GREAT EASTERN ENERGY CORPORATION LTD.

Ref: GEECL/QHSE/2025/May/3617

May 26, 2025

The Director
Impact Assessment, Industry - II,
Monitoring Cell,
Ministry of Environment, Forests and Climate Change,
Agni - Block, "Indira Paryavaran Bhawan", Jor Bagh Road,
Aliganj, New Delhi - 110 003

Sub.: Submission of Half Yearly Environmental Clearance Compliance Reports (October-2024 to March 2025) of Great Eastern Energy Corporation Ltd. ("GEECL")

Ref.:

1. Environment Clearance: F. No. J-11011/264/2007-IA II (I); dated June 28, 2007 (Exploration & Production of Coal Bed Methane ("CBM") in Ranging (South) Coal Field, West Bengal).
2. Environment Clearance: F. No. J-11011/352/2010-IA II (I); dated November 24, 2011 (Expansion of Exploration & Production of CBM in Raniganj (South), CBM Block, West Bengal) and Environmental clearance validity extension letter dated May 1, 2019 issued by MOEF&CC for extending the validity till November 24, 2021 and Amendment in Environmental Clearance letter dated November 25, 2020 issued by MOEF&CC. Validity extended due to outbreak of Covid till November, 2022 by Government of India (MOEF&CC) Gazette notification S.O. 221(E) dated January 18, 2021.
3. OM dated April 12, 2022, in the EC vide letter No. J-11011/352/2010- IAII(I) dated November 24, 2011 till November 24, 2023, with all other terms and conditions remain unchanged.
4. Environment Clearance Identification. No. EC23B002WB112414, F. No. EN/T-II-1/043/2022, dated April 27, 2023 (Drilling of 20 shale gas exploratory Wells in Raniganj (South) CBM Block, West Bengal) issued by SEIAA West Bengal.

Dear Sir,

We are hereby submitting compliance status for the period of October-2024 to March-2025 for above referenced Environmental Clearances granted to our project Exploration & Production of CBM and Drilling of 20 shale gas exploratory wells in Raniganj (South), West Bengal.

Thanking You,

Yours faithfully,
For **Great Eastern Energy Corporation Ltd.**

Jairam K Shrinivasan
Joint President-Operations & HR

Enclosure: Annexure- I, II, and III (Half Yearly EC Compliance Status Reports along with Monitoring Reports as Appendix-A, B, C, D, E, F, G, H and I)

Copy to:

1. The IGF & Incharge, GOI, MoEF & CC, Integrated Regional Office, Kolkata, 1B-198, Salt Lake City, Sector III, Kolkata-700 106
2. The Member Secretary, Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar, New Delhi - 110 032
3. The Member Secretary, West Bengal State Pollution Control Board, Paribesh Bhawan,10A, Block - LA, Sector-III, Salt Lake City, Kolkata - 700 106.
4. The Additional Principal Chief Conservator of Forests (C), Ministry of Environment, Forest and Climate Change, Regional Office (EZ) A/3, Chandrashekharpur, Bhubaneswar -751023.
5. The Member Secretary, SEIAA, Govt. of Bengal, Pranisampad Bhawan, 5th Floor LB Block, Sector -III Salt Lake Kolkata - 700106.

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Annexure – I

Compliance Status of conditions of Environmental Clearance
F. NO. J-11011/264/2007-IA II (I) Dated: June 28, 2007
Monitoring Report - 36
Monitoring Period (October-2024 to March-2025)

Part – I

DATA – SHEET

1.	Name of the project	Exploration & Production of Coal Bed Methane
2.	Clearance letter No. & date.	F. NO. J-11011/264/2007-IA II (I); Dated: June 28,2007
3.	Locations:	Raniganj (South) CBM Block
	a. District (s)	Paschim Bardhaman, Bankura, Purulia
	b. State (s)	West Bengal
4.	Address of Contact Person at Registered Office (with pin code) & telephone/fax numbers	Jairam K Shrinivasan Joint President - Operations & HR Great Eastern Energy Corporation Ltd., M-10, ADDA Industrial Estate, Asansol - 713 305, West Bengal. Ph. No. +91-341-662 8818 Cell No. +91-81700-03140 Fax: +91-341-662 8811 Email: jkshrini@geecl.com URL: www.geecl.com

Part – II

Sr. No.	Part A: Specific Conditions	Status of Compliance
I.	The company shall comply with the guidelines for disposal of solid waste, drill cutting, and drill fluids for onshore drilling operation notified vide GSR.546 (E) dated August 30, 2005.	The company is complying with the guidelines for disposal of solid waste, drill cutting and drill fluids as per notified vide GSR.546 (E) dated August 30, 2005.
II.	The company shall monitor Non-Methane Hydrocarbons (NMHC).	Online gas chromatograph has been installed in Gas Gathering Station. Methane & Non-Methane Hydrocarbons Report (**Appendix-A**), Ambient Air Quality Report (**Appendix-B**), Gas generator Exhaust (Flue gas) (**Appendix-G**) & Feed Gas Quality Analysis (**Appendix-H**) is attached.
III.	The drilling shall be restricted to the mine free area. The company shall use water-based drilling mud.	The drilling is done in mine free area only. Water based drilling mud is used.
IV.	The surface facilities shall be installed as per applicable codes and standards, international practices, and applicable local regulations.	The surface facilities have been installed as per applicable codes and standards, international practices, and applicable local regulations.
V.	The top soil removed wherever suitable shall be stacked separately for reuse during restoration process.	Top soil removed during well site development are stored separately and covered with polythene sheet. After drilling is over, this topsoil is re-used for restoring the area.
VI.	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 onshore disposal.	Waste drilling fluid and separated drill cuttings are stored onsite in impervious HDPE lined pit for natural evaporation and drying. Drill cuttings are evaluated as per US EPA 1311 and have been found to be non-toxic. After completion of operation, dried drill cuttings are covered in place using top soil stored previously. The surface is graded to prevent water accumulation, and the area is re-vegetated with native species to reduce the potential for erosion and promote full recovery of the area's ecosystem. Drill cutting reports have been submitted previously. No drilling activity since September 11, 2013. After restarting drilling operation, latest drill cutting reports shall be submitted in the compliance report.
VII.	The company shall take necessary measures to prevent fire hazards and soil remediation as needed. At place of ground flaring, the flaring pit shall be lined with refractory bricks and efficient burning system shall be provided. In case of overhead flare stacks, the stack height shall be provided as per the norms to minimize gaseous emission and heating load during flaring.	Portable fire extinguishers are available at every well site. Gas gathering station has been provided with fire hydrant system and sprinkler system. Automatic gas detection system has also been provided in GGS as stipulated in Oil Mines Regulation 2017 and OISD 189. Overhead stack of 30 meters has been provided at GGS.

VIII.	The produced water during drilling operations shall be collected in the lined waste pits to prevent ground water contamination. The water shall be treated to the prescribed standards before disposal. The treated produced water shall be used for irrigation, pisciculture and ground water recharge etc.	Produced well water is collected in lined pit and analyzed quarterly as per CPCB guidelines. Analysis reports attached as (**Appendix-C**). The production well water is being re- used in fire hydrant system and other operations.
IX.	The company shall take necessary measures to reduce noise levels at the drill site by providing mitigation measures such as proper acoustic enclosures to the DG set and meet the norms notified by the MoEF&CC. Height of all the stacks/vents shall be provided as per the CPCB guidelines.	DG sets with acoustic enclosures are operated at the drill site. DG set stack monitoring is done on monthly basis. Stack emission report for DG sets operating at GEECL's sites is attached **(Appendix-D)** At production wells gas generators are used to reduce use of fossil fuel. The company has taken the following measures to reduce noise levels: • Provision of silencers & Thermal claddings. • Regular maintenance & inspection of machinery & equipment. • Use of ear plugs/muffs.
X.	The design, material of construction, assembly, inspection, testing and safety aspects of operation and maintenance of pipeline and transporting the oil shall be governed by ASME/ANSI B 31.8/B31.4 and OISD standard 141.	GEECL is following the standards for design, material of construction, assembly, inspection, testing and safety aspects of operation and maintenance of pipeline and transporting the Coal Bed Methane gas: ASME/ANSI B 31.8-Gas Transmission & Distribution Piping System OISD-STD-226-Natural Gas Transmission Pipelines and City Gas Distribution Networks OISD-STD-141-Design and Construction requirements for cross Country Hydrocarbon Pipeline. API 1102-Recommended Practice for Steel Pipelines crossing Rail, Road, and Highways API 1104-Standard for Welding Pipelines and Related facilities API-1107-Recommended Pipeline Maintenance Welding Practices API 5L-Specification for Line Pipes API 6D-Specifications for pipeline valves NACE-SP-01-69-2007 (formerly Known as NACE-RP-01-69-2002)-Recommended Practice Control of External Corrosion on Underground or Submerged Metallic Piping Systems.
XI.	Annual safety audit should be conducted for the initial three years by an independent agency and report submitted to this Ministry of ensuring the strict compliance of safety regulations on operation and maintenance.	This is complied.
XII.	The project authorities should plant a minimum of 10 trees for every cut along the pipeline route in consultation with the local Divisional Forest Officer (s).	Due care is being taken that felling of trees is prevented. However, the condition will be complied if there is a need of tree felling in pipeline route.
	The project authorities should install SCADA system with dedicated optical fiber-based	GPRS based SCADA System has been installed at GEECL's Gas Gathering Station for well site

XIII.	telecommunication link for safe operation of pipeline and Leak Detection System. Additional sectionalizing valves in the residential areas and sensitive installations should be provided to prevent the amount of gas going to the atmosphere in the event of pipeline system for internal corrosion monitoring. Coating and impresses current cathodic protection system should be provided to prevent external corrosion.	flow monitoring, optical fiber-based SCADA system is installed at Gas Gathering Station for operational control and GPRS based SCADA system implemented for custody transfer. A similar system is being extended for SV stations. Sectionalizing Valves (SV) has been provided as per codes i.e., OISD 226 and ASME B 31.8. Permanent pigging facility is available for some of the sections of pipeline and temporary pigging arrangement is planned for section other than above. Additionally for internal corrosion monitoring GEECL has conducted the pipeline health check-up survey to identify the steel thickness losses and coating in February 2016. As per standard NACE RP-0502 (2002) (Pipeline external corrosion direct assessment methodology and its clause Cl.3.4 selection of indirect inspection tools and sub clause 3.4.1.3) pipeline coating and cathodic protection system has been provided with 'Impressed Current Cathodic Protection' (ICCP) for steel pipelines to prevent external corrosion.
XIV.	The project authorities shall patrol and inspect the pipeline regularly for detection of faults as per OISD guidelines and continuous monitoring of pipeline operation by adopting non-destructive method (s) of testing as envisaged in the EMP. Pearson survey and continuous potential survey should be conducted at regular intervals to ensure the adequacy of cathodic protection system.	GEECL conducts patrolling once in 15 days for downstream pipeline & Once in a month for upstream Pipeline with resolute patrolling staff. Monitoring and maintenance schedule of pipeline has been implemented as per OISD STD-130, 145, 188 & 226. For adequacy of cathodic protection system, CAT/Pearson survey and DCVG/continuous potential survey are being conducted as per the frequency given in OISD 226. The last survey was conducted in FY-2024-25. Next survey is scheduled in 2029-30, Apart from above GEECL takes PSP reading at feeding points on fortnightly basis.
XV.	Proper infrastructure and sanitation facilities shall be provided for the construction workers during construction. All the construction wastes shall be managed so that there is no impact on the surrounding environment.	Infrastructure and sanitation facilities have been provided during entire construction jobs and shall be continued for the drilling of remaining wells after restart of drilling activity.
XVI.	The company shall take necessary measures to prevent fire hazards, containing oil spill and soil remediation as need.	Portable fire extinguishers and fire hydrant systems are available to prevent fire hazards. Daily inspection of equipment is done to check oil leak from equipment's. Drip pans are provided to prevent oil spills.
XVII.	The project proponent shall also comply with the environmental protection measures and safeguards recommended in the EIA/EMP/risk analysis report as well as the recommendations of the public hearing panel.	Being Complied.

Sr. No.	Part B General Conditions	Status of Compliance
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.	GEECL is observing and complying with all the applicable laws and regulations lay down by the West Bengal State Pollution Control Board and the State Government from time to time.
II.	No further expansion or modification in the project shall be conducted 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.	Prior Environmental Clearance has been obtained for expansion project of an additional 200 Wells and associated facilities for compression and distribution of CBM gas. (Ref F. No. J-11011/352/2010-IA II (I), November 24, 2011 and Environmental clearance validity extension letter dated May 1, 2019 issued by MOEF&CC for extending the validity till November 24, 2021 and Amendment in Environmental Clearance letter dated November 25, 2020 issued by Ministry of Environment, Forest and Climate Change). Furthermore, existing amended EC extended till November 24, 2022, by Government of India (Ministry of Environment, Forest, and Climate Change) Gazette notification S.O. 221(E) dated January 18, 2021. OM dated April 12, 2022, issued towards extension of the validity of the EC No. J-11011/352/2010-IA II (I) by 1 year till November 24, 2023, with all other terms and conditions remaining unchanged. The Half yearly compliance is being submitted for both Environmental Clearances.
III.	The project authorities must comply with the rules and regulations under Manufacture, Storage, and Import of Hazardous Chemicals Rules, 2000 as amended subsequently. Prior approvals from Chief Inspector of Factories, Chief Controller of Explosive, Fire Safety Inspectorate etc. must be obtained, wherever applicable.	This is complied and shall further be complied during project operation.
IV.	The project authorities must comply with the rules and regulations about handling and disposal of Hazardous Wastes (Management and Handling) Rules, 1989/2003 wherever applicable. Authorization from the State Pollution Control Board must be obtained for collections/ treatment/ storage/ disposal of hazardous wastes.	Being complied.
V.	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).	Cladding and acoustic enclosures are provided at compressor areas to bring further noise level to acceptable level. Periodic upkeep of the above measures will be taken up to mitigate the issue of noise level in specific locations. Further, at the boundary of both GGS we have acceptable level of noise as per EPA rules.

		Additional measures for providing Earmuffs and earplugs are available close to compressor and GG set area. Noise Monitoring Report is attached (**Appendix–E)**
VI.	A separate Environmental Management Cell equipped with full-fledged laboratory facilities must be set to conduct the environmental management monitoring functions.	A dedicated Environment Management Cell is formed within the Organization for constant Improvement, Monitoring, Safeguarding, and reporting of environmental Activities. The environment management cell comprises of Assistant General Manager Geology, Assistant General Manager -QHSE and Manager- Safety Environmental monitoring and the laboratory facility of Mitra S. K. Private Limited, approved by MoEF&CC & West Bengal State Pollution Control Board is being utilized. However, during Drilling operations a separate laboratory will be made available at site as per requirement for testing and monitoring purpose.
VII.	The project authorities will provide adequate funds both recurring and non-recurring to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purposes.	The separate Health, Safety and Environment budget is allocated every year pertaining to implementation of conditions Stipulated by MoEF&CC and State Government and are not diverted for any other purpose.
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.	Being complied/shall further be complied.
IX.	The Project Proponent shall inform the public that the project has been accorded environmental clearance by Ministry and copies of the clearance letter are available with the State Pollution Control Board/Committee and may also be seen at Website of the Ministry of Forests at http:/www.envfor.nic.in. This shall be advertised within seven days of the issues of this letter in at least two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned.	Press advertisement published on July 06, 2007, in Bangla newspaper and The Business Standard (English), copy submitted to MoEF&CC, Regional office Bhubaneswar vide our letter dated November 16, 2009.
X.	The Project Authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and financial approval of the project by the concerned authorities and the date of commencing the land development work.	The same has been complied.

XI.	The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Wastes (Management & Handling) Rules, 1989, 2003 and the Public Liability Insurance Act, 1991 along with their amendments and rules	The company is complying with the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Wastes (Management & Handling) Rules, 1989, 2003 and the Public Liability Insurance Act, 1991 along with their amendments and rules.

Annexure – II

Compliance Status of conditions of Environmental Clearance
F. NO. J-11011/352/2010-IA II (I) November 24, 2011
Monitoring Report - 27
Monitoring Period (October-2024 to March-2025)

Part – I
DATA SHEET

1.	Name of the project	Expansion of Exploration & Production of Coal Bed Methane Gas in Raniganj (South) CBM Block, West Bengal by M/s Great Eastern Energy Corporation Ltd.
2.	Clearance letter No. & date.	F. NO. J-11011/352/2010-IA II (I), November 24, 2011, and Environmental clearance validity extension letter dated May 01, 2019, issued by Ministry of Environment, Forests and Climate Change for extending the validity till November 24, 2021, and Amendment in Environmental Clearance letter dated November 25, 2020, issued by Ministry of Environment, Forest, and Climate Change. Furthermore, existing amended EC extended till November 24, 2022, by Government of India (Ministry of Environment, Forest, and Climate Change) Gazette notification S.O. 221(E) dated January 18, 2021. OM dated April 12, 2022, issued towards extension of the validity of the EC No. J-11011/352/2010-IA II (I) by 1 year till November 24, 2023, with all other terms and conditions remaining unchanged.
3.	Locations:	Raniganj (South) CBM Block
	a. District (s)	Paschim Bardhaman, Bankura & Purulia
	b. State (s)	West Bengal
4.	Address of Contact Person at Registered Office (with pin code) & telephone/fax numbers	Jairam K Shrinivasan Joint President- Operations & HR Great Eastern Energy Corporation Ltd., M-10, ADDA Industrial Estate, Asansol - 713 305,West Bengal. Ph. No. +91-341-662 8818 Cell No. +91-81700-03140 Fax: +91-341-662 8811 Email: jkshrini@geecl.com URL: www.geecl.com

Part – II

Sr. No.	Part A: Specific Conditions	Status of Compliance
I.	All the specific conditions and general conditions specified in the earlier environmental clearance letters accorded vide Ministry's letter no. J- 11011/264/2007-IA II (I) dated June 28, 2007, shall be complied.	The company is complying with all the specific conditions and general conditions specified in the earlier environmental clearance letter accorded vide Ministry's letter no. J-11011/264/2007-IA II (I) dated June 28, 2007, and half yearly compliance reports are being submitted regularly to MoEF&CC New Delhi, Bhubaneswar, WBPCB and CPCB.
II.	As proposed, only 200 pilot-cum-production wells shall be drilled up to a depth of 1100m. No additional wells shall be drilled without prior permission from this Ministry.	200 pilot-cum-production wells shall be drilled up to a depth of 1100m. In case of additional wells, prior permission from the Ministry shall be taken.
III.	As proposed, no forest land shall be used for the proposed facilities. No Forest land shall be used for the installation of Group Gathering Stations and Pipeline laying in the proposed locations.	No forest land shall be used for the proposed facilities and laying of pipeline.
IV.	Permission and recommendation of the State Forest Department shall be obtained regarding impact of the proposed exploratory and production wells on the Biharinath PF and Gourangi Pahar PF and all the recommendation shall be implemented in a time bound manner.	Permission and recommendation of the West Bengal Forest Department obtained and submitted on July 12, 2012, along with Monitoring Report 01. No CBM Exploration & Production activity is conducted near Biharinath sector and Poradiha sector which covers Biharinath PF and Gourangi Pahar PF. Recommendation of permission shall be implemented in time bound manner if drilling activity is planned near this sector.
V.	Compensation for the land acquisition to the land oustees, if any, and for standing crops 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 NRRP, 2007.	Lands are purchased from the owner on need basis at the prevailing market price. Forest land will not be acquired. Compulsory land acquisition under the Land Acquisition Act 1984, as amended till date will not be resorted to.
VI.	All the surface facilities including GGS, CGS, and SV Station shall be as per applicable codes and standard, international practices and applicable local regulations.	Both GGS facilities are as per Oil Mines Regulation 2017 and CGS facility having CNG filling station is as per OISD-STD-179 and pipeline design facility is as per ASME B31.8.
VII.	Ambient air quality shall be monitored near the closest human settlements as per the National Ambient Air Quality Emission Standard (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 is being monitored for existing & expansion project. (**Appendix-B)**

VIII.	The company shall monitor data on methane and non-methane hydrocarbon at the drilling site, GGS, CGS, and at the SV station from where the gas is supplied to the customer.	This is complied. Report submitted as **Appendix-A, B, G & H**
IX.	Mercury shall be analyzed in air, water and drill cutting twice during drilling period.	It is unlikely that there will be any mercury in the emissions, effluents, and drill cuttings from the proposed project during drilling period. Also, in previous monitoring of CBM produced water and drill cutting, mercury has never been reported. However, GEECL is monitoring mercury in air, water & drill cutting (Ref. **Appendix-B & C**)
X.	The flare system shall be designed as per good oil field practices and Oil Industry Safety Directorate (OISD) guidelines. The company shall take 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 an efficient burning system. In case of overhead flare stacks, the stack height shall be provided as per the regulatory requirements and emissions from stacks shall meet the MoEF&CC/CPCB guidelines.	The flare system is designed based API 521 and 537. Measures to prevent fire hazards are in place. Automatic gas detection system has been installed at GGS. Elevated flare system with stack height 30 meter as per CPCB guidelines has been installed at GGS.
XI.	The company shall make the arrangement for control of noise from drilling activity, compressor station and DG sets by providing necessary mitigation measures such as proper acoustic enclosures to DG sets and meets the norms notified by the MoEF&CC. Height of all the stacks/vents shall be as per the CPCB guidelines.	DGs are having acoustic enclosure with stack height in accordance with CPCB guidelines. Compressors are having in built system for control of noise and vibration. Operators at compressor area are provided with earmuffs. DG set stack monitoring is done on monthly basis. Stack emission report for DG sets operating at GEECL's sites is attached (**Appendix-D**). All the DG sets have been replaced with GG sets at all producing well sites to reduce the environment footprint. Gas genset Exhaust report attached as (Flue gas) (**Appendix-G**) The company has taken the following measures to reduce noise levels: • Provision of silencers & Thermal claddings. • Regular maintenance & inspection of machinery & equipment. • Use of ear plugs/muffs.
XII.	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 August 30, 2005.	The Company is complying with the guidelines for disposal of solid waste, drill cutting and drill fluids as per notified vide GSR.546 (E) dated August 30, 2005.

