



Power

Ref: APL/REGL/TPP/EMD/MoEFCC/EC/220/11/22
Date: 28.11.2022

To,
Dr. Bhardwaj Adiraju,
Ministry of Environment, Forests & Climate Change,
Integrated Regional Office, Aranya Bhawan, North Block
Sector 19, Naya Raipur, Atal Nagar,
Chhattisgarh 492 002

Sub: Submission of Six Monthly Compliance status of Environment Clearance (EC) for 1x600 MW Raigarh Energy Generation Limited, a Coal based Thermal Power Plant at village Chote Bhandar, Bade Bhandar, Sarvani & Amali Bhona in Tehsil Pussore of Raigarh District, Chhattisgarh.

Ref: Environment clearance vide letter no. **J-13012/57/2008-IA.II (T) dated 20.05.2011** and its subsequent amendment vide letter dated 16.04.2015 and 26.11.2019.

Dear Sir,

With reference to the above, please find enclosed herewith Six-Monthly Environment Clearance (EC) compliance status report along with environmental monitoring reports as Ambient Air, Water Quality, Noise level, Soil quality, CAAQM data, Met. data, Greenbelt development details, Fly ash data & CSR progress report etc. for the period of **April'2022 to September'2022** in soft copy (e-mail).

This is for your kind information and record please.

Thanking You,
Yours faithfully,
for Raigarh Energy Generation Limited

(Santosh Kumar Singh)
Authorized Signatory

Encl.: As above

CC:

Member Secretary,
Central Pollution Control Board,
Parivesh Bhavan, East Arjun Nagar,
New Delhi – 110 032
Regional Officer

Chhattisgarh Environment Conservation Board,
TV Tower road, Raigarh – 496 001, Chhattisgarh

Member Secretary,
Chhattisgarh Environment Conservation Board,
Prayavas Bhavan, North Block, Sector-19,
Naya Raipur – 490 009, Chhattisgarh

Raigarh Energy Generation Limited
(Formerly known as Korba West Power Company Limited)
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SIX MONTHLY COMPLIANCE REPORT OF ENVIRONMENTAL CLEARANCE (EC)

for

**RAIGARH ENERGY GENERATION LIMITED
600 (1x600) MW THERMAL POWER PLANT**

At

**BADE BHANDAR VILLAGE, PUSSORE TEHSIL
RAIGARH DISTRICT CHHATTISGARH**

Submitted to:

Integrated Regional Office
Ministry of Environment, Forest and Climate Change
Chhattisgarh Environment Conservation Board, Raipur &
Central Pollution Control Board. New Delhi



Submitted By:

**Environment Management Department,
Raigarh Energy Generation Limited,
Bade & Chhote Bhandar Village, Pussore Tehsil
Raigarh District, Chhattisgarh**

PERIOD: April'2022 – September'2022

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**Raigarh Energy Generation Limited
(1x600 MW Coal Based Thermal Power Plant)**

Introduction

"Raigarh Energy Generation Limited (formerly known Korba West Power Company Limited) was set up a Coal based thermal power plant of capacity 1x600 MW at village Chote Bhandar, Bade Bhandar, Sarvani & Amali Bhona, in Tehsil Pussore of Raigarh District.

REGL has been granted Environmental Clearance by Hon'ble MoEFCC vide letter No. J- 13012/57/2008-IA.II (T), dated 20.05.2010 and Amendment of Environment Clearance dated 16.04.2015. MoEFCC has already granted change in name of Environmental Clearance vide letter dated 22.10.2019"

REGL is committed towards Environment and its community it operates within. The company has adopted four project affected peripheral villages and executing most of the CSR works in those villages in the field of their livelihood, infrastructure development, cleanliness, community health and education. We have engaged M/s Vardan Envirolab, Gurgaon, (HR) for their service of sampling, monitoring and analysis as per statutory guidelines. Stations were identified by the Environmental Officer of REGL. The samples were analysed partly at site and partly at their MoEFCC recognized laboratory situated at Gurgaon. This report presents the data generated for the First & Second quarter. The report includes sampling locations, methodology, testing procedure and compilation for the Environmental parameters i.e. Air, Water & Noise with a view to evaluate the impact due to the thermal power plant activities. Our unit is not in operation since 22nd May'2017 due to major breakdown of generator earth failure. Hopefully we will be able to resume our operation from 15th December'2019.

Raigarh Energy Generation Limited

**Compliance Status on Environment Clearance
(1x600 MW Coal Based Thermal Power Plant)**

Environmental Clearance No: F. No. J 13012/57/2008-IA. II (T), dated: 20.05.2010
and its subsequent amendment vide letter dated: 16.04.2015 and extension dated
26.11.2019 & 17 & 30.07.2020

Sr. No.	EC Conditions	Compliance Status
A	Specific Conditions	
i	Detailed hydro-geological study shall be conducted and submitted within six months from an institute/organization of repute to assess impact of surface water regime. Specific mitigation measures shall be spelt out and action plan for implementation of the same shall be provided. It shall be ensured that the area drainage is not disturbed due to the proposed power plant.	Complied. Hydro-geological study has been done by reputed institute "National Institute of Hydrology, Roorkee" and report has already been submitted. The entire plant area is almost flat. There are no streams within the plant premises. Regular water quality monitoring being carried out by an agency accredited by NABL & Recognized by MoEFCC.
ii	Hydro-geological study of the area shall be also reviewed annually and results submitted to the Ministry and concerned agency in the State Govt. In case adverse impact on ground water quantity and quality is observed at any stage, immediate mitigating steps to contain any adverse impact on ground water shall be undertaken.	Being Complied. The ground water quality and ground water level monitoring being carried out on regular basis. Monitoring report is enclosed as Annexure - I.
iii	Source of water for meeting the requirement during lean season shall be specified and submitted to the Regional Office of the Ministry within three months.	Being complied. 15 MCM Water has been allotted from Mahanadi River by Water Resources Dept. Govt. This quantity is adequate to meet the plant's requirement, including the lean season.
iv	No ground water shall be extracted for use in operation of the power plant even in lean season.	Noted, Being Complied.
v	No water bodies including natural drainage system in the area shall be disturbed due to activities associated with the setting up/operation of the power plant.	Noted There is no water body within the power plant premises.
vi	COC of 5.0 shall be adopted.	COC of 5.0 is being maintained during plant operation.

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vii	Local employable youth shall be trained in skills relevant to the project for eventual employment in the project itself. The action taken report and details thereof to this effect shall be submitted to the Regional Office of the Ministry and the State Govt. Dept. concerned from time to time.	Being Complied. About 70 Number of local employments has been created which is 36% of total on Roll employees. For contractual side we deployed approx. 340 number which is 43% of total contract manpower.
viii	Additional soil for levelling of the proposed site shall be generated within the sites (to the extent possible) so that natural drainage system of the area is protected and improved.	Entire plant area is almost flat. There are no natural streams within the plant premises.
ix	Provision for installation of FGD shall be provided for future use.	Space for FGD is provided in plant layout. As per MoEFCC' Notification dated 05.09.2022, Raigarh TPP is falling under Category "C" Non-retiring TPP & the timelines for compliance of SO ₂ emission is up to December'2026 . Accordingly, the work is under progress & shall be completed within the scheduled time
x	A stack 275 m with flue gas velocity of 25 m/s shall be installed.	Complied. One flue stack 275 meters has been provided and online continuous emission monitoring system (CEMS) installed for PM, SO _x & NO _x . Exit velocity is more than 25 m/sec & records are being maintained.
xi	High Efficiency Electrostatic Precipitators (ESPs) shall be installed to ensure that particulate emission does not exceed 50 mg/Nm ³ .	A High Efficiency Electrostatic Precipitators has been provided (ESP) to meet particulate emission less than 50 mg/Nm ³ . Monitoring report enclosed as Annexure- I
xii	Adequate dust extraction system such as cyclones/ bag filters and water spray system in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided.	Adequate dust suppression system like water sprinkling system, dust extraction system, dry fog dust suppression system has been installed throughout coal handling chain and bag filters in LHS, RHS bunkers and crusher house, The high concentrated slurry disposal system and closed transferring pipelines have installed for ash disposal in dyke.
xiii	Utilization of 100% Fly Ash generated shall be made from 4 th year of operation of the plant. Status of implementation shall be reported to the Regional Office of the Ministry from time to time.	Fly ash utilization for the month of April '22 to September'22 is less than 100% due to NGT banned low lying are filling in Raigarh district. Fly Ash utilization report is attached as Annexure - IV .

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xiv	Fly ash shall be collected in dry form and storage facility (silos) shall be provided. Unutilized fly ash shall be disposed-off in the ash pond in the form of slurry form. Mercury and other heavy metals (As, Hg, Cr, Pb etc.) will be monitored in the bottom ash as also in the effluents emanating from the existing ash pond. No ash shall be disposed off in low lying area.	Being Complied. We have established two nos. of silo (Intermediate and Main) with capacity of 1000 MT & 2500 MT respectively for utilization of dry fly ash. High concentration slurry disposal system is provided for disposal of unutilized ash in ash pond. Ash water circulation system is provided. Monitoring of Mercury and other heavy metals (As, Cr, Pb etc.) is being carried out regularly and report is enclosed in Annexure - I.
xv	Ash pond shall be lined with HDP/LDP lining or any other suitable impermeable media such that no leachate takes place at any point of time. Adequate safety measures shall also be implemented to protect the ash dyke from getting breached.	Well-designed Ash Pond with LDPE lining has been established as per guidelines of MoEF/CEA/CPCB. Safety measure such as bund with toe wall and lining of side slope done to prevent any leachate.
xvi	For disposal of Bottom Ash in abandoned mines (if proposed to be undertaken) it shall be ensured that the bottom and sides of the mined-out areas are adequately lined with clay before Bottom Ash is filled up. The project proponent shall inform the State Pollution Control Board well in advance before undertaking the activity.	Compliance assured, once got approval from concern authority
xvii	Green Belt consisting of 3 tiers of plantations of native species around plant and at least 100 m width shall be raised. Wherever 100 m width is not feasible a 50 m width shall be raised, and adequate justification shall be submitted to the Ministry. Tree density shall not less than 2500 per ha with survival rate not less than 75 %.	Green belt / plantation is being developed. about 2,19,000 trees/saplings have been planted. Local plant species being preferred for the plantation as fast growing with thick canopy cover adequate height with longer duration of foliage, Perennial, and evergreen along with fruit bearing plants in adequate have also been planted. Greenbelt development plan has been approved by DFO. Greenbelt development status is enclosed as Annexure - III.
xviii	Two nearest village shall be adopted and basic amenities like development of roads, drinking water supply, primary health centre, primary school etc. shall be developed in co-ordination with the district administration.	Being Complied Four nearby villages are adopted for development of basic amenities such as construction of approach road, community hall, school room, safe drinking water facilities have been completed in all the adopted villages. Pond deepening work has been undertaken in village Bade bhandar and

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		<p>Sarwani. Tailoring training has been started from September 2020, total trained about 110 during the year.</p> <p>The activities carried earlier are being monitored and sustained by the beneficiaries</p>
xix	<p>The project proponent shall also adequately contribute in the development of the neighbouring villages. Special package with implementation schedule for providing fluoride free potable drinking water supply in the nearby villages and schools shall be undertaken in a time bound manner.</p>	<p>Development activities are being carried out in the neighbouring villages. Water filter cum cooler has been provided to Govt H S School, Bade Bhandar village.</p> <p>Detailed CSR report enclosed as Annexure-II.</p>
xx	<p>A good action plan for R&R (if applicable) with package for the project affected persons be submitted and implemented as per prevalent R&R policy within three months from the date of issue of this letter.</p>	<p>The project is out of Abadi/population area. The R&R plan has already been prepared, implemented, under progress and submitted to MoEF & CECB, Raipur.</p>
xxi	<p>An amount of Rs 6.0 Crores shall be specially earmarked for development activities for tribals of the nearby villages as committed by the project proponent vide its letter dated 23.03.2010. Specific schemes for upliftment of tribal families mentioning sustainable livelihood schemes shall be submitted to the Ministry within three months with time bound implementation and in-built monitoring programme. The above amount shall be over and above the fund earmarked for CSR activities.</p>	<p>Being Complied.</p> <p>The requisite amount for tribal development has been spent and the expenditure report of 6.52 crore has been submitted. Specific livelihood schemes like poultry, mushroom production and vegetable cultivation are being carried out for upliftment of the tribal families. Tailoring training is also undergoing where interested tribal women is attending the training. Self-Help-Groups (SHGs) of women have been formed in the villages to take up various livelihood schemes. Two tribal cooperatives formed to take up various livelihood schemes. These are registered cooperative society. Besides above, infrastructure development activities like construction of CC road, community hall, Sanskritic munch, drinking water facility etc. have been undertaken in the tribal villages for their upliftment. CSR activities are under implementation. CSR report enclosed as Annexure-II.</p>

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xxii	Further an amount of Rs 15.0 Crores shall be earmarked as one-time capital cost for CSR programme as committed by the project proponent vide its letter dated 23.03.2010. Subsequently a recurring expenditure of Rs 3.0 Crores per annum shall be earmarked as recurring expenditure for CSR activities. Details of the activities to be undertaken shall be submitted within one month along with road map for implementation.	Being complied. The CSR activities are undertaken through Adani Foundation: 1. Infrastructure development in the villages, 2. Livelihood Enhancement and training, 3. Education, 4. Community Health and 5. Promotion of Sports and Culture. CSR report is enclosed as Annexure- II .
xxiii	While identifying CSR programme the company shall conduct need-based assessment for the nearby villages to study economic measures with action plan which can help in upliftment of poor section of society. Income generating projects consistent with the traditional skills of the people besides development of fodder farm, fruit bearing orchards, vocational training etc. can form a part of such programme. Company shall provide separate budget for community development activities and income generating programmes. This will be in addition to vocational training for individuals imparted to take up self-employment and jobs.	Various income generating activities were implemented and are under execution. Self Employed Tailor training conducted where 110 girls and women are trained. The company is industry partner for ITI Sariya, where Fitter, Electrician and COPA trade course is under operation. CSR report enclosed as Annexure-II .
xxiv	It shall be ensured that in-built monitoring mechanism for the schemes identified is in place and annual social audit shall be got done from the nearest government institute of repute in the region. The project proponent shall also submit the status of implementation of the scheme from time to time.	Complied. (FY 19-20) Social audit has been carried out by reputed institute IISWBM, Kolkata. Audit report already submitted with previous compliance reports, (FY 2022-23) Social audit field study is ongoing at site & final report will be submitted along with Next Half yearly compliance report
xxv	Harnessing solar power within the premises of the plant particularly at available roof tops shall be undertaken and status of implementation shall be submitted periodically to the Regional Office of the Ministry.	Being complied. All streetlights have been replaced with Solar & solar geysers are installed in roof top of residential complexes within plant premises.

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xxvi	A long-term study on radio activity and heavy metals contents on coal to be used shall be carried out through a reputed institute. Thereafter mechanism for an in-built continuous monitoring for radio activity and heavy metals in coal and fly ash (including bottom ash) shall be put in place.	Compliance assured. Radioactive analysis carried out by Board of Radiation and Isotope Technology, Department of Atomic Energy, Govt. of India time to time and report submitted.
xxvii	Mercury emissions shall also be monitored on periodic basis.	Analysis report for Mercury emission monitoring stack is enclosed in <u>Annexure - I.</u>
xxix	Fly ash shall not be used for agricultural purpose. No mine void filling will be undertaken as an option for ash utilization without adequate lining of mine with suitable media such that no leachate shall take place at any point of time. In case, the option of mine void filling is to be adopted, proper detailed study of soil characteristics of the mine area shall be undertaken from an institute of repute and adequate clay lining shall be ascertained by the State Pollution Control Board and implementation done in close co- ordination with the State Pollution Control Board.	Being followed Consultation with State Pollution Control Board & concern department being followed on regular basis.
xxx	Green Belt shall also be developed around the ash pond over and above the Green Belt around the plant boundary.	Being Complied Green belt / plantation is being developed. About 219000 saplings have been planted. Local plant species being preferred for the plantation as fast growing with thick canopy cover adequate height with longer duration of foliage, Perennial and evergreen along with fruit bearing plants in adequate have also been planted. Greenbelt development plan has been approved by DFO. Greenbelt development status is enclosed as <u>Annexure - III.</u>
xxxi	An Environmental Cell comprising of at least one expert in environmental science/ engineering, ecology, occupational health and social science, shall be created preferably at the project site itself and shall be headed by an officer of appropriate superiority and qualification. It shall be ensured that the Head of the Cell shall	Noted & complied. We have already established an Environmental Management Cell & Environment Head has direct reported to Senior Management.

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	directly report to the Head of the Plant who would be accountable for implementation of environmental regulations and social impact improvement/ mitigation measures.	
xxxii	The project proponent shall formulate a well laid Corporate Environmental Policy and identify and designate responsible officers at all levels of its hierarchy for ensuring adherence to the policy and compliance with the conditions stipulated in this clearance letter and other applicable environmental laws and regulations.	Complied
B.	GENERAL CONDITIONS	
i	The treated effluents conforming to the prescribed standards only shall be re-circulated and reused within the plant. There shall be no discharge outside the plant boundary except during monsoon. Arrangements shall be made that effluents and storm water do not get mixed.	ETP has been established to treat effluents and treated water is being reuse within the premises. The concept of "Zero Discharge Condition" is implemented. Separate drainage network is established for storm water. Effluent water quality report is enclosed in Annexure – I
ii	A sewage treatment plant shall be provided (as applicable) and the treated sewage shall be used for raising greenbelt/plantation.	Sewage Treatment Plants has been installed and the treated effluent is being used for plantation/greenbelt. Analysis report of STP is enclosed in Annexure – I.
iii	Rainwater harvesting should be adopted. Central Groundwater Authority/ Board shall be consulted for finalization of appropriate rainwater harvesting technology within a period of three months from the date of clearance and details shall be furnished.	A Rainwater harvesting & recharging system has already been constructed. 04 nos. of rain water harvesting ponds have been constructed within premises.
iv	Adequate safety measures shall be provided in the plant area to check/minimize spontaneous fires in coal yard, especially during summer season. Copy of these measures with full details along with location plant layout shall be submitted to the Ministry as well as to the Regional Office of the Ministry.	Complied Adequate safety personnel are available in the plant site to take preventive control measures. Fire hydrant system provided for prevention of spontaneous fires in coal yard, especially during summer season. Emergency preparedness plan is submitted at respective authorities.

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v	Storage facilities for auxiliary liquid fuel such as LDO and/ HFO/LSHS shall be made in the plant area in consultation with Department of Explosives, Nagpur. Sulphur content in the liquid fuel will not exceed 0.5%. Disaster Management Plan shall be prepared to meet any eventuality in case of an accident taking place due to storage of oil.	The fuel such as LDO and HFO are properly stored in minimum risk area & in consultation with Department of Explosives, Nagpur after getting NOC for the same. Disaster management plan (DMP) has been prepared to handle the any eventuality in case of an accident taking place due to storage of oil.
vi	Regular monitoring of ground water level shall be carried out by establishing a network of existing wells and constructing new piezometers. Monitoring around the ash pond area shall be carried out particularly for heavy metals (Hg, Cr, As, Pb) and records maintained and submitted to the Regional Office of this Ministry. The data so obtained should be compared with the baseline data so as to ensure that the ground water quality is not adversely affected due to the project.	02 Nos Piezometric wells are established within the plant premises.
vii	Monitoring surface water quantity and quality shall also be regularly conducted, and records maintained. The monitored data shall be submitted to the Ministry regularly. Further, monitoring points shall be located between the plant and drainage in the direction of flow of ground water and records maintained. Monitoring for heavy metals in ground water shall be undertaken.	The surface water samples being collected, and analysis report is enclosed as Annexure I .
viii	First Aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.	First aid and sanitation for labours was provided during the construction.
ix	Noise levels emanating from turbines shall be so controlled such that the noise in the work zone shall be limited to 75 dBA. For people working in the high noise area, requisite personal protective equipment like earplugs/ear muffs etc. shall be provided. Workers engaged in noisy areas such as turbine area, air compressors etc shall be periodically examined to maintain audiometric record and for treatment for any hearing loss including shifting to non-	Being Complied Necessary action has been taken to maintain noise levels in work zone area within 75 dB (A) from source during the plant operation. The personal protective equipment's (PPE) are provided to workers & employees working in noisy areas. Noise level monitoring is carried out regularly. Periodic audiometric check-up is being carried out.

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	noisy/less noisy areas.	
x	Regular monitoring of ground level concentration of SO ₂ , NO _x , PM _{2.5} & PM ₁₀ and Hg shall be carried out in the impact zone and records maintained. If at any stage these levels are found to exceed the prescribed limits, necessary control measures shall be provided immediately. The location of the monitoring stations and frequency of monitoring shall be decided in consultation with SPCB. Periodic reports shall be submitted to the Regional Office of this Ministry. The data shall also be put on the website of the company.	Being Complied Regular monitoring of SO ₂ , NO _x , PM _{2.5} & PM ₁₀ CO and Hg is being carried and records are being maintained during construction phase as well as operational phase. Environmental monitoring report is enclosed as Annexure – I. Three online Continuous Ambient Air Quality Monitoring Station (CAAQM) System and one mobile Van for Ambient Air Quality Monitoring have been established within plant premise in consultation with Regional Office, Chhattisgarh Environment Conservation Board, Raigarh.
xi	Provision shall be made for the housing of construction labour (as applicable) 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.	Complied. All necessary facilities were provided during construction for contractual labours.
xii	The project proponent shall advertise in at least two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned within seven days from the date of this clearance letter, informing that the project has been accorded environmental clearance and copies of clearance letter are available with the State Pollution Control Board/Committee and may also be seen at Website of the Ministry of Environment and Forests at http://envfor.nic.in .	Complied. Advertised in three newspapers Hindustan Times, Dainik bhaskar & Nai Duniya on 28.02.2010
xiii	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad / Municipal Corporation, urban local Body and the Local NGO, if any, from whom suggestions/ representations, if any, received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.	Complied. Copy of Environment Clearance has been provided to concerned authority. Previous compliance status updated in company website. http://www.adanipower.com

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xiv	A separate Environment Management Cell with qualified staff shall be set up for implementation of the stipulated environmental safeguards.	Being Complied. We have already established an Environment Management Cell with well qualified staff for implementation of the stipulated environmental safeguards.
xv	The proponent shall upload the status of compliance of the stipulated EC 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 MOEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; SPM, RSPM (PM _{2.5} & PM ₁₀), SO ₂ , NO _x (ambient levels as well as stack emissions) shall be displayed at a convenient location near the main gate of the company in the public domain.	Being Complied. Regular Environmental Monitoring report is being submitted to Regional office, MoEF, CPCB and CECB, Chhattisgarh. The environmental parameters display board provided at main gate of the plant. Previous compliance status was updated in company website. http://www.adanipower.com
xvi	The environment statement for each financial year ending 31 st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Offices of the Ministry by e-mail.	The Environment Statement for the year 2021-22 has been submitted to Chhattisgarh Environment Conservation Board (CECB) vide letter no. Ref. No.: REGL/ENV/22-23/35, dated-14/09/2022. Copy of Environmental statement report is enclosed as annexure - V
xvii	The project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental safeguards to the Ministry of Environment and Forests, its Regional Office, Central Pollution Control Board and State Pollution Control Board. The project proponent shall upload the status of compliance of the environment of the environmental clearance conditions on their website and update the same periodically and simultaneously send the same by e-mail to the Regional Office, Ministry of Environment and Forests	Being Complied. Six monthly Environmental Clearance compliance status report is regularly submitted to MoEFCC, CPCB and SPCB. The same is sent by email also. Last compliance report for the period of October'2021 – March'22 had been submitted to your good office via our latter no. Ref: APL/REGL/TPP/EMD/MoEFCC/EC/215/5/22 dated- 27.05.2022

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xviii	Regional Office of the Ministry of Environment & Forests will monitor the implementation of the stipulated conditions. A complete set of documents including Environmental Impact Assessment Report and Environment Management Plan along with the additional information submitted from time to time shall be forwarded to the Regional Office for their use during monitoring. Project proponent will up-load the compliance status in their website and up-date the same from time to time at least six monthly basis. Criteria pollutants levels including NOx (from stack & ambient air) shall be displayed at the main gate of the power plant.	Complied																																							
xix	Separate funds shall be allocated for implementation of environmental protection measures along with item-wise break-up. These cost shall be included as part of the project cost. The funds earmarked for the environment protection measures shall not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.	<p>Being Complied Previous F.Y. 2021-22 Environmental Protection costs are given below.</p> <table border="1" data-bbox="886 848 1479 1247"> <thead> <tr> <th>Sl No</th> <th>Expenditure head</th> <th>Actual Expenditure FY 21-22(In Lakh)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Environmental protection O&M</td> <td>41.84</td> </tr> <tr> <td>2</td> <td>Environmental Monitoring Cost</td> <td>8.35</td> </tr> <tr> <td>3</td> <td>Legal & consent Fee</td> <td>20.0</td> </tr> <tr> <td>4</td> <td>CSR</td> <td>36.31</td> </tr> <tr> <td>3</td> <td>Environmental Lab Setup</td> <td>22.6</td> </tr> <tr> <td>4</td> <td>Fly Ash Management</td> <td>769.35</td> </tr> <tr> <td>5</td> <td>Greenbelt Development</td> <td>60.0</td> </tr> <tr> <td>6</td> <td>Environmental Awareness Training</td> <td>1.0</td> </tr> <tr> <td>7.</td> <td>Tree Plantation</td> <td>7.2</td> </tr> <tr> <td>7</td> <td>World Environment Day</td> <td>0.30</td> </tr> <tr> <td>8</td> <td>Waste Management at Site</td> <td>4.81</td> </tr> <tr> <td colspan="2" style="text-align: center;">Total:</td> <td>971.76</td> </tr> </tbody> </table>	Sl No	Expenditure head	Actual Expenditure FY 21-22(In Lakh)	1	Environmental protection O&M	41.84	2	Environmental Monitoring Cost	8.35	3	Legal & consent Fee	20.0	4	CSR	36.31	3	Environmental Lab Setup	22.6	4	Fly Ash Management	769.35	5	Greenbelt Development	60.0	6	Environmental Awareness Training	1.0	7.	Tree Plantation	7.2	7	World Environment Day	0.30	8	Waste Management at Site	4.81	Total:		971.76
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Total:		971.76																																							
xx	The project authorities shall inform the Regional Office as well as the Ministry regarding the date of financial closure and final approval of the project by the concerned authorities and the dates of start of land development work and commissioning of plant.	Complied.																																							
xxi	Full cooperation shall be extended to the Scientists/Officers from the Ministry / Regional Office of the Ministry at Bangalore / CPCB/ SPCB who would be monitoring the compliance of environmental status.	Noted, Full co-operation shall be extended to all concerned authorities.																																							

Raigarh Energy Generation Limited

Conditions of EC Amendment Letter		
i	The coal shall be transported on road through mechanically covered trucks.	Noted. The vehicles are engaged for coal transporting are mechanically covered and periodic refresher training is also being imparted on traffic for safety and environment rules.
ii	Avenue plantation of 2/3 rows all along the road for transportation of coal shall be carried out by the project proponent at its own expenses in consultation with the State Government Authorities.	The joint inspection of coal transportation route has been carried out with by Van Vikas Nigam (Govt. of Chhattisgarh). Agency has given a preliminary proposal for plantation in available avenue of around 10 km out of 50 km. The proposal is under scrutiny and finalization for execution.
iii	Periodic maintenance of the roads used for transportation of coal shall be carried out by the project proponent at its own expenses and shall also facilitate the traffic control on the roads in consultation with State Government Authorities.	Noted, The proposed coal transportation road has been recently constructed by NHAI, therefore no maintenance is required. Traffic vigilance and controls are provided as and when required by state authorities.
EC amendment – MoEF&CC notification vide letter number S.O. 1561 (E) dated 21st May'2020		
Sl. No.	Condition of Notification	Compliance Status
1)	Setting up technology solution for emission norms i) Compliance of specified emission norms for Particulate Matter, as per extent notifications and instructions of Central Pollution Control Board, issued from time to time. ii) In case of washeries, middling and rejects to be utilized in FBC (Fluidised Bed Combustion) technology based thermal power plant. Washery to have linkage for middling and rejects in Fluidised Bed Combustion plants.	Noted. i) Technology solutions are being implemented for mitigating fugitive emissions of Particulate Matter. ii) Washeries, middling and rejects are not applicable for this Thermal Power Plant.

Raigarh Energy Generation Limited

<p>2)</p>	<p>Management of Ash Ponds</p> <p>i) The thermal power plants shall comply with conditions, as notified in the Fly Ash notifications issued from time to time, without being entitled to additional capacity of fly ash pond (for existing power generation capacity) on ground of switching from washed coal to unwashed coal.</p> <p>ii) Appropriate Technology solutions shall be applied to optimise water consumption for Ash management.</p> <p>iii) The segregation of ash may be done at the Electro- Static Precipitator stage, if required, based on site specific conditions, to ensure maximum utilisation of fly ash</p> <p>iv) Subject to 2(i) above, the thermal power plants to dispose fly ash in abandoned or working mines (to be facilitated by mine owner) with environmental safeguards.</p>	<p>i) Noted & being complied. Fly ash is disposed to nearby stone quarry and being supplied to brick manufacturer. Fly Ash generation and utilization is regularly submitted to CEA, New Delhi. Please refer <u>Annexure IV</u></p> <p>ii) Water requirement is being restricted to 15 MCM. Optimization of water has been incorporated as part of plant design and COC is being maintained more than 5.0</p> <p>iii) Noted & being complied</p> <p>iv) Noted & will be complied as & when fly ash is disposed in abandoned or working mines</p>
<p>3)</p>	<p>Transportation</p> <p>i) Coal transportation may be undertaken by covered Railway wagon (railway wagons covered by tarpaulin or other means) and/or covered conveyor beyond the mine area. However, till such time enabling Rail transport/conveyer beyond infrastructure is not available, road transportation may be undertaken in trucks, covered by tarpaulin or other means.</p> <p>ii) It shall be ensured by the thermal power plant that</p> <p>a) Rail siding facility or conveyer facility is set up at or near the power plant, for transportation by rail or conveyer; and</p> <p>b) If transportation by rail or conveyer facility is not available, ensure that the coal is transported out from the</p>	<p>i) We have taken EC amendment for the Coal transportation by road, till the time railway line will be constructed/ commission.</p> <p>ii) Currently, we are transporting coal by road in tarpaulin covered truck.</p> <p>a) Coal is being unloaded at Vimla siding nearby Bhudevpur railway station in Raigarh district.</p> <p>b) Coal is being transported by tarpaulin covered truck from off- take site from being supplied Vimla siding as well as other market purchasing.</p>

Raigarh Energy Generation Limited

	Delivery Point of the respective mine in covered trucks (by tarpaulin or other means), or any mechanized closed trucks by roads.	
--	--	--

Project Name- Raigarh Energy Generation Ltd.

Village Chhote Bhandar, Post Office Bade Bhandar, Tehsil Pussore, Dist.Raigarh-496100 (Chhattisgarh)

1st Quarter Environmental Monitoring Report

1st Quarterly Environmental Monitoring Report



Submitted To:
M/s Raigarh Energy Generation Ltd.
Village Chhote Bhandar, Post office Bade Bhandar,
Tehsil Pussore, Dist.-Raigarh -496100 (Chhattisgarh)

Conducted by:
M/s Vardan EnviroLab
Plot no. 82A, Sector-5, IMT Manesar, Gurugram (Haryana)

(Recognized by MoEF & CC, NABL Government of India)

Project Name- Raigarh Energy Generation Ltd.

Village Chhote Bhandar, Post Office Bade Bhandar, Tehsil Pussore, Dist. Raigarh-496100 (Chhattisgarh)

1st Quarter Environmental Monitoring Report

The growing concern for environmental protection and the passing of various environmental legislations have increased the responsibilities of Ministry- of Environment, Forests & Climate Chang, Pollution Control boards in many folds. Besides enforcing the various environmental legislations MoEF&CC, CPCB & SPCB strive to propagate the necessity awareness regarding the various legal provision and environmental protection measures in the country

Electric Power scenario has occupied a significant place in the development program of the country. Development and environment can neither be separated nor ignored. In fact, they are complimentary to each other. These issues have become a concern of the community, particularly the environment impact due to industries in the developing countries

However, the prerequisite for sustainable development is judicious planning of environmental status, likely impacts of the approach adopted on the environment including inhabitants of the locality, availability of the eco-friendly technology, emerging waste disposal and waste utilization processes, techniques of land reclamation for the restoration of aesthetic beauty and soon.

