m^3	1		0.42				0.26		0.38				0.25
Ammonia	µg/m^3	400		24.52				28.41		26.48				26.17
Ozone	µg/m^3	180		36.54				39.88		40.26				40.24
Lead	µg/m^3	1		0.18				0.12		0.18				0.13
Nickel	ng/m^3	20		12.62				13.76		13.40				12.63
Arsenic	ng/m^3	6		1.54				1.28		1.48				1.29
Benzene	µg/m^3	5		1.70				1.58		1.82				1.54

ANNEXURE I

Name of Location			GGS- 02						GGS-04				PARULIA	
Date			Apr'21	May'21	Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21	Jun'21	Jul'21	Apr'21	May'21
Parameter	UoM	NAAQS LIMIT												
PM 2.5	$\mu g/m^3$	60	44.67	34.88	20.05	22.07	25.42	19.63	42.76	36.19	22.10	20.72	39.51	37.92
PM 10	$\mu g/m^3$	100	85.01	77.50	64.32	76.39	80.69	60.23	81.09	74.24	65.42	62.54	79.90	71.35
Nitrogen Dioxide	$\mu g/m^3$	80	41.96	39.12	37.43	38.54	39.60	33.33	40.33	38.25	38.62	38.45	42.51	38.25
Sulphur Dioxide	$\mu g/m^3$	80	5.79	6.01	5.96	5.91	5.97	5.17	6.01	5.98	5.90	6.03	5.85	6.03
Carbon Monoxide	mg/m^3	2	0.53	0.48	0.43	0.44	0.42	0.38	0.52	0.49	0.44	0.71	0.52	0.49
Hydrocarbon	mg/m^3	NIL	1.94	1.74	1.64	1.66	1.79	1.35	2.02	1.72	1.55	1.50	1.86	1.74
Mercury	mg/m^3			< 0.002				< 0.002		< 0.002				< 0.002
Hydrocarbon as Non Methane	mg/m^3	NIL	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
VOC's	$\mu g/m^3$			2.18				2.38		2.36				2.54
Benzo(a)Pyrene	ng/m^3	1		0.46				0.20		0.40				0.36
Ammonia	$\mu g/m^3$	400		26.34				23.71		26.34				25.84
Ozone	$\mu g/m^3$	180		40.18				34.26		40.26				34.98
Lead	$\mu g/m^3$	1		0.16				0.09		0.18				0.19
Nickel	ng/m^3	20		10.40				10.57		10.62				10.30
Arsenic	ng/m^3	6		1.36				1.02		1.46				1.36
Benzene	$\mu g/m^3$	5		1.72				1.24		1.68				1.58

ANNEXURE I

Name of Location			PARULIA				SARASWATIGUNJ						PRATPPUR	
Date			Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21	Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21
Parameter	UoM	NAAQS LIMIT												
PM 2.5	µg/m^3	60	24.14	22.46	23.23	22.96	46.46	34.24	24.24	18.08	20.96	23.10	50.83	33.75
PM 10	µg/m^3	100	72.43	72.52	80.02	69.98	90.70	76.59	67.98	57.97	72.33	71.01	87.37	69.75
Nitrogen Dioxide	µg/m^3	80	36.24	38.76	38.26	33.50	42.21	38.09	38.85	37.52	39.03	35.19	42.94	39.14
Sulphur Dioxide	µg/m^3	80	5.86	5.88	5.85	5.03	5.88	5.88	5.90	5.75	6.09	5.43	5.77	5.90
Carbon Monoxide	mg/m^3	2	0.44	0.44	0.42	0.39	0.52	0.49	0.42	0.40	0.41	0.46	0.53	0.48
Hydrocarbon	mg/m^3	NIL	1.62	1.64	1.81	1.44	1.98	1.84	1.58	1.56	1.73	1.54	1.84	1.62
Mercury	mg/m^3					< 0.002		< 0.002				< 0.002		< 0.002
Hydrocarbon as Non Methane	mg/m^3	NIL	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
VOC's	µg/m^3					2.59		2.38				2.67		2.32
Benzo(a)Pyrene	ng/m^3	1				0.21		0.46				0.24		0.24
Ammonia	µg/m^3	400				25.48		27.32				27.52		22.62
Ozone	µg/m^3	180				39.12		36.44				40.58		36.54
Lead	µg/m^3	1				0.11		0.20				0.11		0.14
Nickel	ng/m^3	20				11.94		14.60				12.97		10.60
Arsenic	ng/m^3	6				1.18		1.54				1.24		1.32
Benzene	µg/m^3	5				1.48		1.68				1.51		1.62

Name of Location			PRATPPUR				BANSIA						JAMGORA	
Date			Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21	Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21
Parameter	UoM	NAAQS LIMIT												
PM 2.5	µg/m^3	60	23.53	23.84	23.33	20.29	35.48	36.88	24.26	23.69	15.92	21.11	40.27	39.57
PM 10	µg/m^3	100	70.68	77.59	85.65	68.48	71.65	70.21	74.42	74.93	53.20	62.67	91.79	73.25
Nitrogen Dioxide	µg/m^3	80	37.97	38.87	38.09	34.42	43.38	39.98	40.47	39.81	35.95	32.85	44.67	39.37
Sulphur Dioxide	µg/m^3	80	5.79	5.90	5.78	5.27	5.54	5.65	6.04	6.00	5.77	5.01	6.36	5.93
Carbon Monoxide	mg/m^3	2	0.41	0.43	0.41	0.43	0.51	0.49	0.44	0.44	0.35	0.36	0.52	0.49
Hydrocarbon	mg/m^3	NIL	1.54	1.60	1.89	1.41	1.92	1.64	1.68	1.68	1.52	1.40	2.08	1.80
Mercury	mg/m^3					< 0.002		< 0.002				< 0.002		< 0.002
Hydrocarbon as Non Methane	mg/m^3	NIL	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
VOC's	µg/m^3					2.51		2.08				2.47		2.48
Benzo(a)Pyrene	ng/m^3	1				0.19		0.30				0.18		0.52
Ammonia	µg/m^3	400				24.66		26.44				25.03		25.88
Ozone	µg/m^3	180				38.75		34.62				36.39		36.48
Lead	µg/m^3	1				0.11		0.13				0.10		0.18
Nickel	ng/m^3	20				12.05		9.75				11.37		11.64
Arsenic	ng/m^3	6				1.13		1.28				1.09		1.42
Benzene	µg/m^3	5				1.43		1.44				1.33		1.64