XIII.	Total fresh water requirements from local approved water suppliers shall not exceed 75m^3/day for each well during drilling phase and 2m^3/day for each GGS & 1m^3/day at each CGS during operation phase and prior permission shall be obtained from the concerned Authority and a copy submitted to the Ministry's Regional Office at Bhubaneswar. No ground water shall be used without permission of CGWA/SGWA.	GEECL re-uses CBM Produced water in its operation like fire hydrant and other operation.
XIV.	During drilling and development of wells, wastewater (@ 64 m^3 per well) will be segregated into waste drilling fluid and drill cuttings. Drill cutting shall be stored onsite impervious HDPE lined pit for solar evaporation and drying. Effluent shall be properly treated and treated effluent shall conform to CPCB standards. The produced water @ 25m^3/day/well shall be stored onsite HDPE lined pit for solar evaporation and reuse in drilling of new wells and fire hydrant system. No effluent shall be discharged outside the premises and 'Zero' discharge concept shall be adopted. Domestic effluent shall be disposed of through septic tank followed by soak pit.	Drill cutting is stored onsite impervious HDPE lined pit for solar evaporation and drying. The produced water is stored onsite HDPE lined pit for solar evaporation and reuse in drilling of new wells and fire hydrant system. domestic effluent is disposed of through septic tank followed by soak pit.
XV.	Ground water quality monitoring shall be done to assess if produced water storage or disposal has any effect.	Ground water quality monitoring report is attached as **Appendix F.**
XVI.	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 onshore disposal on land. Proper toxicological analysis shall be done to ensure there is no hazardous material. The treated wastewater shall be reused in other wells during drilling operations. Copy of toxicological analysis shall be submitted to Ministry's Regional Office at Bhubaneswar.	No drilling activity since September 11, 2013. After restart of drilling operation, latest drill cutting reports shall be submitted in the compliance report.
XVII.	Only water based drilling mud shall be used. The drilling mud shall be recycled. Hazardous waste shall be disposed of as per Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008. The recyclable waste (oily sludge) and spent oil shall be disposed of to the authorized recyclers/reprocesses.	Water based drilling media is being/shall be used. Hazardous waste, Used Oil, Waste containing oil and Used oil filters is disposed through authorized recyclers.
	The company shall conduct long term subsidence study by collecting base line data before initiating drilling operation till the project lasts. The data so collected shall be submitted six monthly to the Ministry and its Regional Office at Bhubaneswar.	To date, no surface subsidence has been associated with coal bed methane development in USA. DGH initiated a study on probable land subsidence due to extraction of oil & natural gas from shallow reservoir in Bheema Gas

XVIII.		field (Block CB-ONN-2000/2), near Surat Gujarat, where the gas reservoir is at a shallow depth (about 200 meters below the ground surface level), apprehending a possibility of land subsidence. Land subsidence investigation conducted by CMRI from August 2004 to June 2005 led to the conclusion that there is not any land subsidence movement following 1.6 - 4.7 kg/cm2 pressure depletion at shallow gas reservoirs. Copy of DGH reports submitted with monitoring report - 1 of expansion project. However, as mentioned in certified compliance Report Letter No. 102-157/12/EPE/134 Dated 02.05.2024. Work Order no. (GEECL/5100010357) dated 01.08.2024 given to IISER, Mohali for the continuation of the study (Long-term Land subsidence Study) for Raniganj South CBM project for 210 sq. Km area since 2019 to present date. Report is a**ttached in Appendix -I**
XIX.	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.	System for prevention of fire hazards, containment of oil spill and soil remediation is in place. There is no ground flaring. Overhead flare system is provided with knockout drums and same is adopted for expansion project.
XX.	The project authorities shall install SCADA system with dedicated optical fiber-based telecommunication link for safe operation of pipeline and Leak Detection System. Additional sectionalizing valves in the residential area and sensitive installations shall be provided to prevent the amount of gas going to the atmosphere in the event of pipeline failure. Intelligent pigging facility shall be provided for the entire pipeline system for internal corrosion monitoring. Coating and impressed current Cathodic protection system shall be provided to prevent external corrosion.	GPRS based SCADA system has been installed at GEECL's Gas Gathering Station for well site flow monitoring, optical fiber-based SCADA system is installed at Gas Gathering Station for operational control and GPRS based SCADA system implemented for custody transfer. The similar system is being extended for SV stations. Sectionalizing Valves (SV) has been provided as per codes i.e., OISD 226 and ASME B 31.8. Permanent pigging facility is available for some of the section of pipeline and temporary pigging arrangement is planned for section other than above. Additionally for internal corrosion monitoring GEECL has conducted the pipeline health check-up survey to identify the steel thickness losses and coating in February 2016. As per standard NACE RP-0502 (2002) (Pipeline external corrosion direct assessment methodology and its clause Cl.3.4 selection of indirect inspection tools and sub clause 3.4.1.3) pipeline coating and cathodic protection system has been provided with 'Impressed Current Cathodic Protection'

		(ICCP) for steel pipelines to prevent external corrosion.
XXI.	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.	These conditions are complied with and shall be complied for expansion project also. Fire protection measures are available at all well sites as per OISD 189. Flare stack of 30 meter as per CPCB guidelines provided.
XXII.	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 CH_4 and H_2S shall be provided.	There will be no underground coal fire during drilling as the drilling media is water based. Portable gas detectors for methane are available during drilling operation. Coal Bed Methane gas does not contain H_2S.
XXIII.	The design, material of construction, assembly, inspection, testing and safety aspects of operation 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.	These conditions are being complied.
XXIV.	Annual safety audit shall be conducted for the initial three years by an independent agency and report submitted to this Ministry for ensuring the strict compliance of safety regulations on operations and maintenance.	This is complied.
XXV.	The project authorities shall patrol and inspect the pipeline regularly for detection of faults as per OISD guidelines and continuous monitoring of pipeline operation by adopting non-destructive method (s) of testing as envisaged in the EMP. Pearson survey and continuous potential survey should be conducted at regular intervals to ensure the adequacy of Cathodic protection system.	These conditions are being complied.
XXVI.	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.	Coal Bed Methane gas does not contain H_2S.
XXVII.	Adequate well protection system shall be provided like Blow Out Preventer (BOP), or diverter systems as required based on the geological formation of the blocks.	BOP shall be used in future field development campaigns.
XXVIII.	The top soil removed shall be stacked separately for reuse during restoration process.	Top soil excavated from air pit and mud pit are stored separately and covered with plastic and are being re-utilized at well site at floor bed area.

XXIX.	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 Preparedness and Response Plan are in place and implemented for existing & expansion project.
XXX.	Project proponent shall comply with the environment protection measures and safeguards recommended in the EIA/EMP/risk analysis report/disaster management plan.	This is being Complied.
XXXI.	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. If 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.	This shall be followed in case any abandonment is required. OISD Standard 175 shall be followed in case of abandonment.
XXXII.	Occupational health surveillance of the workers shall be conducted as per the prevailing Acts and Rules.	GEECL has policy for pre-employment medical check-ups. Subsequent periodic examinations are undertaken for those employees who participate in operational work where health problems are likely to occur. All major operational activities for well drilling and completion are outsourced to competent national and international service providers. Occupational Health Surveillance of work force of service provider is ensured in accordance with their company's policy.
XXXIII.	Company shall adopt Corporate Environment Policy as per the Ministry's O.M. No. J-11013/41/2006-IAII (I) dated April 26, 2011, and implemented.	GEECL has implemented and is certified for ISO 14001:2015 (Environment Management System), ISO 45001:2018 (Occupational Health & Safety Management System) and ISO 9001:2015 (Quality Management System). These International Management Systems contains the intent of Corporate Environment Policy as per the Ministry's O.M. No. J-11013/41/2006-IA. II (I) dated April 26, 2011.
XXXIV.	Provision shall be made for the housing of construction labor within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, Safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	Local work forces are engaged during site developments which are provided with temporary sanitation arrangement, drinking water etc. during the job.

Sr. No.	Part B General Conditions	Status of Compliance
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.	GEECL is observing and complying with all the applicable laws and regulations lay down by the West Bengal State Pollution Control Board and the State Government from time to time.
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.	No further expansion or modification in the project shall be conducted without prior approval of the Ministry of Environment, Forests and Climate Change.
III.	The project authorities must comply with the rules and regulations under Manufacture, Storage, and Import of Hazardous Chemicals Rules, 2000 as amended subsequently. Prior approvals from the Chief Inspector of Factories, Chief Controller of Explosive, Fire Safety Inspectorate etc. must be obtained, wherever applicable.	This is complied and shall further be complied during project operation.
IV.	The project authorities must comply with the rules and regulations regarding handling and disposal of Hazardous Wastes (Management and Handling) Rules, 2008 wherever applicable. Authorization from the State Pollution Control Board must be obtained for collections/treatment/storage/disposal of hazardous wastes.	Authorization received from WBPCB.
V.	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).	Cladding and acoustic enclosures are provided at compressor areas to bring further noise level to an acceptable level. Periodic upkeep of the above measures will be taken up to mitigate the issue of noise level in specific locations. Further, at the boundary of both GGS we have acceptable level of noise as per EPA rules. Additional measures for providing Earmuffs and earplugs are available close to compressor and GG set area. Noise Monitoring Report is attached as **Appendix–E**
VI.	A separate Environmental Management Cell equipped with full-fledged laboratory facilities must be set to conduct the environmental management monitoring functions.	A dedicated Environment Management Cell is being formed Within the Organization for constant Improvement, Monitoring, Safeguarding, and reporting of environmental Activities. The environment management cell comprises of an Assistant General Manager Geology, Assistant General Manager -QHSE and Manager- Safety

		Environmental monitoring and laboratory facility of Mitra S. K. Private Limited, approved by MoEF&CC & West Bengal State Pollution Control Board is being utilized. However, during Drilling operations separate laboratory made available at site for testing and monitoring purpose.
VII.	The Company shall earmark sufficient funds for environment protection and pollution control measures shall be used to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds provided shall not be diverted for any other purposes.	Adequate funds have been provided for implementing the conditions stipulated by the MoEF&CC & WBPCB and the State Government and are not diverted for any other purpose.
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.	Six monthly compliance report of expansion project is being/shall be submitted to authorities.
IX.	The proponent shall send a copy of clearance letter to 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.	This is complied.
X.	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&CC, the respective Zonal office of CPCB and the WBPCB. The criteria pollutant levels namely PM10, SO2, NOx, HC (Methane and Non-methane), VOCs (ambient level as well as stack emissions) or critical Sectoral parameters, indicated for the projects shall be monitored and displayed at convenient location near the main gate of the company in the public domain.	Display of critical sectoral parameters for the project like ambient levels, stack emissions are being displayed at strategic locations.
XI.	The project proponent shall also submit six monthly reports on the status of the compliances 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&CC, the respective Zonal office of CPCB and WBPCB. The	This is being complied.

	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 Environmental (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 be sent to the respective Regional offices of the MoEF&CC by e-mail.	This is being complied/shall further be complied.
XIII.	The Project Proponent shall inform the public that the project has been accorded environmental clearance by Ministry and copies of the clearance letter are available with the WBPCB and may also be seen at Website of the Ministry of Forests at http:/www.envfor.nic.in. This shall be advertised within seven days of the issues of this letter in at least 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.	This has been complied. Copy submitted on July 12, 2012, with Monitoring Report - 1 for the EC letter no. F. NO. J-11011/352/2010-IA II (I) November 24, 2011.
XIV.	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.	This has been complied. Copy submitted on July 12, 2012, with Monitoring Report-1 for the EC Letter no. F. NO. J-11011/352/2010-IA II (I) November 24, 2011.
XV.	The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Wastes (management & Handling) Rules, 1989, 2003 and the Public Liability Insurance Act, 1991 along with their amendments and rules.	The company is complying with the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Wastes (Management & Handling) Rules, 1989, 2003 and the Public Liability Insurance Act, 1991 along with their amendments and rules.

Annexure - III

Compliance Status of conditions of Environmental Clearance

F. No. EN/T-II-1/043/2022, EC No. EC23B002WB112414(B2) April 27, 2023

Monitoring Report - 4

Monitoring Period (Oct-2024 to March-2025)

DATA SHEET

1.	Name of the project	Drilling of 20 Shale gas Exploratory Wells in Raniganj (South) CBM Block, West Bengal by Great Eastern Energy Corporation Limited.
2.	Clearance letter No. & date.	**F. No. EN/T-II-1/043/2022** Proposal No. SIA/WB/IND2/278404/2022 June16,2022 and Environmental clearance no.EC23B002WB112414, issued by West Bengal SEIAA on April 27, 2023.
3.	Locations:	Raniganj (South) CBM Block
	a. District (s)	Paschim Bardhaman, Bankura & Purulia
	b. State (s)	West Bengal
4.	Address of Contact Person at Registered Office (with pin code) & telephone/fax numbers	Jairam K Shrinivasan Joint President- Operations & HR Great Eastern Energy Corporation Ltd., M-10, ADDA Industrial Estate, Asansol - 713305, West Bengal. Ph. No. +91-341-662 8818 Cell No. +91-81700-03140 Fax: +91-341-662 8811 Email: jkshrini@geecl.com URL: www.geecl.com

Sr. No.	I. Statutory Compliance	Status of Compliance
i.	The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for non-forest purpose involved in the project.	No forest land shall be used for the proposed facilities and laying of pipeline.
ii.	The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.	Not Applicable
iii	The project proponent shall prepare a Site-Specific Conservation Plan & Wildlife Management Plan and approved by the Chief Wildlife Warden. The recommendations of the approved Site- Specific Conservation Plan / Wildlife Management Plan shall be implemented in consultation with the State Forest Department. The implementation report shall be furnished along with the six-monthly compliance report. (in case of the presence of schedule -I species in the study area)	Not Applicable
iv.	The project proponent shall obtain Consent to Establish / Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the concerned State pollution Control Board / Committee.	The company has obtained Consent to Establish (Memo No. 666-2N-334/2005 (E) Dated December 29,2022) & Consent To Operate (Consent Letter No. CO118225) Dated April 30,2019 for existing & expansion projects. Consent to Establish shall be obtained for this project before starting drilling operation and Consent to Operate (WBPCB/4783919/2024) have been renewed for existing & expansion project.
v.	Necessary authorization required under the Hazardous and Other Wastes (Management and Trans- Boundary Movement) Rules, 2016, Solid Waste Management Rules, 2016 shall be obtained and the provisions contained in the Rules shall be strictly adhered to.	The company has necessary authorization under the provision of hazardous and other wastes required under the hazardous and other wastes (Management and Trans-Boundary Movement) Rule ,2016. Ref. No. WBPCB/ 3654353/2023.
vi.	The project proponent shall obtain and adhere to statutory clearance under the Coastal Regulation Zone Notification, 2011, as applicable.	The project is not in Coastal Regulation Zone.
Sr. No.	**II. Air quality Monitoring and preservation**	**Status of Compliance**
i.	The National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R.No.826(E) dated 16th November 2009 shall be complied with.	The company is complying with the National Ambient Air Quality Emission standard issued by the Ministry vide G.S.R.No.826 (E) dated 16th November 2009. Ambient Air Quality Monitoring is being carrying out for existing project **(Attached report Appendix-B)**
	To control source and the fugitive emissions, suitable pollution control devices shall be installed	Not applicable.

ii.	to meet the prescribed norms and / or the NAAQS. Sulphur content should not exceed 0.5% in the coal for use in coal fired boilers to control particulate emissions within permissible limits (as applicable). The gaseous emissions shall be dispersed through stack of adequate height as per CPCB / SPCB guidelines.	
iii.	The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board (SPCB) and it shall be ensured that at least one stations each is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated.	The location of Ambient air quality monitoring station shall be carried out as per guidelines of SPCB.
iv	Ambient air quality shall be monitored at the nearest 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 PM10, PM2.5, SO2, NOx, CO, CH4, HC, Non-methane HC etc.	Ambient Air Quality is being monitored for existing & expansion projects. (**Appendix-B)**
v.	During exploration, production, storage and handling, the fugitive emission of methane, if any, shall be monitored using Infra-red camera / appropriate technology.	Gas detection system has been installed in GGS which has infra-red technology and connected with SCADA for any methane emission.
vi	The project proponent also to ensure trapping / storing of the CO_2 generated, if any, during the process and handling.	Not applicable.
vii.	Approach road shall be made pucca to minimize generation of suspended dust.	Once the project starts, approach roads shall be made pucca as per requirement to minimize generation of suspended dust.
Sr. No.	**III. Water quality monitoring and preservation**	**Status of Compliance**
i.	As proposed by the project proponent, Zero Liquid Discharge shall be ensured and no waste / treated water shall be discharged to any surface water body, sea and / or on land. Domestic sewage shall be disposed off through septic tank / soak pit.	Wastewater at well sites shall be collected in an evaporation pit and the pit will be lined with High Density Polyethylene (HDPE) liner to prevent percolation of the water into the ground. After natural evaporation, excess water will be used for our operation during drilling of new wells with zero discharge to any streams.
ii.	The effluent discharge shall conform to the standards prescribed under the Environment (Protection) Rules, 1986, or as specified by the State Pollution Control Board while granting Consent under the Air / Water Act, whichever is more stringent.	Shall be complied.
iii	Total fresh water requirement shall not exceed the proposed quantity or as specified by the Committee. Prior permission shall be obtained from the concerned regulatory authority / CGWA in this regard.	GEECL re-uses CBM Produced water in its operation like fire hydrant and other operations.
	The company shall construct the garland drain all around the drilling site to prevent runoff of any oil containing waste into the nearby water bodies. A	Well pads will be prepared as per regulations/best practices. GEECL is going to drill only exploratory wells hence there

iv.	separate drainage system shall be created for oil contaminated and non-oil contaminated. Effluent shall be properly treated and treated wastewater shall conform to CPCB standards.	will not be any generation of oil containing waste and thus there won't be any runoff. Effluent in the form of waste mud will be tested and generated waste will be identified based on HWMH Rules 2016 and will be disposed accordingly, and solid waste will be disposed as per CPCB standards.
v.	Drill cuttings separated from drilling fluid shall be adequately washed and disposed in HOPE lined pit. Waste mud shall be tested for hazardous contaminants and disposed according to HWMH Rules, 2016. No effluent / drilling mud / drill cutting shall be discharged / disposed off into nearby surface water bodies. The company shall comply with the guideline for disposal of solid waste, drill cutting fluids for onshore drilling operation notified vide GSR.545 (E) dated 30th August 2005.	Shall be complied during drilling operation.
Sr. No.	**IV. Noise monitoring and prevention**	**Status of Compliance**
i.	The company shall make all arrangements for control of noise from the drilling activity. Acoustic enclosure shall be provided for the DG sets along with the adequate stack height as per CPCB guidelines.	DG sets with acoustic enclosures are operated at the drill site. DG set stack monitoring is done on monthly basis. Stack emission report for DG sets operating at GEECL's sites is attached **(Appendix-D)** At production wells gas generators are used to reduce use of fossil fuel. The company has taken the following measures to reduce noise levels: • Provision of silencers & Thermal claddings. • Regular maintenance & inspection of machinery & equipment. • Use of ear plugs/muffs.
ii.	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.	Cladding and acoustic enclosures are provided at compressor areas to bring further noise level to an acceptable level. Periodic upkeep of the above measures will be taken up to mitigate the issue of noise level in specific locations. Further, at the boundary of both GGS we have acceptable level of noise as per EPA rules. Additional measures for providing Earmuffs and earplugs are available close to compressor and GG set area. Noise Monitoring Report is attached as **Appendix–E.**
iii.	The ambient noise levels shall conform to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time)	This is compiled and shall further be complied during project operations.

Sr. No.	V. Energy Conservation measures	Status of Compliance
i	The energy source for lighting purpose shall preferably be LED based.	This shall be complied.
Sr. No.	**VI. Waste management**	**Status of Compliance**
i.	Oil spillage prevention and mitigation 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 recyclers	Spill management plan is in place. For oil spillage prevention and mitigation, oil storage area has concrete bunds or kept with secondary containment available underneath to avoid any containment Spill kit and dip trays are also made available. Waste disposal and recycling are being done by authorized agency.
ii.	Oil content in the drill cuttings shall be monitored by some Authorized agency and report shall be sent to the State Environment Impact Assessment Authority.	Oil content in the drill cutting shall be monitored by NABL agency and reports will be submitted along with compliance reports after starting the Drilling activity. No drilling activity has been conducted since September 11, 2013.
Sr. No.	**VII. Safety, Public hearing and Human Health Issues.**	**Status of Compliance**
i.	Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.	Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan are in place and implemented for exiting & expansion project.
ii	Blow Out Preventer 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.	This shall be followed during drilling of shale exploratory wells.
iii.	Company shall prepare operating manual in respect of all activities, which would cover all safety & environment related issues and measures to be taken for protection. One set of environmental manuals 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 environmental monitoring shall be available at the project site office. Remote monitoring of site should be done.	Shall be complied.
iv.	On completion of drilling, the company has to plug the drilled wells safely and obtain certificate from environment safety angle from the concerned authority.	Shall be complied.

v.	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 the area in 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.	This shall be followed in case any abandonment is required. OISD Standard 175 shall be followed in case of abandonment.
vi.	The Company shall take necessary measures to prevent fire hazards, containing oil spill and soil remediation as needed. Possibility of using ground flares 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.	System for prevention of fire hazards, containment of oil spill and soil remediation is in place. There is no ground flaring. Overhead flare system is provided with knockout drums and same is adopted for expansion project.
vii.	Training shall be imparted to all employees on the safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.	Required training are imparted to all employees on the safety and health aspects of chemical handling. GEECL has policy for pre-employment medical check-ups. Subsequent periodic examinations are undertaken for those employees who participate in operational work where health problems are likely to occur.
viii.	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 location of high risk of exposure along with self-containing breathing apparatus.	Coal Bed Methane gas does not contain H2S.
ix.	Provision shall be made for the housing of construction labor within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	This shall be followed during project execution.
x.	Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	GEECL has policy for pre-employment medical check-ups. Subsequent periodic examinations are undertaken for those employees who are involved in operational work where health problem is likely to occur. All major operational activities for well drilling and completion are outsourced to competent national and international service providers. Occupational Health Surveillance of work force of service provider is ensured in accordance with their company's policy.
xi.	The Company shall carry out long term subsidence study by collecting base line data before initiating drilling operation till the project lasts. The data so collected shall be submitted six monthly to the Ministry of Environment, Forests & Climate	Drilling operation yet to start, However, we carried out long term subsidence study for CBM wells. Report is attached in **Appendix -I**

	Change / State Environment Impact Assessment Authority / State Pollution Control Board.	
Sr. No.	**VIII. Environment Management Plan (EMP)**	**Status of Compliance**
i.	The project proponent should submit the proposed EMP on a six-monthly basis. The Office Memorandum issued by the Mo EF & CC vide F. No. 22-65/2017-IA.III dated 30.09.2020 should be strictly followed.	This is complied and shall further be complied during project operations.
ii.	The project proponent shall install display board for display of all the environmental parameters including sensor-based air, water and noise quality monitoring stations within their premises.	Noted.
iii	Need based activities for local people is part of the EMP. Details of such activities submitted by the project proponent is given in annexure 2	Need based activity for local people shall be complied.
iv.	The company shall have a well laid down environmental policy duly approve by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements / deviation / violation of the environmental / forest / wildlife norms / conditions. The company shall have defined system of reporting infringements / deviation / violation of the environmental / forest / wildlife norms / conditions and / or shareholders / stake holders. The copy of the board resolution in this regard shall be submitted to the Ministry of Environment, Forests & Climate Change / State Environment Impact Assessment Authority / State Pollution Control Board as a part of six-monthly report.	GEECL has implemented and is certified for ISO 14001:2015 (Environment Management System), ISO 45001:2018 (Occupational Health & Safety Management System) and ISO 9001:2015 (Quality Management System). These International Management Systems contains the intent of Corporate Environment Policy as per the Ministry's O.M. No. J-11013/41/2006-IA. II (I) dated April 26, 2011.
v.	A separate Environmental Cell equipped with full-fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions, with qualified personnel shall be set up under the control of Senior Executive, who will directly to the head of the organization.	A dedicated Environmental Management Cell is formed within the Organization for constant Improvement, Monitoring, Safeguarding, and reporting of environmental Activities. The environment management cell comprises of Assistant General Manager Geology, Assistant General Manager -QHSE and Manager-Safety Environmental monitoring and the laboratory facility of Mitra S. K. Private Limited, approved by MoEF&CC & West Bengal State Pollution Control Board is being utilized. However, during Drilling operations a separate laboratory will be made available at site for testing and monitoring purpose if deemed necessary.

vi.	Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry of Environment, Forests & Climate Change / State Environment Impact Assessment Authority / State Pollution Control Board along with the Six-Monthly Compliance Report.	Shall be complied
vii.	Self environmental audit shall be conducted annually. Every three years third party environmental audit shall be carried out.	Audit is being conducted on every year and three-year intervals by Third Party agency on ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018.
Sr. No.	**IX. Miscellaneous**	**Status of Compliance**
i.	The environmental clearance accorded shall be valid for a period of 10 years for the proposed project.	Noted.
ii.	The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently.	Press advertisement published on May 03, 2023, in Bangla newspaper Ananda bazar Patrika and The Telegraph Calcutta (English).
iii.	The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.	The copies of the environmental clearance submitted to heads of local bodies, panchayats, and municipal bodies in addition to relevant offices of the Government for display it.
iv.	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.	The company is complying and uploading the Environmental Clearance compliance report on the company website every six-monthly basis.
v.	The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the Ministry of Environment, Forests & Climate Change / State Environment Impact Assessment Authority / State Pollution Control Board.	Six monthly compliance report of expansion project is being/shall be submitted to authorities.
vi.	The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment	This is complied.