M/s Raigarh Energy Generation Ltd., Village Chhote Bhandar, Post Office Bade Bhandar, Raigarh - 496100, India, has engaged M/S Vardan EnviroLab, Gurugram, (HR) to provide Environmental Services in respect of ambient air quality monitoring, stack emission, noise level monitoring & Sampling and Analysis of ground water quality, surface water quality, treated effluent sewage, effluent water from ETP, and soil for Raigarh Energy Generation Ltd., Raigarh district of Chhattisgarh, as per guidelines of MoEF & CC and CPCB Gazette notification.

M /S Vardan EnviroLab, Gurugram, (HR) has deployed entirely its own personnel, facilities and expertise for doing this service. Sampling/Monitoring Stations were identified by the Environmental Officer of Raigarh Energy Generation Ltd., The samples were analyzed partly at site and partly at our MoEF Recognized laboratory situated at Gurugram (HR).

This report presents the data generated for the period from 1st April 2022 to 30th June 2022 i.e. for First quarter which includes sampling locations, Methodology, testing procedure and compilation for the Environmental parameters i.e. Air, Water & Noise with a view to evaluate the impact due to the thermal power plant activities.

During the course of our operations for the above task, the staff and management of Raigarh Energy Generation Ltd, were extremely co-operative. We are grateful to them for their invaluable support and assistance rendered to us during the course of the sampling and monitoring.

Date: 10/08/22



M/s Vardan EnviroLab Gurugram (HR)

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Date:

(Authorised Signatory)

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Chapter - 1.0

INTRODUCTION

M/s Raigarh Energy Generation Ltd., a subsidiary of Adani Power, is a power generation company based at Raigarh in the State of Chattisgarh. On 07-Sep-2019, "Adani Power Limited" got approval from NCLT to become new owner of this project "Raigarh Energy Generation Ltd.", has commissioned its Thermal Power Plant first 600MW Unit at Village Chhote Bhandar, Post Office Bade Bhandar, Raigarh- 496100, India. The second unit of 600MW is under implementation. Raigarh Energy Generation Ltd., is also committed towards the environment and the community it operates in. It has successfully implemented several community welfare schemes in the field of livelihood, infrastructure, community health and education which has so far benefited over 60,000 people from close to 75 villages.



Figure No.1. Raigarh Energy Generation Ltd.

Chapter - 2.0

PROJECT PROFILE

2.1 Topography & Drainage

Topography of this area is generally undulating. The area is drained by Mand River approximately 3 km. away from plant in North direction and Mahanadi River approximately 5 km. away from plant in South direction.

2.2 Location

Plant is bounded by Northern Latitudes of 21° 44' 00" to 21° 44' 42" and Eastern Longitude of 83° 16' 30" to 83° 17' 18". This area falls in the survey of India top sheet no. 64 O/1, 64 O/2, 64 O/5 and 64 O/6. The location of the mine area is shown in **Fig. No. 2**

2.3 Climate

The climate of the area is Sub-tropical type. It is in the zone of humid tropic climate where temperature and humidity of air are very high. The temperature varies from the minimum - maximum temperature range between 29.5°C - 49 °C in summer, and 8°C - 25 °C in winter. The humidity varies from 35% to 82%. The annual average rainfall in the area is about 1300 mm.

2.4 Communication

The nearest railway station is Kirodimal, which is at a distance of -23 Km towards North direction. The area is well connected with N.H. No. 216. Nearest Airport is Raipur -250 km in SW direction. Nearest village is Bade Bhandar - 1 km. in North direction and nearest town is Raigarh -21 km. in North-East direction.

2.5 Location Map

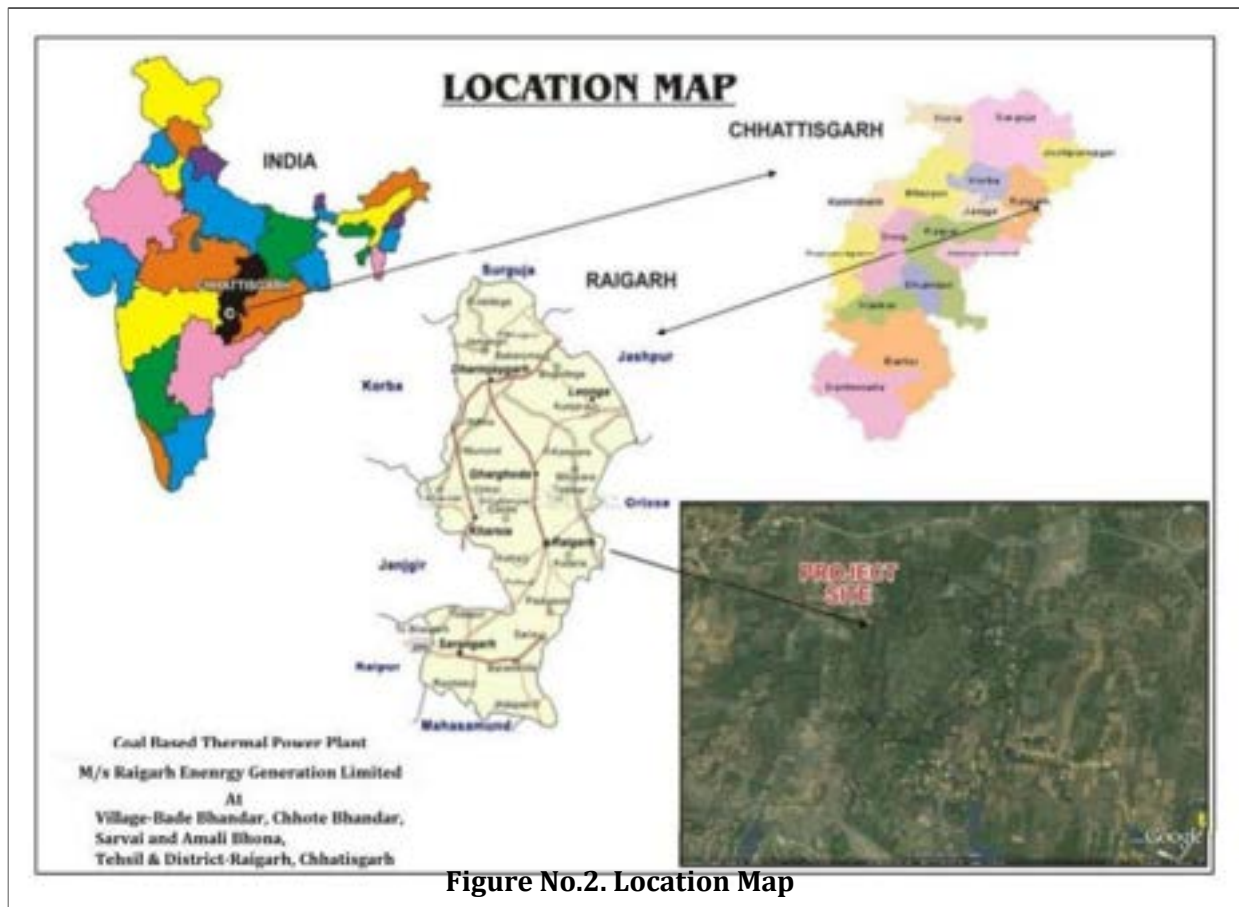


Figure No.2. Location Map

Chapter - 3.0

SCOPE OF STUDY AND METHODOLOGY

3.1 Scope of Study

The scope of study includes Environmental Services in respect of ambient air quality monitoring, noise level monitoring & Sampling and Analysis of ground water quality, surface water quality, treated effluent sewage, effluent water from ETP and soil.

3.2 Methodology

As mentioned in the scope of work covering the various Environmental components monitoring and sampling and its analysis was carried out on the basis of guidelines of Ministry of Environment Forest & Climate Control of Government of India & Chattisgarh State Pollution Control Board. Sampling procedure method reference and Analysis procedure method reference are mentioned in monitoring reports.

3.2.1 Ambient Air Quality Monitoring

The ambient air quality has been carried out at various sources of air pollution surrounding and in the Plant. The prime objective of the ambient air quality monitoring is to assess the existing air quality of the area. The ambient air quality monitoring was carried out for 24 hours at each station. At all stations SO₂, NO₂, PM₁₀, PM_{2.5}, CO and Mercury were monitored. All the samples collected were analyzed for quantitative analysis of various pollutants. The ambient air quality sampling locations were identified by the Environmental Officer of Raigarh Energy Generation Ltd.

3.2.2 Water Environment

The ground water samples, surface water samples were collected from selected locations in two liter sterilized plastic cans. These samples were analyzed as per IS 10500:2012. The domestic effluent and Industrial effluent samples were collected and analyzed for parameters: pH , Total suspended solids, Biochemical Oxygen Demand, Chemical Oxygen Demand and Oil & Grease.

3.2.3 Noise Environment

Sound level meter was used to know the sound levels generated due to plant activities at different locations. The measurements were taken for Equivalent sound level over a time period for day and night which is expressed in dB(A).

3.2.4 Soil

The Soil samples were collected from selected locations. These samples were analyzed for Physico-Chemical parameters including heavy metals.

Chapter - 4.0

SAMPLING LOCATION MAP AND ANALYSIS REPORTS

4.1 Ambient Air Quality Monitoring



Figure No.3. Plan Showing Ambient Air Quality Location Map

Location Code: -

- A1- Site Office
- A2- PalsadaVillage
- A3- Kathali Village
- A4- Chhote Bhandar Village
- A5- Bade Bhandar Village
- A6- Kondataral Village
- A7-Chatamura Chowk
- A8- Supa, Near REGL Plant
- A9- Near Main Gate



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REGL/AA/01
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office - Bade
Bade Bandar, Tehsil- Pussore, Dist-
Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/A/2204220001
Format No.: 7.8 F 01
Party Reference No.: NIL

Sample Description: Ambient Air Quality Monitoring

Report Date: 26/04/2022
Period of Analysis: 22-26/04/2022
Receipt Date: 22/04/2022

General Information:-

Sampling Location : Village - Palsada
Sample Collected By : Vardan EnviroLab Representative
Sampling Equipment Used : RDS & FPS
Instrument Code : VEL/RDS/FPS/01
Instrument Calibration Status : Calibrated
Latitude (N) : 21°44'13"
Longitude (E) : 83°16'30"
Meteorological Condition During Monitoring : Clear Sky
Date of Sampling : 18/04/2022 to 19/04/2022
Time of Sampling : 10:20 AM to 10:20 AM
Ambient Temperature (°C) : Min.26°C & Max. 38°C
Surrounding Activity : Human, Vehicular & other Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182
Sampling Duration : 24 Hrs.
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	IS: 5182 (P-24), 2019	28.33	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P- 23)-2006, RA.2017	68.89	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P- 6)-2006, RA.2017	15.74	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P- 2)-2001, RA.2017	8.70	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P- 9)-1974, RA.2014	0.61	mg/m ³	4.0
6.	Mercury (Hg)	Method Of Air Sampling and Analysis, 3 rd 1988, Method No.317	*BDL{**DL-1.0}	ng/m ³	--

Note:- *BDL-Below Detection Limit, **DL-Detection Limit.



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REGL/AA/02 **Report No.:** VEL/A/2204220002
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office- Bade Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh) **Format No.:** 7.8 F 01
Party Reference No.: NIL
Sample Description: Ambient Air Quality Monitoring **Report Date:** 26/04/2022
Period of Analysis: 22-26/04/2022
Receipt Date: 22/04/2022

General Information:-

Sampling Location : Village - Kathli
Sample Collected By : Vardan EnviroLab Representative
Sampling Equipment Used : RDS &FPS
Instrument Code : VEL/RDS/FPS/02
Instrument Calibration Status : Calibrated
Latitude (N) : 21°44'17"
Longitude (E) : 83°16'19"
Meteorological Condition During Monitoring : Clear Sky
Date of Sampling : 18/04/2022 to 19/04/2022
Time of Sampling : 10:45 AM to 10:45 AM
Ambient Temperature (°C) : Min.26°C & Max. 38°C
Surrounding Activity : Human, Vehicular & other Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182
Sampling Duration : 24 Hrs.
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	IS: 5182 (P-24), 2019	34.02	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P- 23)-2006, RA.2017	73.41	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P- 6)-2006, RA.2017	17.22	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P- 2)-2001, RA.2017	9.94	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P- 9)-1974, RA.2014	0.67	mg/m ³	4.0
6.	Mercury (Hg)	Method Of Air Sampling and Analysis, 3 rd 1988, Method No.317	*BDL(**DL -1.0)	ng/m ³	--

Note: *BDL-Below Detection Limit, **DL-Detection Limit.



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ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REGL/AA/03 **Report No.:** VEL/A/2204220003
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
 Village -Chhote Bhandar, Post Office- Bade Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh) **Format No.:** 7.8 F 01
Party Reference No.: NIL
Report Date: 26/04/2022
Sample Description: Ambient Air Quality Monitoring **Period of Analysis:** 22-26/04/2022
Receipt Date: 22/04/2022

General Information:-

Sampling Location : Village - Chhote Bhandar
Sample Collected By : Vardan EnviroLab Representative
Sampling Equipment Used : RDS &FPS
Instrument Code : VEL/RDS/FPS/01
Instrument Calibration Status : Calibrated
Latitude (N) : 21°44'22"
Longitude (E) : 83°16'43"
Meteorological Condition During Monitoring : Clear Sky
Date of Sampling : 19/04/2022 to 20/04/2022
Time of Sampling : 10:35 AM to 10:35 AM
Ambient Temperature (°C) : Min.29°C & Max. 39°C
Surrounding Activity : Human, Vehicular & Other Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182
Sampling Duration : 24 Hrs.
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	IS: 5182 (P-24), 2019	30.11	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P- 23)-2006, RA.2017	72.54	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P- 6)-2006, RA.2017	16.29	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P- 2)-2001, RA.2017	9.14	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P- 9)-1974, RA.2014	0.72	mg/m ³	4.0
6.	Mercury (Hg)	Method Of Air Sampling and Analysis, 3 rd 1988, Method No.317	*BDL(**DL-1.0)	ng/m ³	--

Note:- *BDL-Below Detection Limit ,**DL-Detection Limit.



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ISO 9001 | ISO 14001 | ISO 45001

Test Report

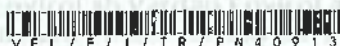
Sample Number: VEL/REGL/AA/04 **Report No.:** VEL/A/2204220004
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village -Chhote Bhandar, Post Office- Bade Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh) **Format No.:** 7.8 F 01
Party Reference No.: NIL
Sample Description: Ambient Air Quality Monitoring **Report Date:** 26/04/2022
Period of Analysis: 22-26/04/2022
Receipt Date: 22/04/2022

General Information:-

Sampling Location : Village - Bade Bhandar
Sample Collected By : Vardan EnviroLab Representative
Sampling Equipment Used : RDS &FPS
Instrument Code : VEL/RDS/FPS/02
Instrument Calibration Status : Calibrated
Latitude (N) : 21°44'29"
Longitude (E) : 83°17'6"
Meteorological Condition During Monitoring : Clear Sky
Date of Sampling : 19/04/2022 to 20/04/2022
Time of Sampling : 11:20 AM to 11:20 AM
Ambient Temperature (°C) : Min.29°C & Max. 39°C
Surrounding Activity : Human, Vehicular & other Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182
Sampling Duration : 24 Hrs.
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	IS: 5182 (P-24), 2019	30.47	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P- 23)-2006, RA.2017	73.58	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P- 6)-2006, RA.2017	20.24	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P- 2)-2001, RA.2017	11.22	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P- 9)-1974, RA.2014	0.71	mg/m ³	4.0
6.	Mercury (Hg)	Method Of Air Sampling and Analysis, 3 rd 1988, Method No.317	*BDL(**DL-1.0)	ng/m ³	--

Note:- *BDL-Below Detection Limit ,**DL-Detection Limit.



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REL/A/01-05
Name & Address of Party: M/s Raipur Energen Limited
Formerly GMR Chhattisgarh Energy Ltd. Village Raikheda, Block - Tilda, Dist- Raipur Chhattisgarh
Sample Description: Ambient Air
Sampling Location: Near Raw Water Area
Sample Collected by: Vardan EnviroLab Representative
Sampling & Analysis Protocol: IS:5182 & CBCP Guidelines

Report No.: VEL/A/2205/30/001-005
Format No.: 7.8 F-03
Party Reference No.: 5703004128 Date-21/04/2022
Reporting Date: 01/06/2022
Receipt Date: 30/05/2022

TEST RESULTS

Date of Monitoring	PM _{2.5} (ug/m ³)	PM ₁₀ (ug/m ³)	SO ₂ (ug/m ³)	NO ₂ (ug/m ³)	CO (mg/m ³)	Hg (ug/m ³)
05.05.2022	33.12	58.17	15.63	21.78	0.42	ND
11.05.2022	21.74	49.38	17.29	25.78	0.21	ND
14.05.2022	26.46	55.37	22.72	29.94	0.35	ND
20.05.2022	34.76	64.96	13.65	21.75	0.32	ND
28.05.2022	31.39	60.14	15.81	24.87	0.61	ND
Monthly Average	29.49	57.60	17.02	24.82	0.38	ND
Maximum	34.76	64.96	22.72	29.94	0.61	ND
Minimum	21.74	49.38	13.65	21.75	0.21	ND

End of Report

(Checked By)
ANJU INDOLIA
Sr. Analyst

(Approved By)
Dr. Sh. Prakash Singh
Authorised Signatory

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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REI/A/06-10
Name & Address of Party: M/s Raipur Energen Limited
Formerly GMR Chhattisgarh Energy Ltd. Village Raikheda, Block - Tilda, Dist- Raipur Chhattisgarh
Sample Description: Ambient Air
Sampling Location: Near Doosan
Sample Collected by: Vardan EnviroLab Representative
Sampling & Analysis Protocol: IS :5182 & CBCP Guidelines

Report No.: VEL/A/2205/30/006-010
Format No.: 7.8 F-03
Party Reference No.: S703004128 Date-21/04/2022
Reporting Date: 01/06/2022
Receipt Date: 30/05/2022

TEST RESULTS

Date of Monitoring	PM _{2.5} (ug/m ³)	PM ₁₀ (ug/m ³)	SO ₂ (ug/m ³)	NO ₂ (ug/m ³)	CO (mg/m ³)	Hg (ug/m ³)
05.05.2022	25.38	41.49	13.61	22.77	0.09	ND
11.05.2022	23.62	43.21	16.42	21.74	0.06	ND
14.05.2022	37.69	77.40	16.67	23.23	0.07	ND
20.05.2022	35.67	67.56	13.96	25.57	0.10	ND
28.05.2022	22.55	47.59	18.21	29.32	0.14	ND
Monthly Average	28.98	55.45	15.77	24.53	0.09	ND
Maximum	37.69	77.40	18.21	29.32	0.14	ND
Minimum	22.55	41.49	13.61	21.74	0.06	ND

End of Report

(Checked by)
Anju
ANJU INDOLIA
Sr. Analyst





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REL/A/11-15
Name & Address of Party: M/s Raipur Energen Limited
Formerly GMR Chhattisgarh Energy Ltd. Village Raikheda, Block – Tilda, Dist- Raipur Chhattisgarh
Sample Description: Ambient Air
Sampling Location: Near STP
Sample Collected by: Vardan EnviroLab Representative
Sampling & Analysis Protocol: IS :5182 & CBCP Guidelines

Report No.: VEL/A/2205/30/011-015
Format No.: 7.8 F-03
Party Reference No.: 5703004128 Date-21/04/2022
Reporting Date: 01/06/2022
Receipt Date: 30/05/2022

TEST RESULTS

Date of Monitoring	PM _{2.5} (ug/m ³)	PM ₁₀ (ug/m ³)	SO ₂ (ug/m ³)	NO ₂ (ug/m ³)	CO (mg/m ³)	Hg (ug/m ³)
05.05.2022	17.02	42.46	19.46	29.38	0.93	ND
11.05.2022	34.85	56.42	14.27	25.01	0.77	ND
14.05.2022	28.68	48.01	15.31	21.33	0.86	ND
20.05.2022	21.25	55.95	13.52	22.16	0.85	ND
28.05.2022	29.45	61.33	13.42	23.10	1.07	ND
Monthly Average	26.25	52.84	15.19	24.20	0.90	ND
Maximum	34.85	61.33	19.46	29.38	1.07	ND
Minimum	17.02	42.46	13.42	21.33	0.77	ND

End of Report

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Sr. Analyst





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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
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Test Report

Sample Number: VEL/REL/A/16
Name & Address of Party: M/s Raipur Energen Limited
Formerly GMR Chhattisgarh Energy Ltd. Village Raikheda, Block - Tilda, Dist- Raipur Chhattisgarh
Sample Description: Ambient Air
Sampling Location: Raikheda Village (Ramesh House)
Sample Collected by: Vardan EnviroLab Representative
Sampling & Analysis Protocol: IS :5182 & CBCP Guidelines

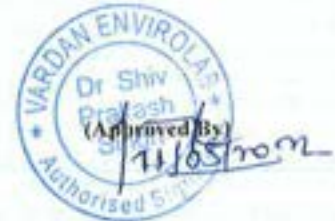
Report No.: VEL/A/2205/09/016
Format No.: 7.8 F-03
Party Reference No.: 5703004128 Date-21/04/2022
Reporting Date: 11/05/2022
Receipt Date: 09/05/2022

TEST RESULTS

Date of Monitoring	PM _{2.5} (ug/m ³)	PM ₁₀ (ug/m ³)	SO ₂ (ug/m ³)	NO ₂ (ug/m ³)	CO (mg/m ³)	Hg (ug/m ³)
06.05.2022	15.67	31.28	5.06	9.33	0.02	ND
Monthly Average	15.67	31.28	5.06	9.33	0.02	ND

End of Report

(Checked By)
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Sr. Analyst





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Test Report

Sample Number:	VEL/REL/A/17	Report No.:	VEL/A/2205/09/017
Name & Address of Party:	M/s Raipur Energen Limited Formerly GMR Chhattisgarh Energy Ltd. Village Raikheda, Block - Tilda, Dist- Raipur Chhattisgarh	Format No.:	7.8 F-03
Sample Description:	Ambient Air	Party Reference No.:	5703004128 Date-21/04/2022
Sampling Location:	Mura Village (Near Petrol Pump)	Reporting Date:	11/05/2022
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	09/05/2022
Sampling & Analysis Protocol:	IS :5182 & CBCP Guidelines		

TEST RESULTS

Date of Monitoring	PM _{2.5} (ug/m ³)	PM ₁₀ (ug/m ³)	SO ₂ (ug/m ³)	NO ₂ (ug/m ³)	CO (mg/m ³)	Hg (ug/m ³)
06.05.2022	38.86	48.23	7.22	17.16	0.11	ND
Monthly Average	38.86	48.23	7.22	17.16	0.11	ND

End of Report

(Checked By)
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Sr. Analyst





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Test Report

Sample Number: VEI/REL/A/18
Name & Address of Party: M/s Raipur Energen Limited
Formerly GMR Chhattisgarh Energy Ltd. Village Raikheda, Block - Tilda, Dist- Raipur Chhattisgarh
Sample Description: Ambient Air
Sampling Location: Chicholi Village (Near Sinha Furniture)
Sample Collected by: Vardan EnviroLab Representative
Sampling & Analysis Protocol: IS :5182 & CBCP Guidelines

Report No.: VEL/A/2205/19/018
Format No.: 7.8 F-03
Party Reference No.: 5703004128 Date-21/04/2022
Reporting Date: 21/05/2022
Receipt Date: 19/05/2022

TEST RESULTS

Date of Monitoring	PM _{2.5} (ug/m ³)	PM ₁₀ (ug/m ³)	SO ₂ (ug/m ³)	NO ₂ (ug/m ³)	CO (mg/m ³)	Hg (ug/m ³)
17.05.2022	14.96	29.35	3.95	6.96	0.03	ND
Monthly Average	14.96	29.35	3.95	6.96	0.03	ND

End of Report

(Checked By)
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Test Report

Sample Number: VEL/REL/A/19
Name & Address of Party: M/s Raipur Energen Limited
Formerly GMR Chhattisgarh Energy Ltd. Village Raikheda, Block – Tilda, Dist- Raipur Chhattisgarh
Sample Description: Ambient Air
Sampling Location: Gaitara Village (Near Rupendra Verma House)
Sample Collected by: Vardan EnviroLab Representative
Sampling & Analysis Protocol: IS :5182 & CBCP Guidelines

Report No.: VEL/A/220S/19/019
Format No.: 7.8 F-03
Party Reference No.: 5703004128 Date-21/04/2022
Reporting Date: 21/05/2022
Receipt Date: 19/05/2022

TEST RESULTS

Date of Monitoring	PM _{2.5} (ug/m ³)	PM ₁₀ (ug/m ³)	SO ₂ (ug/m ³)	NO ₂ (ug/m ³)	CO (mg/m ³)	Hg (ug/m ³)
17.05.2022	11.92	30.86	2.9	6.6	0.04	ND
Monthly Average	11.92	30.86	2.9	6.6	0.04	ND

End of Report

(Checked By)
Anju
ANJU INDOLIA
Sr. Analyst

VARDAN ENVIROLAB
Dr. Shilpa
(Approved By)
Shilpa
21/05/2022
Authorised Signatory



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Test Report

Sample Number: VEL/REGL/AA/01 Report No.: VEL/A/2206/28/001
Name & Address of the Party: M/s Raigarh Energy Generation Ltd. Format No.: 7.8 F 03
Village - Chhote Bhandar, Post Office- Bade Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh) Party Reference No.: NIL
Report Date: 02/07/2022
Period of Analysis: 28/06/2022 to 02/07/2022
Receipt Date: 28/06/2022

Sample Description: Ambient Air Quality Monitoring

General Information:-

Sampling Location : Village - Palsada
Sample Collected By : Vardan EnviroLab Representative
Sampling Equipment Used : RDS & FPS
Instrument Code : VEL/RDS/FPS/01
Instrument Calibration Status : Calibrated
Latitude (N) : 21°44'13"
Longitude (E) : 83°16'30"
Meteorological Condition During Monitoring : Clear Sky
Date of Sampling : 22/06/2022 to 23/06/2022
Time of Sampling : 10:20 AM to 10:20 AM
Ambient Temperature (°C) : Min.29°C & Max. 42°C
Surrounding Activity : Human, Vehicular & other Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182
Sampling Duration : 24 Hrs.
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	IS: 5182 (P-24), 2019	26.54	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P- 23)-2006, RA.2017	62.47	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P- 6)-2006, RA.2017	18.20	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P- 2)-2001, RA.2017	9.52	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P- 9)-1974, RA.2014	0.56	mg/m ³	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m ³	--

Note:- STP-Standard Testing Procedure. *BLQ-Below Limit of Quantification. **LOQ-Limit of Quantification.

End of Report

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Test Report

Sample Number: VEL/REGL/AA/02 Report No.: VEL/A/2206/28/002
Name & Address of the Party: M/s Raigarh Energy Generation Ltd. Format No.: 7.8 F 03
Village - Chhote Bhandar, Post Office- Bade Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh) Party Reference No.: NIL
Report Date: 02/07/2022
Period of Analysis: 28/06/2022 to 02/07/2022
Receipt Date: 28/06/2022

Sample Description: Ambient Air Quality Monitoring

General Information:-

Sampling Location : Village - Kathli
Sample Collected By : Vardan EnviroLab Representative
Sampling Equipment Used : RDS & FPS
Instrument Code : VEL/RDS/FPS/02
Instrument Calibration Status : Calibrated
Latitude (N) : 21°44'17"
Longitude (E) : 83°16'19"
Meteorological Condition During Monitoring : Clear Sky
Date of Sampling : 22/06/2022 to 23/06/2022
Time of Sampling : 10:45 AM to 10:45 AM
Ambient Temperature (°C) : Min.29°C & Max. 42°C
Surrounding Activity : Human, Vehicular & other Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182
Sampling Duration : 24 Hrs.
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	IS: 5182 (P-24), 2019	33.25	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P- 23)-2006, RA.2017	76.58	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P- 6)-2006, RA.2017	19.62	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P- 2)-2001, RA.2017	7.66	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P- 9)-1974, RA.2014	0.59	mg/m ³	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m ³	--

Note:- STP-Standard Testing Procedure, *BLQ-Below Limit of Quantification, **LOQ-Limit of Quantification.
End of Report

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Test Report

Sample Number: VEL/REGL/AA/03 Report No.: VEL/A/2206/28/003
Name & Address of the Party: M/s Raigarh Energy Generation Ltd. Format No.: 7.8 F 03
Village - Chhote Bhandar, Post Office- Bade Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh) Party Reference No.: NIL
Report Date: 02/07/2022
Period of Analysis: 28/06/2022 to 02/07/2022
Receipt Date: 28/06/2022

Sample Description: Ambient Air Quality Monitoring

General Information:-

Sampling Location : Village - Chhote Bhandar
Sample Collected By : Vardan EnviroLab Representative
Sampling Equipment Used : RDS & FPS
Instrument Code : VEL/RDS/FPS/01
Instrument Calibration Status : Calibrated
Latitude (N) : 21°44'22"
Longitude (E) : 83°16'43"
Meteorological Condition During Monitoring : Clear Sky
Date of Sampling : 25/06/2022 to 26/06/2022
Time of Sampling : 10:35 AM to 10:35 AM
Ambient Temperature (°C) : Min.29°C & Max. 42°C
Surrounding Activity : Human, Vehicular & Other Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182
Sampling Duration : 24 Hrs.
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	IS: 5182 (P-24), 2019	34.87	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P- 23)-2006, RA.2017	65.41	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P- 6)-2006, RA.2017	14.02	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P- 2)-2001, RA.2017	10.26	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P- 9)-1974, RA.2014	0.61	mg/m ³	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m ³	--

Note:- STP-Standard Testing Procedure. *BLQ-Below Limit of Quantification. **LOQ-Limit of Quantification
End of Report

(Checked By)
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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
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Test Report

Sample Number:	VEL/REGL/AA/04	Report No.:	VEL/A/2206/28/004
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office - Bade Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	Format No.:	7.8 F 03
		Party Reference No.:	NIL
		Report Date:	02/07/2022
		Period of Analysis:	28/06/2022 to 02/07/2022
		Receipt Date:	28/06/2022
Sample Description:	Ambient Air Quality Monitoring		

General Information:-

Sampling Location	: Village – Bade Bhandar
Sample Collected By	: Vardan EnviroLab Representative
Sampling Equipment Used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/02
Instrument Calibration Status	: Calibrated
Latitude (N)	: 21°44'29"
Longitude (E)	: 83°17'6"
Meteorological Condition During Monitoring	: Clear Sky
Date of Sampling	: 25/06/2022 to 26/06/2022
Time of Sampling	: 11:20 AM to 11:20 AM
Ambient Temperature (°C)	: Min.29°C & Max. 42°C
Surrounding Activity	: Human, Vehicular & other Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: CPCB Guidelines & IS-5182
Sampling Duration	: 24 Hrs.
Parameter Required	: As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	IS: 5182 (P-24), 2019	32.14	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P- 23)-2006, RA.2017	69.85	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P- 6)-2006, RA.2017	18.42	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P- 2)-2001, RA.2017	8.63	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P- 9)-1974, RA.2014	0.75	mg/m ³	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m ³	--

Note:- STP-Standard Testing Procedure, *BLQ-Below Limit of Quantification, **LOQ-Limit of Quantification.
End of Report

(Checked By)
Anil Indolia

ANIL INDOLIA
Analyst



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4.2 Noise Level Monitoring



Figure No.4. Plan Showing Noise Level Monitoring Location Map

Ambient Noise Level Monitoring Locations

Location Code: - N1- PalsadaVillage
N2- Kathali Village
N3- Chote Bhandar Village
N4- Bade Bhandar Village



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Test Report

Sample Number: VEL/REGL/AN/01
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office- Bade Bhandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/N/2204220001
Format No.: 7.8 F 01
Party Reference No.: NIL
Reporting Date: 26/04/2022
Receipt Date: 22/04/2022

Sample Description: Ambient Noise Level Monitoring

General Information:-

Sample Collected By : Vardan EnviroLab Representative
Sampling Location : Village- Palsada
Instrument Used : Sound Level Meter
Instrument Code : VEL/SLM/05
Instrument Calibration Status : Calibrated
Meteorological Condition During Monitoring : Clear sky
Date of Monitoring : 18/04/2022 to 19/04/2022
Time of Monitoring : 06:00 AM to 06:00AM
Ambient Temperature (°C) : Min.26°C & Max. 38 °C
Surrounding Activity : Human, Vehicular and other Activities
Sampling Duration : 24 Hrs.
Scope of Monitoring : Regulatory Requirement
Protocol Used : IS 9989 & CPCB Guidelines
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L _{Max}	IS:9989	60.1	55.8
2.	L _{Min}	IS:9989	39.3	37.2
3.	L _{eq}	IS:9989	51.19	43.41

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6.00 AM to 10.00 PM.
2. Night Time is reckoned between 10.00 PM to 6.00 AM.
3. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.

Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply



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Test Report

Sample Number: VEL/REGL/AN/02
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office- Bade Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/N/2204220002
Format No.: 7.8 F 01
Party Reference No.: NIL
Reporting Date: 26/04/2022
Receipt Date: 22/04/2022

Sample Description: Ambient Noise Level Monitoring

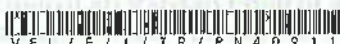
General Information:-

Sample Collected By : Vardan EnviroLab Representative
Sampling Location : Village-Kathli
Instrument Used : Sound Level Meter
Instrument Code : VEL/SLM/06
Instrument Calibration Status : Calibrated
Meteorological Condition During Monitoring : Clear sky
Date of Monitoring : 18/04/2022 to 19/04/2022
Time of Monitoring : 06:00 AM to 06:00AM
Ambient Temperature (°C) : Min.26°C & Max. 38 °C
Surrounding Activity : Human, Vehicular and other Activities
Sampling Duration : 24 Hrs.
Scope of Monitoring : Regulatory Requirement
Protocol Used : IS 9989 & CPCB Guidelines
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L _{Max}	IS:9989	61.8	54.1
2.	L _{Min}	IS:9989	39.4	36.1
3.	L _{eq}	IS:9989	50.47	41.75

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6.00 AM to 10.00 PM.
2. Night Time is reckoned between 10.00 PM to 6.00 AM.
3. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.
Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply



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Test Report

Sample Number: VEL/REGL/AN/03
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office- Bade Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/N/2204220003
Format No.: 7.8 F 01
Party Reference No.: NIL
Reporting Date: 26/04/2022
Receipt Date: 22/04/2022

Sample Description: Ambient Noise Level Monitoring

General Information:-

Sample Collected By : Vardan EnviroLab Representative
Sampling Location : Village-Chhote Bhandar
Instrument Used : Sound Level Meter
Instrument Code : VEL/SLM/07
Instrument Calibration Status : Calibrated
Meteorological Condition During Monitoring : Clear sky
Date of Monitoring : 19/04/2022 to 20/04/2022
Time of Monitoring : 06:00 AM to 06:00AM
Ambient Temperature (°C) : Min.29°C & Max. 39 °C
Surrounding Activity : Human, Vehicular and other Activities
Sampling Duration : 24 Hrs.
Scope of Monitoring : Regulatory Requirement
Protocol Used : IS 9989 & CPCB Guidelines
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L _{Max}	IS:9989	63.7	49.3
2.	L _{Min}	IS:9989	38.8	37.1
3.	L _{eq}	IS:9989	51.17	42.62

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

- Day Time is from 6.00 AM to 10.00 PM.
- Night Time is reckoned between 10.00 PM to 6.00 AM.
- Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.

Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REGL/AN/04
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office- Bade Bhandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/N/2204220004
Format No.: 7.8 F 01
Party Reference No.: NIL
Reporting Date: 26/04/2022
Receipt Date: 22/04/2022

Sample Description: Ambient Noise Level Monitoring

General Information:-

Sample Collected By : Vardan EnviroLab Representative
Sampling Location : Village- Bade Bhandar
Instrument Used : Sound Level Meter
Instrument Code : VEL/SLM/08
Instrument Calibration Status : Calibrated
Meteorological Condition During Monitoring : Clear sky
Date of Monitoring : 19/04/2022 to 20/04/2022
Time of Monitoring : 06:00 AM to 06:00AM
Ambient Temperature (°C) : Min.29°C & Max. 39 °C
Surrounding Activity : Human, Vehicular and other Activities
Sampling Duration : 24 Hrs.
Scope of Monitoring : Regulatory Requirement
Protocol Used : IS 9989 & CPCB Guidelines
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L _{Max}	IS:9989	66.4	50.6
2.	L _{Min}	IS:9989	41.2	36.3
3.	L _{eq}	IS:9989	52.95	41.29

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6.00 AM to 10.00 PM.
2. Night Time is reckoned between 10.00 PM to 6.00 AM.
3. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.
Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEI/REI/N/01-08
 Name & Address of Party: M/s Raipur Energen Limited
 Formerly GMR Chhattisgarh Energy Ltd.
 Village Raikheda, Block - Tilda, Dist-
 Raipur Chhattisgarh

Report No.: VEI/N/2205/30/001-008
 Format No.: 7.8 F-03
 Party Reference No.: 5703004128 Date-21/04/2022
 Reporting Date: 01/06/2022
 Receipt Date: 30/05/2022

Sample Description: Noise Monitoring
 Sample Collected by: Vardan EnviroLab Representative

TEST RESULTS

Location Name	Date of Monitoring	Time Zone	1	2	3	4	5	6	7	8	9	10	Day/Night		
													Min	Max	Avg.
Near Admin Building	03-04.05.2022	Day	52.3	60.4	55.2	63.4	57.5	64.1	53.8	56.4	60.1	56.4	52.3	64.1	58.0
		Night	46.5	47.8	50.3	53.1	48.9	50.3	49.7	52.4	52.3	53.1	46.5	53.1	50.4
Field Hostel	03-04.05.2022	Day	47.5	43.6	48.1	40.9	43.5	46.3	45.8	46.9	50.1	50.3	40.9	50.3	46.3
		Night	39.8	41.2	42.1	38.5	39.9	41.5	42.3	40.1	44.5	41.3	38.5	44.5	41.1
Near Gate No.- I	11-12.05.2022	Day	52.3	56.4	55.6	51.4	59.8	55.2	53.6	53.6	60.5	54.7	51.4	60.5	55.3
		Night	48.2	45.6	46.3	52.4	51.6	53.8	45.6	46.3	42.9	46.1	42.9	53.8	47.9
Near Gaitara village Gate	16-17.05.2022	Day	48.6	47.3	52.4	48.2	52.3	49.8	55.6	50.1	48.9	46.8	46.8	55.6	50.0
		Night	40.5	39.8	42.1	39.8	40.2	36.9	40.6	41.5	42.5	43.2	36.9	43.2	40.7
Near Bhatapara village Gate	16-17.05.2022	Day	46.3	45.8	48.7	49.7	45.3	50.1	51.3	50.6	52.9	54.6	45.3	54.6	49.5
		Night	40.3	38.9	42.6	40.1	40.5	41.8	43.5	43.6	40.1	42.6	38.9	43.6	41.4
Near Mura village Gate	16-17.05.2022	Day	46.8	51.2	53.6	51.4	48.5	51.3	55.6	49.8	50.7	53.4	46.8	55.6	51.2
		Night	38.2	44.5	41.6	39.8	42.5	43	38.5	42.6	46.8	41.9	38.2	46.8	41.9
Near OHC	23-24.05.2022	Day	56.1	59.7	60.4	61.2	55.7	62.3	66.4	54.2	59.8	55.4	54.2	66.4	59.1
		Night	50.2	51.3	49.5	53.4	50.1	54.2	52.6	55.8	50.6	52	49.5	55.8	52.0
Near Weighbridge	27-28.05.2022	Day	60.2	63.4	59.8	65.4	70.9	56.8	60.2	54.8	56.2	62.3	54.8	70.9	61.0
		Night	51.3	53.6	55.4	49.8	50.3	56.4	50.1	48.9	53.1	51.7	48.9	56.4	52.1

End of Report

(Checked by)
ANJU INDOLIA
 Sr. Analyst



4.3 Ground water Quality Analysis



Figure No.5. Plan Showing Ground Water Quality Monitoring Location Map

Location Code: -

- GW1- Site Office
- GW2- PalsadaVillage
- GW3- Kathali Village
- GW4- Chote Bhandar Village
- GW5- Bade Bhandar Village



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REL/VV/01-06
Name & Address of Party: M/s Raipur Energen Limited
Formerly GMR Chhattisgarh Energy Ltd.
Village Raikheda, Block - Tilda, Dist-
Raipur Chhattisgarh
Report No.: VEL/W/2205/30/001-006
Format No.: 7.8 F-03
Party Reference No.: 5703004128 Date-21/04/2022
Reporting Date: 01/06/2022
Receipt Date: 30/05/2022
Sample Description: Ground Water Sample
Sample Collected by: Vardan EnviroLab Representative
Sampling & Analysis Protocol: APHA 23rd Edition 2017

TEST RESULTS

S. No	Parameter	Unit	Gaitara (HPW)	Mura (HPW)	Chicholi (HPW)	Raikheda (HPW)	Near phillips Office Borewell	Field Hostel Tap Water
Date of Sampling			27.05.2022	27.05.2022	27.05.2022	27.05.2022	27.05.2022	27.05.2022
1.	pH	--	7.60	8.10	7.90	7.92	7.35	8.10
2.	Temperature	°C	26.5	26.8	25.9	25.8	25.7	26.1
3.	Total Dissolved Solids	mg/l.	545.05	888.42	358.18	337.3	252.45	380.82
4.	Conductivity	mS/cm	813.52	1.326	534.6	503.4	376.8	568.4
5.	Turbidity	NTU	1.4	2.1	1.4	0.9	0.76	1.2
6.	Chloride	mg/L	62.5	298.4	50.3	32.4	52.3	45.3
7.	Total Hardness	mg/l.	274.24	712.3	245.6	261.3	152.64	234.2
8.	Calcium Hardness	mg/L	212.41	601.8	192.4	226.5	122.12	201.6
9.	Magnesium Hardness	mg/l.	61.83	110.5	53.2	34.83	30	32.6
10.	P-alkalinity	mg/L	Nil	Nil	Nil	Nil	Nil	Nil
11.	M-alkalinity	mg/L	43.6	50.3	41.8	35.2	43.5	38.4
12.	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable

End of Report

(Checked by)
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Sr. Analyst



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4.6 Effluent Sample Analysis Report

Locations

1. STP Outlet
2. ETP Outlet



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REL/WW/66-73
Name & Address of Party: M/s Raipur Energen Limited
Formerly GMR Chhattisgarh Energy Ltd. Village Raikheda, Block - Tilda, Dist- Raipur Chhattisgarh
Report No.: VEL/A/2205/30/066-073
Format No.: 7.8 F-03
Party Reference No.: 5703004128 Date-21/04/2022
Reporting Date: 01/06/2022
Receipt Date: 30/05/2022

Sample Description: Waste Water
Sampling Location: STP Outlet
Sample Collected by: Vardan EnviroLab Representative
Sampling & Analysis Protocol: APHA 23rd Edition 2017

TEST RESULTS

S. No.	Date	STP Outlet				
		pH	TSS (mg/L)	BOD (mg/L)	COD (mg/L)	Oil & Grease (mg/L)
Limits		5.5-9.0	100	30	250	10
1.	03.05.2022	7.4	49.5	12.9	58.4	1.5
2.	06.05.2022	7.1	36.8	14.6	68.5	1.07
3.	09.05.2022	7.0	41.5	15.8	60.9	2.3
4.	12.05.2022	7.1	62.9	16.3	72.5	1.1
5.	16.05.2022	7.2	36.7	13.9	58.9	1.25
6.	20.05.2022	7.0	39.7	16.8	66.5	2.04
7.	24.05.2022	7.3	38.1	13.5	58.7	1.74
8.	28.05.2022	7.3	40.1	15.2	62.8	1.68
Minimum		7.4	62.9	16.8	72.5	2.3
Maximum		7.0	36.7	12.9	58.4	1.07
Monthly Average		7.18	43.16	14.88	63.40	1.59

End of Report

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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REL/WW/01-08
Name & Address of Party: M/s Raipur Energen Limited
Formerly GMR Chhattisgarh Energy Ltd. Village
Raikheda, Block - Tilda, Dist- Raipur
Chhattisgarh
Report No.: VEL/A/2205/30/001-008
Format No.: 7.8 F-03
Party Reference No.: 5703004128 Date-21/04/2022
Reporting Date: 01/06/2022
Receipt Date: 30/05/2022

Sample Description: Waste Water
Sampling Location: ETP Outlet
Sample Collected by: Vardan EnviroLab Representative
Sampling & Analysis Protocol: APHA 23rd Edition 2017

TEST RESULTS

S. No.	Date	ETP Outlet				
		pH	TSS (mg/L)	BOD (mg/L)	COD (mg/L)	Oil & Grease (mg/L)
	Limits	5.5-9.0	100	30	250	10
1.	03.05.2022	8.1	35.0	26.2	136.4	1.25
2.	06.05.2022	7.5	49.0	24.5	86.5	2.3
3.	09.05.2022	7.8	43.1	20.8	98.4	1.56
4.	12.05.2022	6.9	44.7	24.2	136.2	0.9
5.	16.05.2022	7.3	38.3	22.6	70.3	ND
6.	20.05.2022	7.9	36.4	18.8	74.6	1.42
7.	24.05.2022	7.3	33.8	19.4	60.9	2.8
8.	28.05.2022	6.8	37.3	24.6	100.2	1.98
	Minimum	6.80	33.80	18.80	60.90	0.90
	Maximum	8.10	49.01	26.20	136.40	2.80
	Monthly Average	7.45	39.71	22.64	95.44	1.74

End of Report

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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REL/WW/09-13
Name & Address of Party: M/s Raipur Energen Limited
Formerly GMR Chhattisgarh Energy Ltd. Village Raikheda, Block - Tilda, Dist- Raipur Chhattisgarh
Report No.: VEL/A/2205/01/009-013
Format No.: 7.8 F-03
Party Reference No.: 5703004128 Date-21/04/2022
Reporting Date: 03/06/2022
Receipt Date: 01/06/2022

Sample Description: Waste Water
Sampling Location: Ash Pond Effluent
Sample Collected by: Vardan EnviroLab Representative
Sampling & Analysis Protocol: APHA 23rd Edition 2017

TEST RESULTS

S. No.	Date	pH	Oil & Grease (mg/L)	Suspended Solid (mg/L)	Temperature (Intake of Water in °C)
Limits		6.5 - 8.5	20	100	--
1.	03.05.2022	6.95	2.20	55.25	26.5
2.	09.05.2022	8.20	1.05	60.42	30.4
3.	17.05.2022	7.68	ND	45.82	29.4
4.	23.05.2022	7.98	0.98	52.61	27.5
5.	30.05.2022	8.15	1.75	60.45	26.9
Monthly Average		7.79	1.50	54.91	28.14

End of Report

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REL/WW/14-39
Name & Address of Party: M/s Raipur Energen Limited
Formerly GMR Chhattisgarh Energy Ltd. Village
Raikheda, Block - Tilda, Dist- Raipur
Chhattisgarh

Report No.: VEL/A/2205/01/014-039
Format No.: 7.8 F-03
Party Reference No.: 5703004128 Date-21/04/2022
Reporting Date: 03/06/2022
Receipt Date: 01/06/2022

Sample Description: Waste Water
Sampling Location: Condenser Cooling Water
Sample Collected by: Vardan EnviroLab Representative
Sampling & Analysis Protocol: APHA 23rd Edition 2017

TEST RESULTS

S. No.	Date	Parameter			
		Condenser Inlet Cooling Temperature °C	Condenser Outlet Cooling Temperature °C	Temp. Diff(Deg. C)	pH
1.	02.05.2022	28	33	5	8.1
2.	03.05.2022	30	35	5	7.9
3.	04.05.2022	34	39	5	8.2
4.	05.05.2022	29	34	5	7.1
5.	06.05.2022	31	36	5	8.4
6.	07.05.2022	30	35	5	8.6
7.	09.05.2022	33	38	5	7.9
8.	10.05.2022	35	40	5	7.5
9.	11.05.2022	34	39	5	7.4
10.	12.05.2022	31	36	5	8.7
11.	13.05.2022	29	34	5	8.3
12.	14.05.2022	30	35	5	7.5
13.	16.05.2022	34	39	5	7.6
14.	17.05.2022	33	38	5	8.1
15.	18.05.2022	31	36	5	7.1
16.	19.05.2022	30	35	5	8.6
17.	20.05.2022	28	33	5	7.9
18.	21.05.2022	30	35	5	8.1
19.	23.05.2022	29	34	5	7.9
20.	24.05.2022	35	40	5	8.2

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Test Report

Sample Number: VEI/REL/WW/14-39		Report No.: VEL/A/2205/01/014-039			
S. No.	Date	Parameter			
		Condenser Inlet Cooling Temperature °C	Condenser Outlet Cooling Temperature °C	Temp. Diff(Deg. C)	pH
21.	25.05.2022	33	38	5	8.4
22.	26.05.2022	31	36	5	7.9
23.	27.05.2022	32	37	5	7.2
24.	28.05.2022	34	39	5	7.5
25.	30.05.2022	35	40	5	6.6
26.	31.05.2022	29	34	5	7.8
Average		31	36	5	7.9
Maximum		35	40	5	8.7
Minimum		28	33	5	6.6

End of Report

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Sr. Analyst





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REL/WW/40-65
Name & Address of Party: M/s Raipur Energen Limited
Formerly GMR Chhattisgarh Energy Ltd. Village
Raikheda, Block - Tilda, Dist- Raipur
Chhattisgarh
Report No.: VEL/A/2205/01/040-065
Format No.: 7.8 F-03
Party Reference No.: 5703004128 Date-21/04/2022
Reporting Date: 03/06/2022
Receipt Date: 01/06/2022

Sample Description: Waste Water
Sampling Location: Cooling Tower Blow Down
Sample Collected by: Vardan EnviroLab Representative
Sampling & Analysis Protocol: APHA 23rd Edition 2017

TEST RESULTS

S. No.	Date	Parameter Name				
		Free Available Chlorine (mg/litre)	Zinc (mg/litre)	Chromium (Total) (mg/litre)	Phosphate (mg/litre)	Other Corrosion inhibiting material (mg/litre)
	Limit	≥ 0.5	1	0.1	5	—
1.	02.05.2022	0.17	0.2	0.04	2.73	NA
2.	03.05.2022	0.14	0.2	0.02	2.45	NA
3.	04.05.2022	0.13	0.5	0.05	2.62	NA
4.	05.05.2022	0.28	0.2	0.07	2.13	NA
5.	06.05.2022	0.20	0.3	0.03	2.34	NA
6.	07.05.2022	0.24	0.3	0.06	2.43	NA
7.	09.05.2022	0.22	0.1	0.02	2.55	NA
8.	10.05.2022	0.16	0.4	ND	2.85	NA
9.	11.05.2022	0.23	0.6	0.03	2.51	NA
10.	12.05.2022	0.25	0.4	0.06	2.15	NA
11.	13.05.2022	0.30	0.3	0.03	3.52	NA
12.	14.05.2022	0.32	0.6	0.02	3.75	NA
13.	16.05.2022	0.13	0.2	0.06	2.18	NA
14.	17.05.2022	0.17	0.1	0.08	2.63	NA
15.	18.05.2022	0.28	0.3	0.05	2.51	NA
16.	19.05.2022	0.14	0.2	0.03	2.22	NA
17.	20.05.2022	0.10	0.4	0.06	2.33	NA
18.	21.05.2022	0.17	0.7	0.05	2.38	NA
19.	23.05.2022	0.24	0.1	0.07	2.61	NA
20.	24.05.2022	0.12	0.3	0.04	2.18	NA
21.	25.05.2022	0.18	0.2	0.08	2.75	NA
22.	26.05.2022	0.27	0.5	0.02	2.49	NA

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REL/WW/40-65		Report No.: VEL/A/2205/01/040-065				
S. No.	Date	Parameter Name				
		Free Available Chlorine (mg/litre)	Zinc (mg/litre)	Chromium (Total) (mg/litre)	Phosphate (mg/litre)	Other Corrosion inhibiting material (mg/litre)
	Limit	≥ 0.5	1	0.1	5	--
23.	27.05.2022	0.15	0.2	0.06	3.49	NA
24.	28.05.2022	0.19	0.2	0.05	3.01	NA
25.	30.05.2022	0.12	0.3	ND	2.45	NA
26.	31.05.2022	0.09	0.3	0.02	2.72	NA
	Average	0.19	0.28	0.05	2.61	NA
	Maximum	0.32	0.67	0.08	3.75	NA
	Minimum	0.09	0.06	0.02	2.13	NA

End of Report

(Checked by)
ANJU INDOLIA
Sr. Analyst

(Approved By)
Dr. Sh. Prakash Singh
Authorized Signatory

Project Name- Raigarh Energy Generation Ltd.

Village Chhote Bhandar, Post Office Bade Bhandar, Tehsil Pussore, Dist.Raigarh-496100 (Chattisgarh)

1st Quarter Environmental Monitoring Report

4.7 Stack Monitoring

Locations

1. TPP



Test Report

Sample Number: VEL/REGL/S/01 **Report No.:** VEL /S/2204220001
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village- Chhote Bhandar, Post Office-
Bade Bandar, Tehsil- Pussore, Dist-
Raigarh - 496100 (Chhattisgarh) **Format No.:** 5.10 F-01
Party Reference No.: NIL
Report Date: 26/04/2022
Period of Analysis: 22-26/04/2022
Receipt Date: 22/04/2022

Sample Description: STACK EMISSION MONITORING

Sample Collected By : VEL Team
Date & Time of Sampling : 19/04/2022
Location : TPP
Sampling Duration (Minutes) & Time : 37.0 Min. & 11:40 AM to 12:17 PM
Meteorological Condition : Clear Sky
Stack Attached To : TPP
Stack Diameter (m) : 7.5
Stack Height (m) : 275
Instrument Calibration Status : Calibrated
Ambient Temperature - Ta (°C) : 36.0
Temperature of Stack Gases - Ts (°C) : 128
Velocity of Stack Gases (m/sec.) : 19.05
Flow rate of PM (LPM) : 27.0
Flow rate of Gas (LPM) : 2.0 (850.4 m³/sec)
Sampling condition : Isokinetic
Protocol Used : IS-11255 & EPA

TEST RESULTS

S. No.	Parameters	Protocol	Results	Units	Limits
1.	Particulate Matter (as PM)	IS: 11255 (P-1):1985, RA.2014	43.92	mg/Nm ³	50.0
2.	Sulphur Dioxide (as SO ₂)	IS: 11255 (P-2):1985, RA.2014	629.75	mg/Nm ³	200.0
3.	Oxide of Nitrogen (as NO ₂)	IS: 11255 (P-7). RA.2017	264.56	mg/Nm ³	450.0
4.	Mercury (as Hg)	APHA 3 rd Edition, 2017, 303 A (Page No. 365)	*BDL(**DL0.001)	mg/Nm ³	0.03

Note:- *BDL- Below Detection Limit, ** DL- Detection Limit





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REI/S/01-02
Name & Address of Party: M/s Raipur Energen Limited
Formerly GMR Chhattisgarh Energy Ltd.
Village Raikheda, Block - Tilda, Dist-
Raipur Chhattisgarh
Report No.: VEL/S/2205/30/001-002
Format No.: 7.8 F-03
Party Reference No.: 5703004128 Date-21/04/2022
Reporting Date: 01/06/2022
Receipt Date: 30/05/2022

Sample Description: Stack Monitoring
Sampling Location: Unit -I
Sample Collected by: Vardan EnviroLab Representative
Sampling & Analysis Protocol: IS :11255

TEST RESULTS

S. No.	Date of Monitoring	Parameter		
		Unit-I		
		PM (mg/Nm ³)	SO ₂ (mg/Nm ³)	NO _x (mg/Nm ³)
1	12.05.2022	42.32	1186.34	305.28
2	20.05.2022	33.98	1102.48	256.74
Monthly Average		38.15	1144.41	281.01
Maximum		42.32	1186.34	305.28
Minimum		33.98	1102.48	256.74

End of Report

(Checked By)

ANJU INDOLIA
Sr. Analyst



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REL/S/03-04
Name & Address of Party: M/s Raipur Energen Limited
Formerly GMR Chhattisgarh Energy Ltd.
Village Raikheda, Block - Tilda, Dist-
Raipur Chhattisgarh
Report No.: VEL/S/2205/30/003-004
Format No.: 7.8 F-03
Party Reference No.: 5703004128 Date-21/04/2022
Reporting Date: 01/06/2022
Receipt Date: 30/05/2022
Sample Description: Stack Monitoring
Sampling Location: Unit -II
Sample Collected by: Vardan EnviroLab Representative
Sampling & Analysis Protocol: IS :11255

TEST RESULTS

S. No.	Date of Monitoring	Parameter		
		Unit-II		
		PM (mg/Nm ³)	SO ₂ (mg/Nm ³)	NO _x (mg/Nm ³)
1	12.05.2022	34.62	1235.64	256.45
2	20.05.2022	40.34	1187.20	301.31
Monthly Average		37.48	1211.42	278.88
Maximum		40.34	1235.64	301.31
Minimum		34.62	1187.20	256.45

End of Report

(Checked by)
ANJU INDIA
Sr. Analyst





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REGL/ST/01
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office -
Bade Bade Bandar, Tehsil - Pussore, Dist -
Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/ST/2206/28/001
Format No.: 7.8 F 03
Party Reference No.: NIL
Report Date: 02/07/2022
Period of Analysis: 28/06/2022 to 02/07/2022
Receipt Date: 28/06/2022

Sample Description: Stack Emission Monitoring

General Information:-

Sample Collected By : VEL Team
Date & Time of Sampling : 26/06/2022
Location : TPP
Sampling Duration (Minutes) : 35.0
Meteorological Condition : Clear Sky
Stack Attached To : TPP
Stack Diameter (m) : 7.5
Stack Height (m) : 275
Instrument Calibration Status : Calibrated
Ambient Temperature - Ta (°C) : 31.0
Temperature of Stack Gases - Ts (°C) : 136.0
Velocity of Stack Gases (m/sec.) : 20.27
Flow rate of PM (LPM) : 24.0
Flow rate of Gas (LPM) : 2.0 (998.99 m³/sec)
Sampling Condition : Isokinetic
Protocol Used : IS: 11255 & EPA

TEST RESULTS

S. No.	Parameters	Test Method	Results	Units	Limits
1.	Particulate Matter (as PM)	IS: 11255 (P-1):1985, RA.2014	36.24	mg/Nm ³	50.0
2.	Sulphur Dioxide (as SO ₂)	IS: 11255 (P-2):1985, RA.2014	698.51	mg/Nm ³	200.0
3.	Oxides of Nitrogen (as NO ₂)	IS: 11255 (P-7), RA.2017	184.75	mg/Nm ³	450.0
4.	Mercury (as Hg)	APIIA 3 rd Edition, 2017, 303 A (Page No. 365)	BLQ(LOQ 0.001)	mg/Nm ³	0.03

Note:- *BLQ-Below Limit of Quantification, **L.OQ-Limit of Quantification.
End of Report

(Checked By)

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S. Anand



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Chapter - 5.0

CONCLUSION

RAIGARH ENERGY GENERATION LTD., authorities have been taken successful steps in controlling environmental pollution in and around the project. This fact is clear from analytical results of different environmental parameters. A brief conclusion is as follows.

Sr. No.	Environmental Parameters	Conclusion
5.1	Air Environment	After analysis of the samples from five different locations it is observed that both the individuals and average concentration of air pollutants in respect of SO ₂ , NO ₂ , PM ₁₀ , PM _{2.5} , CO and Mercury are well within the prescribed limits of NAAQM standards. People of township and of surrounding villages do not have any problems regarding the air quality and have no grievances because of Thermal Power Plant activities.
5.2	Water Environment	The analytical result of the samples from the ground water of villages, surface water from river, and domestic & industrial effluent after treatment shows that the concentrations of different water parameters are well within prescribed limits and will not cause any adverse impact on human health and on surrounding area. People of surrounding areas express satisfaction about the water quality of That area.
5.3	Noise Environment	The observations taken at four village location during day and night time shows that the noise level are well within prescribed limits of CPCB. Hence there is no possibility of any adverse effect of noise generated due to Thermal Power Plant activities on peoples of Surrounding areas.

All the above details show that Thermal Power Plant of RAIGARH ENERGY GENERATION LTD. is not causing any adverse impact on the human health and ecological balance.

Project Name- Raigarh Energy Generation Ltd.

Village Chhote Bhandar, Post Office Bade Bhandar, Tehsil Pussore, Dist.Raigarh-496100 (Chhattisgarh)

2nd Quarter Environmental Monitoring Report

2nd Quarterly Environmental Monitoring Report



Submitted To:

**M/s Raigarh Energy Generation Ltd.
Village Chhote Bhandar, Post office Bade Bhandar,
Tehsil Pussore, Dist.-Raigarh -496100 (Chhattisgarh)**

Conducted by:

**M/s Vardan EnviroLab
Plot no. 82A, Sector-5, IMT Manesar, Gurugram (Haryana)**

(Recognized by MoEF & CC, NABL Government of India)

PREFACE

The growing concern for environmental protection and the passing of various environmental legislations have increased the responsibilities of Ministry- of Environment, Forests & Climate Chang, Pollution Control boards in many folds. Besides enforcing the various environmental legislations MoEF&CC, CPCB & SPCB strive to propagate the necessity awareness regarding the various legal provision and environmental protection measures in the country

Electric Power scenario has occupied a significant place in the development program of the country. Development and environment can neither be separated nor ignored. In fact, they are complimentary to each other. These issues have become a concern of the community, particularly the environment impact due to industries in the developing countries

However, the prerequisite for sustainable development is judicious planning of environmental status, likely impacts of the approach adopted on the environment including inhabitants of the locality, availability of the eco-friendly technology, emerging waste disposal and waste utilization processes, techniques of land reclamation for the restoration of aesthetic beauty and soon.

M/s Raigarh Energy Generation Ltd., Village Chhote Bhandar, Post Office Bade Bhandar, Raigarh - 496100, India, has engaged M/S Vardan EnviroLab, Gurugram, (HR) to provide Environmental Services in respect of ambient air quality monitoring, stack emission, noise level monitoring & Sampling and Analysis of ground water quality, surface water quality, treated effluent sewage, effluent water from ETP, and soil for Raigarh Energy Generation Ltd., Raigarh district of Chhattisgarh, as per guidelines of MoEF & CC and CPCB Gazette notification.

M /S Vardan EnviroLab, Gurugram, (HR) has deployed entirely its own personnel, facilities and expertise for doing this service. Sampling/Monitoring Stations were identified by the Environmental Officer of Raigarh Energy Generation Ltd., The samples were analyzed partly at site and partly at our MoEF Recognized laboratory situated at Gurugram (HR).

This report presents the data generated for the period from 1st July 2022 to 30th September 2022, i.e. for Second quarter which includes sampling locations, Methodology, testing procedure and compilation for the Environmental parameters i.e. Air, Water & Noise with a view to evaluate the impact due to the thermal power plant activities.

During the course of our operations for the above task, the staff and management of Raigarh Energy Generation Ltd, were extremely co-operative. We are grateful to them for their invaluable support and assistance rendered to us during the course of the sampling and monitoring.

Date: 21/11/22



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Date:

(Authorised Signatory)

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Chapter - 1.0

INTRODUCTION

M/s Raigarh Energy Generation Ltd., a subsidiary of Adani Power, is a power generation company based at Raigarh in the State of Chattisgarh. On 07-Sep-2019, "Adani Power Limited" got approval from NCLT to become new owner of this project "Raigarh Energy Generation Ltd.", has commissioned its Thermal Power Plant first 600MW Unit at Village Chhote Bhandar, Post Office Bade Bhandar, Raigarh- 496100, India. The second unit of 600MW is under implementation. Raigarh Energy Generation Ltd., is also committed towards the environment and the community it operates in. It has successfully implemented several community welfare schemes in the field of livelihood, infrastructure, community health and education which has so far benefited over 60,000 people from close to 75 villages.



Figure No.1. Raigarh Energy Generation Ltd.

Chapter - 2.0

PROJECT PROFILE

2.1 Topography & Drainage

Topography of this area is generally undulating. The area is drained by Mand River approximately 3 km. away from plant in North direction and Mahanadi River approximately 5 km. away from plant in South direction.

2.2 Location

Plant is bounded by Northern Latitudes of 21° 44' 00" to 21° 44' 42" and Eastern Longitude of 83° 16' 30" to 83° 17' 18". This area falls in the survey of India top sheet no. 64 O/1, 64 O/2, 64 O/5 and 64 O/6. The location of the mine area is shown in **Fig. No. 2**

2.3 Climate

The climate of the area is Sub-tropical type. It is in the zone of humid tropic climate where temperature and humidity of air are very high. The temperature varies from the minimum - maximum temperature range between 29.5°C - 49 °C in summer, and 8°C - 25 °C in winter. The humidity varies from 35% to 82%. The annual average rainfall in the area is about 1300 mm.