Name of Location			JAMGORA				KULDIHA						JATGORIA	
Date														
Parameter	UoM	NAAQS LIMIT	Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21	Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21
PM 2.5	µg/m^3	60	20.04	18.54	26.07	24.66	49.76	35.30	20.40	21.93	16.44	26.80	44.92	31.25
PM 10	µg/m^3	100	65.07	69.78	84.78	73.09	86.76	70.50	62.59	70.15	70.37	80.13	83.77	61.01
Nitrogen Dioxide	µg/m^3	80	39.81	37.97	37.36	35.61	39.92	39.68	38.44	38.62	39.46	35.16	42.81	35.16
Sulphur Dioxide	µg/m^3	80	5.96	5.89	5.83	5.42	6.08	5.90	5.91	5.85	6.20	5.51	5.93	5.75
Carbon Monoxide	mg/m^3	2	0.42	0.42	0.42	0.46	0.54	0.48	0.43	0.43	0.41	0.45	0.52	0.48
Hydrocarbon	mg/m^3	NIL	1.70	1.68	1.84	1.59	1.98	1.68	0.16	1.62	1.67	1.74	2.08	1.58
Mercury	mg/m^3					< 0.002		< 0.002				< 0.002		< 0.002
Hydrocarbon as Non Methane	mg/m^3	NIL	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
VOC's	µg/m^3					2.70		2.46				2.97		2.32
Benzo(a)Pyrene	ng/m^3	1				0.28		0.38				0.38		0.30
Ammonia	µg/m^3	400				27.75		26.32				29.25		20.58
Ozone	µg/m^3	180				41.16		38.64				41.63		32.44
Lead	µg/m^3	1				0.14		0.16				0.17		0.14
Nickel	ng/m^3	20				13.52		12.30				16.12		9.20
Arsenic	ng/m^3	6				1.31		1.44				1.46		1.32
Benzene	µg/m^3	5				1.56		1.72				1.69		1.52

ANNEXURE I

Name of Location			JATGORIA				Gopalpur Warehouse						KANTABERIA	
Date			Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21	Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21
Parameter	UoM	NAAQS LIMIT												
PM 2.5	µg/m^3	60	26.93	19.37	18.09	28.44	46.42	30.71	19.45	24.14	24.39	24.67	44.76	34.50
PM 10	µg/m^3	100	71.09	64.80	56.69	82.17	83.84	70.37	61.49	72.06	79.55	75.63	83.52	68.76
Nitrogen Dioxide	µg/m^3	80	37.52	36.93	35.62	33.05	39.32	38.74	38.19	38.44	38.57	35.47	43.02	39.63
Sulphur Dioxide	µg/m^3	80	5.76	5.89	5.50	5.42	6.19	6.04	5.78	5.88	6.19	5.65	6.05	5.90
Carbon Monoxide	mg/m^3	2	0.43	0.41	0.36	0.41	0.54	0.50	0.43	0.44	0.43	0.45	0.53	0.49
Hydrocarbon	mg/m^3	NIL	1.68	1.52	1.59	1.77	1.84	1.65	1.54	1.68	1.83	1.62	1.76	1.82
Mercury	mg/m^3					< 0.002		< 0.002				< 0.002		< 0.002
Hydrocarbon as Non Methane	mg/m^3	NIL	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
VOC's	µg/m^3					3.04		2.44				2.84		2.56
Benzo(a)Pyrene	ng/m^3	1				0.41		0.38				0.30		0.42
Ammonia	µg/m^3	400				30.58		26.44				28.83		24.32
Ozone	µg/m^3	180				42.07		38.22				41.37		40.12
Lead	µg/m^3	1				0.19		0.20				0.14		0.18
Nickel	ng/m^3	20				16.88		11.32				14.43		12.40
Arsenic	ng/m^3	6				1.55		1.42				1.34		1.54
Benzene	µg/m^3	5				1.73		1.68				1.61		1.70

ANNEXURE I

Name of Location			KANTABERIA				NACHAN						SARENGA	
Date			Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21	Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21
Parameter	UoM	NAAQS LIMIT												
PM 2.5	µg/m^3	60	23.01	21.89	21.49	25.11	44.42	38.48	22.23	22.06	18.66	23.56	42.63	30.32
PM 10	µg/m^3	100	66.87	75.78	77.46	79.21	80.44	65.88	68.14	73.47	56.93	73.75	78.32	63.07
Nitrogen Dioxide	µg/m^3	80	36.93	38.72	38.94	34.29	43.01	36.60	37.21	39.01	35.03	35.13	42.14	38.76
Sulphur Dioxide	µg/m^3	80	5.88	5.95	5.99	5.46	5.87	5.35	5.80	5.87	5.78	5.38	5.69	5.52
Carbon Monoxide	mg/m^3	2	0.42	0.44	0.43	0.43	0.53	0.46	0.42	0.43	0.37	0.42	0.52	0.49
Hydrocarbon	mg/m^3	NIL	1.74	1.70	1.76	1.71	1.78	1.58	1.58	1.64	1.58	1.57	1.76	1.62
Mercury	mg/m^3					< 0.002		< 0.002				< 0.002		< 0.002
Hydrocarbon as Non Methane	mg/m^3	NIL	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
VOC's	µg/m^3					2.81		2.18				2.72		2.26
Benzo(a)Pyrene	ng/m^3	1				0.32		0.28				0.29		0.32
Ammonia	µg/m^3	400				29.04		24.38				27.88		23.47
Ozone	µg/m^3	180				41.93		36.48				40.52		34.58
Lead	µg/m^3	1				0.16		0.14				0.15		0.12
Nickel	ng/m^3	20				15.29		9.84				14.19		9.00
Arsenic	ng/m^3	6				1.38		1.36				1.33		1.32
Benzene	µg/m^3	5				1.66		1.58				1.59		1.48

ANNEXURE I

Name of Location			SARENGA			
Date			Jun'21	Jul'21	Aug'21	Sep'21
Parameter	UoM	NAAQS LIMIT				
PM 2.5	µg/m^3	60	20.66	22.58	22.89	18.11
PM 10	µg/m^3	100	65.68	70.16	71.14	60.96
Nitrogen Dioxide	µg/m^3	80	37.43	38.92	38.85	32.94
Sulphur Dioxide	µg/m^3	80	5.75	6.06	6.03	5.11
Carbon Monoxide	mg/m^3	2	0.43	0.43	0.42	0.38
Hydrocarbon	mg/m^3	NIL	1.58	1.62	1.63	1.38
Mercury	mg/m^3					< 0.002
Hydrocarbon as Non Methane	mg/m^3	NIL	< 0.003	< 0.003	< 0.003	< 0.003
VOC's	µg/m^3					2.41
Benzo(a)Pyrene	ng/m^3	1				0.16
Ammonia	µg/m^3	400				24.02
Ozone	µg/m^3	180				35.23
Lead	µg/m^3	1				0.08
Nickel	ng/m^3	20				10.14
Arsenic	ng/m^3	6				1.05
Benzene	µg/m^3	5				1.27