	(Protection) Rules, 1986, as amended subsequently and put on the website of the company.	
vii.	The project proponent shall inform the State Environment Impact Assessment Authority/ State Pollution Control Board, the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.	Shall be complied.
viii.	Restoration of the project site shall be carried out satisfactorily and report shall be sent to the State Environment Impact Assessment Authority.	Shall be complied.
ix.	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.	The company will adhere to the stipulations made by the state pollution Control Board and the State Government.
x.	The project proponent shall abide by all the commitments and recommendations made in the EIA / EMP report, commitment made during Public Hearing and also that during their presentation to the State Expert Appraisal Committee.	Shall be complied.
xi.	No further expansion or modifications in the plant shall be carried out without prior approval of the State Environment Impact Assessment Authority.	No further expansion or modification in the project shall be conducted without prior approval of the Ministry of Environment, Forests and Climate Change.
xii.	Concealing factual data or submission of false / fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.	Noted.
xiii.	The State Environment Impact Assessment Authority may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.	Noted.
xiv.	The State Environment Impact Assessment Authority reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.	Noted.
xv.	The State Environment Impact Assessment Authority / State Pollution Control Board shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer(s) of the State Environment Impact Assessment Authority / State Pollution Control Board by furnishing the requisite data / information / monitoring reports.	Noted.
xvi.	The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention' & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India /	The company is complying with the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Wastes (Management & Handling) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and rules.

	High Courts and any other Court of Law relating to the subject matter.	
xvii.	Any appeal against this EC shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.	Noted.
xviii	The contact details of the proponent and the name of the consultant are given in EC.	Noted.

Appendix - A

Methane and Non-Methane Hydrocarbons Report

Totalflow Laptop Monthly Report October 2024
Printed date: 11/01/2024

Station ID: ABBNGC
Device ID : T103334224 Location: Location of stream 1

Date/Time: 11/01/2024 00:00:00

Daily Period Seq #:	:	167	Hydrogen Sulphide	:	0.0000
CarbonDioxide	:	0.2992	Nitrogen	:	0.9759
Ethane	:	0.0223	Methane	:	98.6681
IsoButane	:	0.0000	Propane	:	0.0002
NeoPentane	:	0.0000	Butane	:	0.0000
Pentane	:	0.0000	IsoPentane	:	0.0000
Hexane	:	0.0342	Hexane+	:	0.0342
Octane	:	0.0000	Heptane	:	0.0000
Decane	:	0.0000	Nonane	:	0.0000
Relative Density	:	0.5627	Ideal CV	:	8898.0886
Compressibility	:	0.9980	Wet Btu(Inferior CV)	:	8027.5378
Normal Density	:	0.6887	Superior Wobbe	:	11885.8081
GPM	:	16.6551	Dry Btu(Superior CV)	:	8915.8388
			UnNormalized Total	:	99.5102

Methane and Non-Methane Hydrocarbons Report

Totalflow Laptop Monthly Report November 2024
Printed date: 12/01/2024

Station ID: ABBNGC
Device ID : T103334224 Location: Location of stream 1

Date/Time: 12/01/2024 00:00:00			Hydrogen Sulphide	:	0.0000
Daily Period Seq #:	:	168	Nitrogen	:	0.9218
CarbonDioxide	:	0.2726	Methane	:	98.7509
Ethane	:	0.0221	Propane	:	0.0008
IsoButane	:	0.0000	Butane	:	0.0000
NeoPentane	:	0.0000	IsoPentane	:	0.0000
Pentane	:	0.0000	Hexane+	:	0.0317
Hexane	:	0.0317	Heptane	:	0.0000
Octane	:	0.0000	Nonane	:	0.0000
Decane	:	0.0000	Ideal CV	:	8901.8514
Relative Density	:	0.5621	Wet Btu(Inferior CV)	:	8030.9092
Compressibility	:	0.9980	Superior Wobbe	:	11896.9047
Normal Density	:	0.6877	Dry Btu(Superior CV)	:	8919.6104
GPM	:	16.9034	UnNormalized Total	:	99.4957

Methane and Non-Methane Hydrocarbons Report

Totalflow Laptop Monthly Report December 2024
Printed date: 01/01/2025

Station ID: ABBNGC
Device ID : T103334224 Location: Location of stream 1

Date/Time: 01/01/2025 00:00:00

Daily Period Seq #:	:	169	Hydrogen Sulphide	:	0.0000
CarbonDioxide	:	0.2166	Nitrogen	:	0.9037
Ethane	:	0.0151	Methane	:	98.8388
IsoButane	:	0.0000	Propane	:	0.0009
NeoPentane	:	0.0000	Butane	:	0.0000
Pentane	:	0.0000	IsoPentane	:	0.0000
Hexane	:	0.0249	Hexane+	:	0.0249
Octane	:	0.0000	Heptane	:	0.0000
Decane	:	0.0000	Nonane	:	0.0000
Relative Density	:	0.5613	Ideal CV	:	8905.7727
Compressibility	:	0.9980	Wet Btu(Inferior CV)	:	8034.3322
Normal Density	:	0.6867	Superior Wobbe	:	11910.7436
GPM	:	16.8805	Dry Btu(Superior CV)	:	8923.5129
			UnNormalized Total	:	99.9126

Methane and Non-Methane Hydrocarbons Report

Totalflow Laptop Monthly Report January 2025
Printed date: 02/01/2025

Station ID: ABBNGC
Device ID : T103334224 Location: Location of stream 1

Date/Time: 02/01/2025 00:00:00			Hydrogen Sulphide	:	0.0000
Daily Period Seq #:	:	170	Nitrogen	:	0.9257
CarbonDioxide	:	0.2189	Methane	:	98.8223
Ethane	:	0.0068	Propane	:	0.0008
IsoButane	:	0.0001	Butane	:	0.0000
NeoPentane	:	0.0000	IsoPentane	:	0.0000
Pentane	:	0.0000	Hexane+	:	0.0255
Hexane	:	0.0255	Heptane	:	0.0000
Octane	:	0.0000	Nonane	:	0.0000
Decane	:	0.0000	Ideal CV	:	8903.2360
Relative Density	:	0.5614	Wet Btu(Inferior CV)	:	8032.0266
Compressibility	:	0.9980	Superior Wobbe	:	11906.4581
Normal Density	:	0.6868	Dry Btu(Superior CV)	:	8920.9651
GPM	:	16.9000	UnNormalized Total	:	99.6683

Methane and Non-Methane Hydrocarbons Report

Totalflow Laptop Monthly Report February 2025
Printed date: 03/01/2025

Station ID: ABBNGC
Device ID : T103334224 Location: Location of stream 1

Date/Time: 03/01/2025 00:00:00			Hydrogen Sulphide	:	0.0000
Daily Period Seq #:	:	171	Nitrogen	:	0.9415
CarbonDioxide	:	0.2728	Methane	:	98.7499
Ethane	:	0.0007	Propane	:	0.0006
IsoButane	:	0.0002	Butane	:	0.0000
NeoPentane	:	0.0000	IsoPentane	:	0.0000
Pentane	:	0.0000	Hexane+	:	0.0344
Hexane	:	0.0344	Heptane	:	0.0000
Octane	:	0.0000	Nonane	:	0.0000
Decane	:	0.0000	Ideal CV	:	8899.5001
Relative Density	:	0.5622	Wet Btu(Inferior CV)	:	8028.7617
Compressibility	:	0.9980	Superior Wobbe	:	11893.3054
Normal Density	:	0.6877	Dry Btu(Superior CV)	:	8917.2472
GPM	:	16.9008	UnNormalized Total	:	99.3465

Methane and Non-Methane Hydrocarbons Report

Totalflow Laptop Monthly Report March 2025
Printed date: 04/01/2025

Station ID: ABBNGC
Device ID : T103334224 Location: Location of stream 1

Date/Time: 04/01/2025 00:00:00			Hydrogen Sulphide	:	0.0000
Daily Period Seq #:	:	172	Nitrogen	:	0.9035
CarbonDioxide	:	0.3104	Methane	:	98.7399
Ethane	:	0.0002	Propane	:	0.0006
IsoButane	:	0.0001	Butane	:	0.0000
NeoPentane	:	0.0000	IsoPentane	:	0.0000
Pentane	:	0.0000	Hexane+	:	0.0452
Hexane	:	0.0452	Heptane	:	0.0000
Octane	:	0.0000	Nonane	:	0.0000
Decane	:	0.0000	Ideal CV	:	8903.1054
Relative Density	:	0.5626	Wet Btu(Inferior CV)	:	8032.1657
Compressibility	:	0.9980	Superior Wobbe	:	11893.2342
Normal Density	:	0.6883	Dry Btu(Superior CV)	:	8920.8987
GPM	:	16.9057	UnNormalized Total	:	99.3371

Appendix-B
Summary Report

Sample Identified As : **AAQM**

Customer Name : **Great Eastern Energy Corp. Ltd.**

Address : **M10 ADDA Industrial Estate Asansol West Bengal – 713305**

Parameters(Units)	**Method**	**Oct-2024**	**Jan-2025**
		Well No-25	W.O.R-05, S-43
		MSKGL/ED/2024-25/005711	MSKGL/ED/2024-25/009181
Particulate Matter (<10 micron) in µg/m^3	IS 5182: Part.23,2006	95.6	95.6
Particulate Matter (<2.5 micron) in µg/m^3	USEPA CFR-40,Part-50,Appendix-L	54.5	59.5
Sulphur Dioxide (SO2) in µg/m^3	IS 5182: Part.2,2001	10.2	9.6
Nitrogen Dioxide (NO2) in µg/m^3	IS 5182: Part.6,2006	35.2	42.7
Carbon monoxide (as CO) in mg/m^3	IS 5182 (Part 10)-1999;Rffm:2009 (NDIR)	0.85	0.63
Mercury (as Hg) in µg/m^3	EPA-IO5 .0-June,1999	<6.0	<6.0
Hydrocarbon in ppm	IS 5182 (Part 17): 1979	3.5	4.3
Hydrocarbon (as Methane) in ppm	IS 5182 (Part 17): 1979	3.5	4.3
Hydrocarbon (as Non-Methane) in ppm	IS:5182(Part-11):2006	<2.0	<2.0
Hydrocarbon-Ethane in ppm	IS 5182 (Part 17): 1979	<2.0	<2.0
VOCs in ug/m3	NIOSH-1501 - 15th March,2003	<4.2	<4.2
Benzene in µg/m^3	IS 5182 (PART-11):2006	<4.2	<4.2
Ethyl Benzene in µg/m^3	IS:5182(Part-11):2006 Reaff,2012	<4.2	<4.2
Propene in ppm	IS 5182 (Part 17): 1979	<2.0	<2.0
Toluene in ug/m^3	IS 5182 (PART-11):2006	<4.2	<4.2
m-Xylene in ug/m^3	IS 5182 (PART-11):2006	<4.2	<4.2
n- Butane in ppm	IS 5182 (Part 17): 1979	<2.0	<2.0
o-Xylene in ug/m^3	IS 5182 (PART-11):2006	<4.2	<4.2
p-Xylene in ug/m^3	IS 5182 (PART-11):2006	<4.2	<4.2
Pentene in ppm	IS 3025 (Part 11) -1984 Rffm:2012	<2.0	<2.0
ISO Butane in ppm	IS 3025 (Part 11) -1984 Rffm:2012	<2.0	<2.0

Appendix-C
Summary Report
Month: October-2024

Sample Identified As : **Water (CBM)**

Customer Name : **Great Eastern Energy Corp. Ltd.**

Address : **M10 ADDA Industrial Estate Asansol West Bengal – 713305**

Parameters (Units)	**Unit**	**Test Method**	Well No-S-27	Well No-S-28	Well No-S-21	Well No-S-18	Well No-S-19
			MSKGL/ED/2024-25/005394	MSKGL/ED/2024-25/005396	MSKGL/ED/2024-25/005397	MSKGL/ED/2024-25/005398	MSKGL/ED/2024-25/005399
Bicarbonate (as HCO_3)	mg/l	APHA22nd Edtn2012,2320 B	597.8	645.62	310.86	597.8	286.94
Biochemical Oxygen Demand	mg/l	APHA (23rd Edition) 5210B 2017	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)
Calcium (as Ca)	mg/l	APHA (23rd Edition) 3500 Ca B,2017	4.23	3.25	9.32	3.2	21.21
Carbonate (as $CaCO_3$)	mg/l	APHA (23rd Edition) 2320B 2017	117.6	117.6	BDL(DL:2.0)	156.8	156.8
Chemical Oxygen Demand	mg/l	APHA (23rd Edition) 5220B, 2017	8	8	BDL(DL:4.0)	BDL(DL:4.0)	8
Chloride (as Cl)	mg/l	APHA (23rd Edition)4500-Cl B 2017	78.38	97.97	48.98	83.27	39.19
Conductivity	us/cm	APHA (23rd Edition) 2510B	1205	1320	760	1320	800
Copper (as Cu)	mg/l	APHA (23rd Edition)3120B 2017 (ICP OES)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
Cyanide (as CN)	mg/l	APHA (23rd Edition)4500 CN- F 2017	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
Fluoride (as F)	mg/l	APHA (23rd Edition)4500 - F C/D, 2017	2.89	1.6	0.96	1.42	0.767
Hexavalent Chromium (as Cr^{+6})	mg/l	APHA 23rd Edtn-2017, 3500 Cr B	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Lead (as Pb)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Magnesium (as Mg)	mg/l	APHA (23rd Edition) 3500 Mg B,2017	1.56	1.33	5.22	1.24	8.12
Mercury (as Hg)	mg/l	IS 3025(Part 48)-1994; Rffm:2014	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
Nickel (as Ni)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
Oil and Grease	mg/l	APHA (23rd Edition) 5520B 2017	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)
Phenolic Compounds (as C_6H_5OH)	mg/l	APHA (23rd Edition)5530C 2017 (Chloroform Extraction)	BDL(DL:0.001)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
Potassium (as K)	mg/l	APHA (23rd Edition) 3500 K B 2017	3.15	2.72	3.64	2.73	4.01
Sodium (as Na)	mg/l	APHA (23rd Edition) 3500 Na B 2017	464.99	438.36	207.33	500.36	211.15
Sulphate (as SO_4)	mg/l	APHA (23rd Edition) 4500-SO4 E 2017	12.19	13.07	10.6	15.2	7.81
Sulphide (as S)	mg/l	APHA (23rd Edition)4500 S2- D,2017	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)
Temperature	0C	APHA 23rd EDITION,2550 B	25	25	25	25	25
Total Chromium (as Cr)	mg/l	APHA (23rd Edition)3111 D 2017 (AAS Flame)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
Total Dissolved Solids	mg/l	APHA(23rd Edition) 2540C	780	860	498	860	520
Total Suspended Solid	mg/l	APHA(23rd Edition)2540D	6.2	5.6	3.4	2.8	8.6
Zinc (as Zn)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
pH value	----	APHA(23rd Edition) 4500-H-B	8.71 At 25 deg C	8.65 At 25 deg C	8.35 At 25 deg C	8.91 At 25 deg C	8.18 At 25 deg C

Summary Report
Month: October-2024

Sample Identified As : **Water (CBM)**

Customer Name : **Great Eastern Energy Corp. Ltd.**

Address : **M10 ADDA Industrial Estate Asansol West Bengal – 713305**

Parameters (Units)	**Unit**	**Test Method**	Well No-S-13	Well No-S-03	Well No-S-02	Well No-45	Well No-05
			MSKGL/ED/2024-25/005400	MSKGL/ED/2024-25/005418	MSKGL/ED/2024-25/005419	MSKGL/ED/2024-25/005420	MSKGL/ED/2024-25/005421
Bicarbonate (as HCO_3)	mg/l	APHA22nd Edtn2012,2320 B	358.68	741.27	717.36	717.36	513.89
Biochemical Oxygen Demand	mg/l	APHA (23rd Edition) 5210B 2017	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	3.4	BDL(DL:2.0)
Calcium (as Ca)	mg/l	APHA (23rd Edition) 3500 Ca B,2017	3.22	2.48	4.37	2.03	3.07
Carbonate (as $CaCO_3$)	mg/l	APHA (23rd Edition) 2320B 2017	98	98	117.6	98	BDL(DL:4.0)
Chemical Oxygen Demand	mg/l	APHA (23rd Edition) 5220B, 2017	BDL(DL:4.0)	BDL(DL:4.0)	8	12	8
Chloride (as Cl)	mg/l	APHA (23rd Edition)4500-Cl B 2017	53.88	102.87	97.97	137.16	88.17
Conductivity	us/cm	APHA (23rd Edition) 2510B	1020	1440	1510	1490	1640
Copper (as Cu)	mg/l	APHA (23rd Edition)3120B 2017 (ICP OES)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
Cyanide (as CN)	mg/l	APHA (23rd Edition)4500 CN- F 2017	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
Fluoride (as F)	mg/l	APHA (23rd Edition)4500 - F C/D, 2017	0.85	1.68	1.02	2.48	1.05
Hexavalent Chromium (as Cr^{+6})	mg/l	APHA 23rd Edtn-2017, 3500 Cr B	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Lead (as Pb)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Magnesium (as Mg)	mg/l	APHA (23rd Edition) 3500 Mg B,2017	2.14	BDL(DL:0.96)	1.72	BDL(DL:0.96)	BDL(DL:0.96)
Mercury (as Hg)	mg/l	IS 3025(Part 48)-1994; Rffm:2014	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.96)	BDL(DL:0.001)
Nickel (as Ni)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
Oil and Grease	mg/l	APHA (23rd Edition) 5520B 2017	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)
Phenolic Compounds (as C_6H_5OH)	mg/l	APHA (23rd Edition)5530C 2017 (Chloroform Extraction)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
Potassium (as K)	mg/l	APHA (23rd Edition) 3500 K B 2017	2.23	3.05	2.96	2.68	2.44
Sodium (as Na)	mg/l	APHA (23rd Edition) 3500 Na B 2017	381.54	503.74	505.49	479.02	387.65
Sulphate (as SO_4)	mg/l	APHA (23rd Edition) 4500-SO4 E 2017	9.8	12.1	12.8	13.92	10.66
Sulphide (as S)	mg/l	APHA (23rd Edition)4500 S2- D,2017	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)
Temperature	0C	APHA 23rd EDITION,2550 B	25	25	25	25	25
Total Chromium (as Cr)	mg/l	APHA (23rd Edition)3111 D 2017 (AAS Flame)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
Total Dissolved Solids	mg/l	APHA(23rd Edition) 2540C	712	940	980	970	820
Total Suspended Solid	mg/l	APHA(23rd Edition)2540D	3.2	3.8	6.2	12.2	4.5
Zinc (as Zn)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
pH value	---	APHA(23rd Edition) 4500-H-B	8.65 At 25 deg C	8.6	8.67	8.61	8.31