2.4 Communication

The nearest railway station is Kirodimal, which is at a distance of -23 Km towards North direction. The area is well connected with N.H. No. 216. Nearest Airport is Raipur -250 km in SW direction. Nearest village is Bade Bhandar - 1 km. in North direction and nearest town is Raigarh -21 km. in North-East direction.

2.5 Location Map

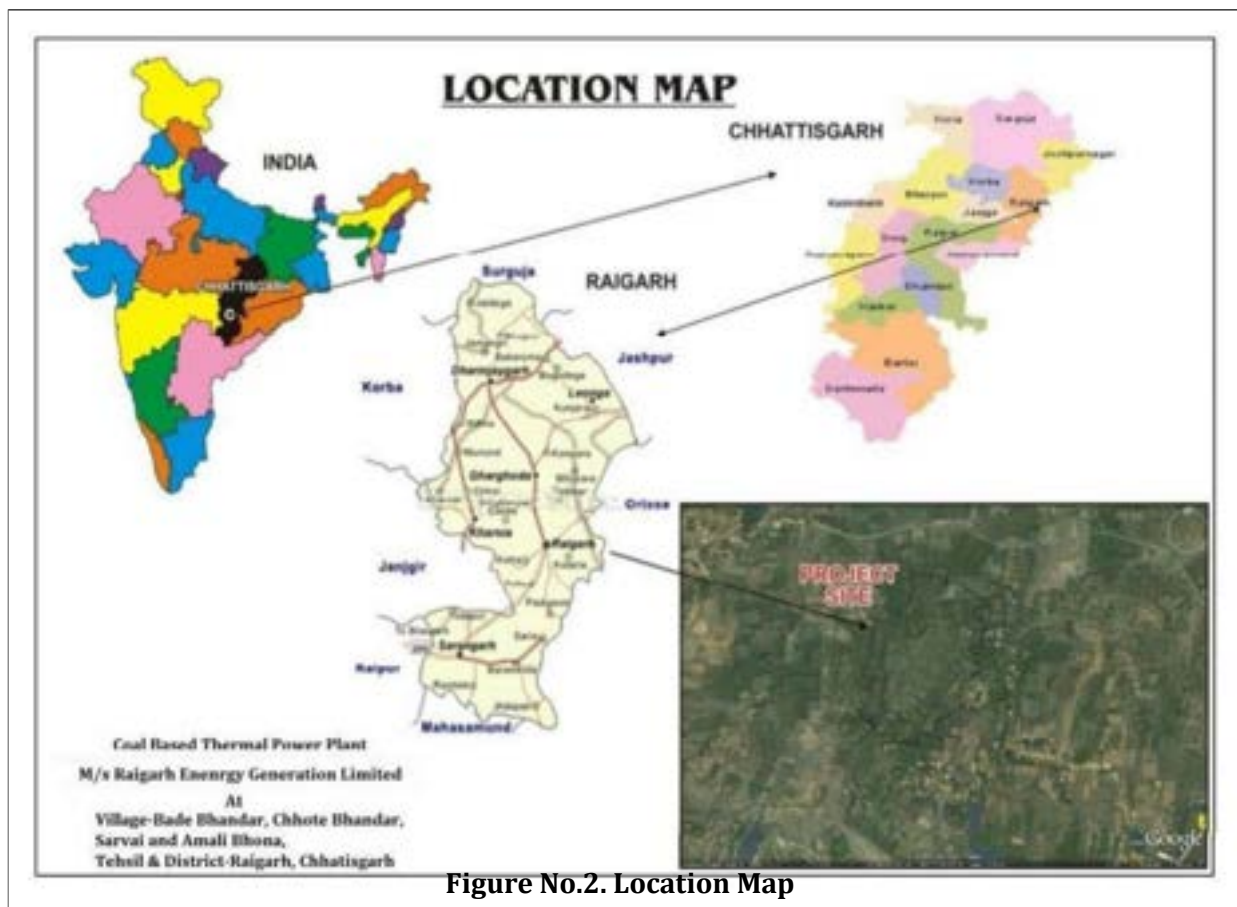


Figure No.2. Location Map

Chapter – 3.0

SCOPE OF STUDY AND METHODOLOGY

3.1 Scope of Study

The scope of study includes Environmental Services in respect of ambient air quality monitoring, noise level monitoring & Sampling and Analysis of ground water quality, surface water quality, treated effluent sewage, effluent water from ETP and soil.

3.2 Methodology

As mentioned in the scope of work covering the various Environmental components monitoring and sampling and its analysis was carried out on the basis of guidelines of Ministry of Environment Forest & Climate Control of Government of India & Chattisgarh State Pollution Control Board. Sampling procedure method reference and Analysis procedure method reference are mentioned in monitoring reports.

3.2.1 Ambient Air Quality Monitoring

The ambient air quality has been carried out at various sources of air pollution surrounding and in the Plant. The prime objective of the ambient air quality monitoring is to assess the existing air quality of the area. The ambient air quality monitoring was carried out for 24 hours at each station. At all stations SO₂, NO₂, PM₁₀, PM_{2.5}, CO and Mercury were monitored. All the samples collected were analyzed for quantitative analysis of various pollutants. The ambient air quality sampling locations were identified by the Environmental Officer of Raigarh Energy Generation Ltd.

3.2.2 Water Environment

The ground water samples, surface water samples were collected from selected locations in two liter sterilized plastic cans. These samples were analyzed as per IS 10500:2012. The domestic effluent and Industrial effluent samples were collected and analyzed for parameters: pH , Total suspended solids, Biochemical Oxygen Demand, Chemical Oxygen Demand and Oil & Grease.

3.2.3 Noise Environment

Sound level meter was used to know the sound levels generated due to plant activities at different locations. The measurements were taken for Equivalent sound level over a time period for day and night which is expressed in dB(A).

3.2.4 Soil

The Soil samples were collected from selected locations. These samples were analyzed for Physico-Chemical parameters including heavy metals.

Chapter – 4.0

SAMPLING LOCATION MAP AND ANALYSIS REPORTS

4.1 Ambient Air Quality Monitoring



Figure No.3. Plan Showing Ambient Air Quality Location Map

Location Code: -

- A1- Village-Amalibhauna
- A2- Village- Kathali
- A3- Village- Chhote Bhandar
- A4- Village-Bade Bhandar
- A5- Near Site Office
- A6- Near Fire Office



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Test Report

Sample Number: VEL/REGL/AA/01 Report No.: VEL/A/2207300001
Name & Address of the Party: M/s Raigarh Energy Generation Ltd. Format No.: 7.8 F-03
Village -Chhote Bhandar, Post Office- Bade Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh) Party Reference No.: NIL
Report Date: 03/08/2022
Period of Analysis: 30/07/2022 to 03/08/2022
Receipt Date: 30/07/2022

Sample Description: Ambient Air Quality Monitoring

General Information:-

Sampling Location : Village - Palsada
Sample Collected By : Vardan EnviroLab Representative
Sampling Equipment Used : RDS & FPS
Instrument Code : VEL/RDS/FPS/01
Instrument Calibration Status : Calibrated
Latitude (N) : 21°44'13"
Longitude (E) : 83°16'30"
Meteorological Condition During Monitoring : Cloudy Sky
Date of Sampling : 26/07/2022 to 27/07/2022
Time of Sampling : 10:20 AM to 10:20 AM
Ambient Temperature (°C) : Min.25°C & Max. 32°C
Surrounding Activity : Human, Vehicular & other Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182
Sampling Duration : 24 Hrs.
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	SOP No. VEL/SOP/01, Section No. SP 63	25.76	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS 5182 (P 23) , Gravimetric Method	59.64	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS 5182 (P 6) ,Jacob & Hochheiser	16.40	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS 5182 (P 2) ,Modified West and Gaeke	7.08	µg/m ³	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography	0.90	mg/m ³	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m ³	--

Note:- STP-Standard Testing Procedure, *BLQ-Below Limit of Quantification, **LOQ-Limit of Quantification.

End of Report



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ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REGL/AA/02 Report No.: VEL/A/2207300002
Name & Address of the Party: M/s Raigarh Energy Generation Ltd. Format No.: 7.8 F-03
Village - Chhote Bhandar, Post Office - Bade Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh) Party Reference No.: NIL
Report Date: 03/08/2022
Period of Analysis: 30/07/2022 to 03/08/2022
Receipt Date: 30/07/2022

Sample Description: Ambient Air Quality Monitoring

General Information:-

Sampling Location : Village - Kathli
Sample Collected By : Vardan EnviroLab Representative
Sampling Equipment Used : RDS & FPS
Instrument Code : VEL/RDS/FPS/02
Instrument Calibration Status : Calibrated
Latitude (N) : 21°44'17"
Longitude (E) : 83°16'19"
Meteorological Condition During Monitoring : Cloudy Sky
Date of Sampling : 26/07/2022 to 27/07/2022
Time of Sampling : 10:45 AM to 10:45 AM
Ambient Temperature (°C) : Min.25°C & Max. 32°C
Surrounding Activity : Human, Vehicular & other Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182
Sampling Duration : 24 Hrs.
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	SOP No. VEL/SOP/01, Section No. SP 63	29.46	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS 5182 (P 23) , Gravimetric Method	55.40	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS 5182 (P 6) ,Jacob & Hochheiser	15.80	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS 5182 (P 2) ,Modified West and Gaeke	7.98	µg/m ³	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography	0.82	mg/m ³	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m ³	--

Note:- STP-Standard Testing Procedure, *BLQ-Below Limit of Quantification, **LOQ-Limit of Quantification, ***End of Report***



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Test Report

Sample Number: VEL/REGL/AA/03 Report No.: VEL/A/2207300003
Name & Address of the Party: M/s Raigarh Energy Generation Ltd. Format No.: 7.8 F-03
Village - Chhote Bhandar, Post Office- Bade Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh) Party Reference No.: NIL
Report Date: 03/08/2022
Period of Analysis: 30/07/2022 to 03/08/2022
Receipt Date: 30/07/2022

Sample Description: Ambient Air Quality Monitoring

General Information:-

Sampling Location : Village - Chhote Bhandar
Sample Collected By : Vardan EnviroLab Representative
Sampling Equipment Used : RDS & FPS
Instrument Code : VEL/RDS/FPS/01
Instrument Calibration Status : Calibrated
Latitude (N) : 21°44'22"
Longitude (E) : 83°16'43"
Meteorological Condition During Monitoring : Cloudy Sky
Date of Sampling : 27/07/2022 to 28/07/2022
Time of Sampling : 10:35 AM to 10:35 AM
Ambient Temperature (°C) : Min.25°C & Max. 34°C
Surrounding Activity : Human, Vehicular & Other Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182
Sampling Duration : 24 Hrs.
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	SOP No. VEL/SOP/01, Section No. SP 63	30.08	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS 5182 (P 23) , Gravimetric Method	61.73	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS 5182 (P 6) ,Jacob & Hochheiser	17.00	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS 5182 (P 2) ,Modified West and Gaeke	8.98	µg/m ³	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography	0.71	mg/m ³	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m ³	--

Note:- STP-Standard Testing Procedure, *BLQ-Below Limit of Quantification, **LOQ-Limit of Quantification.

End of Report



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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
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Test Report

Sample Number: VEL/REGL/AA/04 Report No.: VEL/A/2207300004
Name & Address of the Party: M/s Raigarh Energy Generation Ltd. Format No.: 7.8 F-03
Village - Chhote Bhandar, Post Office - Bade Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh) Party Reference No.: NIL
Report Date: 03/08/2022
Period of Analysis: 30/07/2022 to 03/08/2022
Receipt Date: 30/07/2022

Sample Description: Ambient Air Quality Monitoring

General Information:-

Sampling Location : Village - Bade Bhandar
Sample Collected By : Vardan EnviroLab Representative
Sampling Equipment Used : RDS & FPS
Instrument Code : VEL/RDS/FPS/02
Instrument Calibration Status : Calibrated
Latitude (N) : 21°44'29"
Longitude (E) : 83°17'6"
Meteorological Condition During Monitoring : Cloudy Sky
Date of Sampling : 27/07/2022 to 28/07/2022
Time of Sampling : 11:20 AM to 11:20 AM
Ambient Temperature (°C) : Min.25°C & Max. 34°C
Surrounding Activity : Human, Vehicular & other Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182
Sampling Duration : 24 Hrs.
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	SOP No. VEL/SOP/01, Section No. SP 63	33.76	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS 5182 (P 23), Gravimetric Method	59.88	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS 5182 (P 6) Jacob & Hochheiser	16.92	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS 5182 (P 2), Modified West and Gaeke	8.80	µg/m ³	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography	0.79	mg/m ³	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m ³	--

Note:- STP-Standard Testing Procedure, *BLQ-Below Limit of Quantification, **LOQ-Limit of Quantification.

End of Report



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Test Report

Sample Number: VEL/REGL/AA/01
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar,
Post Office- Bade Bandar, Tehsil-
Pussore, Dist- Raigarh - 496100
(Chhattisgarh)

Report No.: VEL/A/2209030001
Format No.: 7.8 F-03
Party Reference No.: 5703005102
Dated- 28.06.2022
Report Date: 08/09/2022
Period of Analysis: 03/09/2022 to 08/09/2022
Receipt Date: 03/09/2022

Sample Description: Ambient Air Quality Monitoring

General Information:-

Sampling Location : Village - Palsada
Sample Collected By : Vardan EnviroLab Representative
Sampling Equipment Used : RDS & FPS
Instrument Code : VEL/RDS/FPS/01
Instrument Calibration Status : Calibrated
Latitude (N) : 21°44'13"
Longitude (E) : 83°16'30"
Meteorological Condition During Monitoring : Intermittent Clouds
Date of Sampling : 29/08/2022 to 30/08/2022
Time of Sampling : 10:30 AM to 10:30 AM
Ambient Temperature (°C) : Min.24°C & Max. 32°C
Surrounding Activity : Human, Vehicular & other Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182
Sampling Duration : 24 Hrs.
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1	Particulate Matter (PM _{2.5})	SOP No. VEL/SOP/01, Section No. SP 63	23.06	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS 5182 (P 23) , Gravimetic Method	49.44	µg/m ³	100
3	Nitrogen Dioxide (NO ₂)	IS 5182 (P 6) ,Jacob & Hochheiser	15.67	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS 5182 (P 2) ,Modified West and Gaeke	7.22	µg/m ³	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography	0.83	mg/m ³	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m ³	--

Note:- STP-Standard Testing Procedure, *BLQ-Below Limit of Quantification, **LOQ-Limit of Quantification, ***End of Report***





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REGL/AA/02
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office-
Bade Bandar, Tehsil- Pussore, Dist-
Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/A/2209030002
Format No.: 7.8 F-03
Party Reference No.: 5703005102
Dated- 28.06.2022

Report Date: 08/09/2022
Period of Analysis: 03/09/2022 to 08/09/2022
Receipt Date: 03/09/2022

Sample Description: Ambient Air Quality Monitoring

General Information:-

Sampling Location : Village - Kathli
Sample Collected By : Vardan EnviroLab Representative
Sampling Equipment Used : RDS & FPS
Instrument Code : VEL/RDS/FPS/02
Instrument Calibration Status : Calibrated
Latitude (N) : 21°44'17"
Longitude (E) : 83°16'19"
Meteorological Condition During Monitoring : Intermittent Clouds
Date of Sampling : 29/08/2022 to 30/08/2022
Time of Sampling : 10:45 AM to 10:45 AM
Ambient Temperature (°C) : Min.24°C & Max. 32°C
Surrounding Activity : Human, Vehicular & other Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182
Sampling Duration : 24 Hrs.
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	SOP No. VEL/SOP/01, Section No. SP 63	27.35	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS 5182 (P 23) , Gravimetic Method	52.48	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS 5182 (P 6) ,Jacob & Hochheiser	16.80	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS 5182 (P 2) ,Modified West and Gaeke	8.06	µg/m ³	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography	0.74	mg/m ³	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m ³	--

Note:- STP-Standard Testing Procedure, *BLQ-Below Limit of Quantification, **LOQ-Limit of Quantification,
End of Report



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REGL/AA/03
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office-
Bade Bandar, Tehsil- Pussore, Dist-
Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/A/2209030003
Format No.: 7.8 F-03
Party Reference No.: 5703005102
Dated- 28.06.2022

Report Date: 08/09/2022
Period of Analysis: 03/09/2022 to 08/09/2022
Receipt Date: 03/09/2022

Sample Description: Ambient Air Quality Monitoring

General Information:-

Sampling Location : Village – Chhote Bhandar
Sample Collected By : Vardan EnviroLab Representative
Sampling Equipment Used : RDS & FPS
Instrument Code : VEL/RDS/FPS/01
Instrument Calibration Status : Calibrated
Latitude (N) : 21°44'22"
Longitude (E) : 83°16'43"
Meteorological Condition During Monitoring : Intermittent Clouds
Date of Sampling : 30/08/2022 to 31/08/2022
Time of Sampling : 10:20 AM to 10:20 AM
Ambient Temperature (°C) : Min.25°C & Max. 32°C
Surrounding Activity : Human, Vehicular & Other Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182
Sampling Duration : 24 Hrs.
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	SOP No. VEL/SOP/01, Section No. SP 63	32.44	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS 5182 (P 23) , Gravimetic Method	57.51	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS 5182 (P 6) ,Jacob & Hochheiser	16.98	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS 5182 (P 2) ,Modified West and Gaeke	7.83	µg/m ³	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography	0.68	mg/m ³	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m ³	--

Note:- STP-Standard Testing Procedure, *BLQ-Below Limit of Quantification, **LOQ-Limit of Quantification.
End of Report



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Test Report

Sample Number: VEL/REGL/AA/04
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village – Chhote Bhandar, Post Office-
Bade Bandar, Tehsil- Pussore, Dist-
Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/A/2209030004
Format No.: 7.8 F-03
Party Reference No.: 5703005102
Dated- 28.06.2022

Report Date: 08/09/2022
Period of Analysis: 03/09/2022 to 08/09/2022
Receipt Date: 03/09/2022

Sample Description: Ambient Air Quality Monitoring

General Information:-

Sampling Location : Village – Bade Bhandar
Sample Collected By : Vardan EnviroLab Representative
Sampling Equipment Used : RDS & FPS
Instrument Code : VEL/RDS/FPS/02
Instrument Calibration Status : Calibrated
Latitude (N) : 21°44'29"
Longitude (E) : 83°17'6"
Meteorological Condition During Monitoring : Intermittent Clouds
Date of Sampling : 30/08/2022 to 31/08/2022
Time of Sampling : 11:45 AM to 11:45 AM
Ambient Temperature (°C) : Min.26°C & Max. 33°C
Surrounding Activity : Human, Vehicular & other Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182
Sampling Duration : 24 Hrs.
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	SOP No. VEL/SOP/01, Section No. SP 63	35.56	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS 5182 (P 23) , Gravimetric Method	56.67	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS 5182 (P 6) ,Jacob & Hochheiser	17.42	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS 5182 (P 2) ,Modified West and Gaeke	7.92	µg/m ³	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography	0.74	mg/m ³	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m ³	--

Note:- STP-Standard Testing Procedure, *BLQ-Below Limit of Quantification, **LOQ-Limit of Quantification.
End of Report





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/AA/05	Report No.:	VEL/A/2209030005
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village -Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description :	Ambient Air Quality Monitoring	Report Date:	08/09/2022
		Period of Analysis:	03/09/2022 to 08/09/2022
		Receipt Date:	03/09/2022

General Information:-

Sampling Location	: Near Site Office
Sample collected by	: Vardan EnviroLab Representative
Sampling Equipment used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/01
Instrument Calibration Status	: Calibrated
Latitude	: 21°44'27"
Longitude	: 83°16'32"
Meteorological condition during monitoring	: Intermittent Clouds
Date of Sampling	: 31/08/2022 to 01/09/2022
Time of Sampling	: 12:00 PM to 12:00 PM
Ambient Temperature (°C)	: Min.26°C, Max. 33 °C
Surrounding Activity	: Human , Vehicular & other Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: IS-5182 & CPCB Guidelines
Sampling Duration	: 24 hrs.
Parameter Required	: As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	SOP No. VEL/SOP/01, Section No. SP 63	27.46	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS 5182 (P 23) , Gravimetric Method	58.43	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS 5182 (P 6) ,Jacob & Hochheiser	22.16	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS 5182 (P 2) ,Modified West and Gaeke	9.41	µg/m ³	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography	0.63	mg/m ³	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m ³	--

Note:- STP-Standard Testing Procedure, *BLQ-Below Limit of Quantification, **LOQ-Limit of Quantification, ***End of Report***



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/AA/01	Report No.:	VEL/A/2209290001
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office- Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102 Dated- 28.06.2022
		Report Date:	04/10/2022
		Period of Analysis:	29/09/2022 to 04/10/2022
		Receipt Date:	29/09/2022

Sample Description: Ambient Air Quality Monitoring

General Information:-

Sampling Location	: Village - Amalibhauna
Sample Collected By	: Vardan EnviroLab Representative
Sampling Equipment Used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/01/04
Instrument Calibration Status	: Calibrated
Latitude (N)	: 21°44'13"
Longitude (E)	: 83°16'30"
Meteorological Condition During Monitoring	: Intermittent Rain
Date of Sampling	: 26/09/2022 to 27/09/2022
Time of Sampling	: 10:30 AM to 10:30 AM
Ambient Temperature (°C)	: Min.24°C & Max. 32°C
Surrounding Activity	: Human, Vehicular & other Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: CPCB Guidelines & IS-5182
Sampling Duration	: 24 Hrs.
Parameter Required	: As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	SOP No. VEL/SOP/01, Section No. SP 63	25.46	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS 5182 (P 23), Gravimetric Method	43.23	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS 5182 (P 6), Jacob & Hochheiser	12.67	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS 5182 (P 2), Modified West and Gaeke	8.35	µg/m ³	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography	0.78	mg/m ³	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m ³	--

Note:- STP-Standard Testing Procedure, *BLQ-Below Limit of Quantification, **LOQ-Limit of Quantification.
End of Report



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/AA/02	Report No.:	VEL/A/2209290002
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office - Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102 Dated- 28.06.2022
		Report Date:	04/10/2022
		Period of Analysis:	29/09/2022 to 04/10/2022
		Receipt Date:	29/09/2022
Sample Description:	Ambient Air Quality Monitoring		

General Information:-

Sampling Location	: Village - Kathli
Sample Collected By	: Vardan EnviroLab Representative
Sampling Equipment Used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/02/03
Instrument Calibration Status	: Calibrated
Latitude (N)	: 21°44'17"
Longitude (E)	: 83°16'19"
Meteorological Condition During Monitoring	: Intermittent Rain
Date of Sampling	: 26/09/2022 to 27/09/2022
Time of Sampling	: 10:45 AM to 10:45 AM
Ambient Temperature (°C)	: Min.24°C & Max. 32°C
Surrounding Activity	: Human, Vehicular & other Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: CPCB Guidelines & IS-5182
Sampling Duration	: 24 Hrs.
Parameter Required	: As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	SOP No. VEL/SOP/01, Section No. SP 63	25.27	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS 5182 (P 23), Gravimetric Method	48.25	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS 5182 (P 6), Jacob & Hochheiser	14.74	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS 5182 (P 2), Modified West and Gaeke	9.03	µg/m ³	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography	0.62	mg/m ³	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m ³	--

Note:- STP-Standard Testing Procedure, *BLQ-Below Limit of Quantification, **LOQ-Limit of Quantification.
End of Report



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Test Report

Sample Number: VEL/REGL/AA/03
Name & Address of the Party: M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office - Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)
Report No.: VEL/A/2209290003
Format No.: 7.8 F-03
Party Reference No.: 5703005102
Dated- 28.06.2022
Report Date: 04/10/2022
Period of Analysis: 29/09/2022 to 04/10/2022
Receipt Date: 29/09/2022

Sample Description: Ambient Air Quality Monitoring

General Information:-

Sampling Location : Village - Chhote Bhandar
Sample Collected By : Vardan EnviroLab Representative
Sampling Equipment Used : RDS & FPS
Instrument Code : VEL/RDS/FPS/03/01
Instrument Calibration Status : Calibrated
Latitude (N) : 21°44'22"
Longitude (E) : 83°16'43"
Meteorological Condition During Monitoring : Intermittent Rain
Date of Sampling : 26/09/2022 to 27/09/2022
Time of Sampling : 10:20 AM to 10:20 AM
Ambient Temperature (°C) : Min.24°C & Max. 32°C
Surrounding Activity : Human, Vehicular & Other Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182
Sampling Duration : 24 Hrs.
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	SOP No. VEL/SOP/01, Section No. SP 63	30.65	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS 5182 (P 23) , Gravimetric Method	54.82	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS 5182 (P 6) ,Jacob & Hochheiser	13.56	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS 5182 (P 2) ,Modified West and Gaeke	8.13	µg/m ³	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography	0.75	mg/m ³	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m ³	--

Note:- STP-Standard Testing Procedure, *BLQ-Below Limit of Quantification, **LOQ-Limit of Quantification, ***End of Report***





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REGL/AA/04
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office-
Bade Bandar, Tehsil- Pussore, Dist-
Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/A/2209290004
Format No.: 7.8 F-03
Party Reference No.: 5703005102
Dated- 28.06.2022

Report Date: 04/10/2022
Period of Analysis: 29/09/2022 to 04/10/2022
Receipt Date: 29/09/2022

Sample Description: Ambient Air Quality Monitoring

General Information:-

Sampling Location : Village - Bade Bhandar
Sample Collected By : Vardan EnviroLab Representative
Sampling Equipment Used : RDS & FPS
Instrument Code : VEL/RDS/FPS/04/07
Instrument Calibration Status : Calibrated
Latitude (N) : 21°44'29"
Longitude (E) : 83°17'6"
Meteorological Condition During Monitoring : Intermittent Rain
Date of Sampling : 26/09/2022 to 27/09/2022
Time of Sampling : 11:45 AM to 11:45 AM
Ambient Temperature (°C) : Min.24°C & Max. 32°C
Surrounding Activity : Human, Vehicular & other Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : CPCB Guidelines & IS-5182
Sampling Duration : 24 Hrs.
Parameter Required : As Per Work Order

S. No.	Parameters	Protocol	Results	Units	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	SOP No. VEL/SOP/01, Section No. SP 63	32.72	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS 5182 (P 23), Gravimetric Method	53.18	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS 5182 (P 6) Jacob & Hochheiser	14.76	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS 5182 (P 2) Modified West and Gaeke	5.98	µg/m ³	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography	0.63	mg/m ³	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m ³	--

Note:- STP-Standard Testing Procedure, *BLQ-Below Limit of Quantification, **LOQ-Limit of Quantification,
End of Report



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Test Report

Sample Number: VEL/REGL/AA/05
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)
Report No.: VEL/A/2209290005
Format No.: 7.8 F-03
Party Reference No.: 5703005102
Dated- 28.06.2022
Report Date: 04/10/2022
Period of Analysis: 29/09/2022 to 04/10/2022
Receipt Date: 29/09/2022
Sample Description : Ambient Air Quality Monitoring

General Information:-

Sampling Location : Near Site Office
Sample collected by : Vardan EnviroLab Representative
Sampling Equipment used : RDS & FPS
Instrument Code : VEL/RDS/FPS/01/04
Instrument Calibration Status : Calibrated
Latitude : 21°44'27"
Longitude : 83°16'32"
Meteorological condition during monitoring : Cloudy Sky
Date of Sampling : 24/09/2022 to 25/09/2022
Time of Sampling : 12:00 PM to 12:00 PM
Ambient Temperature (°C) : Min.26°C, Max. 33 °C
Surrounding Activity : Human , Vehicular & other Activities
Scope of Monitoring : Regulatory Requirement
Sampling & Analysis Protocol : IS-5182 & CPCB Guidelines
Sampling Duration : 24 hrs.
Parameter Required : As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	SOP No. VEL/SOP/01, Section No. SP 63	24.26	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS 5182 (P 23) , Gravimetric Method	54.32	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS 5182 (P 6) ,Jacob & Hochheiser	23.45	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS 5182 (P 2) ,Modified West and Gaeke	8.71	µg/m ³	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography	0.54	mg/m ³	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m ³	--

Note:- STP-Standard Testing Procedure, *BLQ-Below Limit of Quantification, **LOQ-Limit of Quantification, ***End of Report***

Amith
(Checked By)





Test Report

Sample Number:	VEL/REGL/AA/06	Report No.:	VEL/A/2209290006
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description :	Ambient Air Quality Monitoring	Report Date:	04/10/2022
		Period of Analysis:	29/09/2022 to 04/10/2022
		Receipt Date:	29/09/2022

General Information:-

Sampling Location	: Switch Yard
Sample collected by	: Vardan EnviroLab Representative
Sampling Equipment used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/02/03
Instrument Calibration Status	: Calibrated
Latitude	: 21°44'27"
Longitude	: 83°16'32"
Meteorological condition during monitoring	: Cloudy Sky
Date of Sampling	: 24/09/2022 to 25/09/2022
Time of Sampling	: 12:20 PM to 12:20 PM
Ambient Temperature (°C)	: Min.26°C, Max. 33 °C
Surrounding Activity	: Human , Vehicular & other Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: IS-5182 & CPCB Guidelines
Sampling Duration	: 24 hrs.
Parameter Required	: As Per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (PM _{2.5})	SOP No. VEL/SOP/01, Section No. SP 63	28.16	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS 5182 (P 23) , Gravimetric Method	57.44	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS 5182 (P 6) ,Jacob & Hochheiser	19.12	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS 5182 (P 2) ,Modified West and Gaeke	7.23	µg/m ³	80
5.	Carbon Monoxide (CO)	IS 5182 (P-10) Gas Chromatography	0.62	mg/m ³	4.0
6.	Mercury (Hg)	VEL/ENV/STP/129, Issue No.-01, Issue Date-01/11/2021	BLQ(LOQ-1.0)	ng/m ³	--

Note:- STP-Standard Testing Procedure, *BLQ-Below Limit of Quantification, **LOQ-Limit of Quantification.
End of Report



4.2 Noise Level Monitoring



Figure No.4. Plan Showing Noise Level Monitoring Location Map

Ambient Noise Level Monitoring Locations

Location Code: -

- A1- Village-Amalibhauna
- A2- Village- Kathali
- A3- Village- Chhote Bhandar
- A4- Village-Bade Bhader
- A5- Near Site Office
- A6- Admin Office
- A7- Near Fire Office
- A8- Near DM Plant



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Test Report

Sample Number: VEL/REGL/AN/01 Report No.: VEL/N/2207300001
Name & Address of the Party: M/s Raigarh Energy Generation Ltd. Format No.: 7.8 F-03
Village - Chhote Bhandar, Post Office- Bade Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh) Party Reference No.: NIL
Reporting Date: 03/08/2022
Receipt Date: 30/07/2022

Sample Description: Ambient Noise Level Monitoring

General Information:-

Sample Collected By : Vardan EnviroLab Representative
Sampling Location : Village- Palsada
Instrument Used : Sound Level Meter-01
Instrument Code : VEL/SLM/05
Instrument Calibration Status : Calibrated
Meteorological Condition During Monitoring : Cloudy sky
Date of Monitoring : 26/07/2022 to 27/07/2022
Time of Monitoring : 06:00 AM to 06:00AM
Ambient Temperature (°C) : Min.25°C & Max. 32 °C
Surrounding Activity : Human, Vehicular and other Activities
Sampling Duration : 24 Hrs.
Scope of Monitoring : Regulatory Requirement
Protocol Used : IS 9989 & CPCB Guidelines
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L_{Max}	IS:9989	59.0	51.6
2.	L_{Min}	IS:9989	39.3	38.2
3.	L_{eq}	IS:9989	53.28	42.46

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

- Day Time is from 6.00 AM to 10.00 PM.
- Night Time is reckoned between 10.00 PM to 6.00 AM.
- Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.

Note: Method categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.



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Test Report

Sample Number:	VEL/REGL/AN/02	Report No.:	VEL/N/2207300002
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village – Chhote Bhandar, Post Office- Bade Bhandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	03/08/2022
		Receipt Date:	30/07/2022

Sample Description: Ambient Noise Level Monitoring

General Information:-

Sample Collected By	: Vardan EnviroLab Representative
Sampling Location	: Village-Kathli
Instrument Used	: Sound Level Meter-02
Instrument Code	: VEL/SLM/06
Instrument Calibration Status	: Calibrated
Meteorological Condition During Monitoring	: Cloudy sky
Date of Monitoring	: 26/07/2022 to 27/07/2022
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min.25°C & Max. 32 °C
Surrounding Activity	: Human, Vehicular and other Activities
Sampling Duration	: 24 Hrs.
Scope of Monitoring	: Regulatory Requirement
Protocol Used	: IS 9989 & CPCB Guidelines
Parameter Required	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L _{Max}	IS:9989	62.8	50.7
2.	L _{Min}	IS:9989	42.3	38.1
3.	L _{eq}	IS:9989	56.51	44.78

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6.00 AM to 10.00 PM.
 2. Night Time is reckoned between 10.00 PM to 6.00 AM.
 3. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.
- Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.