ANNEXURE II

Ambient Noise Monitoring Result				
LOCATION	DAY TIME		NIGHT TIME	
	Permissible Limit as per CPCB dB(A)	Noise Level dB(A)	Permissible Limit as per CPCB dB(A)	Noise Level dB(A)
Jatgoria Village	75	69.34	70	66.77
Saraswatigunj Village	75	61.43	70	61.73
Kantaberia Village	75	61.67	70	55.88
Jamgora Village	75	65.69	70	59.84
Kuldiha Village	75	62.51	70	63.43
Pratappur Village	75	68.04	70	67.3
Bansia Village	75	58.44	70	60.53
Parulia Village	75	51.29	70	48.84
Nachan Village	75	67.98	70	68.91
Sarenga Village	75	57.81	70	53.98
Akandara Village (GGS2)	75	70.94	70	68.49
Khatgoria Village (GGS 001)	75	70.92	70	61.42
Gopalpur Warehouse	75	72.71	70	69.22
Malandighi (MCS)	75	71.24	70	67.86
Khatgoria Village (EDD 009)	75	56.71	70	53.98

Produced Water Analysis Report of CBM Raniganj Project of Essar Oil and Gas Exploration and Production Limited
(Compliance Period: Apr'21 -Sep'21)

ANNEXURE III

MONTH					Apr'21								Apr'21				
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDD-053-D3	EDD-049-D3	EDD-017-D7	EDD-405-D5	EDD-405-D2	EDD-015-D4	EDD-012-D1	EDD-022-D1	EDE-018-D1	EDH-058-D1	EDH-064-D3	EDH-044-D1	EDC-409-D3
1	pH		5.5 to 9.0	5.5-9.0	6.76	7.40	7.35	7.62	7.35	7.26	7.73	7.80	6.45	6.85	6.60	6.59	6.95
2	Temperature			40 deg	39.2°C	43.3°C	41.3°C	43.1°C	40.1°C	45.2°C	42.0°C	40.3°C	39.7°C	37.5°C	37.0°C	36.2°C	38.1°C
3	Total Suspended Solids	mg/l	100	100	2	11	4	4	<2	<2	<2	<2	<2	7	<2	<2	11
4	Total Dissolved Solids	mg/l	---	2100	2330	1596	2048	1204	972	2082	2148	1388	1586	3432	3168	908	1282
5	Chloride	mg/l	---	600	962	603	713	464	368	876	842	421	507	1359	1292	340	474
6	Total Hardness	mg/l	---	1000	23.00	30.70	23.00	26.90	30.70	30.70	30.7	15.30	26.90	42.20	34.50	34.50	23.50
7	Sulphate	mg/l	---	1000	6.3	5.0	5.9	4.7	3.5	5.1	6.5	4.2	5.0	7.2	6.6	4.8	4.6
8	Calcium	mg/l		100	6.1	7.7	4.6	6.1	7.7	6.1	7.7	3.1	6.1	10.8	7.7	7.7	6.3
9	Magnesium	mg/l	---	10	1.9	2.8	2.8	2.8	2.7	3.7	2.7	1.9	2.8	3.7	3.7	3.7	1.9
10	Dissolved Oxygen	mg/l		1.2	4.5	3.9	5.1	4.3	5.7	4.8	4	5.5	4.6	3.5	4.1	5.9	4.7
11	BOD, 3 Days at 27ºC	mg/l	30	30	<2	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
12	COD	mg/l	250	100	<8	9.0	8.0	<8	<8	<8	<8	<8	<8	8.0	<8	<8	<8
13	Oil & Grease	mg/l	10	10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
14	Phenolic Compounds	mg/l	1	1.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
15	Sulphide	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
16	Fluoride	mg/l	2	1.5	1.7	1.15	1.35	0.95	0.81	1.60	1.55	0.95	1.2	2.5	2.1	0.65	1.2
17	Total Chromium	mg/l	2	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	0.1	0.022	0.017	0.026	0.240	0.190	0.360	0.026	0.013	0.017	0.015	0.026	<0.01	0.025
19	Copper	mg/l	---	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Nickel	mg/l		3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Lead	mg/l		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
22	Mercury	mg/l	0.01	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Bicarbonate	mg/l			549.00	317.00	519.00	220.00	238.00	421	622.00	433.00	281.00	373.00	363.00	128.00	433.10
24	Sodium	mg/l	---		1050.0	795.0	910.0	590.0	445.0	950	940.0	555.0	675.0	1655.0	1590.0	470.0	520.0
25	Cyanide	mg/l	0.2	0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
26	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
27	Aluminium	mg/l	---														<0.01
28	Lithium	mg/l															<0.1
29	Molybdenum	mg/l	---														<0.05
30	Palladium	mg/l	---														<0.5
31	Selenium	mg/l															<0.005
32	Vanadium	mg/l	---														<0.1
33	Cadmium	mg/l															<0.02
34	Cobalt	mg/l															<0.1

Produced Water Analysis Report of CBM Raniganj Project of Essar Oil and Gas Exploration and Production Limited
(Compliance Period: Apr'21 -Sep'21)