Summary Report
Month: October-2024

Sample Identified As : **Water (CBM)**

Customer Name : **Great Eastern Energy Corp. Ltd.**

Address : **M10 ADDA Industrial Estate Asansol West Bengal – 713305**

Parameters (Units)	Unit	Test Method	Well No-08	Well No-09	Well No-23	Well No-10	Well No-21
			MSKGL/ED/2024-25/005423	MSKGL/ED/2024-25/005424	MSKGL/ED/2024-25/005426	MSKGL/ED/2024-25/005434	MSKGL/ED/2024-25/005444
Bicarbonate (as HCO_3)	mg/l	APHA22nd Edtn2012,2320 B	836.92	836.92	741.27	310.86	1315.16
Biochemical Oxygen Demand	mg/l	APHA (23rd Edition) 5210B 2017	BDL(DL:2.0)	14.6	3.6	BDL(DL:2.0)	3.8
Calcium (as Ca)	mg/l	APHA (23rd Edition) 3500 Ca B,2017	3.25	3.35	2.05	11.25	2.19
Carbonate (as $CaCO_3$)	mg/l	APHA (23rd Edition) 2320B 2017	137.2	BDL(DL:4.0)	117.6	BDL(DL:4.0)	137.2
Chemical Oxygen Demand	mg/l	APHA (23rd Edition) 5220B, 2017	8	80	12	8	12
Chloride (as Cl)	mg/l	APHA (23rd Edition)4500-Cl B 2017	122.46	215.53	176.35	107.11	342.89
Conductivity	us/cm	APHA (23rd Edition) 2510B	1680	1850	1405	640	2230
Copper (as Cu)	mg/l	APHA (23rd Edition)3120B 2017 (ICP OES)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
Cyanide (as CN)	mg/l	APHA (23rd Edition)4500 CN- F 2017	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
Fluoride (as F)	mg/l	APHA (23rd Edition)4500 - F C/D, 2017	0.94	1.9	1.56	1.8	2.05
Hexavalent Chromium (as Cr^{+6})	mg/l	APHA 23rd Edtn-2017, 3500 Cr B	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Lead (as Pb)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Magnesium (as Mg)	mg/l	APHA (23rd Edition) 3500 Mg B,2017	1.03	BDL(DL:0.96)	BDL(DL:0.96)	2.51	BDL(DL:0.96)
Mercury (as Hg)	mg/l	IS 3025(Part 48)-1994; Rffm:2014	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
Nickel (as Ni)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
Oil and Grease	mg/l	APHA (23rd Edition) 5520B 2017	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)
Phenolic Compounds (as C_6H_5OH)	mg/l	APHA (23rd Edition)5530C 2017 (Chloroform Extraction)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
Potassium (as K)	mg/l	APHA (23rd Edition) 3500 K B 2017	3.47	3.47	2.24	3.49	2.98
Sodium (as Na)	mg/l	APHA (23rd Edition) 3500 Na B 2017	565.72	565.22	439.52	161.49	447.64
Sulphate (as SO_4)	mg/l	APHA (23rd Edition) 4500-SO4 E 2017	18.62	22.12	19.92	7.82	23.18
Sulphide (as S)	mg/l	APHA (23rd Edition)4500 S2- D,2017	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)
Temperature	0C	APHA 23rd EDITION,2550 B	25	25	25	25	25
Total Chromium (as Cr)	mg/l	APHA (23rd Edition)3111 D 2017 (AAS Flame)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
Total Dissolved Solids	mg/l	APHA(23rd Edition) 2540C	1092	1206	910	420	1460
Total Suspended Solid	mg/l	APHA(23rd Edition)2540D	2.8	48.6	10.8	6.2	12.8
Zinc (as Zn)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
pH value	None	APHA(23rd Edition) 4500-H-B	8.82	8.18	8.78	8.13 At 25 deg C	8.8

Summary Report
Month: October-2024

Sample Identified As : **Water (CBM)**

Customer Name : **Great Eastern Energy Corp. Ltd.**

Address : **M10 ADDA Industrial Estate Asansol West Bengal – 713305**

Parameters (Units)	Unit	Test Method	Well No-12	Well No-25	Well No-56	Well No-24	Well No-18
			MSKGL/ED/2024-25/005445	MSKGL/ED/2024-25/005446	MSKGL/ED/2024-25/005447	MSKGL/ED/2024-25/005448	MSKGL/ED/2024-25/005449
Bicarbonate (as HCO_3)	mg/l	APHA22nd Edtn2012,2320 B	765.18	765.18	765.18	789.1	741.27
Biochemical Oxygen Demand	mg/l	APHA (23rd Edition) 5210B 2017	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	3.6	BDL(DL:2.0)
Calcium (as Ca)	mg/l	APHA (23rd Edition) 3500 Ca B,2017	2.45	2.38	4.28	2.74	2.94
Carbonate (as $CaCO_3$)	mg/l	APHA (23rd Edition) 2320B 2017	117.6	137.2	98	BDL(DL:4.0)	58.8
Chemical Oxygen Demand	mg/l	APHA (23rd Edition) 5220B, 2017	8	8	8	12	8
Chloride (as Cl)	mg/l	APHA (23rd Edition)4500-Cl B 2017	146.95	156.75	97.97	107.77	107.77
Conductivity	us/cm	APHA (23rd Edition) 2510B	1380	1340	1380	1560	1420
Copper (as Cu)	mg/l	APHA (23rd Edition)3120B 2017 (ICP OES)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
Cyanide (as CN)	mg/l	APHA (23rd Edition)4500 CN- F 2017	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
Fluoride (as F)	mg/l	APHA (23rd Edition)4500 - F C/D, 2017	1.12	1.23	1.3	4.27	2.56
Hexavalent Chromium (as Cr^{+6})	mg/l	APHA 23rd Edtn-2017, 3500 Cr B	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Lead (as Pb)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Magnesium (as Mg)	mg/l	APHA (23rd Edition) 3500 Mg B,2017	6	BDL(DL:0.96)	1.6	BDL(DL:0.96)	BDL(DL:0.96)
Mercury (as Hg)	mg/l	IS 3025(Part 48)-1994; Rffm:2014	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
Nickel (as Ni)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
Oil and Grease	mg/l	APHA (23rd Edition) 5520B 2017	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)
Phenolic Compounds (as C_6H_5OH)	mg/l	APHA (23rd Edition)5530C 2017 (Chloroform Extraction)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
Potassium (as K)	mg/l	APHA (23rd Edition) 3500 K B 2017	4.72	2.86	3.31	3.59	3.39
Sodium (as Na)	mg/l	APHA (23rd Edition) 3500 Na B 2017	790.67	422	456.18	554.07	490.93
Sulphate (as SO_4)	mg/l	APHA (23rd Edition) 4500-SO4 E 2017	15.8	12.2	14.51	21.57	18.2
Sulphide (as S)	mg/l	APHA (23rd Edition)4500 S2- D,2017	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)
Temperature	0C	APHA 23rd EDITION,2550 B	25	25	25	25	25
Total Chromium (as Cr)	mg/l	APHA (23rd Edition)3111 D 2017 (AAS Flame)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
Total Dissolved Solids	mg/l	APHA(23rd Edition) 2540C	880	870	898	1018	920
Total Suspended Solid	mg/l	APHA(23rd Edition)2540D	3.6	3.8	3.4	2.8	3.2
Zinc (as Zn)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
pH value	---	APHA(23rd Edition) 4500-H-B	8.72 At 25 deg C	8.87	8.6	8.29	8.62

Summary Report
Month: October-2024

Sample Identified As **: Water (CBM)**

Customer Name **: Great Eastern Energy Corp. Ltd.**

Address **: M10 ADDA Industrial Estate Asansol West Bengal – 713305**

Parameters(Units)	Unit	Test Method	Well No-40	Well No-13	Well No-16	Well No-48	Well No-S-07
			MSKGL/ED/2024-25/005450	MSKGL/ED/2024-25/005451	MSKGL/ED/2024-25/005452	MSKGL/ED/2024-25/005453	MSKGL/ED/2024-25/005588
Bicarbonate (as HCO_3)	mg/l	APHA22nd Edtn2012,2320 B	765.18	693.45	765.18	741.27	358.68
Biochemical Oxygen Demand	mg/l	APHA (23rd Edition) 5210B 2017	8.6	8.6	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)
Calcium (as Ca)	mg/l	APHA (23rd Edition) 3500 Ca B,2017	1.5	2.43	3.04	2.08	1.16
Carbonate (as $CaCO_3$)	mg/l	APHA (23rd Edition) 2320B 2017	BDL(DL:4.0)	BDL(DL:4.0)	78.4	137.2	BDL(DL:2.0)
Chemical Oxygen Demand	mg/l	APHA (23rd Edition) 5220B, 2017	48	48	BDL(DL:4.0)	BDL(DL:4.0)	8
Chloride (as Cl)	mg/l	APHA (23rd Edition)4500-Cl B 2017	146.95	117.56	117.56	127.36	53.88
Conductivity	us/cm	APHA (23rd Edition) 2510B	1490	1370	1530	1440	1107
Copper (as Cu)	mg/l	APHA (23rd Edition)3120B 2017 (ICP OES)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
Cyanide (as CN)	mg/l	APHA (23rd Edition)4500 CN- F 2017	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
Fluoride (as F)	mg/l	APHA (23rd Edition)4500 - F C/D, 2017	3.38	2.01	1.8	1.65	0.72
Hexavalent Chromium (as Cr^{+6})	mg/l	APHA 23rd Edtn-2017, 3500 Cr B	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.01)
Lead (as Pb)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Magnesium (as Mg)	mg/l	APHA (23rd Edition) 3500 Mg B,2017	BDL(DL:0.96)	BDL(DL:0.96)	1	BDL(DL:0.96)	15.46
Mercury (as Hg)	mg/l	IS 3025(Part 48)-1994; Rffm:2014	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
Nickel (as Ni)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
Oil and Grease	mg/l	APHA (23rd Edition) 5520B 2017	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)
Phenolic Compounds (as C_6H_5OH)	mg/l	APHA (23rd Edition)5530C 2017 (Chloroform Extraction)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
Potassium (as K)	mg/l	APHA (23rd Edition) 3500 K B 2017	3.43	3.75	3.55	2.64	19.48
Sodium (as Na)	mg/l	APHA (23rd Edition) 3500 Na B 2017	477.98	468.85	552.06	455.94	122.57
Sulphate (as SO_4)	mg/l	APHA (23rd Edition) 4500-SO4 E 2017	16.2	15.8	14.6	15.2	9.62
Sulphide (as S)	mg/l	APHA (23rd Edition)4500 S2- D,2017	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)
Temperature	0C	APHA 23rd EDITION,2550 B	25	25	25	25	25
Total Chromium (as Cr)	mg/l	APHA (23rd Edition)3111 D 2017 (AAS Flame)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
Total Dissolved Solids	mg/l	APHA(23rd Edition) 2540C	970	890	998	940	720
Total Suspended Solid	mg/l	APHA(23rd Edition)2540D	22.8	22.8	3	2.9	3.2
Zinc (as Zn)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
pH value	---	APHA(23rd Edition) 4500-H-B	8.26	8.97	8.66	8.95	8.4

Summary Report

Month: January-2025

Sample Identified As : **Water (CBM)**

Customer Name : **Great Eastern Energy Corp. Ltd.**

Address : **M10 ADDA Industrial Estate Asansol West Bengal – 713305**

Parameters(Units)	Unit	Test Method	Well No-S-41	Well No-S-02	Well No-S-19	Well No-S-18	Well No-S-03
			MSKGL/ED/2024-25/009244	MSKGL/ED/2024-25/009245	MSKGL/ED/2024-25/009246	MSKGL/ED/2024-25/009247	MSKGL/ED/2024-25/009248
Bicarbonate (as HCO_3)	mg/l	APHA22nd Edtn2012,2320 B	1108.98	1084.34	1281.49	911.83	961.12
Biochemical Oxygen Demand	mg/l	APHA (23rd Edition) 5210B 2017	4.2	4.4	6.8	BDL(DL:2.0)	4.8
Calcium (as Ca)	mg/l	APHA (23rd Edition) 3500 Ca B,2017	2.73	1.79	3.17	2.55	3.01
Carbonate (as $CaCO_3$)	mg/l	APHA (23rd Edition) 2320B 2017	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)
Chemical Oxygen Demand	mg/l	APHA (23rd Edition) 5220B, 2017	20	20	40	12	20
Chloride (as Cl)	mg/l	APHA (23rd Edition)4500-Cl B 2017	148.45	128.66	197.94	98.97	108.87
Conductivity	us/cm	APHA (23rd Edition) 2510B	2280	2060	2460	1720	1940
Copper (as Cu)	mg/l	APHA (23rd Edition)3120B 2017 (ICP OES)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Cyanide (as CN)	mg/l	APHA (23rd Edition)4500 CN- F 2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Fluoride (as F)	mg/l	APHA (23rd Edition)4500 - F C/D, 2017	1.8	1.98	2.2	2.7	2.01
Hexavalent Chromium (as Cr^{+6})	mg/l	APHA 23rd Edtn-2017, 3500 Cr B	BDL(DL:0.03)	BDL(DL:0.01)	BDL(DL:0.03)	BDL(DL:0.01)	BDL(DL:0.01)
Lead (as Pb)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Magnesium (as Mg)	mg/l	APHA (23rd Edition) 3500 Mg B,2017	BDL(DL:1.0)	BDL(DL:1.0)	1.92	BDL(DL:1.0)	BDL(DL:1.0)
Mercury (as Hg)	mg/l	IS 3025(Part 48)-1994; Rffm:2014	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
Nickel (as Ni)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Oil and Grease	mg/l	APHA (23rd Edition) 5520B 2017	BDL(DL:4.0)	BDL(DL:4.0)	BDL(DL:4.0)	BDL(DL:4.0)	BDL(DL:4.0)
Phenolic Compounds (as C_6H_5OH)	mg/l	APHA (23rd Edition)5530C 2017 (Chloroform Extraction)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
Potassium (as K)	mg/l	APHA (23rd Edition) 3500 K B 2017	3.73	3.28	3.78	2.54	2.85
Sodium (as Na)	mg/l	APHA (23rd Edition) 3500 Na B 2017	300	264	331	216	242
Sulphate (as SO_4)	mg/l	APHA (23rd Edition) 4500-SO4 E 2017	30.6	26.2	34.6	26.4	36.8
Sulphide (as S)	mg/l	APHA (23rd Edition)4500 S2- D,2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Temperature	0C	APHA 23rd EDITION,2550 B	25.4	25.2	25.2	25.4	25.4
Total Chromium (as Cr)	mg/l	APHA (23rd Edition)3111 D 2017 (AAS Flame)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Total Dissolved Solids	mg/l	APHA(23rd Edition) 2540C	1208	1120	1360	930	1020
Total Suspended Solid	mg/l	APHA(23rd Edition)2540D	BDL(DL:2.5)	BDL(DL:2.5)	BDL(DL:2.5)	BDL(DL:2.5)	3.6
Zinc (as Zn)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
pH value	None	APHA(23rd Edition) 4500-H-B	8.01	8.59	8.47	8.13	8.39

Summary Report
Month: January-2025

Sample Identified As **: Water (CBM)**

Customer Name **: Great Eastern Energy Corp. Ltd.**

Address **: M10 ADDA Industrial Estate Asansol West Bengal – 713305**

Parameters (Units)	Unit	Test Method	Well No-S-28	Well No-S-17	Well No-S-14	Well No-S-13	Well No-S-27
			MSKGL/ED/2024-25/009249	MSKGL/ED/2024-25/009250	MSKGL/ED/2024-25/009251	MSKGL/ED/2024-25/009255	MSKGL/ED/2024-25/009256
Bicarbonate (as HCO_3)	mg/l	APHA22nd Edtn2012,2320 B	985.76	1059.69	1478.64	1010.4	1059.6
Biochemical Oxygen Demand	mg/l	APHA (23rd Edition) 5210B 2017	6.5	5.8	12.6	4.2	7.8
Calcium (as Ca)	mg/l	APHA (23rd Edition) 3500 Ca B,2017	3.35	3.43	3.92	3.18	3.81
Carbonate (as $CaCO_3$)	mg/l	APHA (23rd Edition) 2320B 2017	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)
Chemical Oxygen Demand	mg/l	APHA (23rd Edition) 5220B, 2017	30	30	80	20	40
Chloride (as Cl)	mg/l	APHA (23rd Edition)4500-Cl B 2017	118.76	128.66	514.64	128.66	207.84
Conductivity	us/cm	APHA (23rd Edition) 2510B	2270	2240	2820	1856	2030
Copper (as Cu)	mg/l	APHA (23rd Edition)3120B 2017 (ICP OES)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Cyanide (as CN)	mg/l	APHA (23rd Edition)4500 CN- F 2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Fluoride (as F)	mg/l	APHA (23rd Edition)4500 - F C/D, 2017	2.51	2.1	2.55	1.98	2.2
Hexavalent Chromium (as Cr^{+6})	mg/l	APHA 23rd Edtn-2017, 3500 Cr B	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.03)	BDL(DL:0.01)
Lead (as Pb)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Magnesium (as Mg)	mg/l	APHA (23rd Edition) 3500 Mg B,2017	BDL(DL:1.0)	BDL(DL:1.0)	1.63	1.02	1.25
Mercury (as Hg)	mg/l	IS 3025(Part 48)-1994; Rffm:2014	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.05)	BDL(DL:0.001)	BDL(DL:0.05)
Nickel (as Ni)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Oil and Grease	mg/l	APHA (23rd Edition) 5520B 2017	BDL(DL:2.5)	BDL(DL:4.0)	BDL(DL:2.5)	BDL(DL:4.0)	BDL(DL:4.0)
Phenolic Compounds (as C_6H_5OH)	mg/l	APHA (23rd Edition)5530C 2017 (Chloroform Extraction)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
Potassium (as K)	mg/l	APHA (23rd Edition) 3500 K B 2017	3.29	3.37	3.71	2.5	2.94
Sodium (as Na)	mg/l	APHA (23rd Edition) 3500 Na B 2017	299	297	383	197.17	218.82
Sulphate (as SO_4)	mg/l	APHA (23rd Edition) 4500-SO4 E 2017	41.6	42.8	45.2	32.6	44.2
Sulphide (as S)	mg/l	APHA (23rd Edition)4500 S2- D,2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Temperature	0C	APHA 23rd EDITION,2550 B	25.2	25.4	25.2	25.2	25.2
Total Chromium (as Cr)	mg/l	APHA (23rd Edition)3111 D 2017 (AAS Flame)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Total Dissolved Solids	mg/l	APHA(23rd Edition) 2540C	1220	1220	1580	1060	1120
Total Suspended Solid	mg/l	APHA(23rd Edition)2540D	BDL(DL:2.5)	BDL(DL:2.5)	28.6	BDL(DL:2.5)	BDL(DL:2.5)
Zinc (as Zn)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
pH value	None	APHA(23rd Edition) 4500-H-B	8.23	8.41	8.28	7.82	7.91

Summary Report
Month: January-2025

Sample Identified As : **Water (CBM)**

Customer Name : **Great Eastern Energy Corp. Ltd.**

Address : **M10 ADDA Industrial Estate Asansol West Bengal – 713305**

Parameters (Units)	Unit	Test Method	Well No-56	Well No- 59 D	Well No-14	Well No-15	Well No-20
			MSKGL/ED/2024-25/009257	MSKGL/ED/2024-25/009258	MSKGL/ED/2024-25/009259	MSKGL/ED/2024-25/009260	MSKGL/ED/2024-25/009261
Bicarbonate (as HCO_3)	mg/l	APHA22nd Edtn2012,2320 B	1084.34	1774	1281.49	1306	1035.05
Biochemical Oxygen Demand	mg/l	APHA (23rd Edition) 5210B 2017	7.6	5.6	7.2	5.2	5.6
Calcium (as Ca)	mg/l	APHA (23rd Edition) 3500 Ca B,2017	2.64	2.65	2.56	2.2	3.28
Carbonate (as $CaCO_3$)	mg/l	APHA (23rd Edition) 2320B 2017	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)
Chemical Oxygen Demand	mg/l	APHA (23rd Edition) 5220B, 2017	40	30	40	40	32
Chloride (as Cl)	mg/l	APHA (23rd Edition)4500-Cl B 2017	316.7	524.5	197.94	207.84	188.04
Conductivity	us/cm	APHA (23rd Edition) 2510B	2090	3280	2480	2540	2010
Copper (as Cu)	mg/l	APHA (23rd Edition)3120B 2017 (ICP OES)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Cyanide (as CN)	mg/l	APHA (23rd Edition)4500 CN- F 2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Fluoride (as F)	mg/l	APHA (23rd Edition)4500 - F C/D, 2017	2.18	2.2	2.08	2.9	2.6
Hexavalent Chromium (as Cr^{+6})	mg/l	APHA 23rd Edtn-2017, 3500 Cr B	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
Lead (as Pb)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Magnesium (as Mg)	mg/l	APHA (23rd Edition) 3500 Mg B,2017	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)
Mercury (as Hg)	mg/l	IS 3025(Part 48)-1994; Rffm:2014	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
Nickel (as Ni)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Oil and Grease	mg/l	APHA (23rd Edition) 5520B 2017	BDL(DL:4.0)	BDL(DL:4.0)	BDL(DL:4.0)	BDL(DL:4.0)	BDL(DL:4.0)
Phenolic Compounds (as C_6H_5OH)	mg/l	APHA (23rd Edition)5530C 2017 (Chloroform Extraction)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
Potassium (as K)	mg/l	APHA (23rd Edition) 3500 K B 2017	2.38	2.48	3.13	3.4	2.51
Sodium (as Na)	mg/l	APHA (23rd Edition) 3500 Na B 2017	232.45	233.39	291.29	300.34	215.65
Sulphate (as SO_4)	mg/l	APHA (23rd Edition) 4500-SO4 E 2017	38.5	60.2	39.8	45.8	42.4
Sulphide (as S)	mg/l	APHA (23rd Edition)4500 S2- D,2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Temperature	0C	APHA 23rd EDITION,2550 B	25.2	25.2	25.2	25.3	25.2
Total Chromium (as Cr)	mg/l	APHA (23rd Edition)3111 D 2017 (AAS Flame)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Total Dissolved Solids	mg/l	APHA(23rd Edition) 2540C	1130	1800	1398	1420	1090
Total Suspended Solid	mg/l	APHA(23rd Edition)2540D	BDL(DL:2.5)	7.6	BDL(DL:2.5)	BDL(DL:2.5)	BDL(DL:2.5)
Zinc (as Zn)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
pH value	None	APHA(23rd Edition) 4500-H-B	8.4	8.11	8.48	8.35	8.24