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Test Report

Sample Number:	VEL/REGL/AN/03	Report No.:	VEL/N/2207300003
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office- Bade Bhandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	03/08/2022
		Receipt Date:	30/07/2022

Sample Description: Ambient Noise Level Monitoring

General Information:-

Sample Collected By	: Vardan EnviroLab Representative
Sampling Location	: Village-Chhote Bhandar
Instrument Used	: Sound Level Meter-01
Instrument Code	: VEL/SLM/05
Instrument Calibration Status	: Calibrated
Meteorological Condition During Monitoring	: Cloudy sky
Date of Monitoring	: 27/07/2022 to 28/07/2022
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min.25°C & Max. 34 °C
Surrounding Activity	: Human, Vehicular and other Activities
Sampling Duration	: 24 Hrs.
Scope of Monitoring	: Regulatory Requirement
Protocol Used	: IS 9989 & CPCB Guidelines
Parameter Required	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L_{max}	IS-9989	65.8	49.6
2.	L_{min}	IS-9989	47.5	34.2
3.	L_{eq}	IS-9989	52.76	43.78

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

- Day Time is from 6:00 AM to 10:00 PM.
 - Night Time is reckoned between 10:00 PM to 6:00 AM.
 - Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.
- Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.



VEL76-02771878166

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Test Report

Sample Number: VEL/REGL/AN/04
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village – Chhote Bhandar, Post Office- Bade Bhandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/N/2207300004
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 03/08/2022
Receipt Date: 30/07/2022

Sample Description: Ambient Noise Level Monitoring

General Information:-

Sample Collected By : Vardan EnviroLab Representative
Sampling Location : Village- Bade Bhandar
Instrument Used : Sound Level Meter-02
Instrument Code : VEL/SLM/06
Instrument Calibration Status : Calibrated
Meteorological Condition During Monitoring : Cloudy sky
Date of Monitoring : 27/07/2022 to 28/07/2022
Time of Monitoring : 06:00 AM to 06:00AM
Ambient Temperature (°C) : Min.25°C & Max. 34 °C
Surrounding Activity : Human, Vehicular and other Activities
Sampling Duration : 24 Hrs.
Scope of Monitoring : Regulatory Requirement
Protocol Used : IS 9989 & CPCB Guidelines
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L_{Max}	IS:9989	62.6	54.2
2.	L_{Min}	IS:9989	43.0	34.7
3.	L_{90}	IS:9989	53.08	39.76

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6.00 AM to 10.00 PM.
2. Night Time is reckoned between 10.00 PM to 6.00 AM.
3. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.

Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.



VEL18-C317781P0185

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Test Report

Sample Number: VEL/REGL/AN/01
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar,
Post Office- Bade Bandar, Tehsil- Pussore,
Dist- Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/N/2209030001
Format No.: 7.8 F-03
Party Reference No.: 5703005102
Dated- 28.06.2022

Reporting Date: 08/09/2022
Receipt Date: 03/09/2022

Sample Description: Ambient Noise Level Monitoring

General Information:-

Sample Collected By : Vardan EnviroLab Representative
Sampling Location : Village- Palsada
Instrument Used : Sound Level Meter-01
Instrument Code : VEL/SLM/08
Instrument Calibration Status : Calibrated
Meteorological Condition During Monitoring : Intermittent Clouds
Date of Monitoring : 29/08/2022 to 30/08/2022
Time of Monitoring : 06:00 AM to 06:00AM
Ambient Temperature (°C) : Min.24°C & Max. 32°C
Surrounding Activity : Human, Vehicular and other Activities
Sampling Duration : 24 Hrs.
Scope of Monitoring : Regulatory Requirement
Protocol Used : IS 9989 & CPCB Guidelines
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	L _{Max}	IS:9989	56.4	52.2
2	L _{Min}	IS:9989	36.4	36.4
3	L _{eq}	IS:9989	52.16	43.22

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6.00 AM to 10.00 PM.
2. Night Time is reckoned between 10.00 PM to 6.00 AM.
3. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.
Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.





Test Report

Sample Number:	VEL/REGL/AN/02	Report No.:	VEL/N/2209030002
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office- Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	08/09/2022
		Receipt Date:	03/09/2022

Sample Description: Ambient Noise Level Monitoring

General Information:-

Sample Collected By	:	Vardan EnviroLab Representative
Sampling Location	:	Village-Kathli
Instrument Used	:	Sound Level Meter-02
Instrument Code	:	VEL/SLM/09
Instrument Calibration Status	:	Calibrated
Meteorological Condition During Monitoring	:	Intermittent Clouds
Date of Monitoring	:	29/08/2022 to 30/08/2022
Time of Monitoring	:	06:00 AM to 06:00AM
Ambient Temperature (°C)	:	Min.24°C & Max. 32 °C
Surrounding Activity	:	Human, Vehicular and other Activities
Sampling Duration	:	24 Hrs.
Scope of Monitoring	:	Regulatory Requirement
Protocol Used	:	IS 9989 & CPCB Guidelines
Parameter Required	:	As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L _{Max}	IS:9989	58.2	49.8
2.	L _{Min}	IS:9989	40.6	34.8
3.	L _{eq}	IS:9989	53.16	42.11

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6.00 AM to 10.00 PM.
2. Night Time is reckoned between 10.00 PM to 6.00 AM.
3. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.

Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply



VEL/E-03/1/YR/PH6461

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Test Report

Sample Number:	VEL/REGL/AN/03	Report No.:	VEL/N/2209030003
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village – Chhote Bhandar, Post Office- Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	08/09/2022
		Receipt Date:	03/09/2022

Sample Description: Ambient Noise Level Monitoring

General Information:-

Sample Collected By	: Vardan EnviroLab Representative
Sampling Location	: Village-Chhote Bhandar
Instrument Used	: Sound Level Meter-01
Instrument Code	: VEL/SLM/05
Instrument Calibration Status	: Calibrated
Meteorological Condition During Monitoring	: Intermittent Clouds
Date of Monitoring	: 30/08/2022 to 31/08/2022
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min.25°C & Max. 32 °C
Surrounding Activity	: Human, Vehicular and other Activities
Sampling Duration	: 24 Hrs.
Scope of Monitoring	: Regulatory Requirement
Protocol Used	: IS 9989 & CPCB Guidelines
Parameter Required	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L _{Max}	IS:9989	57.2	51.8
2.	L _{Min}	IS:9989	45.1	32.4
3.	L _{eq}	IS:9989	53.16	41.44

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6.00 AM to 10.00 PM.
2. Night Time is reckoned between 10.00 PM to 6.00 AM.
3. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.
Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply



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Test Report

Sample Number: VEL/REGL/AN/04
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar,
Post Office- Bade Bandar, Tehsil- Pussore,
Dist- Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/N/2209030004
Format No.: 7.8 F-03
Party Reference No.: 5703005102
Dated- 28.06.2022

Reporting Date: 08/09/2022
Receipt Date: 03/09/2022

Sample Description: Ambient Noise Level Monitoring

General Information:-

Sample Collected By : Vardan EnviroLab Representative
Sampling Location : Village- Bade Bhandar
Instrument Used : Sound Level Meter-02
Instrument Code : VEL/SLM/06
Instrument Calibration Status : Calibrated
Meteorological Condition During Monitoring : Intermittent Clouds
Date of Monitoring : 30/08/2022 to 31/08/2022
Time of Monitoring : 06:00 AM to 06:00AM
Ambient Temperature (°C) : Min.26°C & Max. 33 °C
Surrounding Activity : Human, Vehicular and other Activities
Sampling Duration : 24 Hrs.
Scope of Monitoring : Regulatory Requirement
Protocol Used : IS 9989 & CPCB Guidelines
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L _{Max}	IS:9989	59.0	50.6
2.	L _{Min}	IS:9989	41.0	31.4
3.	L _{eq}	IS:9989	52.17	38.20

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6.00 AM to 10.00 PM.
2. Night Time is reckoned between 10.00 PM to 6.00 AM.
3. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.

Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply



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ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REGL/AN/05
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village – Chhote Bhandar,
Post Office- Bade Bandar, Tehsil- Pussore,
Dist- Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/N/2209030005
Format No.: 7.8 F-03
Party Reference No.: 5703005102
Dated- 28.06.2022
Reporting Date: 08/09/2022
Receipt Date: 03/09/2022

Sample Description: Ambient Noise Level Monitoring


General Information:-

Sample Collected By : Vardan EnviroLab Representative
Sampling Location : Near Site Office
Instrument Used : Sound Level Meter-03
Instrument Code : VEL/SLM/07
Instrument Calibration Status : Calibrated
Meteorological Condition During Monitoring : Intermittent Clouds
Date of Monitoring : 30/08/2022 to 31/08/2022
Time of Monitoring : 06:00 AM to 06:00AM
Ambient Temperature (°C) : Min.26°C & Max. 33 °C
Surrounding Activity : Human, Vehicular and other Activities
Sampling Duration : 24 Hrs.
Scope of Monitoring : Regulatory Requirement
Protocol Used : IS 9989 & CPCB Guidelines
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
4.	L _{Max}	IS:9989	66.4	53.8
5.	L _{Min}	IS:9989	48.1	41.5
6.	L _{eq}	IS:9989	59.32	45.81

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

4. Day Time is from 6.00 AM to 10.00 PM.
5. Night Time is reckoned between 10.00 PM to 6.00 AM.
6. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.
Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.


(Checked By)


Dr Shiv Prakash
(Approved By)
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ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/AN/01	Report No.:	VEL/N/2209290001
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office- Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	04/10/2022
		Receipt Date:	29/09/2022

Sample Description: Ambient Noise Level Monitoring

General Information:-

Sample Collected By	: Vardan EnviroLab Representative
Sampling Location	: Village- Amalibhauna
Instrument Used	: Sound Level Meter-01
Instrument Code	: VEL/SLM/08
Instrument Calibration Status	: Calibrated
Meteorological Condition During Monitoring	: Cloudy Sky
Date of Monitoring	: 24/09/2022 to 25/09/2022
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min.22°C & Max. 30°C
Surrounding Activity	: Human, Vehicular and other Activities
Sampling Duration	: 24 Hrs.
Scope of Monitoring	: Regulatory Requirement
Protocol Used	: IS 9989 & CPCB Guidelines
Parameter Required	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L _{Max}	IS-9989	58.6	48.2
2.	L _{Min}	IS-9989	37.3	39.6
3.	L _{eq}	IS-9989	51.62	42.36

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

- Day Time is from 6.00 AM to 10.00 PM.
 - Night Time is reckoned between 10.00 PM to 6.00 AM
 - Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.
- Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.



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Test Report

Sample Number: VEL/REGL/AN/02
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar,
Post Office- Bade Bandar, Tehsil- Pussore,
Dist- Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/N/2209290002
Format No.: 7.8 F-03
Party Reference No.: 5703005102
Dated- 28.06.2022
Reporting Date: 04/10/2022
Receipt Date: 29/09/2022

Sample Description: Ambient Noise Level Monitoring

General Information:-

Sample Collected By : Vardan EnviroLab Representative
Sampling Location : Village-Kathli
Instrument Used : Sound Level Meter-02
Instrument Code : VEL/SLM/09
Instrument Calibration Status : Calibrated
Meteorological Condition During Monitoring : Cloudy Sky
Date of Monitoring : 24/09/2022 to 25/09/2022
Time of Monitoring : 06:00 AM to 06:00AM
Ambient Temperature (°C) : Min.22°C & Max. 30 °C
Surrounding Activity : Human, Vehicular and other Activities
Sampling Duration : 24 hrs.
Scope of Monitoring : Regulatory Requirement
Protocol Used : IS 9989 & CPCB Guidelines
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L _{Max}	IS-9989	59.8	46.9
2.	L _{Min}	IS-9989	38.5	32.6
3.	L _{eq}	IS-9989	52.76	41.23

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6:00 AM to 10:00 PM.
2. Night Time is reckoned between 10:00 PM to 6:00 AM.
3. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.

Note: Mixed categories of areas are declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REGL/AN/03
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar,
Post Office- Bade Bandar, Tehsil- Pussore,
Dist- Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/N/2209290003
Format No.: 7.8 F-03
Party Reference No.: 5703005102
Dated- 28.06.2022
Reporting Date: 04/10/2022
Receipt Date: 29/09/2022

Sample Description: Ambient Noise Level Monitoring

General Information:-

Sample Collected By : Vardan EnviroLab Representative
Sampling Location : Village-Chhote Bhandar
Instrument Used : Sound Level Meter-03
Instrument Code : VEL/SLM/05
Instrument Calibration Status : Calibrated
Meteorological Condition During Monitoring : Cloudy Sky
Date of Monitoring : 24/09/2022 to 25/09/2022
Time of Monitoring : 06:00 AM to 06:00AM
Ambient Temperature (°C) : Min 22°C & Max. 30 °C
Surrounding Activity : Human, Vehicular and other Activities
Sampling Duration : 24 Hrs.
Scope of Monitoring : Regulatory Requirement
Protocol Used : IS 9989 & CPCB Guidelines
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L_{Max}	IS:9989	54.6	48.3
2.	L_{Min}	IS:9989	47.3	35.7
3.	L_{eq}	IS:9989	52.31	42.25

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6.00 AM to 10.00 PM.
2. Night Time is reckoned between 10.00 PM to 6.00 AM.
3. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.
Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.



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Test Report

Sample Number: VEL/REGL/AN/04
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar,
Post Office- Bade Bandar, Tehsil- Pussore,
Dist- Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/N/2209290004
Format No.: 7.8 F-03
Party Reference No.: 5703005102
Dated- 28.06.2022
Reporting Date: 04/10/2022
Receipt Date: 29/09/2022

Sample Description: Ambient Noise Level Monitoring

General Information:-

Sample Collected By : Vardan EnviroLab Representative
Sampling Location : Village- Bade Bhandar
Instrument Used : Sound Level Meter-04
Instrument Code : VEL/SLM/06
Instrument Calibration Status : Calibrated
Meteorological Condition During Monitoring : Cloudy Sky
Date of Monitoring : 24/09/2022 to 25/09/2022
Time of Monitoring : 06:00 AM to 06:00AM
Ambient Temperature (°C) : Min.22°C & Max. 30 °C
Surrounding Activity : Human, Vehicular and other Activities
Sampling Duration : 24 Hrs.
Scope of Monitoring : Regulatory Requirement
Protocol Used : IS 9989 & CPCB Guidelines
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L _{50s}	IS:9989	57.4	48.5
2.	L _{50m}	IS:9989	43.6	36.2
3.	L _{eq}	IS:9989	51.03	40.72

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6.00 AM to 10.00 PM.
 2. Night Time is reckoned between 10.00 PM to 6.00 AM.
 3. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.
- Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/AN/05	Report No.:	VEL/N/2209290005
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office- Bade Bandar, Tehsil- Passore, Dist- Raigarh - 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Reporting Date:	Dated- 28.06.2022
		Receipt Date:	04/10/2022
			29/09/2022

Sample Description: Ambient Noise Level Monitoring

General Information:-

Sample Collected By	: Vardan EnviroLab Representative
Sampling Location	: Near Site Office
Instrument Used	: Sound Level Meter-01
Instrument Code	: VEL/SLM/07
Instrument Calibration Status	: Calibrated
Meteorological Condition During Monitoring	: Cloudy Sky
Date of Monitoring	: 24/09/2022 to 25/09/2022
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min.22°C & Max. 30 °C
Surrounding Activity	: Human, Vehicular and other Activities
Sampling Duration	: 24 Hrs.
Scope of Monitoring	: Regulatory Requirement
Protocol Used	: IS 9989 & CPCB Guidelines
Parameter Required	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	L _{Min}	IS 9989	63.7	50.3
2	L _{Max}	IS-9989	45.2	38.1
3	L _{eq}	IS-9989	58.53	44.37

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

4. Day Time is from 6.00 AM to 10.00 PM.
 5. Night Time is reckoned between 10.00 PM to 6.00 AM
 6. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.
 Note: Mixed categories of areas are declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply



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Test Report

Sample Number:	VEL/REGL/AN/06	Report No.:	VEL/N/2209290006
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village – Chhote Bhandar, Post Office- Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated:	28.06.2022
		Reporting Date:	04/10/2022
		Receipt Date:	29/09/2022

Sample Description: Ambient Noise Level Monitoring

General Information:-

Sample Collected By	: Vardan EnviroLab Representative
Sampling Location	: Admin Office
Instrument Used	: Sound Level Meter-02
Instrument Code	: VEL/SLM/04
Instrument Calibration Status	: Calibrated
Meteorological Condition During Monitoring	: Cloudy Sky
Date of Monitoring	: 24/09/2022 to 25/09/2022
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min.22°C & Max. 30 °C
Surrounding Activity	: Human, Vehicular and other Activities
Sampling Duration	: 24 Hrs.
Scope of Monitoring	: Regulatory Requirement
Protocol Used	: IS 9989 & CPCB Guidelines
Parameter Required	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	L _{Max}	IS:9989	61.2	53.2
2	L _{Min}	IS:9989	42.5	36.4
3	L _{eq}	IS:9989	54.70	40.18

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

7. Day Time is from 6.00 AM to 10.00 PM.

8. Night Time is reckoned between 10.00 PM to 6.00 AM.

9. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.

Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
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Test Report

Sample Number:	VEL/REGL/AN/07	Report No.:	VEL/N/2209290007
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office- Bade Bandar, Tehsil- Passore, Dist- Raigarh - 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Reporting Date:	Dated- 28.06.2022
		Receipt Date:	04/10/2022
			29/09/2022

Sample Description: Ambient Noise Level Monitoring

General Information:-

Sample Collected By	: Vardan EnviroLab Representative
Sampling Location	: Switch Yard
Instrument Used	: Sound Level Meter-03
Instrument Code	: VEL/SLM/02
Instrument Calibration Status	: Calibrated
Meteorological Condition During Monitoring	: Cloudy Sky
Date of Monitoring	: 24/09/2022 to 25/09/2022
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min 22°C & Max. 30 °C
Surrounding Activity	: Human, Vehicular and other Activities
Sampling Duration	: 24 Hrs.
Scope of Monitoring	: Regulatory Requirement
Protocol Used	: IS 9989 & CPCB Guidelines
Parameter Required	: As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	L _{Max}	IS:9989	71.4	58.6
2	L _{Min}	IS:9989	42.3	41.2
3	L _{eq}	IS:9989	57.12	45.22

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

10. Day Time is from 6.00 AM to 10.00 PM.
11. Night Time is reckoned between 10.00 PM to 6.00 AM.
12. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.
Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply



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Test Report

Sample Number: VEL/REGL/AN/08
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village - Chhote Bhandar,
Post Office- Bade Bandar, Tehsil- Passore,
Dist- Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/N/2209290008
Format No.: 7.8 F-03
Party Reference No.: 5703005102
Dated- 28.06.2022
Reporting Date: 04/10/2022
Receipt Date: 29/09/2022

Sample Description: Ambient Noise Level Monitoring

General Information:-

Sample Collected By : Vardan EnviroLab Representative
Sampling Location : DM Plant
Instrument Used : Sound Level Meter-04
Instrument Code : VEL/SLM/03
Instrument Calibration Status : Calibrated
Meteorological Condition During Monitoring : Cloudy Sky
Date of Monitoring : 24/09/2022 to 25/09/2022
Time of Monitoring : 06:00 AM to 06:00 AM
Ambient Temperature (°C) : Min. 22°C & Max. 30 °C
Surrounding Activity : Human, Vehicular and other Activities
Sampling Duration : 24 Hrs.
Scope of Monitoring : Regulatory Requirement
Protocol Used : IS 9989 & CPCB Guidelines
Parameter Required : As per Work Order

S. No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1	L _{Min}	IS:9989	70.8	56.6
2	L _{Max}	IS:9989	47.3	35.9
3	L _{eq}	IS:9989	62.24	44.05

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

13. Day Time is from 6:00 AM to 10:00 PM.

14. Night Time is reckoned between 10:00 PM to 6:00 AM.

15. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.

Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.



4.3 Ground water Quality Analysis



Figure No.5. Plan Showing Ground Water Quality Monitoring Location Map

Location Code: -

- GW1- Industrial Canteen
- GW2- Near Ash Pond
- GW3- Village-Bade Bhandar
- GW4- village- Chhote Bhandar
- GW5- village- Amalibhauna



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/06	Report No.:	VEL/GW/2209030001
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village -Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	08/09/2022
		Period of Analysis:	03/09/2022 to 08/08/2022
Sample Description:	Ground Water	Receipt Date:	03/09/2022
Sampling Location:	Village- Palsada	Sampling Date:	31/08/2022
Sample Collected by:	Vardan EnviroLab Representative	Sampling Type:	Grab
Preservation:	Refrigerated	Sample Quantity:	2.5 Ltr + 250 ml
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS 3025		

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 4500H+ B Electrometric Method	7.54	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 2120 B Visual Comparison Method	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	APHA 2130 B Nephelometric Method	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	APHA 2150 B Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 2160 B Flavor Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	APHA 2340 C EDTA Titrimetric Method	196.28	mg/L	200	600
7.	Calcium (as Ca)	APHA 3500 Ca B EDTA Titrimetric Method	49.70	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	APHA 2320 B Titration Method	171.30	mg/L	200	600
9.	Chloride (as Cl)	APHA 4500 Cl B Argentometric Method	55.72	mg/L	250	1000
10.	Residual Free Chlorine	APHA 3500 Cl B Iodometric Method	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025(P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	17.56	mg/L	30	100
13.	Total Dissolved Solids	APHA 2540 C Gravimetric Method	322.00	mg/L	500	2000
14.	Sulphate (as SO ₄)	APHA 4500 E Turbidimetric Method	18.53	mg/L	200	400



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Test Report

Sample No.: VEL/REGL/W/06				Report No.: VEL/GW/2209030001		
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride (as F)	APHA 4500 F D SPADNS Method	0.36	mg/L	1.0	1.5
16.	Nitrate (as NO ₃)	IS 3025 (Part -34), Chromotropic Method	1.64	mg/L	45	No Relaxation
17.	Iron (as Fe)	APHA 3500 Fe B I,10 Phenanthroline Method	0.14	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	APHA 3111 D Direct Nitrous Oxide-Acetylene Flame Method	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19.	Boron	APHA 4500 B C Carmine Method	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	APHA 5530 C Chloroform Extraction	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	APHA 5540 C MBAS Method	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	APHA 3111B Air Acetylene Method	0.12	mg/L	5	15
24.	Copper (as Cu)	APHA 3111 B,Air Acetylene Flame Method	*BLQ(**LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	APHA 3111B Direct Air Acetylene Flame Method	*BLQ(**LOQ- 0.01)	mg/L	0.1	0.3
26.	Mineral Oil	APHA 5520-C Partition Infra Red	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	APHA 4500 S2- F Iodometric Method	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	APHA 3111 B Air Acetylene Method	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	APHA 3114 B Manual Hydride Generation	*BLQ(**LOQ 0.005)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	APHA 3114 B Manual Hydride Generation/ AAS Method	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
33.	Fecal. Coliform	IS:1622:2009	<2	MPN/100ml	--	

Note:- *BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/07	Report No.:	VEL/GW/2209030002
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	08/09/2022
		Period of Analysis:	03/09/2022 to 08/08/2022
Sample Description:	Ground Water	Receipt Date:	03/09/2022
Sampling Location:	Village- Kathli	Sampling Date:	31/08/2022
Sample Collected by:	Vardan EnviroLab Representative	Sampling Type:	Grah
Preservation:	Refrigerated	Sample Quantity:	2.5 Ltr + 250 ml
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS 3025		

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 4500H+ B Electrometric Method	7.26	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 2120 B Visual Comparison Method	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	APHA 2130 B Nephelometric Method	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	APHA 2150 B Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 2160 B Flavor Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	APHA 2340 C EDTA Titrimetric Method	218.44	mg/L	200	600
7.	Calcium (as Ca)	APHA 3500 Ca B EDTA Titrimetric Method	52.61	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	APHA 2320 B Titration Method	224.54	mg/L	200	600
9.	Chloride (as Cl)	APHA 4500 Cl B Argentometric Method	54.13	mg/L	250	1000
10.	Residual Free Chlorine	APHA 3500 Cl B Iodometric Method	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025(P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	21.18	mg/L	30	100
13.	Total Dissolved Solids	APHA 2540 C Gravimetric Method	318.60	mg/L	500	2000
14.	Sulphate (as SO ₄)	APHA 4500 E Turbidimetric Method	20.15	mg/L	200	400



VEL/E-03/1/TR/PN6547

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Test Report

Sample No.: VEL/REGL/W/07					Report No.: VEL/GW/2209030002	
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride (as F)	APHA 4500 F D SPADNS Method	0.43	mg/L	1.0	1.5
16.	Nitrate (as NO ₃)	IS 3025 (Part -34), Chromotropic Method	2.83	mg/L	45	No Relaxation
17.	Iron (as Fe)	APHA 3500 Fe B 1,10 Phenanthroline Method	0.20	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	APHA 3111 D Direct Nitrous Oxide-Acetylene Flame Method	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19.	Boron	APHA 4500 B C Carmine Method	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	APHA 5530 C Chloroform Extraction	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	APHA 5540 C MBAS Method	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	APHA 3111B Air Acetylene Method	0.10	mg/L	5	15
24.	Copper (as Cu)	APHA 3111 B,Air Acetylene Flame Method	*BLQ(**LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	APHA 3111B Direct Air Acetylene Flame Method	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	APHA 5520-C Partition Infra Red	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	APHA 4500 S2- F Iodometric Method	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	APHA 3111 B Air Acetylene Method	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	APHA 3114 B Manual Hydride Generation	*BLQ(**LOQ 0.005)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	APHA 3114 B Manual Hydride Generation/ AAS Method	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
33.	Fecal Coliform	IS:1622:2009	<2	MPN/100ml	**	

Note:- *BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/08	Report No.:	VEL/GW/2209030003
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description:	Ground Water	Reporting Date:	08/09/2022
Sampling Location:	Village- Chhote Bhandar	Period of Analysis:	03/09/2022 to 08/08/2022
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	03/09/2022
Preservation:	Refrigerated	Sampling Date:	31/08/2022
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS 3025	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr.+250 ml

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 4500H+ B Electrometric Method	7.32	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 2120 B Visual Comparison Method	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	APHA 2130 B Nephelometric Method	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	APHA 2150 B Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 2160 B Flavor Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	APHA 2340 C EDTA Titrimetric Method	242.07	mg/L	200	600
7.	Calcium (as Ca)	APHA 3500 Ca B EDTA Titrimetric Method	59.44	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	APHA 2320 B Titration Method	214.40	mg/L	200	600
9.	Chloride (as Cl)	APHA 4500 Cl B Argentometric Method	65.72	mg/L	250	1000
10.	Residual Free Chlorine	APHA 3500 Cl B Iodometric Method	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025(P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	22.78	mg/L	30	100
13.	Total Dissolved Solids	APHA 2540 C Gravimetric Method	392.00	mg/L	500	2000
14.	Sulphate (as SO ₄)	APHA 4500 E Turbidimetric Method	26.35	mg/L	200	400





Test Report

Sample No.: VEL/REGL/W/08					Report No.: VEL/GW/2209030003	
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15	Fluoride (as F)	APHA 4500 F D SPADNS Method	0.31	mg/L	1.0	1.5
16	Nitrate (as NO ₃)	IS 3025 (Part -34), Chromotropic Method	3.76	mg/L	45	No Relaxation
17	Iron (as Fe)	APHA 3500 Fe B 1,10 Phenanthroline Method	0.20	mg/L	1.0	No Relaxation
18	Aluminium (as Al)	APHA 3111 D Direct Nitrous Oxide-Acetylene Flame Method	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19	Boron	APHA 4500 B C Carmine Method	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20	Phenolic Compounds	APHA 5530 C Chloroform Extraction	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21	Anionic Detergents (as MBAS)	APHA 5540 C MBAS Method	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22	Cyanide as CN	APHA 4500CN-D	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23	Zinc (as Zn)	APHA 3111B Air Acetylene Method	*BLQ(**LOQ 0.01)	mg/L	5	15
24	Copper (as Cu)	APHA 3111 B,Air Acetylene Flame Method	*BLQ(**LOQ 0.002)	mg/L	0.05	1.5
25	Manganese (as Mn)	APHA 3111B Direct Air Acetylene Flame Method	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26	Mineral Oil	APHA 5520-C Partition Infra Red	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27	Sulphide	APHA 4500 S2- F Iodometric Method	*BLQ(**LOQ-0.02)	mg/L	200	400
28	Barium (as Ba)	APHA 3111 B Air Acetylene Method	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29	Arsenic (as As)	APHA 3114 B Manual Hydride Generation	*BLQ(**LOQ 0.005)	mg/L	0.01	No relaxation
30	Selenium (as Se)	APHA 3114 B Manual Hydride Generation/ AAS Method	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31	Total Coliform	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32	E. coli	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
33	Fecal Coliform	IS:1622:2009	<2	MPN/100ml	--	

Note:- *BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/09	Report No.:	VEL/GW/2209030004
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description:	Ground Water	Reporting Date:	08/09/2022
Sampling Location:	Village- Bade Bhandar	Period of Analysis:	03/09/2022 to 08/08/2022
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	03/09/2022
Preservation:	Refrigerated	Sampling Date:	31/08/2022
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS 3025	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr.+250 ml

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 4500H+ B Electrometric Method	7.76	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 2120 B Visual Comparison Method	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	APHA 2130 B Nephelometric Method	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	APHA 2150 B Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 2160 B Flavor Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	APHA 2340 C EDTA Titrimetric Method	284.16	mg/L	200	600
7.	Calcium (as Ca)	APHA 3500 Ca B EDTA Titrimetric Method	75.48	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	APHA 2320 B Titration Method	180.34	mg/L	200	600
9.	Chloride (as Cl)	APHA 4500 Cl B Argentometric Method	58.16	mg/L	250	1000
10.	Residual Free Chlorine	APHA 3500 Cl B Iodometric Method	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025(P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	23.29	mg/L	30	100
13.	Total Dissolved Solids	APHA 2540 C Gravimetric Method	396.00	mg/L	500	2000
14.	Sulphate (as SO ₄)	APHA 4500 E Turbidimetric Method	21.52	mg/L	200	400





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/09				Report No.: VEL/GW/2209030004		
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15	Fluoride (as F)	APHA 4500 F D SPADNS Method	0.33	mg/L	1.0	1.5
16	Nitrate (as NO ₃)	IS 3025 (Part -34), Chromotropic Method	3.62	mg/L	45	No Relaxation
17	Iron (as Fe)	APHA 3500 Fe B 1,10 Phenanthroline Method	0.21	mg/L	1.0	No Relaxation
18	Aluminium (as Al)	APHA 3111 D Direct Nitrous Oxide-Acetylene Flame Method	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19	Boron	APHA 4500 B C Carmine Method	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20	Phenolic Compounds	APHA 5530 C Chloroform Extraction	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21	Anionic Detergents (as MBAS)	APHA 5540 C MBAS Method	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22	Cyanide as CN	APHA 4500CN-D	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23	Zinc (as Zn)	APHA 3111B Air Acetylene Method	*BLQ(**LOQ 0.01)	mg/L	5	15
24	Copper (as Cu)	APHA 3111 B,Air Acetylene Flame Method	*BLQ(**LOQ 0.002)	mg/L	0.05	1.5
25	Manganese (as Mn)	APHA 3111B Direct Air Acetylene Flame Method	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26	Mineral Oil	APHA 5520-C Partition Infra Red	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27	Sulphide	APHA 4500 S2- F Iodometric Method	*BLQ(**LOQ-0.02)	mg/L	200	400
28	Barium (as Ba)	APHA 3111 B Air Acetylene Method	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29	Arsenic (as As)	APHA 3114 B Manual Hydride Generation	*BLQ(**LOQ 0.005)	mg/L	0.01	No relaxation
30	Selenium (as Se)	APHA 3114 B Manual Hydride Generation/ AAS Method	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31	Total Coliform	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32	E. coli	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
33	Fecal Coliform	IS:1622:2009	<2	MPN/100ml	--	

Note:- *BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.