ANNEXURE III

MONTH					Jun'21			Jun'21									
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDG-077-D5	EDN-184-D2	EDN-162-D7	EDI-041-D2	EDI-115-v1	EDE-43-V1	EDE-005-D2	EDD-003-D3	EDD-401-D1	EDD-010-V1	EDD-052-D2	EDC-411-D1	EDD-407-D1
1	pH		5.5 to 9.0	5.5-9.0	6.88	6.80	6.65	6.75	6.85	6.55	6.64	6.52	6.59	6.65	6.70	7.08	6.95
2	Temperature			40 deg	37.9°C	38.2°C	38.7°C	36.8°C	34.8°C	35.6°C	35.5°C	36.9°C	37.4°C	33.2°C	35.9°C	36.8°C	34.5°C
3	Total Suspended Solids	mg/l	100	100	<2	5	62	21	7	4	<2	<2	2	<2	6	<2	<2
4	Total Dissolved Solids	mg/l	---	2100	1676	862	4256	3420	1436	1124	1798	1810	998	1392	2688	1162	952
5	Chloride	mg/l	---	600	646	306	1627	1240	526	388	742	689	402	426	1192	431	345
6	Total Hardness	mg/l	---	1000	39.20	54.90	529.20	219.50	47.00	35.3	43.10	35.30	23.50	27.40	50.90	20.00	27.00
7	Sulphate	mg/l	---	1000	3.9	5.3	6.0	5.5	6.9	4.9	5.8	4.5	3.0	3.5	5.1	5.8	4.7
8	Calcium	mg/l		100	9.4	12.6	131.9	53.4	11	7.8	11	7.8	6.3	6.3	12.6	4.7	6.3
9	Magnesium	mg/l	---	10	3.8	5.7	48.6	20.9	4.7	3.8	3.8	3.8	1.9	2.8	4.7	1.9	2.8
10	Dissolved Oxygen	mg/l		1.2	5.3	4.9	4.0	3.7	4.5	4.3	5.0	4.0	4.7	5.5	4.1	4.6	4.3
11	BOD, 3 Days at 27ºC	mg/l	30	30	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
12	COD	mg/l	250	100	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8
13	Oil & Grease	mg/l	10	10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
14	Phenolic Compounds	mg/l	1	1.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
15	Sulphide	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
16	Fluoride	mg/l	2	1.5	0.95	1.75	3.1	2.65	1.58	1.25	2.7	1.95	1.15	1.35	2.2	1.45	1.06
17	Total Chromium	mg/l	2	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	0.1	0.013	0.017	0.033	0.025	0.019	0.013	0.024	0.018	0.011	0.021	0.030	0.014	0.019
19	Copper	mg/l	---	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Nickel	mg/l		3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Lead	mg/l		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
22	Mercury	mg/l	0.01	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Bicarbonate	mg/l			475.80	256.20	1073.00	1152.90	341.6	359.90	372.10	427.00	219.60	390.40	402.60	476.00	390.00
24	Sodium	mg/l	---		710.0	286.0	1965.0	1420.0	480	440.0	825.0	665.0	380.0	505.0	1260.0	385.0	342.0
25	Cyanide	mg/l	0.2	0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.01
26	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
27	Aluminium	mg/l	---		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
28	Lithium	mg/l			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
29	Molybdenum	mg/l	---		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
30	Palladium	mg/l	---		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
31	Selenium	mg/l			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		
32	Vanadium	mg/l	---		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
33	Cadmium	mg/l			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		
34	Cobalt	mg/l			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		

Produced Water Analysis Report of CBM Raniganj Project of Essar Oil and Gas Exploration and Production Limited
(Compliance Period: Apr'21 -Sep'21)

ANNEXURE III

MONTH					Jul'21						Jul'21				Aug'21		
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDN-162-D6	EDI-042-D4	EDI-036-D2	EDI-032-D1	EDD-023-D1	EDD-022-D3	EDD-003-D2	EDD-405-D2	EDG-015-D4	EDG-075-D1	EDD-026 D1	EDC-072-V	EDD-052-D4
1	pH		5.5 to 9.0	5.5-9.0	6.60	6.70	6.55	6.80	7.35	7.10	6.85	6.80	6.95	6.47	7.88	8.30	8.04
2	Temperature			40 deg	33.2°C	31.9°C	29.2°C	32.4°C	35.4°C	32.9°C	36.2°C	36.8°C	38.6°C	36.4°C	38.1°C	37.9°C	38.7°C
3	Total Suspended Solids	mg/l	100	100	788	2	102	14	2	2	2	<2	2	<2	8	21	4
4	Total Dissolved Solids	mg/l	---	2100	4426	4888	6680	3884	1642	1438	1510	1824	1086	1564	1426	2446	2838
5	Chloride	mg/l	---	600	1795	2495	2895	1608	665	589	627	713	431	641	458	908	1030
6	Total Hardness	mg/l	---	1000	715.00	270.00	304.00	94.00	24	20.00	16.00	24.00	24.00	20.00	59.00	110.00	43.00
7	Sulphate	mg/l	---	1000	8.0	9.2	6.3	7.4	4.5	5.3	4.0	6.2	5.7	7.1	6.0	7.5	5.8
8	Calcium	mg/l		100	181.6	67.5	74.6	23.6	4.7	4.7	3.1	4.7	4.7	4.7	14.0	27.0	9
9	Magnesium	mg/l	---	10	64.2	24.7	28.5	8.5	2.8	1.9	1.9	2.8	2.8	1.9	6	10	5.0
10	Dissolved Oxygen	mg/l		1.2	2.8	3.3	2.9	4.2	4.5	5.0	4.8	4.9	5.0	5.3	3.7	3.2	4.3
11	BOD, 3 Days at 27ºC	mg/l	30	30	3	<2	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
12	COD	mg/l	250	100	12.0	8.0	10.0	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8
13	Oil & Grease	mg/l	10	10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
14	Phenolic Compounds	mg/l	1	1.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
15	Sulphide	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
16	Fluoride	mg/l	2	1.5	3.49	2.4	0.85	1.95	0.95	0.6	1.15	0.085	0.61	1.28	1.65	2.7	2.7
17	Total Chromium	mg/l	2	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	0.1	0.033	0.013	0.024	0.011	0.021	0.017	0.025	0.015	0.011	0.018	0.015	0.023	0.017
19	Copper	mg/l	---	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Nickel	mg/l		3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Lead	mg/l		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
22	Mercury	mg/l	0.01	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Bicarbonate	mg/l			994.00	1147.00	1769.00	1196	518.00	403.00	360.00	622.00	250.00	415.00	<0.01	<0.01	<0.01
24	Sodium	mg/l	---		1570.0	1975.0	2740.0	1570	692.0	610.0	645.0	770.0	410.0	680.0	<0.1	<0.1	<0.1
25	Cyanide	mg/l	0.2	0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05
26	Hexavalent Chromium	mg/l	0.1		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.5	<0.5	<0.5
27	Aluminium	mg/l	---												<0.005	<0.005	<0.005
28	Lithium	mg/l													<0.1	<0.1	<0.1
29	Molybdenum	mg/l	---												<0.02	<0.02	<0.02
30	Palladium	mg/l	---												<0.1	<0.1	<0.1
31	Selenium	mg/l													403.00	634.00	647.00
32	Vanadium	mg/l	---												570.0	1080.0	1340.0
33	Cadmium	mg/l													<0.02	<0.02	<0.02
34	Cobalt	mg/l													<0.01	<0.01	<0.01

Produced Water Analysis Report of CBM Raniganj Project of Essar Oil and Gas Exploration and Production Limited