Summary Report
Month: January-2025

Sample Identified As **: Water (CBM)**

Customer Name **: Great Eastern Energy Corp. Ltd.**

Address **: M10 ADDA Industrial Estate Asansol West Bengal – 713305**

Parameters (Units)	Unit	Test Method	Well No-12	Well No-55	Well No-05	Well No-53	Well No-45
			MSKGL/ED/2024-25/009262	MSKGL/ED/2024-25/009263	MSKGL/ED/2024-25/009264	MSKGL/ED/2024-25/009265	MSKGL/ED/2024-25/009266
Bicarbonate (as HCO_3)	mg/l	APHA22nd Edtn2012,2320 B	1256.84	1281.49	1848.3	1035.05	2168.67
Biochemical Oxygen Demand	mg/l	APHA (23rd Edition) 5210B 2017	7.6	8.6	12.2	8.2	5.8
Calcium (as Ca)	mg/l	APHA (23rd Edition) 3500 Ca B,2017	2	2.49	1.08	3.91	1.37
Carbonate (as $CaCO_3$)	mg/l	APHA (23rd Edition) 2320B 2017	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)
Chemical Oxygen Demand	mg/l	APHA (23rd Edition) 5220B, 2017	48	50	80	50	40
Chloride (as Cl)	mg/l	APHA (23rd Edition)4500-Cl B 2017	207.84	217.73	197.94	98.97	514.64
Conductivity	us/cm	APHA (23rd Edition) 2510B	2370	2470	4380	2140	4140
Copper (as Cu)	mg/l	APHA (23rd Edition)3120B 2017 (ICP OES)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Cyanide (as CN)	mg/l	APHA (23rd Edition)4500 CN- F 2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Fluoride (as F)	mg/l	APHA (23rd Edition)4500 - F C/D, 2017	2.4	2.2	3.01	1.6	2.8
Hexavalent Chromium (as Cr^{+6})	mg/l	APHA 23rd Edtn-2017, 3500 Cr B	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
Lead (as Pb)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Magnesium (as Mg)	mg/l	APHA (23rd Edition) 3500 Mg B,2017	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	1.07	1.05
Mercury (as Hg)	mg/l	IS 3025(Part 48)-1994; Rffm:2014	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
Nickel (as Ni)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Oil and Grease	mg/l	APHA (23rd Edition) 5520B 2017	BDL(DL:4.0)	BDL(DL:4.0)	BDL(DL:4.0)	BDL(DL:4.0)	BDL(DL:4.0)
Phenolic Compounds (as C_6H_5OH)	mg/l	APHA (23rd Edition)5530C 2017 (Chloroform Extraction)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
Potassium (as K)	mg/l	APHA (23rd Edition) 3500 K B 2017	2.82	3	5.88	2.86	4.58
Sodium (as Na)	mg/l	APHA (23rd Edition) 3500 Na B 2017	266.16	277.31	469.42	229.06	420.68
Sulphate (as SO_4)	mg/l	APHA (23rd Edition) 4500-SO4 E 2017	42.1	44.2	52.1	40.8	60.8
Sulphide (as S)	mg/l	APHA (23rd Edition)4500 S2- D,2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Temperature	0C	APHA 23rd EDITION,2550 B	25.2	25.2	25.2 DEG C	25.2	25.2
Total Chromium (as Cr)	mg/l	APHA (23rd Edition)3111 D 2017 (AAS Flame)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Total Dissolved Solids	mg/l	APHA(23rd Edition) 2540C	1320	1360	2360	1180	2250
Total Suspended Solid	mg/l	APHA(23rd Edition)2540D	BDL(DL:2.5)	BDL(DL:2.5)	12.4	60	15.8
Zinc (as Zn)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
pH value	None	APHA(23rd Edition) 4500-H-B	8.05	8.36	8.56	8.11	7.98

Summary Report
Month: January-2025

Sample Identified As : **Water (CBM)**

Customer Name : **Great Eastern Energy Corp. Ltd.**

Address : **M10 ADDA Industrial Estate Asansol West Bengal – 713305**

Parameters (Units)	Unit	Test Method	Well No-08	Well No-09	Well No-07	Well No-21	Well No-29
			MSKGL/ED/2024-25/009267	MSKGL/ED/2024-25/009268	MSKGL/ED/2024-25/009269	MSKGL/ED/2024-25/009270	MSKGL/ED/2024-25/009271
Bicarbonate (as HCO_3)	mg/l	APHA22nd Edtn2012,2320 B	1256.84	1182.91	1281.49	1675.8	1503
Biochemical Oxygen Demand	mg/l	APHA (23rd Edition) 5210B 2017	6.8	7.8	4.8	9.5	8.6
Calcium (as Ca)	mg/l	APHA (23rd Edition) 3500 Ca B,2017	2.43	2.38	2.55	3.57	2.77
Carbonate (as $CaCO_3$)	mg/l	APHA (23rd Edition) 2320B 2017	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)
Chemical Oxygen Demand	mg/l	APHA (23rd Edition) 5220B, 2017	40	48	40	50	60
Chloride (as Cl)	mg/l	APHA (23rd Edition)4500-Cl B 2017	207.84	207.84	247.42	415.67	197.94
Conductivity	us/cm	APHA (23rd Edition) 2510B	2180	2530	2808	3398	2960
Copper (as Cu)	mg/l	APHA (23rd Edition)3120B 2017 (ICP OES)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Cyanide (as CN)	mg/l	APHA (23rd Edition)4500 CN- F 2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Fluoride (as F)	mg/l	APHA (23rd Edition)4500 - F C/D, 2017	2.4	2.15	2.5	2.51	2.92
Hexavalent Chromium (as Cr^{+6})	mg/l	APHA 23rd Edtn-2017, 3500 Cr B	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
Lead (as Pb)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Magnesium (as Mg)	mg/l	APHA (23rd Edition) 3500 Mg B,2017	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	1.29	1.14
Mercury (as Hg)	mg/l	IS 3025(Part 48)-1994; Rffm:2014	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
Nickel (as Ni)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Oil and Grease	mg/l	APHA (23rd Edition) 5520B 2017	BDL(DL:4.0)	BDL(DL:4.0)	BDL(DL:4.0)	BDL(DL:4.0)	BDL(DL:4.0)
Phenolic Compounds (as C_6H_5OH)	mg/l	APHA (23rd Edition)5530C 2017 (Chloroform Extraction)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
Potassium (as K)	mg/l	APHA (23rd Edition) 3500 K B 2017	2.23	3.04	2.86	3.99	4.7
Sodium (as Na)	mg/l	APHA (23rd Edition) 3500 Na B 2017	235.91	276.92	318.16	404.84	355.47
Sulphate (as SO_4)	mg/l	APHA (23rd Edition) 4500-SO4 E 2017	48.5	48.2	54.8	60.8	52.4
Sulphide (as S)	mg/l	APHA (23rd Edition)4500 S2- D,2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Temperature	0C	APHA 23rd EDITION,2550 B	25.2	25.2	25.2	25.2	25.2
Total Chromium (as Cr)	mg/l	APHA (23rd Edition)3111 D 2017 (AAS Flame)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
Total Dissolved Solids	mg/l	APHA(23rd Edition) 2540C	1160	1280	1480	1780	1580
Total Suspended Solid	mg/l	APHA(23rd Edition)2540D	BDL(DL:2.5)	BDL(DL:2.5)	BDL(DL:2.5)	BDL(DL:2.5)	BDL(DL:2.5)
Zinc (as Zn)	mg/l	APHA (23rd Edition)3120B 2017	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
pH value	None	APHA(23rd Edition) 4500-H-B	8.44	7.76	8.1	8.37	8.3

Appendix-D
Summary Report

Sample Identified As : **Flue Gas (Diesel Genset)**
Customer Name : **Great Eastern Energy Corp. Ltd.**
Address : **M10 ADDA Industrial Estate Asansol West Bengal – 713305**

Parameters (Units)	**Method**	**Oct,24**	**Nov,24**	**Dec,24**	**Jan,25**	**Feb,25**	**Mar,25**
		SL-CJXSDG08020394 (North GGS)	SL-CJXSDG12040005 (South GGS)	SL-CJXSDG101202028 (Well No-30)	SL-CJXSDG10080113 (Well No-S-19)	SL-CJXSDG11080174 (Well No-S-2)	SL-CJXSDG10080111 (Well No-S-33)
		MSKGL/ED/2024-25/005386	MSKGL/ED/2024-25/005953	MSKGL/ED/2024-25/007542	MSKGL/ED/2024-25/009182	MSKGL/ED/2024-25/010089	MSKGL/ED/2025-26/000126
Barometric pressure (mm of Hg)	USEPA Part 2 - 25/09/1996	754	754	754	754	754	754
Concentration of Carbon Monoxide (g/kw-hr)	IS 13270:1992,Ref:2009	0.062	0.128	0.220	0.262	0.244	0.244
Concentration of Oxides of Nitrogen (g/kw-hr)	EPA Part-7	0.107	0.115	0.269	0.161	0.246	0.264
Concentration of Non-methane Hydro Carbon (g/kw-hr)	USEPA 18 - 25/09/1996	< 0.002	< 0.002	< 0.005	<0.005	< 0.004	< 0.005
a) Concentration of Ethane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
b) Concentration of Propene (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
c) Concentration of n-Butane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
d) Concentration of Iso-Butane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
e) Concentration of Pentane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Temperature of emission (^{0} C)	USEPA Part 2 - 25/09/1996	120	210	192	107	108	148
Quantity of gas flow (Nm3/hr)	USEPA Part 2 - 25/09/1996	154	179	182	197	158	193
Velocity of gas (m/s)	USEPA Part 2 - 25/09/1996	7.52	10.35	10.11	9.4	7.38	10.05
Concentration of Sulphur dioxide (mg/Nm3)	USEPA Part 6 - 25/09/1996	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Concentration of Particulate Matters (g/kw-hr)	USEPA-17 16/08/1996	0.033	0.078	0.075	0.066	0.08	0.082
Concentration of methane Hydro Carbon (g/kw-hr)	USEPA 18 - 25/09/1996	0.026	0.032	0.04	0.04	0.03	0.05
Concentration of (NOx + HC) (g/kw-hr)	USEPA 18 - 25/09/1996	0.133	0.147	0.314	0.199	0.272	0.314

Appendix-E

Noise levels in and around installations													
Sr. No.	**Monitoring Locations**	**October – 2024**		**November – 2024**		**December - 2024**		**January – 2025**		**February - 2025**		**March – 2025**	
		Leq. dB (A)		**Leq. dB (A)**		**Leq. dB (A)**		**Leq. dB (A)**		**Leq. dB (A)**		**Leq. dB (A)**	
		Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
01	GGS (North)	64.3	63.2	64.6	61.8	68.2	62.6	65.3	64.2	64.8	62.3	66.3	62.8
02	GGS (South)	64.2	62.8	63.6	62.6	66.2	63.2	65.8	63.3	64.6	62.3	65.6	63.2
03	CGS	62.2	NA	61.6	NA	63.1	NA	61.6	NA	62.2	NA	61.3	NA

Noise levels in nearby villages of wells													
Sr. No.	Monitoring Locations	October – 2024		November – 2024		December - 2024		January – 2025		February - 2025		March – 2025	
		Leq. dB (A)		Leq. dB (A)		Leq. dB (A)		Leq. dB (A)		Leq. dB (A)		Leq. dB (A)	
		Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
1	Koilapur Village (W#01)	47.3	44.8	46.2	45.8	45.2	42.7	45.2	42.7	44.1	43.2	44.1	42.2
2	100m away from well site (W#02)	45.6	42.1	44.3	42.6	45.8	43.3	43.6	42.4	44.3	42.9	45.2	42.9
3	100m away from well site (W#03)	43.8	41.6	46.6	43.7	44.8	42.6	45.2	42.6	46.5	43.8	46.7	43.6
4	100m away from well site (W#04)	44.7	42.5	44.6	42.9	43.2	41.2	45.6	43.8	45.1	42.7	45.8	42.2
5	100m away from well site (W#05)	46.2	43.5	44.8	42.7	45.1	41.9	45.5	43.8	46.2	44.7	46.7	43.4
6	100m away from well site (W#06)	45.8	43.7	44.3	42.6	45.3	43.4	44.8	41.1	46.4	43.9	45.8	43.2
7	Dheka Village (W#07)	46.3	43.2	48.2	45.4	47.2	45.9	45.7	42.8	44.9	42.4	44.2	41.9
8	100m away from well site (W#08)	46.6	44.1	46.3	44.2	45.7	43.5	46.2	43.7	45.9	44.1	46.7	43.7
9	100m away from well site (W#09)	46.8	43.5	46.8	43.3	47.8	45.9	44.8	42.5	47.4	45.2	45.8	42.3
10	Near Ashram (W#10)	47.3	44.7	46.3	44.4	46.2	44.7	46.9	44.1	45.1	42.4	44.5	44.1
11	Shyamdhi Village (W#11)	46.4	43.9	45.3	43.4	44.8	42.2	46.7	44.2	46.9	43.7	46.2	43.5
12	Shyamdhi Village (W#12)	49.8	47.6	50.6	47.7	48.8	46.2	50.9	47.5	47.8	45.7	50.2	47.6
13	100m away from well site (W#13)	45.3	42.3	47.1	44.9	45.1	44.3	47.8	44.9	46.9	43.5	49.7	47.2
14	Dhenwa Village (W#14)	47.2	44.1	46.8	44.3	45.7	43.7	46.7	44.2	46.4	45.1	45.2	43.5
15	100m away from well site (W#15)	47.8	46.2	45.3	42.4	46.9	44.3	45.8	43.7	48.1	45.9	46.7	44.1
16	100m away from well site (W#16)	48.8	45.9	47.6	45.3	48.2	45.4	47.5	44.6	47.9	46.2	47.0	43.8
17	100m away from well site (W#17)	47.9	44.7	46.9	44.3	47.1	44.0	47.9	44.3	46.2	43.7	47.6	44.9
18	Kalajharia Village (W#18)	47.2	44.9	47.0	44.5	46.9	43.0	47.3	45.2	46.1	43.5	46.3	43.1

19	Dhorapada Village (W#19)	47.7	44.3	46.6	43.8	47.3	45.2	46.7	43.7	45.3	43.1	46.2	43.3
20	Kiradi Village (W#20)	48.0	45.7	47.4	45.2	47.9	44.3	47.2	45.1	48.8	45.2	45.4	42.2
21	100m away from well site (W#21)	45.3	43.1	47.2	44.1	47.8	45.1	48.0	45.6	47.7	44.6	47.8	45.2
22	100m away from well site (W#22)	47.9	44.6	46.7	43.2	47.7	44.2	47.7	45.1	46.2	44.9	46.7	43.9
23	100m away from well site (W#23)	48.3	46.1	47.2	45.8	47.9	44.6	48.0	45.1	48.3	45.1	47.7	44.8
24	100m away from well site (W#24)	48.4	43.3	48.7	45.3	47.7	43.3	46.7	43.5	48.2	45.3	46.8	43.2
25	100m away from well site (W#25)	47.7	44.6	47.1	45.0	48.2	45.7	47.4	44.2	47.6	44.9	46.7	43.4
26	Bango Village (W#26)	44.3	42.9	47.8	44.0	47.5	44.8	46.9	45.0	46.9	43.8	46.4	42.9
27	100m away from well site (W#27)	47.9	43.4	48.6	45.8	47.8	45.2	47.1	45.2	47.7	45.2	46.2	43.6
28	100m away from well site (W#28)	46.5	44.7	47.1	44.2	45.6	43.9	47.5	44.9	44.5	43.1	46.9	44.2
29	100m away from well site (W#29)	47.8	45.9	48.5	45.3	46.2	43.8	47.4	45.5	48.2	45.6	47.2	44.9
30	100m away from well site (W#30)	44.9	42.5	44.6	42.1	48.3	46.7	47.1	45.0	46.9	44.2	46.1	44.7
31	100m away from well site (W#31)	46.2	43.4	46.9	44.0	47.7	45.4	46.7	43.7	47.0	44.0	47.3	45.8
32	Mahalipad Village (W#32)	45.8	43.3	48.4	46.5	47.1	45.2	45.5	43.1	47.1	44.9	46.7	44.1
33	100m away from well site (W#33)	44.9	42.7	46.6	43.8	46.9	44.7	47.3	45.6	46.9	43.2	45.1	43.0
34	100m away from well site (W#34)	45.7	43.9	44.3	42.5	46.9	45.1	47.2	44.7	47.0	44.9	46.9	44.4
35	Uperbaluksund Village (W#35)	43.7	41.0	44.2	42.1	42.9	40.7	45.7	43.9	46.1	44.5	44.2	42.0
36	100m away from well site (W#36)	44.6	42.2	45.5	42.9	46.1	44.8	45.2	43.0	46.7	44.9	47.8	44.6
37	100m away from well site (W#37)	43.4	41.9	44.6	42.8	43.2	41.7	42.6	40.4	45.3	42.9	41.3	39.7
38	100m away from well site (W#38)	45.1	43.2	44.3	42.1	46.1	43.6	44.3	42.1	46.4	44.1	45.5	43.2
39	100m away from well site (W#39)	43.0	41.1	43.8	42.4	47.3	42.7	47.7	43.4	46.9	42.6	46.6	41.9
40	100m away from well site (W#40)	46.9	44.1	45.5	43.1	45.1	42.9	47.1	44.7	46.3	43.7	45.3	43.1

41	100m away from well site (W#41)	44.8	42.2	46.6	43.4	44.9	42.1	45.2	43.5	46.9	44.1	46.4	44.2
42	Gudgudpada Village (W#42)	45.9	43.1	46.2	44.1	46.7	44.3	46.2	44.1	47.5	44.9	45.6	43.4
43	100m away from well site (W#43)	46.1	43.9	45.1	43.7	46.3	43.4	46.2	43.7	46.7	44.1	46.4	44.2
44	100m away from well site (W#44)	44.7	42.3	45.2	42.6	45.0	43.1	44.9	42.4	44.1	41.9	44.8	42.9
45	100m away from well site (W#45)	45.8	43.1	46.0	43.8	46.1	44.0	45.8	43.7	46.0	43.9	46.4	44.5
46	Borthal Village (W#46)	45.4	42.7	45.0	43.1	46.7	44.8	47.1	44.9	45.3	43.1	47.1	44.9
47	Borthal Village (W#47)	46.3	43.9	45.8	43.4	44.3	42.6	47.2	44.9	46.6	44.5	45.2	43.1
48	100m away from well site (W#48)	44.7	42.2	46.0	43.5	45.3	43.0	46.9	43.7	45.5	43.4	46.4	44.2
49	100m away from well site (W#49)	45.2	42.8	46.7	44.2	47.0	44.9	45.2	42.6	46.2	43.9	45.0	42.9
50	100m away from well site (W#50)	46.0	43.6	44.4	42.0	45.8	42.7	45.4	42.7	45.6	43.5	46.9	44.1
51	100m away from well site (W#51)	44.7	41.9	45.5	43.2	46.2	44.1	44.2	41.9	46.2	43.7	44.9	42.1
52	Talkudi Village (W#52)	45.5	43.2	46.3	44.1	46.4	43.9	45.2	42.9	46.5	43.9	46.8	44.5
53	100m away from well site (W#53)	44.4	42.1	45.5	43.2	43.9	41.3	46.3	44.1	45.6	43.2	46.6	43.9
54	Talkudi Village (W#54)	45.4	42.8	46.7	44.3	47.2	44.8	46.4	43.2	45.9	43.4	45.3	43.4
55	100m away from well site (W#55)	44.9	42.1	45.8	43.5	44.5	42.2	46.5	44.3	46.7	44.3	46.2	43.9
56	100m away from well site (W#56)	47.8	44.3	46.5	44.1	46.1	43.9	45.8	43.4	44.2	42.1	47.5	45.3
57	100m away from well site (W#102)	44.3	41.9	45.8	42.6	46.6	43.2	45.7	42.9	47.2	44.9	46.5	43.8
58	Salvedia (S-01)	47.8	44.5	45.2	42.4	43.8	41.1	46.2	43.4	44.7	41.8	45.1	42.4
59	100 M away from Well Sites (S-02)	46.5	43.7	47.2	44.8	45.3	42.4	46.5	44.7	47.1	44.8	46.2	43.5
60	Bauntod (S-03)	44.2	42.1	45.3	42.7	45.6	43.2	43.2	41.1	44.7	42.5	46.8	43.4
61	100m away from Well Sites (S-04)	43.9	41.3	45.7	42.6	44.8	41.6	46.2	44.7	44.3	41.9	44.5	42.3
62	100m away from Well Sites (S-05)	42.3	39.9	42.7	40.1	43.6	41.2	42.4	39.8	43.3	40.9	41.6	39.8

63	100 M away from Well Sites (S-07)	44.8	42.4	46.2	43.3	45.8	42.9	44.3	41.9	42.8	39.9	44.2	41.3
64	100 M away from Well Sites (S-08)	44.2	41.8	43.7	40.4	45.3	42.7	45.9	42.3	43.7	41.2	42.6	39.7
65	Raotoda (S-09)	43.5	40.9	45.2	42.7	46.2	44.1	44.3	41.9	43.9	41.0	44.8	41.2
66	100 M away from Well Sites (S-10)	45.2	42.8	43.2	40.9	44.7	41.2	45.8	42.9	46.2	42.8	43.1	40.4
67	Chaukhari (S-11)	44.7	41.6	44.1	41.7	44.2	42.1	46.2	43.0	46.8	43.7	43.9	41.1
68	100 M away from Well Sites (S-12)	45.2	42.8	46.7	43.4	43.5	41.2	44.6	41.8	45.6	42.3	44.8	41.3
69	100 M away from Well Sites (S-13)	47.1	44.5	45.8	42.7	47.1	44.8	45.1	42.6	45.3	42.7	43.8	40.6
70	100 M away from Well Sites (S-14)	43.2	40.6	45.2	42.5	46.2	42.3	42.2	39.8	43.6	40.1	44.7	41.8
71	Narayan Pur (S-15)	45.8	42.9	46.3	43.8	47.6	44.2	45.3	42.9	44.3	41.6	46.2	43.9
72	Bamuntod (S-16)	43.1	41.0	43.9	41.6	43.6	40.8	46.2	43.8	45.8	42.3	43.9	41.1
73	Iswarda (S-17)	48.2	45.6	47.4	44.6	45.8	43.1	46.4	44.3	46.8	44.6	45.6	43.7
74	100 M away from Well Sites (S-18)	44.6	42.8	43.9	40.7	46.2	43.1	47.5	44.9	46.1	43.4	45.8	42.9
75	100 M away from Well Sites (S-19)	43.5	40.7	44.8	41.9	45.2	42.6	42.9	40.7	44.7	42.1	45.6	43.1
76	Borsal (S-20)	41.1	38.9	41.9	39.8	42.6	40.1	43.2	41.1	41.4	39.1	42.7	40.2
77	100 M away from Well Sites (S-21)	43.4	40.8	44.2	41.7	42.5	39.8	44.3	42.1	45.7	42.9	44.2	41.9
78	100 M away from Well Sites (S-22)	42.6	39.4	43.7	40.9	45.2	42.6	43.6	40.9	42.2	40.1	43.5	41.2
79	100 M away from Well Sites (S-23)	45.4	43.1	44.9	41.1	46.7	43.8	45.7	43.4	44.6	42.2	46.1	43.9
80	100 M away from Well Sites (S-24)	44.3	41.9	45.6	42.7	43.8	41.7	42.8	40.1	45.7	43.3	44.9	42.2
81	100 M away from Well Sites (S-25)	42.9	40.3	44.7	42.1	45.9	42.6	43.1	41.2	44.4	42.1	43.7	41.1
82	100m away from Well Site (S-26)	43.7	41.4	46.2	43.9	44.8	41.9	45.7	43.1	44.7	41.9	42.8	40.3
83	100 M away from Well Site (S-27)	44.3	42.0	45.6	43.3	46.7	43.7	42.4	40.0	43.8	41.1	45.3	42.9
84	Anandpur (S-28)	46.4	44.1	44.9	42.2	45.3	43.1	44.1	41.7	45.2	43.0	44.1	41.7