VEL/E-03/1/TR/PN6542

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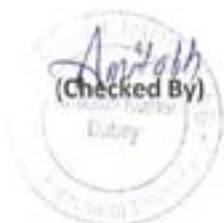
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/01	Report No.:	VEL/GW/2209290001
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description:	Ground Water	Reporting Date:	04/10/2022
Sampling Location:	Industrial Canteen	Period of Analysis:	29/09/2022 to 04/10/2022
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	29/09/2022
Preservation:	Refrigerated	Sampling Date:	24/09/2022
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS 3025	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr + 250 ml

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 4500H+ B Electrometric Method	7.16	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 2120 B Visual Comparison Method	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	APHA 2130 B Nephelometric Method	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	APHA 2150 B Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 2160 B Flavor Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	APHA 2340 C EDTA Titrimetric Method	189.39	mg/L	200	600
7.	Calcium (as Ca)	APHA 3500 Ca B EDTA Titrimetric Method	50.30	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	APHA 2320 B Titration Method	169.28	mg/L	200	600
9.	Chloride (as Cl)	APHA 4500 Cl B Argentometric Method	52.22	mg/L	250	1000
10.	Residual Free Chlorine	APHA 3500 Cl B Iodometric Method	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025(P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	15.53	mg/L	30	100
13.	Total Dissolved Solids	APHA 2540 C Gravimetric Method	306.00	mg/L	500	2000
14.	Sulphate (as SO ₄)	APHA 4500 E Turbidimetric Method	16.58	mg/L	200	400



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/06			Report No.: VEL/GW/2209290001			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride (as F)	APHA 4500 F D SPADNS Method	0.21	mg/L	1.0	1.5
16.	Nitrate (as NO ₃)	IS 3025 (Part -34), Chromotropic Method	1.82	mg/L	45	No Relaxation
17.	Iron (as Fe)	APHA 3500 Fe B 1,10 Phenanthroline Method	0.27	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	APHA 3111 D Direct Nitrous Oxide-Acetylene Flame Method	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19.	Boron	APHA 4500 B C Carmine Method	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	APHA 5530 C Chloroform Extraction	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	APHA 5540 C MBAS Method	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	APHA 3111B Air Acetylene Method	0.14	mg/L	5	15
24.	Copper (as Cu)	APHA 3111 B Air Acetylene Flame Method	*BLQ(**LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	APHA 3111B Direct Air Acetylene Flame Method	*BLQ(**LOQ- 0.01)	mg/L	0.1	0.3
26.	Mineral Oil	APHA 5520-C Partition Infra Red	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	APHA 4500 S2- F Iodometric Method	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	APHA 3111 B Air Acetylene Method	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	APHA 3114 B Manual Hydride Generation	*BLQ(**LOQ 0.005)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	APHA 3114 B Manual Hydride Generation/ AAS Method	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
33.	Fecal. Coliform	IS:1622:2009	<2	MPN/100ml	--	

Note:- *BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/02	Report No.:	VEL/GW/2209290002
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bhandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description:	Ground Water	Reporting Date:	04/10/2022
Sampling Location:	Guest House Canteen	Period of Analysis:	29/09/2022 to 04/10/2022
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	29/09/2022
Preservation:	Refrigerated	Sampling Date:	24/09/2022
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS 3025	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr.+250 ml

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 4500H+ B Electrometric Method	7.56	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 2120 B Visual Comparison Method	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	APHA 2130 B Nephelometric Method	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	APHA 2150 B Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 2160 B Flavor Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	APHA 2340 C EDTA Titrimetric Method	239.66	mg/l.	200	600
7.	Calcium (as Ca)	APHA 3500 Ca B EDTA Titrimetric Method	59.30	mg/l.	75	200
8.	Alkalinity (as CaCO ₃)	APHA 2320 B Titration Method	227.57	mg/l.	200	600
9.	Chloride (as Cl)	APHA 4500 Cl B Argentometric Method	63.38	mg/l.	250	1000
10.	Residual Free Chlorine	APHA 3500 Cl B Iodometric Method	*BLQ(**LOQ-0.15)	mg/l.	0.2	1
11.	Ammonia	IS 3025(P-34)	*BLQ(**LOQ-0.3)	mg/l.	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	22.29	mg/l.	30	100
13.	Total Dissolved Solids	APHA 2540 C Gravimetric Method	330.26	mg/l.	500	2000
14.	Sulphate (as SO ₄)	APHA 4500 E Turbidimetric Method	26.81	mg/l.	200	400



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/02			Report No.: VEL/GW/2209290002			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride (as F)	APHA 4500 F D SPADNS Method	0.47	mg/L	1.0	1.5
16.	Nitrate (as NO ₃)	IS 3025 (Part -34), Chromotropic Method	2.34	mg/L	45	No Relaxation
17.	Iron (as Fe)	APHA 3500 Fe B I,10 Phenanthroline Method	0.17	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	APHA 3111 D Direct Nitrous Oxide-Acetylene Flame Method	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19.	Boron	APHA 4500 B C Carmine Method	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	APHA 5530 C Chloroform Extraction	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	APHA 5540 C MBAS Method	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	APHA 3111B Air Acetylene Method	0.12	mg/L	5	15
24.	Copper (as Cu)	APHA 3111 B,Air Acetylene Flame Method	*BLQ(**LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	APHA 3111B Direct Air Acetylene Flame Method	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	APHA 5520-C Partition Infra Red	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	APHA 4500 S2- F Iodometric Method	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	APHA 3111 B Air Acetylene Method	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	APHA 3114 B Manual Hydride Generation	*BLQ(**LOQ 0.005)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	APHA 3114 B Manual Hydride Generation/ AAS Method	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
33.	Fecal Coliform	IS:1622:2009	<2	MPN/100ml	--	

Note:- *BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/03	Report No.:	VEL/GW/2209290003
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description:	Ground Water	Reporting Date:	04/10/2022
Sampling Location:	Piezometer Well (Near Ash Pond)	Period of Analysis:	29/09/2022 to 04/10/2022
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	29/09/2022
Preservation:	Refrigerated	Sampling Date:	24/09/2022
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS 3025	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr + 250 ml

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 4500H+ B Electrometric Method	7.36	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 2120 B Visual Comparison Method	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	APHA 2130 B Nephelometric Method	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	APHA 2150 B Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 2160 B Flavor Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	APHA 2340 C EDTA Titrimetric Method	230.42	mg/L	200	600
7.	Calcium (as Ca)	APHA 3500 Ca B EDTA Titrimetric Method	49.76	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	APHA 2320 B Titration Method	225.31	mg/L	200	600
9.	Chloride (as Cl)	APHA 4500 Cl B Argentometric Method	62.47	mg/L	250	1000
10.	Residual Free Chlorine	APHA 3500 Cl B Iodometric Method	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025(P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	25.83	mg/L	30	100
13.	Total Dissolved Solids	APHA 2540 C Gravimetric Method	315.86	mg/L	500	2000
14.	Sulphate (as SO ₄)	APHA 4500 E Turbidimetric Method	26.34	mg/L	200	400



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGI/W/03			Report No.: VEL/GW/2209290003			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride (as F)	APHA 4500 F D SPADNS Method	0.32	mg/L	1.0	1.5
16.	Nitrate (as NO ₃)	IS 3025 (Part -34), Chromotropic Method	3.19	mg/L	45	No Relaxation
17.	Iron (as Fe)	APHA 3500 Fe B 1,10 Phenanthroline Method	0.24	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	APHA 3111 D Direct Nitrous Oxide-Acetylene Flame Method	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19.	Boron	APHA 4500 B C Carmine Method	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	APHA 5530 C Chloroform Extraction	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	APHA 5540 C MBAS Method	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	APHA 3111B Air Acetylene Method	0.17	mg/L	5	15
24.	Copper (as Cu)	APHA 3111 B,Air Acetylene Flame Method	*BLQ(**LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	APHA 3111B Direct Air Acetylene Flame Method	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	APHA 5520-C Partition Infra Red	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	APHA 4500 S2- F Iodometric Method	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	APHA 3111 B Air Acetylene Method	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	APHA 3114 B Manual Hydride Generation	*BLQ(**LOQ 0.005)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	APHA 3114 B Manual Hydride Generation/ AAS Method	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
33.	Fecal Coliform	IS:1622:2009	<2	MPN/100ml	--	

Note:- *BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/04	Report No.:	VEL/GW/2209290004
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bhandar, Tehsil Pussore, Dist- Raigarh-496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated- 28.06.2022	
		Reporting Date:	04/10/2022
Sample Description:	Ground Water	Period of Analysis:	29/09/2022 to 04/10/2022
Sampling Location:	Village- Bade Bhandar	Receipt Date:	29/09/2022
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	24/09/2022
Preservation:	Refrigerated	Sampling Type:	Grab
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS 3025	Sample Quantity:	2.5 Ltr.+250 ml

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 4500H+ B Electrometric Method	7.33	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 2120 B Visual Comparison Method	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	APHA 2130 B Nephelometric Method	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	APHA 2150 B Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 2160 B Flavor Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	APHA 2340 C EDTA Titrimetric Method	274.35	mg/L	200	600
7.	Calcium (as Ca)	APHA 3500 Ca B EDTA Titrimetric Method	71.52	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	APHA 2320 B Titration Method	172.64	mg/L	200	600
9.	Chloride (as Cl)	APHA 4500 Cl B Argentometric Method	58.16	mg/l.	250	1000
10.	Residual Free Chlorine	APHA 3500 Cl B Iodometric Method	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025(P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	23.30	mg/L	30	100
13.	Total Dissolved Solids	APHA 2540 C Gravimetric Method	382.00	mg/L	500	2000
14.	Sulphate (as SO ₄)	APHA 4500 E Turbidimetric Method	20.52	mg/L	200	400



[Handwritten Signature]



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Test Report

Sample No.: VEL/REGI/W/04			Report No.: VEL/GW/2209290004			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride (as F)	APHA 4500 F D SPADNS Method	0.27	mg/L	1.0	1.5
16.	Nitrate (as NO ₃)	IS 3025 (Part -34), Chromotropic Method	3.12	mg/L	45	No Relaxation
17.	Iron (as Fe)	APHA 3500 Fe B 1,10 Phenanthroline Method	0.24	mg/l.	1.0	No Relaxation
18.	Aluminium (as Al)	APHA 3111 D Direct Nitrous Oxide-Acetylene Flame Method	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19.	Boron	APHA 4500 B C Carmine Method	*BLQ(**LOQ-0.01)	mg/l.	0.5	1
20.	Phenolic Compounds	APHA 5530 C Chloroform Extraction	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	APHA 5540 C MBAS Method	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	APHA 3111B Air Acetylene Method	0.16	mg/L	5	15
24.	Copper (as Cu)	APHA 3111 B,Air Acetylene Flame Method	*BLQ(**LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	APHA 3111B Direct Air Acetylene Flame Method	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	APHA 5520-C Partition Infra Red	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	APHA 4500 S2- F Indometric Method	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	APHA 3111 B Air Acetylene Method	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	APHA 3114 B Manual Hydride Generation	*BLQ(**LOQ 0.005)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	APHA 3114 B Manual Hydride Generation/ AAS Method	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
33.	Fecal Coliform	IS:1622:2009	<2	MPN/100ml	--	

Note:- *BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/05	Report No.:	VEL/GW/2209290005
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village-Chhote Bhandar, Post Office Bade Bandar, Tehsil Passore, Dist- Raigarh- 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description:	Ground Water	Reporting Date:	04/10/2022
Sampling Location:	Village- Chhote Bhandar	Period of Analysis:	29/09/2022 to 04/10/2022
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	29/09/2022
Preservation:	Refrigerated	Sampling Date:	24/09/2022
Sampling & Analysis Protocol:	APIHA 23 rd Edition 2017 & IS 3025	Sampling Type:	Grab
		Sample Quantity:	2.5 Ltr.+250 ml

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APIHA 4500H+ B Electrometric Method	7.46	--	6.5 to 8.5	No Relaxation
2.	Colour	APIHA 2120 B Visual Comparison Method	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	APIHA 2130 B Nephelometric Method	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	APIHA 2150 B Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APIHA 2160 B Flavor Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	APIHA 2340 C EDTA Titrimetric Method	235.62	mg/L	200	600
7.	Calcium (as Ca)	APIHA 3500 Ca B EDTA Titrimetric Method	54.27	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	APIHA 2320 B Titration Method	223.53	mg/L	200	600
9.	Chloride (as Cl)	APIHA 4500 Cl B Argentometric Method	59.34	mg/L	250	1000
10.	Residual Free Chlorine	APIHA 3500 Cl B Iodometric Method	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025(P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APIHA 3500 Mg B Calculation Method	24.35	mg/l.	30	100
13.	Total Dissolved Solids	APIHA 2540 C Gravimetric Method	381.00	mg/L	500	2000
14.	Sulphate (as SO ₄)	APIHA 4500 E Turbidimetric Method	22.76	mg/L	200	400



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Test Report

Sample No.: VEL/REGLAW/05			Report No.: VEL/GW/2209290005			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride (as F)	APHA 4500 F D SPADNS Method	0.42	mg/L	1.0	1.5
16.	Nitrate (as NO ₃)	IS 3025 (Part -34), Chromotropic Method	2.34	mg/L	45	No Relaxation
17.	Iron (as Fe)	APHA 3500 Fe B 1,10 Phenanthroline Method	0.17	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	APHA 3111 D Direct Nitrous Oxide-Acetylene Flame Method	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19.	Boron	APHA 4500 B C Carmine Method	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	APHA 5530 C Chloroform Extraction	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	APHA 5540 C MBAS Method	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	APHA 3111B Air Acetylene Method	0.21	mg/L	5	15
24.	Copper (as Cu)	APHA 3111 B Air Acetylene Flame Method	*BLQ(**LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	APHA 3111B Direct Air Acetylene Flame Method	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	APHA 5520-C Partition Infra Red	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	APHA 4500 S2- F Iodometric Method	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	APHA 3111 B Air Acetylene Method	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	APHA 3114 B Manual Hydride Generation	*BLQ(**LOQ 0.005)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	APHA 3114 B Manual Hydride Generation/ AAS Method	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
33.	Fecal Coliform	IS:1622:2009	<2	MPN/100ml	--	

Note:- *BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/06	Report No.:	VEL/GW/2209290006
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bhandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	04/10/2022
		Period of Analysis:	29/09/2022 to 04/10/2022
		Receipt Date:	29/09/2022
Sample Description:	Ground Water	Sampling Date:	24/09/2022
Sampling Location:	Village- Kathli	Sampling Type:	Grab
Sample Collected by:	Vardan EnviroLab Representative	Sample Quantity:	2.5 Ltr + 250 ml
Preservation:	Refrigerated		
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS 3025		

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 4500H+ B Electrometric Method	7.18	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 2120 B Visual Comparison Method	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	APHA 2130 B Nephelometric Method	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	APHA 2150 B Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 2160 B Flavor Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	APHA 2340 C EDTA Titrimetric Method	225.37	mg/L	200	600
7.	Calcium (as Ca)	APHA 3500 Ca B EDTA Titrimetric Method	54.36	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	APHA 2320 B Titration Method	221.25	mg/L	200	600
9.	Chloride (as Cl)	APHA 4500 Cl B Argentometric Method	57.43	mg/L	250	1000
10.	Residual Free Chlorine	APHA 3500 Cl B Iodometric Method	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025(P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	21.81	mg/L	30	100
13.	Total Dissolved Solids	APHA 2540 C Gravimetric Method	323.74	mg/L	500	2000
14.	Sulphate (as SO ₄)	APHA 4500 E Turbidimetric Method	16.81	mg/L	200	400



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Test Report

Sample No.: VEL/REGL/W/06			Report No.: VEL/GW/2209290006			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride (as F)	APHA 4500 F D SPADNS Method	0.42	mg/L	1.0	1.5
16.	Nitrate (as NO ₃)	IS 3025 (Part -34), Chromotropic Method	3.16	mg/L	45	No Relaxation
17.	Iron (as Fe)	APHA 3500 Fe B 1,10 Phenanthroline Method	0.27	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	APHA 3111 D Direct Nitrous Oxide-Acetylene Flame Method	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19.	Boron	APHA 4500 B C Caraine Method	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	APHA 5530 C Chloroform Extraction	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	APHA 5540 C MBAS Method	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	APHA 3111B Air Acetylene Method	0.17	mg/L	5	15
24.	Copper (as Cu)	APHA 3111 B,Air Acetylene Flame Method	*BLQ(**LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	APHA 3111B Direct Air Acetylene Flame Method	*BLQ(**LOQ-0.01)	mg/L	0.1	0.3
26.	Mineral Oil	APHA 5520-C Partition Infra Red	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	APHA 4500 S2- F Iodometric Method	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	APHA 3111 B Air Acetylene Method	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	APHA 3114 B Manual Hydride Generation	*BLQ(**LOQ 0.005)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	APHA 3114 B Manual Hydride Generation/ AAS Method	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
33.	Fecal Coliform	IS:1622:2009	<2	MPN/100ml	--	

Note:- *BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/07	Report No.:	VEL/GW/2209290007
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village-Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	04/10/2022
		Period of Analysis:	29/09/2022 to 04/10/2022
		Receipt Date:	29/09/2022
Sample Description:	Ground Water	Sampling Date:	24/09/2022
Sampling Location:	Village- Amalibhauna	Sampling Type:	Grab
Sample Collected by:	Vardan EnviroLab Representative	Sample Quantity:	2.5 Ltr + 250 ml
Preservation:	Refrigerated		
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS 3025		

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 4500H+ B Electrometric Method	7.22	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 2120 B Visual Comparison Method	*BLQ(**LOQ-1.0)	Hazen	5	15
3.	Turbidity	APHA 2130 B Nephelometric Method	*BLQ(**LOQ 1.0)	NTU	1	5
4.	Odour	APHA 2150 B Threshold Odour Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 2160 B Flavor Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	APHA 2340 C EDTA Titrimetric Method	184.35	mg/L	200	600
7.	Calcium (as Ca)	APHA 3500 Ca B EDTA Titrimetric Method	45.26	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	APHA 2320 B Titration Method	165.23	mg/L	200	600
9.	Chloride (as Cl)	APHA 4500 Cl B Argentometric Method	49.18	mg/L	250	1000
10.	Residual Free Chlorine	APHA 3500 Cl B Iodometric Method	*BLQ(**LOQ-0.15)	mg/L	0.2	1
11.	Ammonia	IS 3025(P-34)	*BLQ(**LOQ-0.3)	mg/L	--	4.0
12.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	17.35	mg/l.	30	100
13.	Total Dissolved Solids	APHA 2540 C Gravimetric Method	316.00	mg/L	500	2000
14.	Sulphate (as SO ₄)	APHA 4500 E Turbidimetric Method	14.11	mg/L	200	400



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGI/W/07		Report No.: VEL/GW/2209290007				
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride (as F)	APHA 4500 F D SPADNS Method	0.27	mg/L	1.0	1.5
16.	Nitrate (as NO ₃)	IS 3025 (Part -34), Chromotropic Method	1.86	mg/L	45	No Relaxation
17.	Iron (as Fe)	APHA 3500 Fe B 1,10 Phenanthroline Method	0.23	mg/L	1.0	No Relaxation
18.	Aluminium (as Al)	APHA 3111 D Direct Nitrous Oxide-Acetylene Flame Method	*BLQ(**LOQ-0.002)	mg/L	0.03	0.2
19.	Boron	APHA 4500 B C Carmine Method	*BLQ(**LOQ-0.01)	mg/L	0.5	1
20.	Phenolic Compounds	APHA 5530 C Chloroform Extraction	*BLQ(**LOQ 0.0004)	mg/L	0.001	0.002
21.	Anionic Detergents (as MBAS)	APHA 5540 C MBAS Method	*BLQ(**LOQ-0.05)	mg/L	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	*BLQ(**LOQ-0.02)	mg/L	0.05	No relaxation
23.	Zinc (as Zn)	APHA 3111B Air Acetylene Method	0.18	mg/L	5	15
24.	Copper (as Cu)	APHA 3111 B,Air Acetylene Flame Method	*BLQ(**LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	APHA 3111B Direct Air Acetylene Flame Method	*BLQ(**LOQ- 0.01)	mg/L	0.1	0.3
26.	Mineral Oil	APHA 5520-C Partition Infra Red	*BLQ(**LOQ-0.1)	mg/L	1.0	No relaxation
27.	Sulphide	APHA 4500 S2- F Iodometric Method	*BLQ(**LOQ-0.02)	mg/L	200	400
28.	Barium (as Ba)	APHA 3111 B Air Acetylene Method	*BLQ(**LOQ-0.01)	mg/L	0.7	No relaxation
29.	Arsenic (as As)	APHA 3114 B Manual Hydride Generation	*BLQ(**LOQ 0.005)	mg/L	0.01	No relaxation
30.	Selenium (as Se)	APHA 3114 B Manual Hydride Generation/ AAS Method	*BLQ(**LOQ 0.001)	mg/L	0.01	No relaxation
31.	Total Coliform	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
32.	E. coli	IS:15185:2016	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	
33.	Fecal. Coliform	IS:1622-2009	<2	MPN/100ml	--	

Note:- *BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.



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4.4 Surface water Quality Analysis



Figure. No. 6. Plan Showing Surface Water Quality Monitoring Location Map

- Location Code:** - 1. Mand Nadi River (Up Stream)
2. Mand Nadi River (Down Stream)



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/04	Report No.:	VEL/W/2207300004
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	Format No.:	7.8 F-03
Sample Description:	Surface Water	Party Reference No.:	NIL
Sampling Location:	Mahanadi (Down Stream)	Reporting Date:	05/08/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	30/07/2022 to 05/08/2022
Preservation:	Refrigerated	Receipt Date:	30/07/2022
Sampling & Analysis Protocol:	IS-2296, IS-3025, APHA 23 rd Edition 2017	Sampling Date:	27/07/2022
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+250 ml

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA 4500H+ B Electrometric Method	7.79	--
2.	Colour	APHA 2120 B Visual Comparison Method	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	APHA 2130 B Nephelometric Method	BLQ(LOQ 1.0)	NTU
4.	Odour	APHA 2150 B Threshold Odour Method	Agreeable	--
5.	Taste	APHA 2160 B Flavor Threshold Test Method	Agreeable	--
6.	Total Hardness (as CaCO ₃)	APHA 2340 C EDTA Titrimetric Method	163.08	mg/L
7.	Calcium (as Ca)	APHA 3500 Ca B EDTA Titrimetric Method	39.43	mg/L
8.	Alkalinity (as CaCO ₃)	APHA 2320 B Titration Method	108.28	mg/L
9.	Chloride (as Cl)	APHA 4500 Cl B Argentometric Method	96.44	mg/L
10.	Residual Free Chlorine	APHA 3500 Cl B Iodometric Method	BLQ(LOQ 0.15)	mg/L
11.	Ammonia (as NH ₃)	IS 3025(P-34)	BLQ(LOQ 0.3)	mg/L
12.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	15.72	mg/L
13.	Total Dissolved Solids	APHA 2540 C Gravimetric Method	398.00	mg/L
14.	Sulphate (as SO ₄)	APHA 4500 E Turbidimetric Method	30.40	mg/L



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/04			Report No.: VEL/W/2207300004	
S. No.	Parameter	Test-Method	Result	Unit
15.	Fluoride (as F)	APHA 4500 F D SPADNS Method	0.26	mg/L
16.	Nitrate (as NO ₃)	IS 3025 (Part -34). Chromotropic Method	8.10	mg/L
17.	Iron (as Fe)	APHA 3500 Fe B 1,10 Phenanthroline Method	0.23	mg/L
18.	Aluminium (as Al)	APHA 3111 D Direct Nitrous Oxide-Acetylene Flame Method	BLQ(LOQ 0.002)	mg/L
19.	Boron	APHA 4500 B C Carmine Method	BLQ(LOQ 0.001)	mg/L
20.	Phenolic Compounds	APHA 5530 C Chloroform Extraction	BLQ(LOQ 0.0004)	mg/L
21.	Anionic Detergents (as MBAS)	APHA 5540 C MBAS Method	BLQ(LOQ 0.05)	mg/L
22.	Cyanide (as CN)	APHA 4500CN-D	BLQ(LOQ 0.02)	mg/L
23.	Zinc (as Zn)	APHA 3111B Air Acetylene Method	2.06	mg/L
24.	Copper (as Cu)	APHA 3111 B, Air Acetylene Flame Method	0.98	mg/L
25.	Manganese (as Mn)	APHA 3111B Direct Air Acetylene Flame Method	BLQ(LOQ 0.01)	mg/L
26.	Mineral Oil	APHA 5520-C Partition Infra Red	BLQ(LOQ 0.05)	mg/L
27.	Sulphide	APHA 4500 S2- F Iodometric Method	BLQ(LOQ 0.02)	mg/L
28.	Barium	APHA 3111 B Air Acetylene Method	BLQ(LOQ 0.01)	mg/L
29.	Total. Coliform	IS:1622:1981	120	MPN/100ml
30.	E.coli	APHA 9221 F	Present	Absent/100ml
31.	Fecal. Coliform	IS:1622:1981	20	MPN/100ml
32.	Arsenic (as As)	APHA 3114 B Manual Hydride Generation	BLQ(LOQ 0.002)	mg/L
33.	Selenium (as Se)	APHA 3114 B Manual Hvdride Generation/ AAS Method	BLQ(LOQ 0.001)	mg/L

Note:- *BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/02	Report No.:	VEL/W/2207300002
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	Format No.:	7.8 F-03
Sample Description:	Surface Water	Party Reference No.:	NIL
Sampling Location:	Mand River (Up Stream)	Reporting Date:	05/08/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	30/07/2022 to 05/08/2022
Preservation:	Refrigerated	Receipt Date:	30/07/2022
Sampling & Analysis Protocol:	IS-2296, IS-3025, APHA 23 rd Edition 2017	Sampling Date:	27/07/2022
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+250 ml

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA 4500H+ B Electrometric Method	7.82	--
2.	Colour	APHA 2120 B Visual Comparison Method	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	APHA 2130 B Nephelometric Method	BLQ(LOQ 1.0)	NTU
4.	Odour	APHA 2150 B Threshold Odour Method	Agreeable	--
5.	Taste	APHA 2160 B Flavor Threshold Test Method	Agreeable	--
6.	Total Hardness (as CaCO ₃)	APHA 2340 C EDTA Titrimetric Method	133.06	mg/L
7.	Calcium (as Ca)	APHA 3500 Ca B EDTA Titrimetric Method	32.48	mg/L
8.	Alkalinity (as CaCO ₃)	APHA 2320 B Titration Method	82.36	mg/L
9.	Chloride (as Cl)	APHA 4500 Cl B Argentometric Method	41.50	mg/L
10.	Residual Free Chlorine	APHA 3500 Cl B Iodometric Method	BLQ(LOQ 0.15)	mg/L
11.	Ammonia (as NH ₃)	IS 3025(P-34)	BLQ(LOQ 0.3)	mg/L
12.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	12.64	mg/L
13.	Total Dissolved Solids	APHA 2540 C Gravimetric Method	233.00	mg/L
14.	Sulphate (as SO ₄)	APHA 4500 E Turbidimetric Method	18.46	mg/L



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/REGL/W/02		Report No.: VEL/W/2207300002		
S. No.	Parameter	Test-Method	Result	Unit
15.	Fluoride (as F)	APHA 4500 F D SPADNS Method	0.42	mg/L
16.	Nitrate (as NO ₃)	IS 3025 (Part -34), Chromotropic Method	10.06	mg/L
17.	Iron (as Fe)	APHA 3500 Fe B 1,10 Phenanthroline Method	0.24	mg/L
18.	Aluminium (as Al)	APHA 3111 D Direct Nitrous Oxide-Acetylene Flame Method	BLQ(LOQ 0.002)	mg/L
19.	Boron	APHA 4500 B C Carmine Method	BLQ(LOQ 0.001)	mg/L
20.	Phenolic Compounds	APHA 5530 C Chloroform Extraction	BLQ(LOQ 0.0004)	mg/L
21.	Anionic Detergents (as MBAS)	APHA 5540 C MBAS Method	BLQ(LOQ 0.05)	mg/L
22.	Cyanide (as CN)	APHA 4500CN-D	BLQ(LOQ 0.02)	mg/L
23.	Zinc (as Zn)	APHA 3111B Air Acetylene Method	1.43	mg/L
24.	Copper (as Cu)	APHA 3111 B,Air Acetylene Flame Method	BLQ(LOQ 0.002)	mg/L
25.	Manganese (as Mn)	APHA 3111B Direct Air Acetylene Flame Method	BLQ(LOQ 0.01)	mg/L
26.	Mineral Oil	APHA 5520-C Partition Infra Red	BLQ(LOQ 0.05)	mg/L
27.	Sulphide	APHA 4500 S2- F Iodometric Method	BLQ(LOQ 0.02)	mg/L
28.	Barium	APHA 3111 B Air Acetylene Method	BLQ(LOQ 0.01)	mg/L
29.	Total. Coliform	IS:1622:1981	58	MPN/100ml
30.	E.coli	APHA 9221 F	Absent	Absent/100ml
31.	Fecal.Coliform	IS:1622:1981	8	MPN/100ml
32.	Arsenic (as As)	APHA 3114 B Manual Hydride Generation	BLQ(LOQ 0.002)	mg/L
33.	Selenium (as Se)	APHA 3114 B Manual Hydride Generation/ AAS Method	BLQ(LOQ 0.001)	mg/L

Note:- *BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification



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Test Report

Sample Number:	VEL/REGL/W/01	Report No.:	VEL/W/2207300001
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	Format No.:	7.8 F-03
Sample Description:	Surface Water	Party Reference No.:	NIL
Sampling Location:	Mand River (Down Stream)	Reporting Date:	05/08/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	30/07/2022 to 05/08/2022
Preservation:	Refrigerated	Receipt Date:	30/07/2022
Sampling & Analysis Protocol:	IS-2296, IS-3025, APHA 23 rd Edition 2017	Sampling Date:	27/07/2022
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+250 ml

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA 4500H+ B Electrometric Method	8.06	--
2.	Colour	APHA 2120 B Visual Comparison Method	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	APHA 2130 B Nephelometric Method	BLQ(LOQ 1.0)	NTU
4.	Odour	APHA 2150 B Threshold Odour Method	Agreeable	--
5.	Taste	APHA 2160 B Flavor Threshold Test Method	Agreeable	--
6.	Total Hardness (as CaCO ₃)	APHA 2340 C EDTA Titrimetric Method	178.08	mg/L
7.	Calcium (as Ca)	APHA 3500 Ca B EDTA Titrimetric Method	61.50	mg/L
8.	Alkalinity (as CaCO ₃)	APHA 2320 B Titration Method	72.06	mg/L
9.	Chloride (as Cl)	APHA 4500 Cl B Argentometric Method	85.50	mg/L
10.	Residual Free Chlorine	APHA 3500 Cl B Iodometric Method	BLQ(LOQ 0.15)	mg/L
11.	Ammonia (as NH ₃)	IS 3025(P-34)	BLQ(LOQ 0.3)	mg/L
12.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	5.99	mg/L
13.	Total Dissolved Solids	APHA 2540 C Gravimetric Method	296.00	mg/L
14.	Sulphate (as SO ₄)	APHA 4500 E Turbidimetric Method	42.13	mg/L



VEL/E-03/1/TR/PH012



Test Report

Sample No.: VEL/REGL/W/01		Report No.: VEL/W/2207300001		
S. No.	Parameter	Test-Method	Result	Unit
15.	Fluoride (as F)	APHA 4500 F D SPADNS Method	0.29	mg/L
16.	Nitrate (as NO ₃)	IS 3025 (Part -34), Chromotropic Method	3.92	mg/L
17.	Iron (as Fe)	APHA 3500 Fe B 1,10 Phenanthroline Method	0.22	mg/L
18.	Aluminium (as Al)	APHA 3111 D Direct Nitrous Oxide-Acetylene Flame Method	BLQ(LOQ 0.002)	mg/L
19.	Boron	APHA 4500 B C Carmine Method	0.43	mg/L
20.	Phenolic Compounds	APHA 5530 C Chloroform Extraction	BLQ(LOQ 0.0004)	mg/L
21.	Anionic Detergents (as MBAS)	APHA 5540 C MBAS Method	BLQ(LOQ 0.05)	mg/L
22.	Cyanide (as CN)	APHA 4500CN-D	BLQ(LOQ 0.02)	mg/L
23.	Zinc (as Zn)	APHA 3111B Air Acetylene Method	3.1	mg/L
24.	Copper (as Cu)	APHA 3111 B,Air Acetylene Flame Method	0.23	mg/L
25.	Manganese (as Mn)	APHA 3111B Direct Air Acetylene Flame Method	BLQ(LOQ 0.01)	mg/L
26.	Mineral Oil	APHA 5520-C Partition Infra Red	BLQ(LOQ 0.05)	mg/L
27.	Sulphide	APHA 4500 S2- F Iodometric Method	BLQ(LOQ 0.02)	mg/L
28.	Barium	APHA 3111 B Air Acetylene Method	BLQ(LOQ 0.01)	mg/L
29.	Total. Coliform	IS:1622:1981	94	MPN/100ml
30.	E.coli	APHA 9221 F	Absent	Absent/100ml
31.	Fecal.Coliform	IS:1622:1981	17	MPN/100ml
32.	Arsenic (as As)	APHA 3114 B Manual Hydride Generation	BLQ(LOQ 0.002)	mg/L
33.	Selenium (as Se)	APHA 3114 B Manual Hydride Generation/ AAS Method	BLQ(LOQ 0.001)	mg/L