(Compliance Period: Apr'21 -Sep'21)

ANNEXURE III

MONTH						Aug'21								Sep'21	Sep			
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDD-049	EDD-017-D4	EDD-017-D7	EDD-015-D1	EDD-023-D2	EDN-162 D4	EDI-042-V	EDI-042-V1	EDD-008-D2	EDD-008	EDD-012-D3	EDD-015-D1	EDD-015-D3
1	pH		5.5 to 9.0	5.5-9.0	8.84	7.14	8.25	7.31	8.08	6.56	7.70	6.58	6.90	7.35	6.70	6.60	6.53
2	Temperature			40 deg	36.8°C	34.8°C	35.6°C	35.5°C	36.9°C	32.6°C	29.9°C	32.4°C	29.1°C	29.9°C	29.7°C	28.4°C	29.4°C
3	Total Suspended Solids	mg/l	100	100	20	508	98	234	28	92	5	6332	2028	<2	36	61	6
4	Total Dissolved Solids	mg/l	---	2100	1936	4056	2992	4408	2066	7464	5672	6332	2028	1906	5876	3392	2796
5	Chloride	mg/l	---	600	780	1497	1130	1783	812	3045	2042	2618	830	775	2242	1407	1171
6	Total Hardness	mg/l	---	1000	70.00	1088.00	204	913.00	98.00	909	345	392	20	23.00	1627.00	157	20.00
7	Sulphate	mg/l	---	1000	3.5	6.9	5.5	8.0	4.9	8.00	10.00	7	4.00	6.0	8.0	5	4.0
8	Calcium	mg/l		100	16	283	50	240	23	237.0	82.0	97	5.0	6	416	38	5
9	Magnesium	mg/l	---	10	8.0	93.0	19	76.0	9.0	77.0	34.0	36	2	2.0	143.0	15	2.0
10	Dissolved Oxygen	mg/l		1.2	3.9	2.8	3.3	2.9	4.0	4.7	5.9	4.9	5.7	4.5	3.7	4	5.1
11	BOD, 3 Days at 27ºC	mg/l	30	30	<2	3	3	5	<2	3	<2	2	<2	<2	3	<2	<2
12	COD	mg/l	250	100	<8	18.0	15.0	20.0	8.0	9.0	<8	8.0	<8	<8	12.0	8.0	<8
13	Oil & Grease	mg/l	10	10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
14	Phenolic Compounds	mg/l	1	1.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
15	Sulphide	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
16	Fluoride	mg/l	2	1.5	1.25	3.30	2.9	3.15	1.05	3.15	2.6	1.2	1.35	1.3	2.60	0.9	1.1
17	Total Chromium	mg/l	2	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	0.1	0.012	0.027	0.024	0.031	0.019	0.021	0.033	0.012	0.015	0.017	0.029	0.011	0.018
19	Copper	mg/l	---	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Nickel	mg/l		3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Lead	mg/l		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
22	Mercury	mg/l	0.01	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Bicarbonate	mg/l			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**	<0.01	<0.01	<0.01	<0.01	<0.01
24	Sodium	mg/l	---		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**	<0.1	<0.1	<0.1	<0.1	<0.1
25	Cyanide	mg/l	0.2	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**	<0.05	<0.05	<0.05	<0.05	<0.05
26	Hexavalent Chromium	mg/l	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**	<0.5	<0.5	<0.5	<0.5	<0.5
27	Aluminium	mg/l	---		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**	<0.005	<0.005	<0.005	<0.005	<0.005
28	Lithium	mg/l			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**	<0.1	<0.1	<0.1	<0.1	<0.1
29	Molybdenum	mg/l	---		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**	<0.02	<0.02	<0.02	<0.02	<0.02
30	Palladium	mg/l	---		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**	<0.1	<0.1	<0.1	<0.1	<0.1
31	Selenium	mg/l			397.00	988	915.00	1147.00	561.00	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
32	Vanadium	mg/l	---		910.0	1630	1250.0	1910.0	890.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
33	Cadmium	mg/l			<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
34	Cobalt	mg/l			<0.01	<0.01	<0.01	<0.01	<0.01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Produced Water Analysis Report of CBM Raniganj Project of Essar Oil and Gas Exploration and Production Limited
(Compliance Period: Apr'21 -Sep'21)

ANNEXURE III

MONTH					›'21			
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDD-049-D2	EDC-409-D4	EDD-054-D4	EDD-052-D4
1	pH		5.5 to 9.0	5.5-9.0	6.81	6.70	7.11	6.75
2	Temperature			40 deg	28.9°C	30.9°C	28.4°C	27.8°C
3	Total Suspended Solids	mg/l	100	100	41	26	5	37
4	Total Dissolved Solids	mg/l	---	2100	3608	3276	2362	2768
5	Chloride	mg/l	---	600	1511	1271	935	1039
6	Total Hardness	mg/l	---	1000	145.00	329.00	31.00	102.00
7	Sulphate	mg/l	---	1000	7.0	6.0	4.0	6.0
8	Calcium	mg/l		100	34	82	8	23
9	Magnesium	mg/l	---	10	14.0	30.0	3.0	10.0
10	Dissolved Oxygen	mg/l		1.2	4.3	4.9	5.3	4.9
11	BOD, 3 Days at 27ºC	mg/l	30	30	<2	<2	<2	<2
12	COD	mg/l	250	100	<8	<8	<8	<8
13	Oil & Grease	mg/l	10	10	<5.0	<5.0	<5.0	<5.0
14	Phenolic Compounds	mg/l	1	1.2	<0.002	<0.002	<0.002	<0.002
15	Sulphide	mg/l	2	2	<0.5	<0.5	<0.5	<0.5
16	Fluoride	mg/l	2	1.5	0.87	1.45	0.63	1.85
17	Total Chromium	mg/l	2	0.1	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	0.1	0.010	0.015	0.023	0.019
19	Copper	mg/l	---	0.2	<0.05	<0.05	<0.05	<0.05
20	Nickel	mg/l		3	<0.05	<0.05	<0.05	<0.05
21	Lead	mg/l		0.1	<0.1	<0.1	<0.1	<0.1
22	Mercury	mg/l	0.01	0.01	<0.001	<0.001	<0.001	<0.001
23	Bicarbonate	mg/l			<0.01	<0.01	<0.01	<0.01
24	Sodium	mg/l	---		<0.1	<0.1	<0.1	<0.1
25	Cyanide	mg/l	0.2	0.2	<0.05	<0.05	<0.05	<0.05
26	Hexavalent Chromium	mg/l	0.1		<0.5	<0.5	<0.5	<0.5
27	Aluminium	mg/l	---		<0.005	<0.005	<0.005	<0.005
28	Lithium	mg/l			<0.1	<0.1	<0.1	<0.1
29	Molybdenum	mg/l	---		<0.02	<0.02	<0.02	<0.02
30	Palladium	mg/l	---		<0.1	<0.1	<0.1	<0.1
31	Selenium	mg/l			<0.01	<0.01	<0.01	<0.01
32	Vanadium	mg/l	---		<0.1	<0.1	<0.1	<0.1
33	Cadmium	mg/l			<0.05	<0.05	<0.05	<0.05
34	Cobalt	mg/l			<0.5	<0.5	<0.5	<0.5