85	100 M away from Well Site (S-29)	45.7	42.4	45.1	43.3	44.7	41.9	46.7	44.1	46.7	43.2	45.9	42.6
86	100 M away from Well Sites (S-30)	45.9	43.4	43.3	41.0	44.7	42.2	45.1	42.9	44.1	41.6	44.6	42.0
87	Kalidaspur, (S-31)	44.5	42.0	45.5	43.1	46.8	43.6	45.5	43.3	46.1	43.1	44.3	41.3
88	Kalidaspur, (S-32)	43.0	40.2	42.4	39.1	43.7	41.1	42.4	39.5	44.0	41.3	44.1	42.0
89	100 M away from Well Sites (S-33)	45.7	42.3	44.9	42.2	45.4	43.8	46.1	44.7	47.5	44.7	46.2	43.7
90	100 M away from Well Sites (S-34)	47.0	44.4	44.1	41.5	46.3	43.0	45.7	42.1	44.6	41.3	46.2	43.0
91	100 M away from Well Sites (S-35)	44.2	43.6	42.8	41.4	45.3	42.1	46.5	43.7	44.0	42.1	47.0	44.3
92	100 M away from Well Sites (S-36)	45.4	43.3	44.2	42.1	45.0	42.5	43.6	41.7	45.4	42.1	43.5	41.9
93	100 M away from Well Sites (S-38)	42.0	40.21	45.3	43.0	44.2	42.0	46.3	43.3	43.0	40.9	44.5	42.4
94	100 M away from Well Sites (S-39)	44.7	42.5	44.1	41.5	45.3	43.3	44.6	41.5	45.7	43.6	46.8	44.0
95	100 M away from Well Sites (S-40)	44.1	42.0	45.7	42.2	43.7	41.6	44.5	42.2	44.6	41.9	45.5	42.4
96	100 M away from Well Sites (S-41)	43.8	41.4	44.6	42.5	45.2	42.1	41.0	38.7	44.0	42.2	43.5	41.3
97	100 M away from Well Sites (S-42)	41.7	39.0	44.4	41.3	43.1	41.2	41.6	39.3	42.4	40.1	43.0	40.9
98	100 M away from Well Sites (S-43)	44.0	41.5	46.6	43.8	45.0	42.8	44.2	42.1	45.5	42.0	46.8	43.7

Noise Monitoring Report – GGS North							
Sr. No.	**Monitoring Locations**	**October – 2024**	**November – 2024**	**December - 2024**	**January – 2025**	**February - 2025**	**March – 2025**
		Leq.dB (A)	**Leq.dB (A)**	**Leq.dB (A)**	**Leq.dB (A)**	**Leq.dB (A)**	**Leq.dB (A)**
1.	Admin Area- Inside Engineer's Room	59.0	58.7	58.8	61.3	59.5	58.4
2.	SCADA Room	57.9	59.4	60.0	58.2	59.5	61.2
3.	Workshop	54.4	56.1	57.4	54.9	53.3	54.8
4.	Outer Corner-1 - Main Gate/Entry Gate	59.6	58.4	59.1	58.0	58.6	58.4
5.	Outer Corner-2 - Gate No.2	57.2	55.9	57.3	56.1	55.4	57.7
6.	Outer Corner-3 -Opposite corner of Main Header	63.5	62.8	61.6	62.4	60.2	62.6
7.	Outer Corner-4- Corner of Flare Area	55.2	56.1	54.8	53.6	55.2	52.8
8.	Well Head Area - 1 meter away from Well Head	60.4	60.9	61.6	62.5	62.9	63.5
9.	D.G/G.G Area- 1 meter away G.G set	72.7	71.2	72.5	70.1	70.8	71.6
10.	Air Compressor Area- 1 meter away from Air Compressor	71.8	73.6	72.7	73.3	71.6	72.4
11.	CBM Compressor Area- between the Level-I & Level-II CBM Compressor	73.6	73.1	72.8	71.4	73.2	72.7
12.	A.G Compressor Area - between both the Compressor	74.9	74.2	73.2	74.0	72.6	73.3
13.	Surge Vessel Area- between Main Header & Surge Vessel.	70.8	71.6	72.5	71.2	70.1	72.2
14.	1 meter away from Flare Stack	57.7	56.9	58.0	58.7	59.0	59.6
15.	Fire Pump House(1 meter away from Fire Diesel Engine)	71.9	72.5	71.0	70.5	69.8	71.2

Noise Monitoring Report – GGS South							
Sr. No.	**Monitoring Locations**	**October – 2024**	**November – 2024**	**December - 2024**	**January – 2025**	**February - 2025**	**March – 2025**
		Leq.dB (A)	**Leq.dB (A)**	**Leq.dB (A)**	**Leq.dB (A)**	**Leq.dB (A)**	**Leq.dB (A)**
1.	SCADA Room	58.1	57.9	58.6	59.5	58.8	57.8

2.	Workshop	48.4	49.6	50.7	49.0	51.1	50.8
3.	Well Head Area - 1 meter away from Well Head	69.7	68.9	70.2	71.0	69.5	70.7
4.	Outer Corner- 1	55.9	56.2	57.8	56.8	55.4	57.8
5.	Outer Corner-2	59.0	58.6	59.2	57.6	60.1	61.7
6.	Outer Corner-3	64.5	65.1	63.7	62.2	61.9	63.2
7.	Outer Corner-4	54.9	54.2	56.2	55.7	56.8	55.6
8.	D.G/G.G Area- 1 meter away G.G set	74.2	73.9	73.0	74.6	72.5	71.4
9.	Air Compressor Area - 1 meter away from Air Compressor	70.3	69.8	71.2	72.1	69.4	70.5
10.	A.G Compressor Area - between both the Compressor	73.9	74.2	74.7	71.9	72.7	74.5
11.	Surge Vessel Area - between Main Header & Surge Vessel.	71.7	70.7	72.1	69.5	69.1	70.2
12.	1 meter away from Flare Stack	55.2	54.8	53.9	55.7	54.0	52.9
13.	Fire Pump House (1 meter away from Fire Diesel Engine)	54.2	55.6	53.2	55.1	56.2	53.7

Noise Monitoring Report - CGS							
Sr. No.	**Monitoring Locations**	**October – 2024**	**November – 2024**	**December - 2024**	**January – 2025**	**February - 2025**	**March – 2025**
		Leq.dB (A)	**Leq.dB (A)**	**Leq.dB (A)**	**Leq.dB (A)**	**Leq.dB (A)**	**Leq.dB (A)**
1.	Near Main Gate	58.7	59.1	57.2	59.8	60.1	58.2
2.	Admin Area- Inside Supervisor Room	54.9	55.8	53.6	54.2	56.7	55.1
3.	Gas Refilling Area - 1 meter away from Gas refilling point	61.7	62.1	60.2	61.4	60.9	61.8
4.	CNG Compressor Area - Between the Compressors	64.1	65.7	62.1	63.3	61.8	62.6
5.	Process Area (Noise monitoring take place at mid-point of the Process Area)	58.7	60.0	59.3	60.4	61.2	59.7

Appendix-F
Summary Report
Month: December-2024

Sample Identified As : **Ground Water**
Customer Name : **Great Eastern Energy Corp. Ltd.**
Address : **M10 ADDA Industrial Estate Asansol West Bengal – 713305**

Parameters(Units)	Unit	Test Method	Bamuntore (S-22)	Kujkuria (S-30)	Narayanpur (S-15)	Saburbandh (S-24)	Iswarda (S-13)
			MSKGL/ED/2024-25/006918	MSKGL/ED/2024-25/007414	MSKGL/ED/2024-25/007457	MSKGL/ED/2024-25/007482	MSKGL/ED/2024-25/007485
Arsenic(as As)	mg/l	APHA (23rd Edition) 3114C (Hydride Generation),2017	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Bicarbonate	mg/l	APHA23rd Edtn,2320 B,2017	456.77	279.14	304.51	406.02	380.64
Calcium (as Ca)	mg/l	APHA (23rd Edition) 3500 Ca B,2017	153	27	6.74	155.4	80.3
Carbonate	mg/l	TPM/MSK/E/1/X Methods of Analysis Soil Science socity for America Part II ,pg 945	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)
Chemical Oxygen Demand (COD)	mg/l	APHA (23rd Edition) 5220B, 2017	20	12	12	28	28
Chloride (as Cl)	mg/l	APHA (23rd Edition)4500-Cl B ,2017	117.56	58.78	68.58	117.56	97.97
Colour	Hazen	APHA (23rd Edition) 2120B ,2017	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)
Conductivity	us/cm	APHA (23rd Edition) 2510B,2017	1280	814	868	1360	1168
Fluoride (as F)	mg/l	APHA (23rd Edition)4500 - F C/D, 2017	0.3	0.24	0.28	0.32	0.33
Magnesium (as Mg)	mg/l	APHA (23rd Edition) 3500 Mg B,2017	38	4.43	0.54	38.9	24.9
Mercury (as Hg)	mg/l	APHA 22rd Edtn, 3112B,2017	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
Nitrate (as NO3)	mg/l	APHA (23rd Edition) 4500- NO3-E, 2017	5.2	3.52	3.8	6.01	5.2
Nitrite (as NO2)	mg/l	APHA (23rd Edition) 4500-NO2-B 2017	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
Odour	---	APHA(23rd Edition)2150B ,2017	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
Sodium (as Na)	mg/l	APHA (23rd Edition) 3500 Na B, 2017	25.1	72.5	90.6	38.7	26.3
Sulphate (as SO4)	mg/l	APHA (23rd Edition) 4500-SO4 E 2017	50.6	30.6	32.2	56.2	40.6
Temperature	^{O}C	APHA 23rd EDITION,2550 B,2017	25.2	25.2	25.2	25.2	25.2
Total Dissolved Solids (as TDS)	mg/l	APHA(23rd Edition) 2540C,2017	720	460	490	760	680
pH value	----	APHA(23rd Edition) 4500-H-B ,2017	7.25	8.04	8.37	7.47	7.7
Orthophosphate	mg/l	APHA 22nd Edtn, 4500P-D,2017	0.41	0.33	0.39	0.55	0.54
Sodium Adsorption Ratio (as SAR)	----	DIAGONISIS AND IMPROVEMENT OF SALINE AND ALKALINE SOIL	0.47	3.4	9.01	0.72	0.66
% Sodium	----	IS 2488 (Part 5)-1976; Rffm:2009	9.1	63.4	89.5	13.1	15.3

Summary Report
Month: December-2024

Sample Identified As : **Ground Water**
Customer Name : **Great Eastern Energy Corp. Ltd.**
Address : **M10 ADDA Industrial Estate Asansol West Bengal – 713305**

Parameters(Units)	Unit	Test Method	Bagjata (S-29)	Kechka (S-08)	Choukhuri (S-11)	Singhir (S-23)	Majit (S-36)
			MSKGL/ED/2024-25/007486	MSKGL/ED/2024-25/007509	MSKGL/ED/2024-25/007524	MSKGL/ED/2024-25/007525	MSKGL/ED/2024-25/007526
Arsenic (as As)	mg/l	APHA (23rd Edition) 3114C (Hydride Generation),2017	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Bicarbonate	mg/l	APHA23rd Edtn,2320 B,2017	609.02	507.52	203.1	304.51	253.76
Calcium (as Ca)	mg/l	APHA (23rd Edition) 3500 Ca B,2017	261	200	80.75	126	114
Carbonate	mg/l	TPM/MSK/E/1/X Methods of Analysis Soil Science socity for America Part II ,pg 945	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)
Chemical Oxygen Demand (COD)	mg/l	APHA (23rd Edition) 5220B, 2017	48	32	12	12	28
Chloride (as Cl)	mg/l	APHA (23rd Edition)4500-Cl B ,2017	382.08	352.69	78.38	68.58	58.78
Colour	Hazen	APHA (23rd Edition) 2120B ,2017	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)
Conductivity	us/cm	APHA (23rd Edition) 2510B,2017	2498	1890	640	1105	938
Fluoride (as F)	mg/l	APHA (23rd Edition)4500 - F C/D, 2017	0.38	0.41	0.25	0.28	0.31
Magnesium (as Mg)	mg/l	APHA (23rd Edition) 3500 Mg B,2017	53	55	20.96	26.1	28
Mercury (as Hg)	mg/l	APHA 22rd Edtn, 3112B,2017	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
Nitrate (as NO3)	mg/l	APHA (23rd Edition) 4500- NO3-E, 2017	18.6	5.01	9.52	9.2	6.2
Nitrite (as NO2)	mg/l	APHA (23rd Edition) 4500-NO2-B 2017	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
Odour	---	APHA(23rd Edition)2150B ,2017	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
Sodium (as Na)	mg/l	APHA (23rd Edition) 3500 Na B, 2017	66	46	8.69	28	19.4
Sulphate (as SO4)	mg/l	APHA (23rd Edition) 4500-SO4 E 2017	120.8	102.5	58.2	50.2	41.2
Temperature	^{O}C	APHA 23rd EDITION,2550 B,2017	25.2	25.2	25.2	25.2	25.2
Total Dissolved Solids (as TDS)	mg/l	APHA(23rd Edition) 2540C,2017	1360	1080	360	610	510
pH value	----	APHA(23rd Edition) 4500-H-B ,2017	7.22	7.53	7.88	7.83	7.87
Orthophosphate	mg/l	APHA 22nd Edtn, 4500P-D,2017	0.84	0.48	0.51	0.48	0.48
Sodium Adsorption Ratio (as SAR)	----	DIAGONISIS AND IMPROVEMENT OF SALINE AND ALKALINE SOIL	0.97	0.74	0.22	0.59	0.42
% Sodium	----	IS 2488 (Part 5)-1976; Rffm:2009	13.9	11.9	6.1	12.4	9.4

Summary Report

Month: December-2024

Sample Identified As : **Ground Water**
Customer Name : **Great Eastern Energy Corp. Ltd.**
Address : **M10 ADDA Industrial Estate Asansol West Bengal – 713305**

Parameters(Units)	Unit	Test Method	Gopalnagar (S-38)	Rautora (S-09)	Dihika (07)	Purushhotampur (03)	Kulilapur (01)
			MSKGL/ED/2024-25/007527	MSKGL/ED/2024-25/007528	MSKGL/ED/2024-25/007529	MSKGL/ED/2024-25/007530	MSKGL/ED/2024-25/007531
Arsenic(as As)	mg/l	APHA (23rd Edition) 3114C (Hydride Generation),2017	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Bicarbonate	mg/l	APHA23rd Edtn,2320 B,2017	431.39	279.14	380.64	279.14	203.01
Calcium (as Ca)	mg/l	APHA (23rd Edition) 3500 Ca B,2017	123	77	114	86.2	50
Carbonate	mg/l	TPM/MSK/E/1/X Methods of Analysis Soil Science socity for America Part II ,pg 945	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)
Chemical Oxygen Demand (COD)	mg/l	APHA (23rd Edition) 5220B, 2017	28	12	20	12	8
Chloride (as Cl)	mg/l	APHA (23rd Edition)4500-Cl B ,2017	88.17	48.98	117.56	58.78	58.78
Colour	Hazen	APHA (23rd Edition) 2120B ,2017	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.00)
Conductivity	us/cm	APHA (23rd Edition) 2510B,2017	1490	668	1160	990	520
Fluoride (as F)	mg/l	APHA (23rd Edition)4500 - F C/D, 2017	0.24	0.24	0.28	0.27	0.21
Magnesium (as Mg)	mg/l	APHA (23rd Edition) 3500 Mg B,2017	34	18	34	16.3	9.81
Mercury (as Hg)	mg/l	APHA 22rd Edtn, 3112B,2017	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
Nitrate (as NO3)	mg/l	APHA (23rd Edition) 4500- NO3-E, 2017	12.1	2.01	4.2	4.65	2.01
Nitrite (as NO2)	mg/l	APHA (23rd Edition) 4500-NO2-B 2017	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
Odour	---	APHA(23rd Edition)2150B ,2017	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
Sodium (as Na)	mg/l	APHA (23rd Edition) 3500 Na B, 2017	56.6	15	28	25	15
Sulphate (as SO4)	mg/l	APHA (23rd Edition) 4500-SO4 E 2017	54.2	20.1	40.8	48.2	20.5
Temperature	^{O}C	APHA 23rd EDITION,2550 B,2017	25.2	25	25.2	25.2	25.6
Total Dissolved Solids (as TDS)	mg/l	APHA(23rd Edition) 2540C,2017	820	360	610	580	310
pH value	----	APHA(23rd Edition) 4500-H-B ,2017	7.06	7.15	7.9	8.15	7.35
Orthophosphate	mg/l	APHA 22nd Edtn, 4500P-D,2017	0.6	0.34	0.51	0.49	0.41
Sodium Adsorption Ratio (as SAR)	----	DIAGONISIS AND IMPROVEMENT OF SALINE AND ALKALINE SOIL	1.16	0.4	0.59	0.65	0.51
% Sodium	----	IS 2488 (Part 5)-1976; Rffm:2009	21	10.7	12.2	15.5	15.9

Summary Report
Month: December -2024

Sample Identified As : **Ground Water**
Customer Name : **Great Eastern Energy Corp. Ltd.**
Address : **M10 ADDA Industrial Estate Asansol West Bengal – 713305**

Parameters(Units)	Unit	Test Method	Sarjomdih (04)	Shyamdihi (12)	Shyamdihi (10)	Bonogram (55)	Gutgutpara (42)
			MSKGL/ED/2024-25/007532	MSKGL/ED/2024-25/007533	MSKGL/ED/2024-25/007534	MSKGL/ED/2024-25/007535	MSKGL/ED/2024-25/007536
Arsenic(as As)	mg/l	APHA (23rd Edition) 3114C (Hydride Generation),2017	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Bicarbonate	mg/l	APHA23rd Edtn,2320 B,2017	304.51	228.38	152.26	304.51	276.14
Calcium (as Ca)	mg/l	APHA (23rd Edition) 3500 Ca B,2017	116	85	47	113	90.4
Carbonate	mg/l	TPM/MSK/E/1/X Methods of Analysis Soil Science socity for America Part II ,pg 945	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)
Chemical Oxygen Demand (COD)	mg/l	APHA (23rd Edition) 5220B, 2017	12	12	8	20	12
Chloride (as Cl)	mg/l	APHA (23rd Edition)4500-Cl B ,2017	88.17	48.98	29.39	68.58	58.78
Colour	Hazen	APHA (23rd Edition) 2120B ,2017	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)
Conductivity	us/cm	APHA (23rd Edition) 2510B,2017	1314	460	460	968	860
Fluoride (as F)	mg/l	APHA (23rd Edition)4500 - F C/D, 2017	0.28	BDL(DL:0.2)	BDL(DL:0.2)	0.28	0.25
Magnesium (as Mg)	mg/l	APHA (23rd Edition) 3500 Mg B,2017	30.2	8.24	12	19	19.4
Mercury (as Hg)	mg/l	APHA 22rd Edtn, 3112B,2017	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
Nitrate (as NO3)	mg/l	APHA (23rd Edition) 4500- NO3-E, 2017	5.02	1.85	3.02	6.2	5.02
Nitrite (as NO2)	mg/l	APHA (23rd Edition) 4500-NO2-B 2017	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
Odour	---	APHA(23rd Edition)2150B ,2017	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
Sodium (as Na)	mg/l	APHA (23rd Edition) 3500 Na B, 2017	58.1	12	9.6	22	31
Sulphate (as SO4)	mg/l	APHA (23rd Edition) 4500-SO4 E 2017	35.2	24.6	32.2	52.1	5.08
Temperature	^{o}C	APHA 23rd EDITION,2550 B,2017	25.2	25.2	25	25.2	25
Total Dissolved Solids (as TDS)	mg/l	APHA(23rd Edition) 2540C,2017	706	340	260	530	480
pH value	----	APHA(23rd Edition) 4500-H-B ,2017	7.87	7.1	7.96	7.35	7.32
Orthophosphate	mg/l	APHA 22nd Edtn, 4500P-D,2017	0.47	0.48	0.41	0.5	0.55
Sodium Adsorption Ratio (as SAR)	----	DIAGONISIS AND IMPROVEMENT OF SALINE AND ALKALINE SOIL	1.2	0.33	0.32	0.5	0.77
% Sodium	----	IS 2488 (Part 5)-1976; Rffm:2009	23	9.3	10.8	11.4	17.5

Summary Report
Month: December-2024

Sample Identified As : **Ground Water**
Customer Name : **Great Eastern Energy Corp. Ltd.**
Address : **M10 ADDA Industrial Estate Asansol West Bengal – 713305**

Parameters(Units)	Unit	Test Method	Barathol (46)	Chasipatti (47)	Kalajharia (18)	Dherua (16)	Talkuri (54)
			MSKGL/ED/2024-25/007537	MSKGL/ED/2024-25/007538	MSKGL/ED/2024-25/007539	MSKGL/ED/2024-25/007540	MSKGL/ED/2024-25/007541
Arsenic(as As)	mg/l	APHA (23rd Edition) 3114C (Hydride Generation),2017	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Bicarbonate	mg/l	APHA23rd Edtn,2320 B,2017	685.15	890	304.51	177.63	203.1
Calcium (as Ca)	mg/l	APHA (23rd Edition) 3500 Ca B,2017	145	305	156	31	31
Carbonate	mg/l	TPM/MSK/E/1/X Methods of Analysis Soil Science socity for America Part II ,pg 945	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)
Chemical Oxygen Demand (COD)	mg/l	APHA (23rd Edition) 5220B, 2017	32	40	12	8	8
Chloride (as Cl)	mg/l	APHA (23rd Edition)4500-Cl B ,2017	97.97	490	68.58	39.19	48.98
Colour	Hazen	APHA (23rd Edition) 2120B ,2017	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)
Conductivity	us/cm	APHA (23rd Edition) 2510B,2017	1620	3180	1130	570	590
Fluoride (as F)	mg/l	APHA (23rd Edition)4500 - F C/D, 2017	0.31	0.41	0.24	BDL(DL:0.2)	BDL(DL:0.2)
Magnesium (as Mg)	mg/l	APHA (23rd Edition) 3500 Mg B,2017	36	87	20	16	16.2
Mercury (as Hg)	mg/l	APHA 22rd Edtn, 3112B,2017	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
Nitrate (as NO3)	mg/l	APHA (23rd Edition) 4500- NO3-E, 2017	6.2	12.5	6.2	3.02	2.85
Nitrite (as NO2)	mg/l	APHA (23rd Edition) 4500-NO2-B 2017	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
Odour	---	APHA(23rd Edition)2150B ,2017	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
Sodium (as Na)	mg/l	APHA (23rd Edition) 3500 Na B, 2017	80.4	119	20	6.52	8.99
Sulphate (as SO4)	mg/l	APHA (23rd Edition) 4500-SO4 E 2017	60.2	190.5	50.2	14.2	15.2
Temperature	^{O}C	APHA 23rd EDITION,2550 B,2017	25.2	25.2	25.2	25.2	25.2
Total Dissolved Solids (as TDS)	mg/l	APHA(23rd Edition) 2540C,2017	890	1740	610	310	320
pH value	----	APHA(23rd Edition) 4500-H-B ,2017	7.62	7.12	8.2	7.74	7.52
Orthophosphate	mg/l	APHA 22nd Edtn, 4500P-D,2017	0.58	0.6	0.44	0.44	0.32
Sodium Adsorption Ratio (as SAR)	----	DIAGONISIS AND IMPROVEMENT OF SALINE AND ALKALINE SOIL	1.54	1.54	0.4	0.24	0.32
% Sodium	----	IS 2488 (Part 5)-1976; Rffm:2009	24.8	18.3	8.3	8.7	11.5