Note:- *BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/W/04	Report No.:	VEL/W/2207300004
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh- 496100 (Chhattisgarh)	Format No.:	7.8 F-03
Sample Description:	Surface Water	Party Reference No.:	NIL
Sampling Location:	Mahanadi (Up Stream)	Reporting Date:	05/08/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	30/07/2022 to 05/08/2022
Preservation:	Refrigerated	Receipt Date:	30/07/2022
Sampling & Analysis Protocol:	IS-2296, IS-3025, APHA 23 rd Edition 2017	Sampling Date:	27/07/2022
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+250 ml

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA 4500H+ B Electrometric Method	7.33	--
2.	Colour	APHA 2120 B Visual Comparison Method	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	APHA 2130 B Nephelometric Method	BLQ(LOQ 1.0)	NTU
4.	Odour	APHA 2150 B Threshold Odour Method	Agreeable	--
5.	Taste	APHA 2160 B Flavor Threshold Test Method	Agreeable	--
6.	Total Hardness (as CaCO ₃)	APHA 2340 C EDTA Titrimetric Method	105.06	mg/L
7.	Calcium (as Ca)	APHA 3500 Ca B EDTA Titrimetric Method	28.01	mg/L
8.	Alkalinity (as CaCO ₃)	APHA 2320 B Titration Method	112.53	mg/L
9.	Chloride (as Cl)	APHA 4500 Cl B Argentometric Method	65.62	mg/L
10.	Residual Free Chlorine	APHA 3500 Cl B Iodometric Method	BLQ(LOQ 0.15)	mg/L
11.	Ammonia (as NH ₃)	IS 3025(P-34)	BLQ(LOQ 0.3)	mg/L
12.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	8.55	mg/L
13.	Total Dissolved Solids	APHA 2540 C Gravimetric Method	222.09	mg/L
14.	Sulphate (as SO ₄)	APHA 4500 E Turbidimetric Method	9.80	mg/L



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Test Report

Sample No.: VEL/REGL/W/04		Report No.: VEL/W/2207300004		
S. No.	Parameter	Test-Method	Result	Unit
15.	Fluoride (as F)	APHA 4500 F D SPADNS Method	0.22	mg/L
16.	Nitrate (as NO ₃)	IS 3025 (Part -34), Chromotropic Method	5.06	mg/L
17.	Iron (as Fe)	APHA 3500 Fe B 1,10 Phenanthroline Method	0.23	mg/L
18.	Aluminium (as Al)	APHA 3111 D Direct Nitrous Oxide-Acetylene Flame Method	BLQ(LOQ 0.002)	mg/L
19.	Boron	APHA 4500 B C Carmine Method	BLQ(LOQ 0.001)	mg/L
20.	Phenolic Compounds	APHA 5530 C Chloroform Extraction	BLQ(LOQ 0.0004)	mg/L
21.	Anionic Detergents (as MBAS)	APHA 5540 C MBAS Method	BLQ(LOQ 0.05)	mg/L
22.	Cyanide (as CN)	APHA 4500CN-D	BLQ(LOQ 0.02)	mg/L
23.	Zinc (as Zn)	APHA 3111B Air Acetylene Method	1.98	mg/L
24.	Copper (as Cu)	APHA 3111 B, Air Acetylene Flame Method	BLQ(LOQ 0.002)	mg/L
25.	Manganese (as Mn)	APHA 3111B Direct Air Acetylene Flame Method	BLQ(LOQ 0.01)	mg/L
26.	Mineral Oil	APHA 5520-C Partition Infra Red	BLQ(LOQ 0.05)	mg/L
27.	Sulphide	APHA 4500 S2- F Iodometric Method	BLQ(LOQ 0.02)	mg/L
28.	Barium	APHA 3111 B Air Acetylene Method	BLQ(LOQ 0.01)	mg/L
29.	Total. Coliform	IS:1622:2009	43	MPN/100ml
30.	E.Coli	APHA 9221 F	Absent	Absent/100ml
31.	Fecal. Coliform	IS:1622:2009	9	MPN/100ml
32.	Arsenic (as As)	APHA 3114 B Manual Hydride Generation	BLQ(LOQ 0.002)	mg/L
33.	Selenium (as Se)	APHA 3114 B Manual Hydride Generation/ AAS Method	BLQ(LOQ 0.001)	mg/L

Note:- *BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification



Figure. No. 7. Plan Showing Surface Water Quality Monitoring Location Map



Location Code: - 1 Mahanadi River Up Stream
2 Mahanadi River down Stream

4.5 Effluent Sample Analysis Report

Locations

1. STP Outlet
2. ETP Outlet



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/WW/01	Report No.:	VEL/WW/2207300001
Name & Address of the Project:	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	05/08/2022
		Period of Analysis:	30/07/2022 to 05/08/2022
Sample Description:	Effluent Water	Receipt Date:	30/07/2022
Sample Location:	ETP Plant (ETP Inlet)	Sampling Date:	26/07/2022
Sample Collected by:	Vardan EnviroLab Representative	Preservation:	Refrigerated
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017	Sample Quantity:	2.0 Ltr
		Parameter required:	As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Units
1.	pH (at 25 °C)	APHA 4500 H ⁺ B, Electrometric Method	6.09	--
2.	COD	APHA 5220 B, Open Reflux Method	273.76	mg/L
3.	BOD (5 Days at 20 °C)	APHA 5210 C, Ultimate BOD Test	81.05	mg/L
4.	Total Suspended Solids	APHA 2540 D, Gravimetric Method	40.00	mg/L
5.	Oil and Grease	APHA 5520 B, Partition Gravimetric Method	3.90	mg/L

End of Report



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Test Report

Sample Number:	VEL/REGL/WW/02	Report No.:	VEL/WW/2207300002
Name & Address of the Project:	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	05/08/2022
		Period of Analysis:	30/07/2022 to 05/08/2022
Sample Description:	Effluent Water	Receipt Date:	30/07/2022
Sample Location:	ETP Plant (ETP Outlet)	Sampling Date:	26/07/2022
Sample Collected by:	Vardan EnviroLab Representative	Preservation:	Refrigerated
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017	Sample Quantity:	2.0 Ltr
		Parameter required:	As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Units	Limits
1.	pH (at 25 °C)	APHA 4500 H ⁺ B, Electrometric Method	7.36	--	5.5-9.0
2.	COD	APHA 5220 B, Open Reflux Method	52.40	mg/L	250
3.	BOD (5 Days at 20 °C)	APHA 5210 C, Ultimate BOD Test	14.72	mg/L	30
4.	Total Suspended Solids	APHA 2540 D, Gravimetric Method	18.00	mg/L	100
5.	Oil and Grease	APHA 5520 B, Partition Gravimetric Method	0.68	mg/L	10

End of Report





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/WW/01	Report No.:	VEL/WW/2207300001
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
Sample Description:	Waste Water	Party Reference No.:	NIL
Sampling Location :	Ash Pond Effluent	Reporting Date:	05/08/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	30/07/2022 to 05/08/2022
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017	Receipt Date:	30/07/2022
		Sampling Quantity:	3.0 Ltr.
		Sampling Date:	26/07/2022
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits
1.	pH (at 25 °C)	APHA 4500 H+B Electrometric Method	7.80	--	5.5-9.0
2.	Oil & Grease	APHA 5520 B Partition Gravimetric Method	1.0	mg/L	10.0
3.	Total suspended solid (TSS)	APHA 2540 D Gravimetric Method	22.00	mg/L	100.0
4.	Lead (as Pb)	APHA 3111 B Direct Air- Acetylene Flame Method	0.06	mg/L	0.1
5.	Mercury (as Hg)	APHA 3112 B	BLQ(LOQ 0.005)	mg/L	0.01
6.	Total Chromium (as Cr)	APHA 3111 B Direct Air- Acetylene Flame Method	0.23	mg/L	2.0
7.	Arsenic (as As)	APHA 3114 B	*BLQ(**LOQ 0.005)	mg/L	0.2

Note :-BLQ- Below Limit of Quantification. ** LOQ= Limit of Quantification.



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Test Report

Sample Number:	VEL/REGL/WW/03	Report No.:	VEL/WW/2207300003
Name & Address of the Project:	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	05/08/2022
Sample Description:	Treated Sewage Water	Period of Analysis:	30/07/2022 to 05/08/2022
Sample Location:	STP Plant (STP Outlet)	Receipt Date:	30/07/2022
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	26/07/2022
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017	Preservation:	Refrigerated
		Sample Quantity:	2.0 Ltr
		Parameter required:	As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Units	Limits
1.	pH (at 25 °C)	APHA 4500 H ⁺ B, Electrometric Method	7.20	--	6.5-9.0
2.	COD	APHA 5220 B, Open Reflux Method	82.00	mg/L	250
3.	BOD (5 Days at 20 °C)	APHA 5210 C, Ultimate BOD Test	16.80	mg/L	30
4.	Total Suspended Solids	APHA 2540 D, Gravimetric Method	12.00	mg/L	100
5.	Oil and Grease	APHA 5520 B, Partition Gravimetric Method	0.80	mg/L	10

End of Report





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/WW/01	Report No.:	VEL/WW/2209030001
Name & Address of the Project:	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-:	28.06.2022
		Reporting Date:	08/09/2022
Sample Description:	Effluent Water	Period of Analysis:	03/09/2022 to 08/09/2022
Sample Location:	ETP Plant (ETP Inlet)	Receipt Date:	03/09/2022
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	31/08/2022
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017	Preservation:	Refrigerated
		Sample Quantity:	2.0 Ltr
		Parameter required:	As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Units
1.	pH (at 25 °C)	APHA 4500 H ⁺ B, Electrometric Method	6.84	--
2.	COD	APHA 5220 B, Open Reflux Method	284.52	mg/L
3.	BOD (5 Days at 20°C)	APHA 5210 C, Ultimate BOD Test	65.18	mg/L
4.	Total Suspended Solids	APHA 2540 D, Gravimetric Method	56.00	mg/L
5.	Oil and Grease	APHA 5520 B, Partition Gravimetric Method	4.50	mg/L

End of Report



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/WW/02	Report No.:	VEL/WW/2209030002
Name & Address of the Project:	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	08/09/2022
Sample Description:	Effluent Water	Period of Analysis:	03/09/2022 to 08/09/2022
Sample Location:	ETP Plant (ETP Outlet)	Receipt Date:	03/09/2022
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	31/08/2022
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017	Preservation:	Refrigerated
		Sample Quantity:	2.0 Ltr
		Parameter required:	As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Units	Limits
1.	pH (at 25 °C)	APHA 4500 H* B, Electrometric Method	7.42	--	5.5-9.0
2.	COD	APHA 5220 B, Open Reflux Method	43.40	mg/L	250
3.	BOD (5 Days at 20 °C)	APHA 5210 C, Ultimate BOD Test	15.16	mg/L	30
4.	Total Suspended Solids	APHA 2540 D, Gravimetric Method	14.00	mg/L	100
5.	Oil and Grease	APHA 5520 B, Partition Gravimetric Method	0.72	mg/L	10

End of Report



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/WW/01	Report No.:	VEL/WW/2209030001
Name & Address of Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	08/09/2022
Sample Description:	Waste Water	Period of Analysis:	03/09/2022 to 08/09/2022
Sampling Location :	Ash Pond Effluent	Receipt Date:	03/09/2022
Sample Collected by:	Vardan EnviroLab Representative	Sampling Quantity:	3.0 Ltr.
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017	Sampling Date:	30/08/2022
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits
1.	pH (at 25 °C)	APHA 4500 H+B Electrometric Method	6.75	--	5.5-9.0
2.	Oil & Grease	APHA 5520 B Partition Gravimetric Method	3.0	mg/L	10.0
3.	Total suspended solid (TSS)	APHA 2540 D Gravimetric Method	18.00	mg/L	100.0
4.	Lead (as Pb)	APHA 3111 B Direct Air- Acetylene Flame Method	0.07	mg/L	0.1
5.	Mercury (as Hg)	APHA 3112 B	BLQ(LOQ 0.005)	mg/L	0.01
6.	Total Chromium (as Cr)	APHA 3111 B Direct Air- Acetylene Flame Method	0.25	mg/L	2.0
7.	Arsenic (as As)	APHA 3114 B	*BLQ(**LOQ 0.005)	mg/L	0.2

Note :-BLQ= Below Limit of Quantification.** LOQ= Limit of Quantification.



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Test Report

Sample Number:	VEL/REGL/WW/03	Report No.:	VEL/WW/2209030003
Name & Address of the Project:	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	08/09/2022
Sample Description:	Treated Sewage Water	Period of Analysis:	03/09/2022 to 08/09/2022
Sample Location:	STP Plant (STP Outlet)	Receipt Date:	03/09/2022
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	30/08/2022
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017	Preservation:	Refrigerated
		Sample Quantity:	2.0 Ltr
		Parameter required:	As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Units	Limits
1.	pH (at 25 °C)	APHA 4500 H ⁺ B, Electrometric Method	8.14	--	6.5-9.0
2.	COD	APHA 5220 B, Open Reflux Method	62.40	mg/L	250
3.	BOD (5 Days at 20 °C)	APHA 5210 C, Ultimate BOD Test	15.78	mg/L	30
4.	Total Suspended Solids	APHA 2540 D, Gravimetric Method	16.00	mg/L	100
5.	Oil and Grease	APHA 5520 B, Partition Gravimetric Method	0.70	mg/L	10

End of Report





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/ WW/01	Report No.:	VEL/WW/2209290001
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office - Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102 Dated- 28.06.2022
		Reporting Date:	04/10/2022
		Period of Analysis	29/09/2022 to 04/10/2022
		Receipt Date	29/09/2022
Sample Description:	Waste Water	Sampling Date:	24/09/2022
Sampling Location:	Boiler Blow Down	Sampling Quantity:	2 Ltr.
Sample Collected By:	Vardan EnviroLab Representative	Sampling Type:	Grab
Parameter Required:	As per Work Order	Packing Type:	Temp. Sealed
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017		

TEST RESULTS

S. No.	Parameters	Protocol	Results	Unit	Prescribed Limits
1.	Total Suspended Solids	APHA 2540 D Gravimetric Method	5.00	mg/L	100.0
2.	Oil and Grease	APHA 5520 B Partition Gravimetric Method	BLQ(LOQ 0.4)	mg/L	20.0
3.	Copper (as Cu)	APHA 3111 B Direct Air Acetylene Flame Method	BLQ(LOQ 0.002)	mg/L	1.0
4.	Total Residual Chlorine	APHA 3500 Cl B Iodometric Method	BLQ(LOQ 0.15)	mg/L	0.5
5.	Iron as Fe	APHA 3500-Fe B 1,10-Phenanthroline Method	0.35	mg/L	1.0

Note: *BLQ-Below Limit of Quantification, **LOQ-Limit of Quantification

End of Report



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Test Report

Sample Number:	VEL/REGL/ WW/02	Report No.:	VEL/WW/2209290002
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village -Chhote Bhandar, Post Office- Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
		Reporting Date:	04/10/2022
		Period of Analysis	29/09/2022 to 04/10/2022
		Receipt Date	29/09/2022
Sample Description:	Waste Water	Sampling Date:	09/09/2022
Sampling Location:	Cooling Tower	Sampling Quantity:	2 Ltr.
Sample Collected By:	Vardan EnviroLab Representative	Sampling Type:	Grab
Parameter Required:	As per Work Order	Packing Type:	Temp. Sealed
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017		

TEST RESULTS

S. No.	Parameters	Test Method	Result	Unit	Prescribed Limits
1.	Zinc (as Zn)	APHA 23 rd Edition 3111 B Direct Air Acetylene Flame Method	0.26	mg/L	100.0
2.	Chromium (as Cr)	APHA 23 rd Edition 3111 B Direct Air Acetylene Flame Method	0.18	mg/L	20.0
3.	Phosphate	APHA 23 rd Edition 4500 PC	0.65	mg/L	1.0
4.	Free Available Chlorine	APHA 3500 Cl B Iodometric Method	0.37	mg/L	0.5

End of Report





Test Report

Sample Number:	VEL/REGL/WW/03	Report No.:	VEL/WW/2209290003
Name & Address of the Project:	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-	28.06.2022
Sample Description:	Effluent Water	Reporting Date:	04/10/2022
Sample Location:	ETP Plant (ETP Outlet)	Period of Analysis:	29/09/2022 to 04/10/2022
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	29/09/2022
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017	Sampling Date:	24/09/2022
		Preservation:	Refrigerated
		Sample Quantity:	2.0 Ltr
		Parameter required:	As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Units	Limits
1.	pH (at 25 °C)	APHA 4500 H ⁺ B, Electrometric Method	6.85	--	5.5-9.0
2.	COD	APHA 5220 B, Open Reflux Method	47.10	mg/l.	250
3.	BOD (5 Days at 20 °C)	APHA 5210 C, Ultimate BOD Test	17.63	mg/L	30
4.	Total Suspended Solids	APHA 2540 D, Gravimetric Method	12.00	mg/L	100
5.	Oil and Grease	APHA 5520 B, Partition Gravimetric Method	0.80	mg/L	10

End of Report





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/REGI/WW/04
Name & Address of Party: M/s Raigarh Energy Generation Ltd.
Village -Chhofe Bhandar, Post Office Bade
Bandar, Tehsil Pussore, Dist- Raigarh
496100 (Chhattisgarh)

Report No.: VEL/WW/2209290004
Format No.: 7.8 F-03
Party Reference No.: 5703005102
Dated- 28.06.2022
Reporting Date: 04/10/2022
Period of Analysis: 29/09/2022 to 04/10/2022
Receipt Date: 29/09/2022
Sampling Date: 24/09/2022
Sampling Quantity: 3.0 Ltr.
Sampling Date: 30/08/2022
Parameter Required: As per Work Order

Sample Description: Waste Water
Sampling Location : Ash Pond Effluent
Sample Collected by: Vardan EnviroLab Representative
Sampling & Analysis Protocol: APHA 23rd Edition 2017

S. No.	Parameter	Test-Method	Result	Unit	Limits
1.	pH (at 25 °C)	APHA 4500 H+B Electrometric Method	7.16	--	5.5-9.0
2.	Oil & Grease	APHA 5520 B Partition Gravimetric Method	2.0	mg/L	10.0
3.	Total suspended solid (TSS)	APHA 2540 D Gravimetric Method	15.00	mg/L	100.0
4.	Lead (as Pb)	APHA 3111 B Direct Air- Acetylene Flame Method	0.06	mg/L	0.1
5.	Mercury (as Hg)	APHA 3112 B	BLQ(LOQ 0.005)	mg/L	0.01
6.	Total Chromium (as Cr)	APHA 3111 B Direct Air- Acetylene Flame Method	0.32	mg/L	2.0
7.	Arsenic (as As)	APHA 3114 B	*BLQ(**LOQ 0.005)	mg/L	0.2

Note :-BLQ= Below Limit of Quantification, ** LOQ= Limit of Quantification.



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/WW/05	Report No.:	VEL/WW/2209290005
Name & Address of the Project:	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated-:	28.06.2022
		Reporting Date:	04/10/2022
Sample Description:	Treated Sewage Water	Period of Analysis:	29/09/2022 to 04/10/2022
Sample Location:	STP Plant (STP Outlet)	Receipt Date:	29/09/2022
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	24/09/2022
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017	Preservation:	Refrigerated
		Sample Quantity:	2.0 Ltr
		Parameter required:	As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Units	Limits
1.	pH (at 25 °C)	APHA 4500 H ⁺ B, Electrometric Method	7.85	--	6.5-9.0
2.	COD	APHA 5220 B, Open Reflux Method	58.23	mg/L	250
3.	BOD (5 Days at 20 °C)	APHA 5210 C, Ultimate BOD Test	12.82	mg/L	30
4.	Total Suspended Solids	APHA 2540 D, Gravimetric Method	14.00	mg/L	100
5.	Oil and Grease	APHA 5520 B, Partition Gravimetric Method	0.50	mg/L	10

End of Report



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Test Report

Sample Number:	VEL/REGL/AWW/06	Report No.:	VEL/AWW/2209290006
Name & Address of the Project:	M/s Raigarh Energy Generation Ltd. Village Chhote Bhandar, Post- Bade Bhandar, Tehsil Pussore, Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102
		Dated- 28.06.2022	04/10/2022
Sample Description:	Treated Sewage Water	Reporting Date:	04/10/2022
Sample Location:	STP Plant (STP Inlet)	Period of Analysis:	29/09/2022 to 04/10/2022
Sample Collected by:	Vardan EnviroLab Representative	Receipt Date:	29/09/2022
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017	Sampling Date:	24/09/2022
		Preservation:	Refrigerated
		Sample Quantity:	2.0 Ltr
		Parameter required:	As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Units	Limits
1.	pH (at 25 °C)	APHA 4500 H ⁺ B, Electrometric Method	8.10	--	6.5-9.0
2.	COD	APHA 5220 B, Open Reflux Method	182.16	mg/L	250
3.	BOD (5 Days at 20 °C)	APHA 5210 C, Ultimate BOD Test	63.00	mg/L	30
4.	Total Suspended Solids	APHA 2540 D, Gravimetric Method	58.00	mg/L	100
5.	Oil and Grease	APHA 5520 B, Partition Gravimetric Method	7.00	mg/L	10

End of Report



Project Name- Raigarh Energy Generation Ltd.

Village Chhote Bhandar, Post Office Bade Bhandar, Tehsil Pussore, Dist.Raigarh-496100 (Chattisgarh)

2nd Quarter Environmental Monitoring Report

4.6 Stack Monitoring

Locations

1. TPP



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/REGL/ST/01	Report No.:	VEL/ST/2206300001
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office - Bade Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	Format No.:	7.8 F 03
		Party Reference No.:	NIL
		Report Date:	03/08/2022
		Period of Analysis:	30/07/2022 to 03/08/2022
		Receipt Date:	30/07/2022

Sample Description: Stack Emission Monitoring

General Information:-

Sample Collected By	: VEL Representative
Date & Time of Sampling	: 26/07/2022
Location	: TPP
Sampling Duration (Minutes)	: 28.0
Meteorological Condition	: Cloudy Sky
Stack Attached To	: TPP
Stack Diameter (m)	: 7.5
Stack Height (m)	: 275
Instrument Calibration Status	: Calibrated
Ambient Temperature - Ta (°C)	: 33.0
Temperature of Stack Gases - Ts (°C)	: 131.0
Velocity of Stack Gases (m/sec.)	: 18.40
Flow rate of PM (LPM)	: 26.0
Sampling Condition	: Isokinetic
Protocol Used	: IS: 11255 & EPA

TEST RESULTS

S. No.	Parameters	Test Method	Results	Units	Limits
1.	Particulate Matter (as PM)	IS: 11255 (P-1):1985, RA.2014	38.62	mg/Nm ³	50.0
2.	Sulphur Dioxide (as SO ₂)	IS: 11255 (P-2):1985, RA.2014	594.26	mg/Nm ³	200.0
3.	Oxides of Nitrogen (as NO ₂)	IS: 11255 (P-7), RA.2017	248.06	mg/Nm ³	450.0
4.	Mercury (as Hg)	VEL/ENV/STP/144, Issue No-01, Issue Date-01/11/2021:2021	BLQ(LOQ 0.001)	mg/Nm ³	0.03

Note:- *BLQ-Below Limit of Quantification, **LOQ-Limit of Quantification.
End of Report



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Test Report

Sample Number: VEL/REGL/ST/01
Name & Address of the Party: M/s Raigarh Energy Generation Ltd.
Village -Chhote Bhandar, Post Office-
Bade Bandar, Tehsil- Pussore, Dist-
Raigarh - 496100 (Chhattisgarh)

Report No.: VEL/ST/2209030001
Format No.: 7.8 F 03
Party Reference No.: 5703005102
Dated- 28.06.2022

Report Date: 08/09/2022
Period of Analysis: 03/09/2022 to 08/09/2022
Receipt Date: 03/09/2022

Sample Description: Stack Emission Monitoring

General Information:-
Sample Collected By : VEL Representative
Date & Time of Sampling : 30/08/2022
Location : TPP
Sampling Duration (Minutes) : 37.0
Meteorological Condition : Intermittent Clouds
Stack Attached To : TPP
Stack Diameter (m) : 7.5
Stack Height (m) : 275
Instrument Calibration Status : Calibrated
Ambient Temperature - Ta (°C) : 31.0
Temperature of Stack Gases - Ts (°C) : 128.0
Velocity of Stack Gases (m/sec.) : 19.23
Flow rate of PM (LPM) : 25.0
Sampling Condition : Isokinetic
Protocol Used : IS: 11255 & EPA

TEST RESULTS

S. No.	Parameters	Test Method	Results	Units	Limits
1.	Particulate Matter (as PM)	IS: 11255 (P-1):1985, RA.2014	36.83	mg/Nm ³	50.0
2.	Sulphur Dioxide (as SO ₂)	IS: 11255 (P-2):1985, RA.2014	584.14	mg/Nm ³	200.0
3.	Oxides of Nitrogen (as NO ₂)	IS: 11255 (P-7), RA.2017	252.26	mg/Nm ³	450.0
4.	Mercury (as Hg)	VEL/ENV/STP/144, Issue No-01, Issue Date-01/11/2021:2021	BLQ(LOQ 0.001)	mg/Nm ³	0.03

Note:- *BLQ-Below Limit of Quantification ,**LOQ-Limit of Quantification.
End of Report





Test Report

Sample Number:	VEL/REGL/ST/01	Report No.:	VEL/ST/2209290001
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office- Bade Bandar, Tehsil- Pussore, Dist- Raigarh - 496100 (Chhattisgarh)	Format No.:	7.8 F-03
		Party Reference No.:	5703005102 Dated- 28.06.2022
		Report Date:	04/10/2022
		Period of Analysis:	29/09/2022 to 04/10/2022
		Receipt Date:	29/09/2022

Sample Description: Stack Emission Monitoring

General Information:-
Sample Collected By : VEL Representative
Date & Time of Sampling : 24/09/2022
Location : TPP
Sampling Duration (Minutes) : 36.0
Meteorological Condition : Intermittent Clouds
Stack Attached To : TPP
Stack Diameter (m) : 7.5
Stack Height (m) : 275
Instrument Calibration Status : Calibrated
Ambient Temperature - Ta (°C) : 31.0
Temperature of Stack Gases - Ts (°C) : 128.0
Velocity of Stack Gases (m/sec.) : 19.23
Flow rate of PM (LPM) : 25.0
Sampling Condition : Isokinetic
Protocol Used : IS: 11255 & EPA

TEST RESULTS

S. No.	Parameters	Test Method	Results	Units	Limits
1.	Particulate Matter (as PM)	IS: 11255 (P-1):1985, RA.2014	32.73	mg/Nm ³	50.0
2.	Sulphur Dioxide (as SO ₂)	IS: 11255 (P-2):1985, RA.2014	574.62	mg/Nm ³	200.0
3.	Oxides of Nitrogen (as NO _x)	IS: 11255 (P-7), RA.2017	233.18	mg/Nm ³	450.0
4.	Mercury (as Hg)	VEL/ENV/STP/144, Issue No-01, Issue Date-01/11/2021:2021	BLQ(LOQ 0.001)	mg/Nm ³	0.03

Note:- *BLQ-Below Limit of Quantification, **LOQ-Limit of Quantification.
End of Report



Chapter - 5.0

CONCLUSION

RAIGARH ENERGY GENERATION LTD., authorities have been taken successful steps in controlling environmental pollution in and around the project. This fact is clear from analytical results of different environmental parameters. A brief conclusion is as follows.

Sr. No.	Environmental Parameters	Conclusion
5.1	Air Environment	After analysis of the samples from five different locations it is observed that both the individuals and average concentration of air pollutants in respect of SO ₂ , NO ₂ , PM ₁₀ , PM _{2.5} , CO and Mercury are well within the prescribed limits of NAAQM standards. People of township and of surrounding villages do not have any problems regarding the air quality and have no grievances because of Thermal Power Plant activities.
5.2	Water Environment	The analytical result of the samples from the ground water of villages, surface water from river, and domestic & industrial effluent after treatment shows that the concentrations of different water parameters are well within prescribed limits and will not cause any adverse impact on human health and on surrounding area. People of surrounding areas express satisfaction about the water quality of That area.
5.3	Noise Environment	The observations taken at four village location during day and night time shows that the noise level are well within prescribed limits of CPCB. Hence there is no possibility of any adverse effect of noise generated due to Thermal Power Plant activities on peoples of Surrounding areas.

All the above details show that Thermal Power Plant of RAIGARH ENERGY GENERATION LTD. is not causing any adverse impact on the human health and ecological balance.



CSR REPORT

April 2022 to September 2022

Raigarh Energy Generation Limited (REGL) is (1x600MW) coal-based power plant, a unit of Adani Power Limited (APL) has always been committed to the cause of social service and successfully engaged with local communities and has implemented several schemes to address developmental needs of the communities.

Introduction:

Raigarh Energy Generation Limited (REGL) erstwhile Korba West Power company Limited, a unit of Adani Power Limited (APL) is a 1X600 MW coal based thermal power plant. The plant is located at village-Chhote Bhandar, PO- Bade Bhandar, Tehsil-Pussore, District-Raigarh, Chhattisgarh. 15 KM from Pussore tehsil and 25 KM from Raigarh district headquarter. The plant is on the National Highway- 153 (erstwhile NH- 216), east end Raigarh and west end Sarangarh/Saraipali connecting to Raipur, the state capital. The nearest railhead is at Raigarh. The airport is at Jharsuguda 105 KM and Raipur airport is at 225 KM.

In the year 2019, Adani Power Limited acquired erstwhile Korba West Power company Limited through Hon. NCLT, Ahmedabad and renamed Raigarh Energy Generation Limited (REGL).

Adani Power has always been committed to the cause of social service and has repeatedly channelized a part of its resources and activities such that it positively affects the society socially, ethically, and environmentally. The company has taken up various corporate social responsibility initiatives and enhanced value in the society.

With the enactment of the Companies Act, 2013 a broad framework of CSR has been provided in section 135, schedule VIII of the Act and CSR Rules effected from January 2014. Thereafter various amendments made in the CSR Rules. Therefore, the company has formulated a robust CSR policy which encompasses its philosophy and guides its sustained efforts for undertaking and supporting socially useful programs for the welfare and sustainable development of the society. To this, the CSR policy of APL approved by the Board of Directors on 6th August 2014.

ADANI Foundation (AF) is the CSR arm of Adani Group of companies implementing CSR projects and activities at different locations in India focusing on Health, Education, Livelihood, Community Infrastructure Development, and Skill Development of the youths as specified in schedule VII of section 135 of Companies Act -2013 and CSR rules there under.

At REGL, ADANI Foundation is implementing various CSR projects in 15 peripheral villages of plant since acquisition of the plant.

Vision:	Improve Quality of life for all our communities through integrated and sustainable development
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CSR & Group Values: -

Courage:	Trust:	Commitment:
To embrace new and innovative ideas for betterment of the society	Believe in all stakeholders	Stand by our promises and adhere a high standard of work in all CSR activities

Community Health: -

Mobile Healthcare Unit - Swasthya Sewa Tuhar Dwar Project

Ensuring healthy lives and promoting well-being at all ages is essential to meet one of the global agenda of sustainable development goals (SDGs) and we are committed for holistic development of the communities where we operate with an aim to meet goals of SDGs. Quality health care services available free of cost and promote preventive

Major disease treated were: -

- Cold, Fever & Cough – 14.07%
- Gastroenteritis – 13.35%
- Generalized weakness – 12.32%
- Musculoskeletal pain– 8.16%
- Hypertension (BP) – 7.93%
- Skin Disorder- 7.91% and
- Diabetes mellitus- 7.82%



and curative services at the doorsteps of villagers through Mobile Healthcare Unit (MHU) is one of the objectives of the project. The MHU visits 15 villages as per their fixed roaster. The project is implemented in partnership with HelpAge India. During the reporting period, 8134 health check ups, medicl consultation and treatments were conducted, free medicines has been distributed to the patients. Total 2279 new patients were registered and the program coverage reached to 61.79% of the total population in 15 villages.