Ground Water Analysis of Surrounding Areas of CBM Raniganj Project of EOGEPL **ANNEXURE IV**

Compliance Period: Apr'21 to Sep'21

S. No.	Parameter	Unit	S:10500 -1991		Gopalpur Village	Sarenga Village	Ghatakdanga Village	Saraswatiganj village	Jatgoria near Mosjid	Bargoria Village	Kantaberia Village
			Desirable limit	Permissible limit							
1	Colour	Hazen	5	15	<5	<5	<5	<5	<5	<5	<5
2	pH Value		6.5-8.5	No relaxation	6.6	6.25	6.7	6.8	6.89	6.75	6.59
3	Turbidity, NTU	NTU	1	5	4	<1	25	<1	1.5	6.5	3.5
4	Total Dissolved Solids	mg/l	500	2000	138	242	60	114	106	92	114
5	Total Suspended Solids,	mg/l	---	---	2	<2	12	<2	78	3	2
6	Total Alkalinity as $CaCO^3$	mg/l	200	600	165	201	41	88	46	80	78
7	Total Hardness	mg/l	200	600	101.9	180.3	31.4	86.2	54.9	70.6	90.2
8	Aluminium (as Al)	NTU	0.03	0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
9	Ammonia (as total ammonia -N)	mg/l	0.5	No relaxation	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
10	Anionic Detergents (as MBAS)	mg/l	0.2	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
11	Barium (as Ba)	mg/l	0.7	No relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
12	Boron (as B)	mg/l	0.5	1	<1	<1	<1	<1	<1	<1	<1
13	Calcium (as Ca)	mg/l	75	200	25.1	45.5	7.8	22	12.6	15.7	22
14	Chloride (as Cl)	mg/l	250	1000	32	39	18	25	17	9	19
15	Copper (as Cu)	mg/l	0.05	1.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
16	Fluoride (as F)	mg/l	1	1.5	0.41	0.30	0.15	0.71	0.68	0.4	0.35
17	Free Residual Chlorine	mg/l	0.2	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
18	Iron (as Fe)	mg/l	0.3	No relaxation	0.65	0.19	2.8	<0.1	20.5	0.85	0.45
19	Magnesium (as Mg)	mg/l	30	100	9.5	16.2	2.8	7.6	5.8	7.6	8.6
20	Manganese (as Mn)	mg/l	0.1	0.3	<0.05	<0.05	0.083	<0.05	0.286	<0.05	<0.05
21	Mineral Oil	mg/l	0.5	No relaxation	<1	<1	<1	<1	<1	<1	<1
22	Nitrate (as NO^3)	mg/l	45	No relaxation	2.82	10.27	4.3	1.52	<0.5	4.32	1.15
23	Phenolic Compounds (as C^6H^5OH)	mg/l	0.001	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
24	Sulphate (as SO^4)	mg/l	200	400	2.5	3.5	<2.5	4	4.8	<2.5	<2.5
25	Silver (as Ag)	mg/l	0.1	No relaxation	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
26	Sodium (as Na)	mg/l	---	---	10	12	5	12	4	6	11
27	Selenium (as Se)	mg/l	0.01	No relaxation	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
28	Cadmium (as Cd)	mg/l	0.003	No relaxation	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
29	Cyanide (as CN)	mg/l	0.05	No relaxation	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
30	Lead (as Pb)	mg/l	0.01	No relaxation	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
31	Mercury (as Hg)	mg/l	0.001	No relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
32	Total Arsenic (as As)	mg/l	0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
33	Polynuclear aromatic hydrocarbons (as PAH)	mg/l	0.0001	No relaxation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
34	Pesticide Residues	mg/l	0.01	No relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
35	Total Coliform Count,	MPN/100 ml	Shall not be detectable in any 100 ml sample		<1	2	<1	<1	<1	<1	<1
36	Odour		Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
37	Polychlorinated Biphenyls	mg/l	0.0005	No Relaxation	Not Detectable	Not Detectable	Not Detectable	Not Detectable	Not Detectable	Not Detectable	Not Detectable
38	Chloramines	us/cm	4	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
39	Molybdenum	mg/l	0.07	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
40	Sulphide,mg/L	mg/l	0.05	No Relaxation	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

S. No.	Parameter	Unit	S:10500 -1991		Gopalpur Village	Sarenga Village	Ghatakdanga Village	Saraswatiganj village	Jatgoria near Mosjid	Bargoria Village	Kantaberia Village
			Desirable limit	Permissible limit							
41	Electrical Conductivity at 25° C,	µmhos/cm	---	---	380	470	102	250	240	160	190
42	Phosphorus(as P)	mg/l	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
43	Nickel	mg/l	0.02	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
44	Total Chromium	mg/l	0.05	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
45	Zinc	mg/l	5	15	0.015	0.01	0.018	0.017	0.023	0.012	<0.01