Appendix-G
Summary Report
Month: October-2024

Sample Identified As : **Flue Gas (Gas Ganset)**

Customer Name : **Great Eastern Energy Corp. Ltd.**

Address : **M10 ADDA Industrial Estate Asansol West Bengal - 713305**

Parameters (Units)	**Method**	Gas Generator – Well No-S-27 (Sl No--62865726)	Gas Generator – Well No-S-7 (Sl No--63180085)	Gas Generator – Well No-S-10 (Sl No--30579514)	Gas Generator – Well No-45 (Sl No--63189554)	Gas Generator – Well No-10 (Sl No-62865721)	Gas Generator – Well No-21 (Sl No—70220009)	Gas Generator – North GGS (Sl No—69749584)
		MSKGL/ED/2024-25/005387	MSKGL/ED/2024-25/005388	MSKGL/ED/2024-25/005389	MSKGL/ED/2024-25/005390	MSKGL/ED/2024-25/005391	MSKGL/ED/2024-25/005392	MSKGL/ED/2024-25/005393
Quantity of Gas Flow (Nm3/hr)	EPA Part 2, 25.09.1996	159	187	173	157	160	162	167
Velocity of gas (m/sec.)	EPA Part 2, 25.09.1996	7.37	8.97	8.14	7.46	7.34	7.66	7.80
Concentration of Carbon Monoxide (g/kw-hr)	IS 13270:1992,Ref:2009	0.160	0.130	0.226	0.173	0.183	0.156	0.138
Concentration of Oxides of Nitrogen (g/kw-hr)	EPA Part-7	0.275	0.250	0.280	0.285	0.296	0.246	0.307
Concentration of Non-methane Hydro Carbon (g/kw-hr)	USEPA 18 - 25/09/1996	< 0.005	< 0.006	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005
a) Concentration of Ethane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
b) Concentration of Propene (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
c) Concentration of n-Butane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
d) Concentration of Iso-Butane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
e) Concentration of Pentane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Concentration of methane Hydro Carbon (ppm)	USEPA 18 - 25/09/1996	688.29	728.33	731.88	735.4	748.25	753.86	688.15
Concentration of Nox + NMHC (g/kw-hr)	USEPA 18 - 25/09/1996	0.275	0.250	0.280	0.285	0.296	0.246	0.307

Summary Report
Month: November-2024

Sample Identified As : **Flue Gas (Gas Ganset)**

Customer Name : **Great Eastern Energy Corp. Ltd.**

Address : **M10 ADDA Industrial Estate Asansol West Bengal - 713305**

Parameters (Units)	**Method**	Gas Generator – Well No-S-14 (Sl No--75199709)	Gas Generator – Well No-19 (Sl No--62925150)	Gas Generator – Well No-27 (Sl No--DXHM407714)	Gas Generator – Well No.-43 (Sl No--62880107)	Gas Generator – Well No-56 (Sl No-- 63201783)	Gas Generator – Well No-52 (Sl No-- 69759586)	Gas Generator – Well No-40 (Sl No-- 62880491)
		MSKGL/ED/2024-25/005959	MSKGL/ED/2024-25/005966	MSKGL/ED/2024-25/005968	MSKGL/ED/2024-25/005969	MSKGL/ED/2024-25/005970	MSKGL/ED/2024-25/005971	MSKGL/ED/2024-25/005972
Quantity of Gas Flow (Nm3/hr)	EPA Part 2, 25.09.1996	173	181	179	176	180	174	170
Velocity of gas (m/sec.)	EPA Part 2, 25.09.1996	9.84	10.45	10.07	10.28	10.35	10.06	9.54
Concentration of Carbon Monoxide (g/kw-hr)	IS 13270:1992,Ref:2009	0.285	0.285	0.116	0.228	0.220	0.291	0.298
Concentration of Oxides of Nitrogen (g/kw-hr)	EPA Part-7	0.313	0.314	0.158	0.315	0.349	0.320	0.341
Concentration of Non-methane Hydro Carbon (g/kw-hr)	USEPA 18 - 25/09/1996	< 0.006	< 0.006	<0. 002	< 0.006	< 0.006	< 0.006	< 0.006
a) Concentration of Ethane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
b) Concentration of Propene (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
c) Concentration of n-Butane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
d) Concentration of Iso-Butane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
e) Concentration of Pentane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Concentration of methane Hydro Carbon (ppm)	USEPA 18 - 25/09/1996	553.6	524.3	687.2	526.8	536.4	498.5	610.2
Concentration of Nox + NMHC (g/kw-hr)	USEPA 18 - 25/09/1996	0.313	0.314	0.158	0.315	0.349	0.320	0.341

Summary Report
Month: December-2024

Sample Identified As : **Flue Gas (Gas Genest)**

Customer Name : **Great Eastern Energy Corp. Ltd.**

Address : **M10 ADDA Industrial Estate Asansol West Bengal – 713305**

Parameters (Units)	**Method**	Gas Generator – Well No-North GGS (Sl No--25327493)	Gas Generator – Well No-16 (Sl No--62880106)	Gas Generator – Well No-50 (Sl No--62880481)	Gas Generator – Well No-47 (Sl No--62880486)	Gas Generator – Well No-102 (Sl No--70260014)	Gas Generator – Well No-S-24 (Sl No--75219707)	Gas Generator – Well No-S-33 (Sl No--75229708)
		MSKGL/ED/2024-25/007572	MSKGL/ED/2024-25/007573	MSKGL/ED/2024-25/007574	MSKGL/ED/2024-25/007685	MSKGL/ED/2024-25/007686	MSKGL/ED/2024-25/007687	MSKGL/ED/2024-25/007688
Quantity of Gas Flow (Nm3/hr)	EPA Part 2, 25.09.1996	432	173	174	174	170	180	181
Velocity of gas (m/sec.)	EPA Part 2, 25.09.1996	10.21	9.84	10.06	10.06	9.54	10.35	10.45
Concentration of Carbon Monoxide (g/kw-hr)	IS 13270:1992,Ref:2009	0.235	0.202	0.147	0.186	0.199	0.172	0.265
Concentration of Oxides of Nitrogen (g/kw-hr)	EPA Part-7	0.277	0.222	0.194	0.278	0.249	0.340	0.309
Concentration of Non-methane Hydro Carbon (g/kw-hr)	USEPA 18 - 25/09/1996	< 0.004	<0.006	< 0.006	<0.006	<0.006	<0.006	<0.006
a) Concentration of Ethane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
b) Concentration of Propene (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
c) Concentration of n-Butane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
d) Concentration of Iso-Butane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
e) Concentration of Pentane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Concentration of methane Hydro Carbon (ppm)	USEPA 18 - 25/09/1996	720.6	704.36	743.01	726.03	703.58	682.24	676.25
Concentration of Nox + NMHC (g/kw-hr)	USEPA 18 - 25/09/1996	0.277	0.222	0.194	0.278	0.249	0.340	0.309

Summary Report
Month: January-2025

Sample Identified As : **Flue Gas (Gas Ganset)**

Customer Name : **Great Eastern Energy Corp. Ltd.**

Address : **M10 ADDA Industrial Estate Asansol West Bengal – 713305**

Parameters (Units)	**Method**	Gas Generator – Well No-S-19 (Sl No--07439585)	Gas Generator – Well No-S-41 (Sl No--70240010)	Gas Generator – Well No-S-02 (Sl No--62925149)	Gas Generator – Well No-06 (Sl No--62925144)	Gas Generator – Well No-05 (Sl No--62877938)	Gas Generator – Well No-08 (Sl No--07399582)	Gas Generator – Well No-55 (Sl No--62925147)
		MSKGL/ED/2024-25/009183	MSKGL/ED/2024-25/009184	MSKGL/ED/2024-25/009185	MSKGL/ED/2024-25/009186	MSKGL/ED/2024-25/009187	MSKGL/ED/2024-25/009188	MSKGL/ED/2024-25/009189
Quantity of Gas Flow (Nm3/hr)	EPA Part 2, 25.09.1996	192	189	179	189	191	188	177
Velocity of gas (m/sec.)	EPA Part 2, 25.09.1996	9.71	9.81	9.28	10.19	10.25	9.8	9.6
Concentration of Carbon Monoxide (g/kw-hr)	IS 13270:1992,Ref:2009	0.337	0.284	0.238	0.291	0.219	0.219	0.248
Concentration of Oxides of Nitrogen (g/kw-hr)	EPA Part-7	0.390	0.357	0.431	0.306	0.254	0.330	0.335
Concentration of Non-methane Hydro Carbon (g/kw-hr)	USEPA 18 - 25/09/1996	< 0.006	< 0.006	< 0.006	< 0.006	<0.006	< 0.006	< 0.006
a) Concentration of Ethane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
b) Concentration of Propene (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
c) Concentration of n-Butane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
d) Concentration of Iso-Butane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
e) Concentration of Pentane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Concentration of methane Hydro Carbon (ppm)	USEPA 18 - 25/09/1996	695.1	763.98	641.36	483.01	536.46	492.37	629.63
Concentration of Nox + NMHC (g/kw-hr)	USEPA 18 - 25/09/1996	0.390	0.357	0.431	0.306	0.254	0.330	0.335

Summary Report
Month: February -2025

Sample Identified As : **Flue Gas (Gas Ganset)**

Customer Name : **Great Eastern Energy Corp. Ltd.**

Address : **M10 ADDA Industrial Estate Asansol West Bengal – 713305**

Parameters (Units)	**Method**	Gas Generator (Well No-S-15) SL No-62880489	Gas Generator (Well No-S-17) Sl No-62899398	Gas Generator (Well No-S-28) Sl No-63201784	Gas Generator (Well No-25) Sl No-63180524	Gas Generator (North-GGS) Sl No-63180523	Gas Generator (Well No-40) Sl No-63189526	Gas Generator (Well No-26) Sl No-62877938
		MSKGL/ED/2024-25/010108	MSKGL/ED/2024-25/010118	MSKGL/ED/2024-25/010163	MSKGL/ED/2024-25/010164	MSKGL/ED/2024-25/010172	MSKGL/ED/2024-25/010173	MSKGL/ED/2024-25/010174
Quantity of Gas Flow (Nm3/hr)	EPA Part 2, 25.09.1996	168	163	169	167	164	164	169
Velocity of gas (m/sec.)	EPA Part 2, 25.09.1996	8.35	8.15	8.95	8.97	8.71	8.72	8.97
Concentration of Carbon Monoxide (g/kw-hr)	IS 13270:1992,Ref:2009	0.253	0.261	0.242	0.254	0.269	0.224	0.222
Concentration of Oxides of Nitrogen (g/kw-hr)	EPA Part-7	0.332	0.278	0.298	0.277	0.297	0.257	0.301
Concentration of Non-methane Hydro Carbon (g/kw-hr)	USEPA 18 - 25/09/1996	< 0.006	< 0.005	<0.006	<0.005	<0.005	< 0.005	<0.006
a) Concentration of Ethane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
b) Concentration of Propene (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
c) Concentration of n-Butane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
d) Concentration of Iso-Butane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
e) Concentration of Pentane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Concentration of methane Hydro Carbon (ppm)	USEPA 18 - 25/09/1996	686	749.4	677	547.6	617.4	611	660
Concentration of Nox + NMHC (g/kw-hr)	USEPA 18 - 25/09/1996	0.332	0.278	0.298	0.277	0.297	0.257	0.301

Summary Report
Month: March-2025

Sample Identified As : **Flue Gas (Gas Ganset)**

Customer Name : **Great Eastern Energy Corp. Ltd.**

Address : **M10 ADDA Industrial Estate Asansol West Bengal - 713305**

Parameters (Units)	**Method**	GG Sl. No.- 62877934 (Well No-S-33)	GG Sl. No.- 62925146 (Well No-South GGS)	GG Sl. No.- 25374428 (Well No- South GGS)	GG Sl. No.- 62865724 (Well No- 30)	GG Sl. No.- DXHM407716 (Well No- 41)	GG Sl. No.- 70220009 (Well No- 31)	GG Sl. No.- DAHM404446 (Well No- 15)
		MSKGL/ED/2025 -26/000129	MSKGL/ED/2025 -26/000130	MSKGL/ED/2025 -26/000131	MSKGL/ED/2025 -26/000132	MSKGL/ED/2025 -26/000133	MSKGL/ED/2025 -26/000134	MSKGL/ED/2025 -26/000135
Quantity of Gas Flow (Nm3/hr)	EPA Part 2, 25.09.1996	197	198	146	176	204	186	220
Velocity of gas (m/sec.)	EPA Part 2, 25.09.1996	9.86	11.41	9.37	10.07	12.69	10.39	13.96
Concentration of Carbon Monoxide (g/kw-hr)	IS 13270:1992,Ref:2009	0.230	0.210	0.060	0.240	0.300	0.170	0.130
Concentration of Oxides of Nitrogen (g/kw-hr)	EPA Part-7	0.300	0.300	0.062	0.281	0.150	0.270	0.168
Concentration of Non-methane Hydro Carbon (g/kw-hr)	USEPA 18 - 25/09/1996	< 0.006	< 0.007	< 0.001	< 0.006	< 0.003	< 0.006	< 0.03
a) Concentration of Ethane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
b) Concentration of Propene (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
c) Concentration of n-Butane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
d) Concentration of Iso-Butane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
e) Concentration of Pentane (ppm)	USEPA 18 - 25/09/1996	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Concentration of methane Hydro Carbon (ppm)	USEPA 18 - 25/09/1996	656	549	677	447	503	511	565
Concentration of Nox + NMHC (g/kw-hr)	USEPA 18 - 25/09/1996	0.300	0.300	0.062	0.281	0.150	0.270	0.168

Appendix-H
Feed Gas Quality Analysis Report

Test Report THN25-02905.001

Issue Date: 24-Mar-2025
Customer Name: GREAT EASTERN ENERGY CORPORATION LIMITED
Customer Address: M10 ADDA Industrial Estate
Asansol 713305
INDIA

Customer Provided Information		Lab Provided Information	
Product Description:	Gas - CBM GAS	SGS Order Number:	--
Customer Reference:	WO NO.GEECU/51000010750 DT 26/02/2025	Sampled By:	Sample not drawn by the Laboratory
Customer ID:	GGS NORTH	Received:	20-Mar-2025
Sample Source:	As Supplied	Analysed:	24-Mar-2025
Source Location:	ASANSOL	Completed:	24-Mar-2025
Source ID:	--		
Vessel:	--		
Sample Type:	As submitted		
Sampled:	15-Mar-2025		
Client Comments1:	COAL BED		
Client Comments2:	TIME : 11.00AM		
Client Comments3:	PRESSURE : 7.5 BAR		
Quantity:	2 LTR		

Parameter	Method	Result	Unit
Determination of Nat. Gas Composition by GC using 3 Capillary Columns	ISO 6974 - Part 6		
Helium (He)		<0.01	% mol
Oxygen (O2)		0.381	% mol
Nitrogen (N2)		1.772	% mol
Methane (CH4)		97.493	% mol
Carbon Monoxide (CO)		<0.01	% mol
Carbon Dioxide (CO2)		0.210	% mol
Ethane (C2H6)		0.144	% mol
Propane (C3H8)		<0.001	% mol

Authorised Signatory

Vijay Sankpal
Assistant Manager

SGS India Private Limited | Natural Resources - Laboratory Testing Oil, Gas & Chemicals SGS HOUSE, A-77, WAGLE INDUSTRIAL ESTATE, ROAD NO 16, NEAR PASSPORT OFFICE, THANE WEST, 400604, e: ogclab.thane@sgs.com INDIA t: +91 22 61517642 www.sgs.com

Member of the SGS Group (SGS SA)

Test Report THN25-02905.001

Issue Date: 24-Mar-2025
Customer Name: GREAT EASTERN ENERGY CORPORATION LIMITED
Customer Address: M10 ADDA Industrial Estate
Asansol 713305
INDIA

Customer Provided Information		Lab Provided Information	
Product Description:	Gas - CBM GAS	SGS Order Number:	--
Customer Reference:	WO NO.GEECL/5100010750 DT 26/02/2025	Sampled By:	Sample not drawn by the Laboratory
Customer ID:	GGS NORTH	Received:	20-Mar-2025
Sample Source:	As Supplied	Analysed:	24-Mar-2025
Source Location:	ASANSOL	Completed:	24-Mar-2025
Source ID:	--		
Vessel:	--		
Sample Type:	As submitted		
Sampled:	15-Mar-2025		
Client Comments1:	COAL BED		
Client Comments2:	TIME : 11.00AM		
Client Comments3:	PRESSURE : 7.5 BAR		
Quantity:	2 LTR		

Parameter	Method	Result	Unit	
Iso-Butane (C4H10)		<0.001	% mol	
n-Butane (C4H10)		<0.001	% mol	
Iso-Pentane (C5H12)		<0.001	% mol	
n-Pentane (C5H12)		<0.001	% mol	
n-Hexane (C6H14)		<0.001	% mol	
Dew Point	ASTM D1142	9.8	°C	#
Sulfur Compounds in Natural Gas and Gaseous Fuels by GC/FPD	ASTM D6228			
Hydrogen sulfide		<1	ppm v/v	
Total Sulfur		<1	ppm v/v	

- Result is outside of test method limits and/or analytical range used in method precision study

Authorised Signatory

Vijay Sankpal
Assistant Manager

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Test Report THN25-02905.001

Issue Date: 24-Mar-2025
Customer Name: GREAT EASTERN ENERGY CORPORATION LIMITED
Customer Address: M10 ADDA Industrial Estate
Asansol 713305
INDIA

Customer Provided Information		Lab Provided Information	
Product Description:	Gas - CBM GAS	SGS Order Number:	--
Customer Reference:	WO NO.GEECL/5100010750 DT 26/02/2025	Sampled By:	Sample not drawn by the Laboratory
Customer ID:	GGS NORTH	Received:	20-Mar-2025
Sample Source:	As Supplied	Analysed:	24-Mar-2025
Source Location:	ASANSOL	Completed:	24-Mar-2025
Source ID:	--		
Vessel:	--		
Sample Type:	As submitted		
Sampled:	15-Mar-2025		
Client Comments1:	COAL BED		
Client Comments2:	TIME : 11.00AM		
Client Comments3:	PRESSURE : 7.5 BAR		
Quantity:	2 LTR		

Parameter	Method	Result	Unit

End of Test Report

- Result is outside of test method limits and/or analytical range used in method precision study

Authorised Signatory

Vijay Sankpal
Assistant Manager

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Test Report THN25-02905.002

Issue Date: 24-Mar-2025
Customer Name: GREAT EASTERN ENERGY CORPORATION LIMITED
Customer Address: M10 ADDA Industrial Estate
Asansol 713305
INDIA

Customer Provided Information		Lab Provided Information	
Product Description:	Gas - CBM GAS	SGS Order Number:	--
Customer Reference:	WO NO.GEECL/5100010750 DT 26/02/2025	Sampled By:	Sample not drawn by the Laboratory
Customer ID:	GGS SOUTH	Received:	20-Mar-2025
Sample Source:	As Supplied	Analysed:	24-Mar-2025
Source Location:	ASANSOL	Completed:	24-Mar-2025
Source ID:	--		
Vessel:	--		
Sample Type:	As submitted		
Sampled:	15-Mar-2025		
Client Comments1:	COAL BED		
Client Comments2:	TIME : 12.40PM		
Client Comments3:	PRESSURE : 8.6 KG/CM2		
Quantity:	2 LTR		

Parameter	Method	Result	Unit
Determination of Nat. Gas Composition by GC using 3 Capillary Columns	ISO 6974 - Part 6		
Helium (He)		<0.01	% mol
Oxygen (O2)		0.330	% mol
Nitrogen (N2)		2.033	% mol
Methane (CH4)		97.383	% mol
Carbon Monoxide (CO)		<0.01	% mol
Carbon Dioxide (CO2)		0.106	% mol
Ethane (C2H6)		0.148	% mol
Propane (C3H8)		<0.001	% mol

Authorised Signatory

Vijay Sankpal
Assistant Manager

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Test Report THN25-02905.002

Issue Date: 24-Mar-2025

Customer Name: GREAT EASTERN ENERGY CORPORATION LIMITED

Customer Address: M10 ADDA Industrial Estate
Asansol 713305
INDIA

Customer Provided Information		Lab Provided Information	
Product Description:	Gas - CBM GAS	SGS Order Number:	--
Customer Reference:	WO NO.GEECL/5100010750 DT 26/02/2025	Sampled By:	Sample not drawn by the Laboratory
Customer ID:	GGS SOUTH	Received:	20-Mar-2025
Sample Source:	As Supplied	Analysed:	24-Mar-2025
Source Location:	ASANSOL	Completed:	24-Mar-2025
Source ID:	--		
Vessel:	--		
Sample Type:	As submitted		
Sampled:	15-Mar-2025		
Client Comments1:	COAL BED		
Client Comments2:	TIME : 12.40PM		
Client Comments3:	PRESSURE : 8.6 KG/CM2		
Quantity:	2 LTR		

Parameter	Method	Result	Unit	
Iso-Butane (C4H10)		<0.001	% mol	
n-Butane (C4H10)		<0.001	% mol	
Iso-Pentane (C5H12)		<0.001	% mol	
n-Pentane (C5H12)		<0.001	% mol	
n-Hexane (C6H14)		<0.001	% mol	
Dew Point	ASTM D1142	14.2	°C	#
Sulfur Compounds In Natural Gas and Gaseous Fuels by GC/FPD	ASTM D6228			
Hydrogen sulfide		<1	ppm v/v	
Total Sulfur		<1	ppm v/v	

- Result is outside of test method limits and/or analytical range used in method precision study

Authorised Signatory

Vijay Sankpal
Assistant Manager

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Test Report THN25-02905.002

Issue Date: 24-Mar-2025
Customer Name: GREAT EASTERN ENERGY CORPORATION LIMITED
Customer Address: M10 ADDA Industrial Estate
Asansol 713305
INDIA

Customer Provided Information		Lab Provided Information	
Product Description:	Gas - CBM GAS	SGS Order Number:	--
Customer Reference:	WO NO.GEECL/S1000010750 DT 26/02/2025	Sampled By:	Sample not drawn by the Laboratory
Customer ID:	GGS SOUTH	Received:	20-Mar-2025
Sample Source:	As Supplied	Analysed:	24-Mar-2025
Source Location:	ASANSOL	Completed:	24-Mar-2025
Source ID:	--		
Vessel:	--		
Sample Type:	As submitted		
Sampled:	15-Mar-2025		
Client Comments1:	COAL BED		
Client Comments2:	TIME : 12.40PM		
Client Comments3:	PRESSURE : 8.6 KG/CM2		
Quantity:	2 LTR		

Parameter	Method	Result	Unit

End of Test Report

- Result is outside of test method limits and/or analytical range used in method precision study

Authorised Signatory

Vijay Sankpal
Assistant Manager

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Appendix-I
Long Term Subsidence Study Report

Consultancy Project Report

on

Monitoring Land Subsidence and Time-series Analysis over the Raniganj Region of West Bengal Using Satellite Remote Sensing Technique

Submitted to

Great Eastern Energy Corporation Ltd.
M-10 Adda Industrial Area
Asansol-713305

Submitted by

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(23 November 2024)

1. Executive Summary

This study analyzes land deformation patterns and displacement time series in the Raniganj region of West Bengal (WB) using Synthetic Aperture Radar (SAR) data from the Sentinel-1A satellite provided by the European Space Agency (ESA). The analysis explored an advanced SBAS-based multi-temporal interferometric (MT-InSAR) technique, utilizing 141 C-band Sentinel-1 ascending imagery collected over the past five years (June 2019 to May 2024) to generate a velocity map and deformation time series. Additionally, the study incorporates well-depth data from 156 stations to assess the spatial distribution and magnitude of ground displacement. The results reveal deformation in areas south of the Damodar River, with cumulative displacements exceeding 80 mm in some locations, including a subsidence rate of up to 20 mm/year. In contrast, the northern side of the river exhibits minimal subsidence and notable upliftment, with deformation rates of up to 12 mm/year in certain areas. A detailed comparison of the InSAR-derived deformation data with the well-depth measurements shows that the upper side of the river experiences less deformation than the southern side. The southern side, characterized by relatively shallower wells, displays more subsidence, while the northern side, with deeper wells, shows lower deformation rates. Overall, the combined analysis of InSAR velocity data and well-depth measurements provides valuable insights into the land surface dynamics of the Raniganj region.