The MHU team consists of one MBBS Doctor, one Pharmacist and one Social Protection Officer. The number of treatments village and gender wise are as follows: -

SN	Name of Villages	Male	Female	Total
1	Bade Bhandar	277	330	277
2	Chhote Bhandar	398	399	398
3	Amlibhouna	192	223	192
4	Jevridih	137	275	137
5	Sarwani	285	323	285
6	Barpali	362	301	362
7	Kathli	359	283	359
8	Tupakdhar	106	166	106
9	Bunga	432	595	432
10	Ranbhatha	285	415	285
11	Taparda	373	344	373
12	Supa	190	205	190
13	Kotmara	191	124	191
14	Kalma	124	131	124
15	Chandli	152	157	152
Total		3863	4271	8134



- Conducted 43 Home visits by the MHCU team for patients unable to reach at health camp site and 11 patients were referred for secondary treatment
- Organized 64 health awareness sessions in the villages on various topics like precautions against COVID-19, lifestyle diseases, skin and water born disease etc. in which more than 1552 persons participated

Blood Sugar Level Test (Diabetes) Check-up

Blood sugar and Blood pressure is being tested and consultation is provided by MHU team. This has saved medical expenses of the villagers as the patients have to take medicines regularly for longer period. Out of 262 tests conducted, cumulative 174 (110 male and 64 female) were found diabetic, whose blood glucose level was found higher than the normal level (>140mg-dl). After the blood test result, proper consultation was given by MHU Doctor and medicines provided. Total 128 persons is suffering from Diabetes mellitus.

Total Diabetes Test (April 22 to Sep. 22)			Total persons having Blood Sugar Level above the Normal Level i.e.. 140mg-dl (April 22 to Sep. 22)		
Total	Male	Female	Total	Male	Female
262	154	108	174	110	64



Blood Pressure Test (BP) Check-up

Out of 1263 test conducted during the period, 762 (427 male and 335 female) tested were found blood pressure level above than normal value i.e., 80/120 (hypertension). After the blood presure test , proper consultation was given by MHU Doctor and medicines provided.

Total Blood Pressure Test (April 22 to Sep. 22)			Total persons having Blood Pressure above the Normal level - 80/120 mm/hg (April 22 to Sep. 22)		
Total Test	Male	Female	Total Test	Male	Female
1263	718	545	762	427	335



School Health Camp for Adolescent Girls

Health camp organized in Govt. schools of peripheral villages by Mobile Healthcare team for all girls and teachers to spread awareness about health check-up and maintaining a healthy life. During the period total 05 school health awareness and check-up camps organized for girls in 03 Govt. High and Hr. Secondary Schools of Bade Bhandar, Bunga & Supa village. Total 244 girl students participated and out of them 140 students were treated and needs of adolescent girls were addressed.



First Aid Medical Camp

Chandrasahini Devi temple is situated on the bank of Mahanadi. A very big fair is being organized here every year on the eve of Navratri. It is also famous as a tourist place. People from other state like Orissa are also visiting this place. The sentiment of the people is attached with the place and temple. During the festival of Navratri more than 1000 people per day visit the temple from nearby area and



surrounding states. The people come from far places and wait for a day and two to visit and worship in the temple. It is observed and feedback received from the key stake holders that many visitors need attention for first aid medical services and treatment for common ailment like cough and fever. They are unserved. Therefore, organized First Aid Medical Camp during Navratri from 25/09/22 to 2/10/2022 at Ma Chandrasahini Devi Mandir-Chandrapur,

Dabhra block of Skati district and treated more than 1000 peoples. The camp was organized with support of Shri Gopal Ji Mahaprabhu and Ma Chandrasahini Devi Mandir Sarvnik Nyas –Chandrapur.

Observed Mother's Day

Mother's Day is a celebration honoring the mother of the family or individual, as well as motherhood, maternal bonds, and the influence of mothers in society. MHU team along with mother and children made this day memorable and provided valuable information to all the women of the village about the importance and role of women in the family and society. Health awareness sessions were conducted in the villages.



Education: -

Coaching for competitive examination

Coaching class started in coordination with district administration to provide coaching to the local youths to prepare as per the syllabus of the examination for the competitive examinations for clerical grade jobs conducted by railway, bank and state and central govt.



The district administration has provided venue and infrastructural facilities for the coaching classes. The coaching class will motivate the local youths to study and prepare for competitive exams. This will enhance employability opportunities of the local youths by improving their knowledge base and competitive mindset. A total of 35 students were selected for these classes after pre-selection test and counseling session.

Girls Kabaddi Training Program

Sports and games are considered integral to all round development of one's personality. This is an effective tool to engage youths, school students and community. In past various sports and athletic events e.g., Football, Volleyball, Kabaddi and running, jumping etc. were organized successfully for the youths and school students where they participated actively which was appreciated by the communities. State govt. is also promoting sports in the state and organizing various events at different level, promotion of sports and games in peripheral villages will create interest among youths to participate in district and state level games. Keeping above objective in mind started Kabaddi training coaching in the area to develop girls' players to play at district and state level. Kabaddi is one of the most popular sports played in this area. This will be an entry level intervention for youth engagement for various development



activities and pull their energy towards positive direction. Total of 65 girls actively participated in this fitness test, out of which 30 girls were selected from 06 govt. schools of 10 villages on fulfilling all the criteria of training program for kabaddi. The training is provided by state and district level coaches.

Marathon for School Girls

Marathon for schoolgirls was organized on National Sports Day on 29th August. About 100 girls actively participated in 4 km marathon. The program was inaugurated by the Mr. Jeevan Lal Nayak (District Sports Officer Raigarh) in the presence of panchayat representatives, school staff, students, sports teacher, and dignitaries from peripheral villages.



Har Ghar Tiranga Abhiyan in Govt. Schools

This is with reference to 'Har Ghar Tiranga' campaign under the aegis of Azadi Ka Amrit Mahotsav to encourage people to bring the Tiranga home and to hoist it to mark the 75th year of India's independence. Actively participated in 'Har Ghar Tiranga Abhiyan' from 13 to 15 August. Under this campaign, app. 2000 Indian National Flag was distributed in 03 govt. high/hr. sec. schools, public representatives and villagers and encouraged to hoist the Tiranga at their home to celebrate Azadi Ka Amrit Mahotsav.



Observed International Yoga Day

International Yoga Day is observed on 21st, June every year to spread awareness on the invaluable benefits of Yoga. This year theme was "Yoga for Humanity". Organized Yoga Session on International Yoga Day on 21 June 2022 in Govt. Hr. Sec. School, Bade Bhandar where about 50 students, teachers and community members participated in the Yoga Session.



National Fire Service Week is observed

National Fire Service Week is observed every year from 14 to 20th April. This year the theme of National Fire Service Day was "Learn Fire Safety, Increase Productivity". In this



sequence, National Fire Service Day was organized in the Government Higher Secondary School of village Bade Bhandar. The main objective of the event

was to conduct exercises and rehearsals to find out the preparedness to fight the emergency of fire, as well as to create awareness about it among school students, teaching staffs and villagers. This was appreciated by the gram panchayat members.

Response to emergencies like fire, accidents, flood, pandemic is critical and important to act on time. As a responsible citizen, REGL team proactively responded to such emergencies. Our safety and fire team extended support during fire calls from the nearby villages and local administration.



Sustainable Livelihood Development: -

Women's Empowerment- SHGs

In line with the State Policy, the project's focus on working with and strengthening groups of poor women is based on the social mobilization and empowerment approach that seeks enhancement of women's access to productive assets and their capacity to participate in social change processes and to negotiate with, influence, and hold accountable key institutions and decision-making structures that affect their lives. The project of sustainable livelihood is focused on formation and strengthening of self-help groups.

- There is total 184 SHGs in 15 villages having 1914 women members
- 82 Self Help Groups (SHGs) meeting held in 12 villages where total 701 members participated in the meeting
- SHGs took various social and economic activities.

cluster and block levels and beyond to enable them to play a larger and more visible role in society, improve their negotiating skills and to access and implement development projects.

Under the capacity building, the group members were trained on the leadership skills, book-keeping for proper accounts maintenance, credit linkages, conflict resolution and concept of the SHG.

Women in Micro Enterprises- Mushroom Farming

Among the different off farm income generation enterprises, the mushroom farming plays a crucial role in case of enhancing income of the women. During the period organized two-days training workshop on paddy straw mushroom farming for 35 SHG members of 07 SHGs from 3 villages. Also provided information on cost benefit and marketing strategy for paddy straw mushroom. The training was provided by Block Technical Officer of Agriculture department, Pussore.

Total 11 SHGs have started production of Paddy Straw Mushroom after receiving of mushroom cultivation training. AF/REGL CSR team received one day training at Tamnar

The project will seek to build the capacity of women's groups (SHG) to network with other women's groups and form collectives at





Samhita Mushroom Cluster at Tamnar Village. A Mushroom Research Center has been developed by JSPL Foundation at Tamnar village. Four teachers from OP Jindal School, Raigarh visited to 03 women self-help groups of Bunga village and understood the process of mushroom farming, during which the SHG members gave them complete information of farming.

Paddy Cultivation – SRI Method (Govt. Convergence)

“Atma Yojana” is one of the schemes of Agriculture Department of Chhattisgarh Government, the meeting was organized by CSR team with the aim of making the villagers aware about the government schemes and benefiting them with the scheme.

Total of 03 farmers agreed to cultivate paddy through SRI under Atma Yojana. Its objective is to encourage paddy cultivation (SRI) and increase their income by producing good yields. On 02.07.2022, Agriculture Department, Pussore distributed Paddy seeds, Variety-Chhattisgarh Devbhog (15 kg per acre) per beneficiary under Atma Yojana in the presence of Adani Foundation CSR team to three interested farmers. Ambika bidder and Insecticides also provided by the agriculture dept.



ASDC – SAKHSAM (SET Course)



Skill development center is operational at Bade Bhandar village, where tailoring training is provided to the girls of the peripheral villages. Two batches of self-employed tailor (SET) course were successfully completed from April to September 2022. Total 55 girls from 14 villages trained for three-month SET course and learned cutting and sewing. Tailoring kit distributed to the trainees. During the period various extra-curricular activities like rangoli competition, health awareness sessions, financial awareness, tree plantation, Teacher's Day, Hindi Diwas Saksham day, Rakhi preparation organized. Darji Group formed of the trained girls and are cutting and stitching garments, backpack etc. and earning. They



stitched 1000 flags to celebrate Independence Day and earned 30000/- They were appreciated by Aajivika Mission (Bihar). ASDC HO team visited on 09/09/2022 and interacted with the CSR team and trainees of tailor training and visited villages to see girls engaged in sewing activity in villages.

Observed World Environment Day in nearby villages

Observed World Environment Day on 5th June Women SHG and panchayat representative, health workers from Gram Panchayat Barpali and Chandli together took part in Hariyali rally. On this occasion, 625 fruit and other plants were planted at selected and



safe places of the village. Similarly, in ITI Saria, a rally was organized by the students on this day to create awareness among the people about the environment. On this occasion various competitions on environment i. e. poster, slogan, street plays etc. were organized.

Community Infrastructure Development



We believe that developing infrastructure is essential for sustaining and multiplying growth of the society. With a goal to meet the villager's collective need construction of balance work of community center at village Bade Bhandar is in progress. Pond deepening work undertaken on request of villagers of Amalibhouna by REGL. This will enhance the water storage capacity of the pond.

Blood Donation Drive



AF CSR team actively participated in blood donation camp organized in collaboration with State Red Cross Society- Raipur and Fortis Hospital, Jindal- Raigarh on the birthday of our Hon. Chairman on 24th June at REGL site. Total 289 employees and workers donated blood for the noble cause.

Organized 5-S workshop @ ITI Saria



Organized 5- S workshop at ITI Saria. 5-S is workplace management system. 1. Seiri-Reorganization, 2. Seiton-Neatness, 3. Seiso-Cleaning, 4. Seiketsu-Standardization, 5. Shitsuke- Discipline. Its help to increase performance level and accident-free machine/materials and safe workplace.

All Students, teaching staff and management committee of Saria ITI actively participated in this workshop

Media Coverage

अदाणी फाउंडेशन में ओम के उच्चारण के साथ शुरू हुआ योगाभ्यास



राजस्थान राज्य की अग्रणी शिक्षित अदाणी फाउंडेशन में 4 से 12 वर्ष के बच्चों के लिए योग विद्या पर एक दिन का कार्यक्रम किया। इस अवसर पर योग के अर्थ और इसके स्वास्थ्य लाभों के बारे में जानकारी दी गई। कार्यक्रम के अंत में बच्चों को योग के महत्व के बारे में बताया गया।

अदाणी फाउंडेशन की ओम के उच्चारण के साथ शुरू हुआ योगाभ्यास कार्यक्रम का उद्देश्य बच्चों में योग के महत्व के बारे में जागरूकता फैलाना है। कार्यक्रम के अंत में बच्चों को योग के महत्व के बारे में बताया गया।

पर्यावरण दिवस पर रायगढ़ एनर्जी जनरेशन लिमिटेड ने आयोजित किए विविध कार्यक्रम



राजस्थान राज्य की अग्रणी शिक्षित अदाणी फाउंडेशन में 4 से 12 वर्ष के बच्चों के लिए योग विद्या पर एक दिन का कार्यक्रम किया। इस अवसर पर योग के अर्थ और इसके स्वास्थ्य लाभों के बारे में जानकारी दी गई। कार्यक्रम के अंत में बच्चों को योग के महत्व के बारे में बताया गया।

पर्यावरण दिवस पर रायगढ़ एनर्जी जनरेशन लिमिटेड ने आयोजित किए विविध कार्यक्रम। कार्यक्रम के अंत में बच्चों को पर्यावरण के महत्व के बारे में बताया गया।

आजादी का अमृत महोत्सव: हर घर तिरंगा अभियान पर अदाणी फाउंडेशन ने वितरित किये 2500 से अधिक राष्ट्रीय ध्वज



आजादी का अमृत महोत्सव के अंत में हर घर तिरंगा अभियान पर अदाणी फाउंडेशन ने वितरित किये 2500 से अधिक राष्ट्रीय ध्वज। कार्यक्रम के अंत में बच्चों को तिरंगा के महत्व के बारे में बताया गया।

आजादी का अमृत महोत्सव के अंत में हर घर तिरंगा अभियान पर अदाणी फाउंडेशन ने वितरित किये 2500 से अधिक राष्ट्रीय ध्वज। कार्यक्रम के अंत में बच्चों को तिरंगा के महत्व के बारे में बताया गया।

अदाणी फाउंडेशन ने आयोजित किया बालिका मैराथन



अदाणी फाउंडेशन ने आयोजित किया बालिका मैराथन। कार्यक्रम के अंत में बच्चों को मैराथन के महत्व के बारे में बताया गया।

अदाणी फाउंडेशन ने आयोजित किया बालिका मैराथन। कार्यक्रम के अंत में बच्चों को मैराथन के महत्व के बारे में बताया गया।

श्रद्धालुओं के लिए अदाणी फाउंडेशन ने माँ चन्द्रहासिनी मंदिर में निःशुल्क चिकित्सा शिविर लगाया



श्रद्धालुओं के लिए अदाणी फाउंडेशन ने माँ चन्द्रहासिनी मंदिर में निःशुल्क चिकित्सा शिविर लगाया। कार्यक्रम के अंत में बच्चों को चिकित्सा के महत्व के बारे में बताया गया।

श्रद्धालुओं के लिए अदाणी फाउंडेशन ने माँ चन्द्रहासिनी मंदिर में निःशुल्क चिकित्सा शिविर लगाया। कार्यक्रम के अंत में बच्चों को चिकित्सा के महत्व के बारे में बताया गया।

युवाओं को व्यावसायिक प्रतियोगी परीक्षाओं की तैयारी कराने अदाणी फाउंडेशन का निःशुल्क कोचिंग केंद्र शुरू



युवाओं को व्यावसायिक प्रतियोगी परीक्षाओं की तैयारी कराने अदाणी फाउंडेशन का निःशुल्क कोचिंग केंद्र शुरू। कार्यक्रम के अंत में बच्चों को कोचिंग के महत्व के बारे में बताया गया।

युवाओं को व्यावसायिक प्रतियोगी परीक्षाओं की तैयारी कराने अदाणी फाउंडेशन का निःशुल्क कोचिंग केंद्र शुरू। कार्यक्रम के अंत में बच्चों को कोचिंग के महत्व के बारे में बताया गया।

adani

Growth
with
Goodness

Our Values: Courage | Trust | Commitment



Green Belt Development

Plantation on 33% land of 487 acre	167acre	Species
Density of plantation	2500 plants/ Hectare	Casurina, peltaform, chitwan, akasia, Mahagoni, Mango,etc
Area required per plant	4.0 SQM	
Total no. of plantation completed	219000 Nos.	
2021-22	4426 Nos.	
2022-23	2600 Nos.	
Survival rate maintained	< 70%	



Power

Ref: REGL/ENV/CEA/FLYASH/148/10/22
Date: 14/10/2022

To,

**The Chief Engineer
Central Electricity Authority
Thermal Civil Design Division
9th Floor, North Wing,
Sewa Bhawan, R.K.Puram,
New Delhi-110066**

Sub: Submission of Half yearly report on Fly Ash Generation & Utilisation for the period of April'2022 to September'2022 for Raigarh Energy Generation Limited., Raigarh

Ref: Your Letter No- 1/8/1/DATA/2018/TCD dated: 29/04/2020 & mail dated 03.10.2022.

Dear Sir,

With reference to the above-mentioned subject, we are furnishing herewith half yearly Fly Ash report pertaining to fly ash Generation & its Utilization for the period of **April'2022 to September'2022**, as per the prescribed format provided by your office (**Format -I, II & III**).

This is for your kind information and record please.

Thanking You,
Yours faithfully,
for **Raigarh Energy Generation Limited**


(R N Shukla)
Head-Environment

Encl: As above

MINISTRY OF POWER
CENTRAL ELECTRICITY AUTHORITY
THERMAL CIVIL DESIGN DIVISION

General Information on Power Stations, Coal Mines and Quality of Coal

Name of Power Utility: Raigarh Energy Generation Limited

Name of Thermal Power Plant:- Raigarh Energy Generation Limited

PERIOD OF REPORT- April, 2022 to September, 2022

P.O: Bade Bhandar, Tehsil: Pussore,
Raigarh, Chattisgarh

(A) Thermal Power Station								(B) Detail of Nodal Officer				(C) COAL				
Sl.No.	Name of Thermal Power Station with Complete Address	District	State	Environmental Zone	Unit No.	Installed Capacity (MW)	Date of Commissioning	Name	Designation	Contact No. (Land Line and Mobile)	Email	Name of Mine & Its Location	Distance of Mine from TPS (KM)	Quantity of coal received (LMT)	Average Calorific Value of coal (Kcal)	Average Ash Content of coal (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1	Raigarh Energy Generation Limited, P.O: Bade Bhandar, Tehsil: Pussore, Raigarh, Chattisgarh, PIN : 496100	Raigarh	Chhattisgarh	C	1	600	31.03.2014	Samir Kumar Mitra	Station Head	07762-218374	samir.mitra@adani.com	SECL (Bijari, Jampali, Chhal, New Kusmunda), MCL (Lakhanpur, Belpahad, Kulda, Garjanmahal)	110 KM	12.68	--	41.00%

Abbreviations:-
MW-Mega Watt

TPS- Thermal Power Station
KM- Kilometre
LMT- Lakh Metric Tonne
Kcal- Kilocalories

Complete address of Corporate Office / Head Office / Registered Office	
Address :	Adani Corporate House, Shantigram, S G Highway, Ahmedabad, Gujarat, 382421
email ID :	RN.Shukla@adani.com
Telephone	9426600976

Complete address of Thermal Power Plant	
Address :	Village-Bade & Chhote Bhandar, Tehsil-Pussore District-Raigarh, Chhattisgarh
email ID :	samir.mitra@adani.com
Telephone	07762-218374

MINISTRY OF POWER
CENTRAL ELECTRICITY AUTHORITY
THERMAL CIVIL DESIGN DIVISION

Ash Disposal Facilities Available at Thermal Power Station, Mode of Disposal (Dry & Wet) and Ash Stock Available(Fly Ash, Bottom Ash & Pond Ash)

Name of Power Utility: Raigarh Energy Generation Limited

Name of Thermal Power Plant:Raigarh Energy Generation Limited

PERIOD OF REPORT- April, 2022 to September, 2022

Sl.No.	Name of Thermal Power Station	Existing facilities for Ash disposal		Location & Distance of Ash Disposal Area from TPS	Area acquired for Ash Disposal	Design Life of Disposal Area	Additional Area if any proposed	Ash Disposal		Ash Stock Available as on 30.09.2022		
		Dry	Wet					Dry Ash	Wet Ash	Fly Ash	Bottom Ash	Pond Ash
(1)	(2)	(3)	(4)	(KM)	(Ha)	(Years)	(Ha)	(LMT)	(LMT)	(LMT)	(LMT)	(LMT)
1	Raigarh Energy Generation Limited	Fly Ash Silo	Ash Dyke	Within Plant Premises	52.99	15 Years	0	2.53	0.64	0.0000	0.000	23.63

Abbreviations:-
MW-Mega Watt

TPS- Thermal Power Station
KM- Kilometer

LMT- Lakh Metric Tonne
Ha- Hectare

Description	Quantity in LMT
Ash Stock Position as on 01.04.2022	21.13
Generation of Ash during 01.04.2022 to 30.09.2022	5.67
Utilisation of Ash during 01.04.2022 to 30.09.2022	3.17
Ash Stock Position as on 30.09.2022	23.63
Reasons for not Utilising the Legacy Ash may also be provided	...

MINISTRY OF POWER
CENTRAL ELECTRICITY AUTHORITY
THERMAL CIVIL DESIGN DIVISION

Monthly Abstract of Ash Generation and Utilization
(For the Period from April, 2022 to September, 2022)

Name of Power Utility: Raigarh Energy Generation Limited

Name of Thermal Power Plant: Raigarh Energy Generation Limited

Installed Capacity (Total): 600 MW

PERIOD OF REPORT- April, 2022 to September, 2022

Sl. No.	ASH GENERATION AND UTILIZATION (in LMT)						MODES OF ASH UTILIZATION AND UTILIZATION IN EACH MODE (in LMT)									
	Month	Coal consumed	Ash content of coal	Ash Generation	Ash Utilization	% age Utilization	In the making of Fly Ash based Bricks / Blocks / Tiles etc.	In the manufacture of Portland Pozzolana Cement	In the construction of Highways & Roads including Flyovers	Part replacement of cement in concrete	In Hydro Power Sector in RCC Dam Construction	In Ash dyke raising	In the reclamation of low lying Areas	In Mine filling	In Agriculture / Waste land Development	Others
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1	APRIL-2022	2.53821	43.60000	1.10666	0.99870	90.2	0.000	0.000	0.000	0.000	0.000	0.96775	0.03095	0.000	0.000	0.000
2	MAY-2022	2.50861	41.60000	1.04358	0.81737	78.3	0.000	0.000	0.000	0.000	0.000	0.06824	0.74913	0.000	0.000	0.000
3	JUNE-2022	2.47000	42.50000	1.04975	0.44575	42.5	0.000	0.000	0.000	0.000	0.000	0.10500	0.34075	0.000	0.000	0.000
4	JULY-2022	2.39291	37.41991	0.89542	0.29730	33.2	0.000	0.000	0.000	0.000	0.000	0.00000	0.29730	0.000	0.000	0.000
5	AUGUST-2022	0.99499	39.40000	0.39203	0.11190	28.5	0.000	0.000	0.000	0.000	0.000	0.00000	0.11190	0.000	0.000	0.000
6	SEPTEMBER-2022	2.84963	41.60000	1.18545	0.49870	42.1	0.000	0.000	0.000	0.000	0.000	0.00000	0.49870	0.000	0.000	0.000
	TOTAL	13.75435	41.00000	5.67289	3.16972	55.9	0.000	0.000	0.000	0.000	0.000	1.14099	2.02873	0.000	0.000	0.000

Note: (i) Ash means all types of ash including Fly Ash, bottom Ash and Pond Ash etc

(ii) Quantity of ash may be provided in Lakh Metric Ton (LMT) upto five decimal places

(iii) Ash utilisation in Column (6) shall be equal to summation of modes of ash utilisation in each mode i.e. summation of column (8) to column (17)

Abbreviations:-

MW- Mega Watt

TPS- Thermal Power Station

KM- Kilometre

LMT- Lakh Metric Tonne

Kcl- Kilocalories



Ref. No.: REGL/ENV/22-23/35

14th September - 2022

**The Member Secretary,
Chhattisgarh Environmental Conservation Board**
Paryavas Bhavan, North Block, Sector 19, Atal Nagar,
Nawa Raipur, Dist.- Raipur, Chhattisgarh

Sub: Submission of Environmental Statement Report (Form-V) for 600 MW (1x600 MW) coal based thermal power plant at Village-Chhote Bhandar, PO: Bade Bhandar Tehsil : Pussore, District-Raigarh, Chhattisgarh by M/s Raigarh Energy Generation Limited.

Dear Sir,

This has reference to the above subject and General Conditions of the Environment Clearance Letter above cited issued by MoEF & CC, New Delhi. We are hereby submitting Environment Statement Report (Form-V) for the period of April'2021 to March'2022.

Thanking You,

Yours' faithfully,

For, **Raigarh Energy Generation Limited (REGL)**


Samir Kumar Mitra
Station Head

Encl: As cited above

CC - Regional Officer, Chhattisgarh Environment Conservation Board, TV Tower Road, Raigarh.

Raigarh Energy Generation Limited
(Formerly Known as Korba West Power Company Limited)
Adani Corporate House,
Shantigram, Near Vaishno Devi Circle,
S. G. Highway, Khodiyar,
Ahmedabad-382421,
Gujarat, India
CIN: U40102GJ1995PLC114182

Tel +91 79 2656 7555
Fax +91 79 2555 7177
info@adani.com
www.adani.com

Registered Office: Adani Corporate House, Shantigram, Near Vaishno Devi Circle, S. G. Highway, Khodiyar, Ahmedabad-382421, Gujarat, India.

1 X 600 MW (600 MW) Coal Based Thermal Power Plant
At Village- Chhote Bhandar, PO- Bade Bhandar, Tehsil-Pussore,
District. – Raigarh, Chhattisgarh

**Environmental Statement Report,
2021-22**



ENVIRONMENTAL STATEMENT REPORT FOR 1 X600 MW

Financial Year 2021-22



**Chhattisgarh Environment Conservation Board,
Raipur, Chhattisgarh**



**Environment Management Department,
Raigarh Energy Generation Limited,
Bade & Chhote Bhandar Village, Pussore Tehsil
Raigarh District, Chhattisgarh**

ENVIRONMENT STATEMENT FORM-V

(See rule 14)

Environmental Statement for the financial year ending on 31st March, 2022 as per condition stipulated under clause no. xvi of General Conditions in Environmental Clearance granted by Ministry of Environment & Forest vide letter no. J 13012/57/2008-IA.II (T) dated 20th May, 2010.

PART- A

i.	Name and address of the owner/occupier of the industry Operation or Under process.	Mr. Samir Kumar Mitra Station Head Vill – Chhote Bhandar, PO – Bade Bhandar, Tehsil – Pussore, Distt – Raigarh, Chhattisgarh – 496 100
ii.	Industry category Primary-(STC Code) Secondary – (STC Code)	Red Category
iii.	Production category – Units	1 x 600 MW (600 MW)
iv.	Year of establishment	01 st April 2014
v.	Date of the last environmental statement submitted.	28 th September, 2021

PART - B

i. Water and raw Material Consumption: -

i.	Water consumption in m ³ /day	M ³ /day
a	Process	546.6
b	Cooling	21448.6
c	Domestic	118.8
	Total	22114.19

S. No.	Name of the Products	water consumption per unit of products	
		During the previous financial year 2020 -21	During the current financial year 2021-22
1.	Electricity	2.54 M3/ MWh	2.347 M3/ MWh

ii. Raw material consumption

Name of the Raw materials	Name of the Products	Process water consumption per unit of products	
		During the previous financial year 2020 -21	During the current financial year 2021-22
Coal	Electricity	0.77 MT/ MW	0.747 MT/MW
LDO	Electricity	0.000291 KL/ MW	0.00034KL/MW

PART - C

Pollution discharged to environment/unit of output

(Parameter as specified in the consent issued)

SN	Pollutants	Quantity of pollutants discharged (Ton/day)	Concentrations of pollutants in discharges (mg/Nm ³)	Percentage of variation from prescribed standards with reason
a	Water	0.00	0.00	Plant designed is based on zero discharge
b	Air : PM	1.88	37.5	Within the standards of CECB/CPCB
	SO ₂	48.83	989	Communicated with MoEF & CC regarding time of alignment with CEA phasing plan for achievement of new emission standards.
	NO _x	17.38	358	Communicated with MoEF & CC regarding time of alignment with CEA phasing plan for achievement of new emission standards.

- Water- No discharge of wastewater.

Note- 100% effluent is treated and recycled back. Hence, there is no discharge of effluent in the environment.

PART - D

HAZARDOUS WASTES

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

S. No.	Hazardous Wastes	Total Quantity (MT)	
		During the current financial year 2020-21	During the current financial year 2021-22
a.	From Process Used Oil	46.730 KL	6 KL
b.	From Pollution Control Facilities	Nil	Nil

PART - E

SOLID WASTES

S. No.	Solid Wastes	Total Quantity (MT)	
		During the current financial year 2020-21	During the current financial year 2021-22
a.	From Process (Ash)	852208 MT	1095000 MT
b.	From Pollution Control Facility	Nil	Nil
c.	Quantity recycled or reutilized within the unit.	Nil	Nil
	Sold	Nil	Nil
	Disposal (In low lying areas and backfilling of stone quarries)	305756 MT	410445 MT

Remarks: **Unutilized Ash has been stored in ash dyke.**

PART - F

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

1) Hazardous Waste:

Hazardous waste (Used/Spent oil) is sold to authorized vender. (Please Refer Part - D for Hazardous waste generation and disposal)

2) Non Hazardous Solid Waste:

- a) Bottom Ash
- b) Fly Ash

Disposal Practices: The waste generated has been disposed in nearby low-lying areas/ stone quarries. Exploring approaches for utilization avenues like infrastructure, highways, cement industries etc.

PART - G

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

- 1) The stack emissions from the plant are controlled by Electrostatic Precipitator with efficiency of 99.938% for reducing the emission.
- 2) Other pollution control equipment's like Dust Extraction System & Dust Suppression System are installed at various material transfer points to control the fugitive emissions.
- 3) Real time monitoring system for both EQMS & CEMS installed as per the direction of CPCB/RSPCB issued, under Air & Water Act.
- 4) Utilization of rainwater collected during monsoon in Rainwater Harvesting Pond
- 5) We had Installed Effluent Treatment Plant for treating the Industrial Effluent & reusing it.
- 6) WE had Installed Sewage Treatment Plants for treating the Domestic sewage and reusing the treating water.
- 7) Installation of Hydro bins has been installed at ash water recovery system.

- 8) Regular monitoring of ambient air quality, ground & surface water, noise level quality has been carried out to evaluate the quality of environment in and around the plant premises.
- 9) Installation of Bag Filters, Dry fog dust suppression systems are installed throughout coal handling chain.

PART - H

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

Last (FY 2020-21) Environmental Protection cost details are given below:

SI No	Expenditure head	Actual Expenditure FY 21-22(In Lakh)
1	Environmental protection O&M	41.84
2	Environmental Monitoring Cost	8.35
3	Legal & consent Fee	20.0
4	CSR	36.31
3	Environmental Lab Setup	22.6
4	Fly Ash Management	769.35
5	Greenbelt Development	60.0
6	Environmental Awareness Training	1.0
7.	Tree Plantation	7.2
7	World Environment Day	0.30
8	Waste Management at Site	4.81
Total:		971.76

PART - I

Any other Particulars for improving the quality of the environment

- 1) Water sprinkling in dust prone areas in and around plant premises.
- 2) Increasing the density of plants in and around plant premises development of local plant species has been preferred for the plantation having following characteristics.
 - Fast growing with thick canopy cover.
 - Adequate height with longer duration of foliage.
 - Perennial and evergreen

- 3) Integrated housekeeping management is undertaken at top priority to maintain neat, clean, and safe working environment in the plant area.
- 4) Organic waste is being converted to manure and being used in green belt development activities.
- 5) Rain guns and water sprinkling system has been provided in CHP.
- 6) Having certificate from CII to Single Use Plastic (SUP) free organization.
- 7) ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, ISO 50001 :2018, ISO 55001:2014, ISO 46001:2019 has been implemented for betterment of environment.

-End-