Ground Water Analysis of Surrounding Areas of CBM Raniganj Project of EOGEPL

ANNEXURE IV

Compliance Period: Apr'21 to Sep'21

S. No.	Parameter	Unit	S:10500 -1991		Dhabani Village	Labnapara village	Akandara Village	Nachan Village	Kalikapur Village	Bansia Village
			Desirable limit	Permissible limit						
1	Colour	Hazen	5	15	<5	<5	<5	<5	<5	<5
2	pH Value		6.5-8.5	No relaxation	6.51	6.6	6.75	6.5	6.35	6.63
3	Turbidity, NTU	NTU	1	5	4.1	<1	1.8	2.2	10	4.8
4	Total Dissolved Solids	mg/l	500	2000	56	208	58	368	262	272
5	Total Suspended Solids,	mg/l	---	---	2	<2	<2	<2	<2	2
6	Total Alkalinity as $CaCO^3$	mg/l	200	600	40	125	40	107	34	204
7	Total Hardness	mg/l	200	600	31.4	105.8	35.3	290.1	196	172.5
8	Aluminium (as Al)	NTU	0.03	0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
9	Ammonia (as total ammonia -N)	mg/l	0.5	No relaxation	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
10	Anionic Detergents (as MBAS)	mg/l	0.2	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
11	Barium (as Ba)	mg/l	0.7	No relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
12	Boron (as B)	mg/l	0.5	1	<1	<1	<1	<1	<1	<1
13	Calcium (as Ca)	mg/l	75	200	7.8	25.1	7.8	73.8	50.3	42.4
14	Chloride (as Cl)	mg/l	250	1000	10	55	11	136	124	46
15	Copper (as Cu)	mg/l	0.05	1.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
16	Fluoride (as F)	mg/l	1	1.5	0.2	0.55	0.65	0.24	0.39	0.52
17	Free Residual Chlorine	mg/l	0.2	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
18	Iron (as Fe)	mg/l	0.3	No relaxation	0.58	0.21	0.12	0.19	0.75	0.47
19	Magnesium (as Mg)	mg/l	30	100	2.8	8.6	3.8	25.7	17.1	16.2
20	Manganese (as Mn)	mg/l	0.1	0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Mineral Oil	mg/l	0.5	No relaxation	<1	<1	<1	<1	<1	<1
22	Nitrate (as NO^3)	mg/l	45	No relaxation	2.5	5.12	1.5	6.23	11.1	4.36
23	Phenolic Compounds (as C^6H^5OH)	mg/l	0.001	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
24	Sulphate (as SO^4)	mg/l	200	400	3.5	<2.5	<2.5	6	5.3	4.5
25	Silver (as Ag)	mg/l	0.1	No relaxation	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
26	Sodium (as Na)	mg/l	---	---	3	30	7	58	48	35
27	Selenium (as Se)	mg/l	0.01	No relaxation	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
28	Cadmium (as Cd)	mg/l	0.003	No relaxation	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
29	Cyanide (as CN)	mg/l	0.05	No relaxation	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
30	Lead (as Pb)	mg/l	0.01	No relaxation	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
31	Mercury (as Hg)	mg/l	0.001	No relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
32	Total Arsenic (as As)	mg/l	0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
33	Polynuclear aromatic hydrocarbons (as PAH)	mg/l	0.0001	No relaxation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
34	Pesticide Residues	mg/l	0.01	No relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
35	Total Coliform Count,	MPN/100 ml	Shall not be detectable in any 100 ml sample		<1	<1	<1	<1	<1	<1
36	Odour		Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
37	Polychlorinated Biphenyls	mg/l	0.0005	No Relaxation	Not Detectable	Not Detectable	Not Detectable	Not Detectable	Not Detectable	Not Detectable
38	Chloramines	us/cm	4	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
39	Molybdenum	mg/l	0.07	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
40	Sulphide,mg/L	mg/l	0.05	No Relaxation	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Ground Water Analysis of Surrounding Areas of CBM Raniganj Project of EOGEPL

ANNEXURE IV

Compliance Period: Apr'21 to Sep'21

S. No.	Parameter	Unit	S:10500 -1991		Dhabani Village	Labnapara village	Akandara Village	Nachan Village	Kalikapur Village	Bansia Village
			Desirable limit	Permissible limit						
41	Electrical Conductivity at 25° C,	µmhos/cm	---	---	90	355	95	625	520	555
42	Phosphorus(as P)	mg/l	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
43	Nickel	mg/l	0.02	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
44	Total Chromium	mg/l	0.05	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
45	Zinc	mg/l	5	15	<0.01	0.022	<0.01	0.013	0.022	0.024

ANNEXURE V

Expenditure towards Corporate Social Responsibility at EOGEPL CBM Project, Raniganj
(Apr' 21 to Sep' 21)

Thematic Area	Projects	Beneficiaries (No.)	Expenditure (INR)
HEALTH	Community Health Care Services through Mobile Medical Van	**6458**	**899,742.00**
SPORTS AND CULTURAL EVENT	Support to sports	**992**	**76,894.00**
COMMUNITY INFRASTRUCTURE DEVELOPMENT	Support to community	**9274**	**699,917.00**
TOTAL		**16724**	**Rs. 1,676,553.00**

ANNEXURE VI

Expenditure towards Environmental Protection Measures at EOGEPL CBM Project, Raniganj
(April' 21 to September' 21)

S. No.	Particular	Expenses (INR)
1	Installation of Reverse Osmosis Treatment System for Produced Water Treatment (Recurring)	1,47,56,567
2	Environmental Monitoring Activities (Recurring)	Rs. 562,710.00
3	HDPE liners for produced water storage at site when needed (Capital)	Rs. 166,500.00
4	TCLP Analysis of Hazardous waste (One time)	Rs. 1.00
5	Non Hazardous Waste Disposal (Recurring)	Rs. 101,775.00
6	Hazardous Waste Disposal (Recurring)	Rs. 240,204.81
TOTAL		**Rs. 1,071,190.81**

Annexure VII

ESSAR
OIL & GAS

Essar Oil and Gas Exploration and Production Ltd.
AN 81 B, Sector 2B
Martin Luther King Road
Bidhan Nagar,
Durgapur - 713 212
India

CIN : U11203GJ2016PLC091903

T +91 343 253 2202
F +91 343 253 2201
E eogepl@essarenp.co.in
www.essar.com

EOGEPL/CBM- RG (E)/ HSE/ 2021/3464
Date: 6th September 2021

To
The Environmental Engineer and In-Charge
Durgapur regional Office
West Bengal Pollution Control Board
Sahid Khudiram Sarani, City Centre
Durgapur, Paschim Bardhaman 713216

Sub: Submission of Form V: Environmental Statement (FY 2020-21)

Dear Sir,

We are enclosed herewith the Environmental Statement for (FY 2020-21) of Raniganj East CBM Block-RG (E)- CBM-2001/1 Durgapur West Bengal of Essar Oil and Gas Exploration and Production Limited.