2. Introduction

Background

Rapid urbanization, increasing anthropogenic activities, and frequent climate change increase the demand for groundwater resources globally. One-fourth of the Earth's population relies on groundwater as a source of fresh water for irrigation and daily purposes (Famiglietti, 2014). Over-drafting of underground resources from an aquifer system resulting a decline in the head levels and is responsible for the induced land subsidence at local to regional scales(Galloway and Burbey, 2011; Russo and Lall, 2017). Approximately 80% of the land subsidence cases around the world are due to anthropogenic activities, and 60% of these are due to groundwater over-extraction(Bagheri-Gavkosh et al., 2021). These days, groundwater depletion and associated deformation phenomena have been significantly observed in several regions across the globe, including cities like Mexico City (Khorrami et al., 2023), Central Valley of California (Ojha et al., 2018), Spain (Notti et al., 2016), and New Delhi (Garg et al., 2022). India is a prominent user of groundwater around the world. The total groundwater extracted in 2020 is around 244.92 billion cubic meters, of which around 90% is used for irrigation purposes (CGWB-India, 2002). In the last decades, cities and states in India such as Kolkata, Delhi NCR, Lucknow, Punjab, Rajasthan, Haryana, and other regions in the Indo-Gangetic Plain (IGP) witnessed a significant amount of groundwater depletion and associated land subsidence in the area (Awasthi et al., 2022; Baweja et al., 2017; Bonsor et al., 2017; Janardhanan et al., 2023; MacDonald et al., 2016; Panda et al., 2021; Singla et al., 2022).

The study area Raniganj in West Bengal is a major coal-producing region in India (Patra et al., 2022). Due to prolonged underground coal mining activities, the region has been experiencing significant land subsidence and downward movement of the ground surface over the last two decades (Ghosh et al., 2024; Karfa and Tah, 2019; Sarkar, 2017). However, improper water management and monitoring strategy, lack of early warning mechanisms for groundwater monitoring, and associated land subsidence will have a more significant impact on the socio-

economic condition of the region in the near future and may lead further to infrastructure damage. The Raniganj South CBM block, covering an area of 210 sq., has a total of 156 drilled wells since 2007, covering 75 sq. km, with 66 wells actively used. In this context, this research survey focused on precisely measuring the land subsidence over the Raniganj South CBM block by exploring Sentinel-1 data from the European Space Agency using an advanced radar remote sensing technique. This may be further used to analyze how the drafting of currently active drilled wells affects the local scale subsidence and displacement time series of the last five years (June 2019-May 2024) over the study area.

Objectives

The major objectives of the project are outlined as follows:

- Aims to explore a previous five-year Sentinel-1 SAR data archive from June 2019 to May 2024 over the Raniganj region in West Bengal for deformation analysis
- SAR data will be processed using an advanced multi-temporal radar interferometry (MT-InSAR) technique to generate a high-resolution velocity map and displacement time series over the study region
- Analyse the InSAR-derived deformation data with the drilled well data products available over the region

2. Datasets

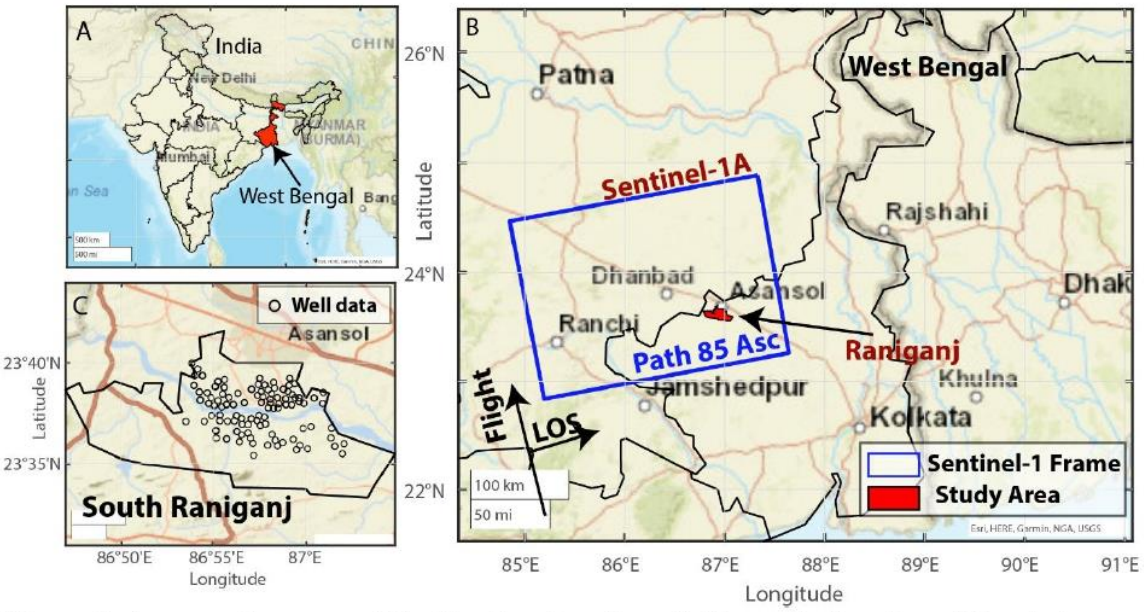

Figure 1. **An overview map of the Raniganj region.** A) Shows the location of the study on a national scale; B) Displays Sentinel-1 ascending footprint over the Ranging area; C) Highlights the zoomed view of the South Raniganj region. The background overlaid street map is obtained from ESRI.

In this study, we analyze Sentinel-1 imagery and 156 well station data in the South Raniganj region of West Bengal (WB). For land deformation analysis, we utilize 141 C-band Synthetic Aperture Radar (SAR) images from the Sentinel-1A satellite provided by the European Space Agency (ESA). These images, with ascending orbital geometry, span the observation period

from June 2019 to April 2024 (Figure 1). The analysis specifically focuses on sub-swath-3, which covers the study area for multi-temporal InSAR processing. The detailed information for the Sentinel-1 SAR dataset is provided in the table below.

Table-1 C-band Sentinel-1 A data products over the study area

SAR sensors and orbits	Sentinel-1 and Ascending track
Acquisition period	11/06/2019 - 03/05//2024
SAR images and polarization	141 and VV
Selected interferograms	586
Spatial resolution	40 m x 40 m
Multi-look factors (Range x Azimuth)	2 x 8
Incidence angle	37 degree
Satellite revisiting time	12 days
Spatiotemporal baselines thresholds	50 m x 100 days
Reference Image	03/03/2022
Total data volume generated	~ 2.4 Terabytes
Analysed pixels over the study area	2,56,608 (out of total ~1.5 million)

3. Methodology

Land subsidence can be precisely measured using the multi-temporal Interferometric Synthetic Aperture Radar (InSAR) technique, which offers accuracy in the millimetre to centimetre range. In this study, we apply an advanced multi-temporal InSAR algorithm to process C-band Sentinel-1 ascending orbit SAR data from June 2019 to May 2024 over the Raniganj region in West Bengal. The analysis utilizes the GMTSAR software package, which is based on the Small Baseline Subset (SBAS) technique and processes a time-series data stack. GMTSAR is an open-source InSAR processing tool that generates interferograms using Generic Mapping Tools (GMT). The SBAS method is employed to produce velocity and displacement time series along the line of sight (LOS). Each interferogram includes phase contributions from surface deformation, topography, atmospheric delay, orbital phase, and noise. Several phase correction techniques are applied to the interferogram, followed by co-registration and phase unwrapping to isolate the phase components associated with surface deformation. The Shuttle Radar Topography Mission (SRTM) digital elevation model (DEM) with a 1-arc second (30-meter) spatial resolution is used to remove the topographic phase. The corrected interferogram stack is then analyzed using a least-squares inversion approach to derive LOS velocity, displacement time series, and error uncertainties. To obtain vertical land motion, the LOS velocity is projected along the vertical direction using a unit vector projection approach, generating vertical displacement time series for further investigation. For comparative analysis between the InSAR-derived velocity map and well-depth data, we select a 100-meter radius around each drill station, retrieve the InSAR pixels within this region, and calculate the average velocity for those pixels. The results are discussed in the following section.

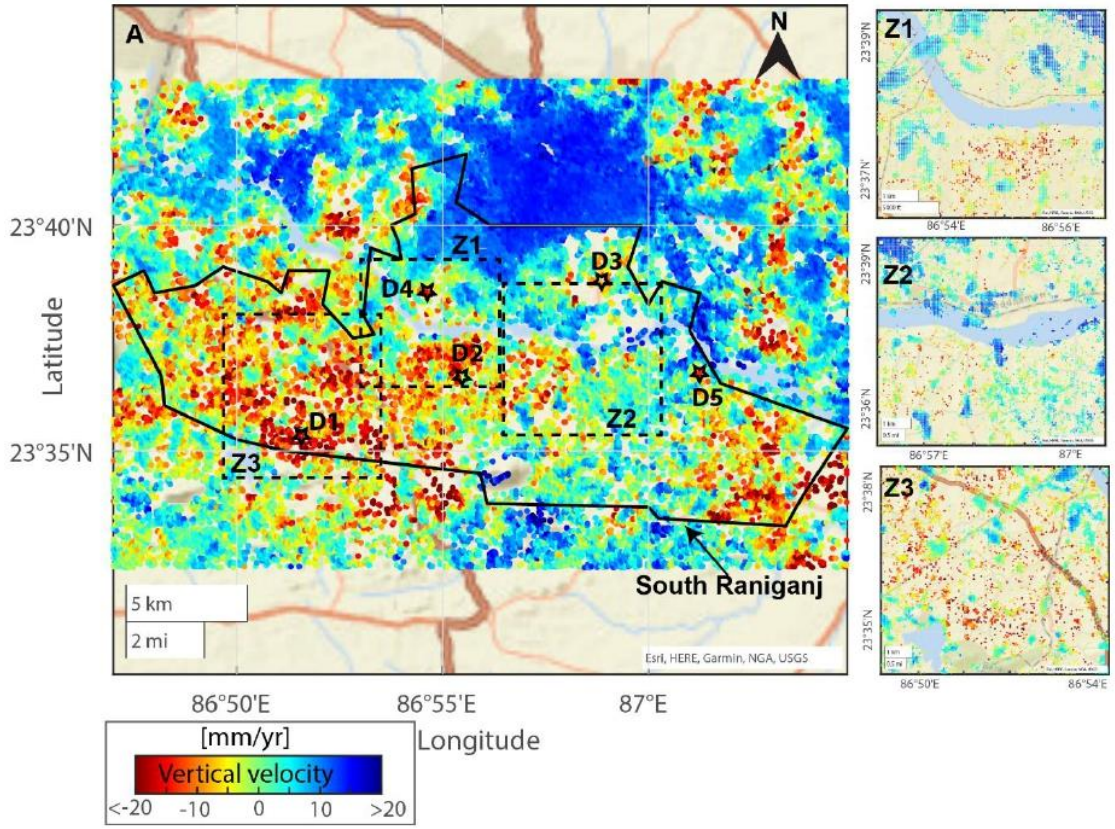

Figure 2. A) InSAR-derived vertical velocity map of Sentine-1A from June 2019 to May 2024 over the Raniganj South block region in West Bengal. The colorbar represents the maximum and minimum velocity ranges from +20 to -20 mm/year. The positive and negative values correspond to surface upliftment and subsidence, respectively. Z1, Z2, and Z3 are the zoomed view maps of certain locations highlighted by dotted boxes over Fig.2A.

4. Results and Discussion

Figure 2 shows the vertical velocity map of the Ranjiganj area in West Bengal, derived from Sentinel-1 data spanning June 2019 to May 2024. In this context, negative and positive velocity values correspond to subsidence and uplift, respectively, represented by red and blue colors. Zero values indicate stable areas, highlighted by green pixels. The velocity map shows subsidence in the southwest and eastern parts of the study area, occurring at rates of 15-20 mm/year. In contrast, the northern region exhibits upliftment, with rates ranging from 10-20 mm/year. A distinct subsidence zone, with a rate of 16 mm/year, is observed near the Damodar River in the central part of the study area. For improved visualization of the deformation pattern across the region, we present three zoomed-in areas marked by Z1, Z2, and Z3 square-dotted boxes at different locations (see Fig. 2). Zoomed Z1 and Z2 areas are along the rivers passed through the region and Z3 is the zoomed view over the west part of the study area. The zoomed-in Z1 and Z2 areas are located along the rivers that pass through the region, while Z3 focuses on the western part of the region.

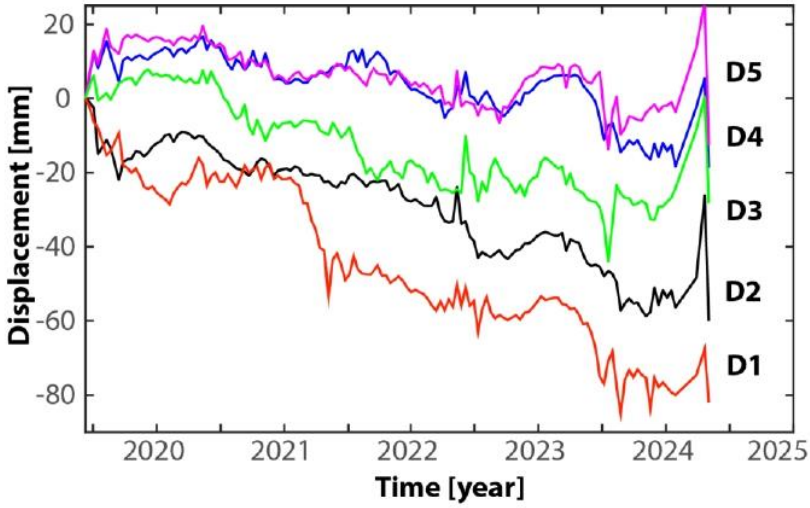

Figure 3. Shows the displacement time series at five locations over the study region, D1 to D5, as highlighted in Fig.2A.

To analyze the deformation patterns in the Raniganj region over the past five years, time series were plotted for five selected locations (D1–D5), as shown in Figures 2 and 3. The time series reveals that pixels at D1 and D2, located south of the Damodar River, experienced cumulative displacements of approximately 80 mm and 60 mm, respectively, over the five-year period. The northern locations (D3 and D4) exhibited displacements of approximately 10 mm and 20 mm, respectively.

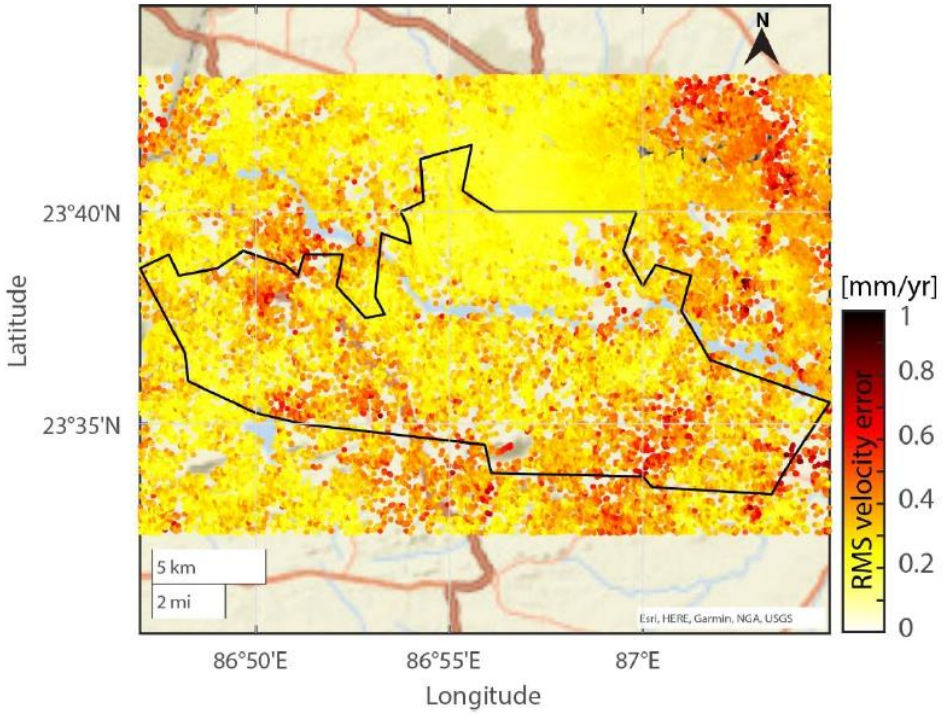

Figure 4. Root mean square (RMS) error of the InSAR-derived velocity map, showing an RMS error of less than 1 mm/yr.

To further assess the reliability of the velocity maps, we generated an error uncertainty map by calculating the root mean square error (RMSE) for each InSAR pixel, as shown in Figure 4. The maximum RMSE value observed was 0.96 mm/year in the western part of the region. In comparison, other areas typically showed RMSE values below 0.4 mm/year, further confirming the accuracy of the velocity results across the study region.

Figure 5 shows a comparative analysis between the InSAR-derived deformation results with existing well-depth data (in meters below ground level) for 156 wells across the study region, primarily located on both sides of the river. The northern side of the river has deeper wells, ranging from 800 to 1400 meters (see Fig. 5B), with velocity variations of less than 10 mm/year of uplift (see Fig. 5A). In contrast, the southern side features shallower wells, ranging from 700 to 1100 meters. It exhibits a subsidence pattern of up to 18 mm/year (see Figs. 5A and 5B). However, the underlying mechanisms driving such variation can be better understood by detailed examining and analysing the lithology and geomorphology of the study region.

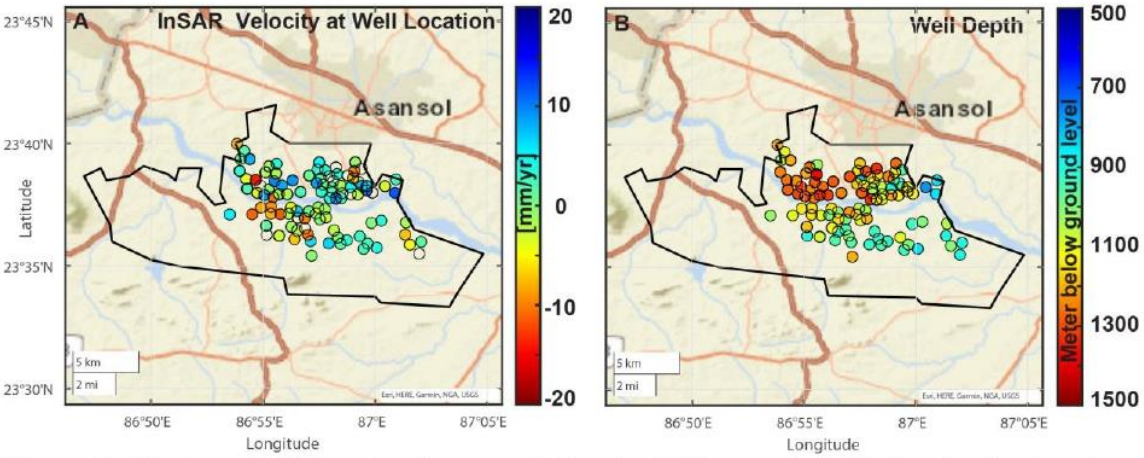

Figure 5. Displays InSAR velocity vs. well depth. A) Shows the InSAR velocity at various well locations for a comparative analysis with drilled data; B) Well depth data for 156 stations, measured in meters below ground level (mbgl). Red circles represent deeper wells, while blue circles indicate shallower wells relative to the ground surface.

5. Conclusion

- The study provides a detailed analysis of surface deformation patterns in the Raniganj South CBM Block, West Bengal, using 141 C-band Sentinel-1A SAR satellite images collected over five years (2019–2024) alongside well-depth data from 156 monitoring stations.
- The results show a maximum subsidence rate of up to 20 mm/year in the southern part of the Damodar River. At the same time, the northern area displays lower subsidence rates, in some regions, upward movements reach up to 20 mm/year.
- A comparison of InSAR-derived deformation data with well-depth measurements indicates that the southern region, with relatively shallower wells, experiences more subsidence. In contrast, the northern region, characterized by deeper wells, shows lower deformation rates.
- GEECL reported that the extraction of over 60 billion cubic feet (cf) of gas over 17 years, with higher recovery rates in the northern part of the block compared to the south.

This indicates that the CBM recovery may have a lower impact on land subsidence in the northern region.

- The southern area may be unexplored, and the cause of subsidence up to 20 mm/year could be due to various factors, including active coal mining, underground resource extraction, and infrastructure activities, which need to be examined and analyzed further.
- Land deformation is influenced by both seasonal and long-term factors. Seasonal deformation is primarily associated with regional rainfall patterns. However, long-term subsidence can result from both natural and anthropogenic activities, including excessive underground resource extraction, infrastructure development, seismic activity, etc.

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