Thanking you for your continued support,

With Best Regards,

For Essar Oil and Gas Exploration and Production Limited

Kannan Rajendran
Chief Operating Officer
Raniganj East, CBM Project-Durgapur

Raniganj East CBM Project-Durgapur

W.B. Pollution Control Board, Regional Office, Durgapur, City Centre, RECEIVED, Contents Not Verified

9/9/21

Enclosures: Form V: Environmental Statement of FY 2020-21

Copy to

1. Senior Environmental Engineer, Head Office, WBPCB, Kolkata
2. The Regional Director, IRO, MOEFCC, IB -194, Sector III, Salt Lake , Kolkata

FORM-V
(See rule 14)

Environmental Statement for the financial year ending with 31st March 2021

PART- A

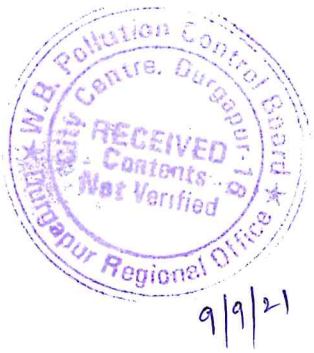
i. **Name and address of the owner/occupier of the industry operation or process.**
Pankaj Kalra – Mines Owner, Raniganj CBM-Durgapur
Essar Oil and Gas Exploration and Production Limited,
3rd Floor, Essar House, 11 K. K. Marg, Mahalaxmi, Mumbai-400034, Maharashtra

ii. **Industry category Primary-(STC Code) :**Coal Bed Methane (Exploration & Production)
Secondary- (STC Code)

iii. **Production Capacity-** ~ 52,200,000 m3/month

iv. **Year of establishment-** Established in year 2008-09.

v. Date of the last environmental statement submitted: 06-07-2019



PART - B

Water and Raw Material Consumption:

i. Water consumption in m^3/d

Process: Nil

Cooling: Not applicable

Domestic: 15 m^3 per day

Sr. No.	Name of Products	Process water consumption per unit of products	
		During the previous financial year	During the current financial year
1	Coal Bed Methane	Nil	Nil

ii. Raw material consumption

Sr. No.	*Name of raw materials**	Name of Products	Consumption of raw material per unit of Output	
			During the previous financial year (2018-2019)	During the current financial year (2019-2020)
1	*Main raw material during drilling phase- Water based Mud*		No Drilling operation	No Drilling operation

* Industry may use codes if disclosing details of raw material would violate contractual obligations, otherwise all industries have to name the raw materials used.

PART- C

Pollution discharged to environment/unit of output

(Parameter as specified in the consent issued)

Sr. No.	Parameter	Pollutants Quantity of Pollutants discharged (mass/day)	Concentration of Pollutants discharged (mass/volume)	Percentage of variation from prescribed standards with reasons
A	Water	Nil	Nil	-
B	Air	Nil	Nil	-

PART- D

HAZARDOUS WASTES

(as specified under Hazardous Wastes (Management & Handling Rules, 1989).

Sr. No	Area	Hazardous Wastes	Total Quantity (Kg)	
			During the previous financial year (2019-2020)	During the current financial year (2020-2021)
1	From Process	1. Waste Oil/used oil 2. Oil contaminated Waste	34. 650 KL 1.640 MT	32. 97 KL 1.9 MT
2	From Pollution Control Facilities (RO Plant)	1. Used RO Membrane Filter	0	1.25 MT

PART - E

SOLID WASTES:

Sr. No	Area	Solid Wastes	Total Quantity (Kg)	
			During the previous financial year	During the current financial year
A	From Process	Waste Mud & Drill Cutting during drilling	No drilling Operation	No drilling Operation
B	From Pollution Control Facilities		-	-
C	1. Quantity recycled or re-utilized within the unit. 2. Solid (recyclable and Reusable) 3. Disposed		-	1. 0 2. 19.465 MT 3. 3.965 MT

Oil and Gas Exploration and Production Limited & ESSAR
Raniganj East
CBM
Project Durgapur

PART - F

Please specify the characteristics (in terms of concentration and quantum) of hazardous as well as solid wastes and indicate disposal practice adopted for both these categories of wastes.

Sr. No.	Types of Waste	Quantity	Mode of Disposal
1	Hazardous Waste- Waste/used Oil	20,000 Litres	Sold to authorize recycler. **Address of recycler:** M/S Amit Lubricants M M Road, Raghunathpur, Dankuni, Hooghly 712247
		32,970 Litres	M/s Lubrina Recycling (P) Ltd Joy Chandipur, PO Bakrahat, PS Bishnupur, Dist @4 pgs (south)
2	Oil contaminated waste	1.535 MT	Sent to TSDF, Haldia **Address:** West Bengal Waste Management Limited, J.l.no-103, Mouza-Purba Srikrishnapur, P.O & P.S.-Sutahata, PIN-721635, Haldia, Dist-Purba Midnapur

PART- G

Impact of the pollution control measures taken on conservation of natural resources and consequently on the cost of production.

1. Reuse of produced water in dust suppression and as utilities.
2. Gas based Generator Sets used at well sites and facilities (i.e GGS 1, 2, 3, 4 and MCS).
3. Connected all well pads with GGS/MCS and Customer end with CGS through pipeline. The Pipeline is also connected with the GAIL pipeline network (as a part of Urja Ganga Pipeline Project) . Maximum Sale of Coal bed Methane Gas and target to achieve "Zero" the Gas flaring.
4. Installation RO (4200 KLD) for the treatment of Produced water generated from CBM wells and additional 2 MLD RO is in operation and 2 MLD more is in advance stage and will be in operation the year ending.
5. Ceramic membrane Oil & water separator in addition to the Gravimetric separator installed in GGS 2 Compressor station and plan for installation of two more in GGS 1 and GGS 3 as a precautionary measure.

Raniganj East CBM Project-Durgapur

PART - H

Additional measures/investment proposal for environmental protection including abatement of pollution.

1. Regular environmental monitoring through CPCB/NABL approved laboratory for Ambient Air and Noise Quality monitoring and DG set Stack emission monitoring, sampling and Analysis of Produced water, Ground water. The analysis and monitoring report was submitted with half yearly Environmental Clearance compliance report.
2. Three Bin waste Management System (different colour code) is developed at all the major site to segregate the waste generated at source.
3. Initiative stated for onsite bio manure from the food waste generated at site
4. Total plantation of the major facility Plan for plantation of 1000 more plant in each consecutive year and awarded to work to export for coming three years.

PART - I

Any Other Particulars for improving the Quality of the Environment.

Participation in the plantation program of forest department in Chua village - this year Forest Deptt has been instructed to organize a plantation programme under "Mission Green" of Govt. of India and the Molandighi Beat has been given a target of organizing plantation drive on about 8Ha land of Forest Deptt. This plantation programme was scheduled to be initiated in July 2021, on a stretch on Molandighi road till Chua More which belongs to Forest Deptt. Since safeguarding the saplings on the road sides is difficult, so EOGEPL has decided to extend CSR support to the "Mission Green" programme in the form of providing 625 bamboo tree-guards.