



## Power

Ref: APL/REGL/TPP/EMD/MoEFCC/EC/214/05/22

Date: 27.05.2022

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, Fly ash data & CSR progress report etc. for the period of **October'2021 to March'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)**

**Head – AESG**

**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**

# **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: October'2021 – March'2022**

## TABLE OF CONTENT

SL. No	Title	Annexures
1	Introduction	
2	<b>Compliance status of Environment Clearances (EC)</b>	
<b>List of Annexures</b>		
1.	Environmental Monitoring Report (Third Party)	Annexure – I
2.	Progress Report of Corporate Social Responsibility	Annexure – II
3.	Green Belt/Plantation Details	Annexure – III
4.	Fly Ash Generation & Utilization details	Annexure – IV

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

**Introduction**

"Raigarh Energy Generation Limited (formerly known as Korba West Power Company Limited) was set up a Coal based thermal power plant of capacity 1x600 MW at village ChoteBhandar, 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 MoEF & CC 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
<b>A.</b>	<b>Specific Conditions</b>	
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.	<b>Complied.</b> 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 <b>Annexure - I.</b>
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.

**Raigarh Energy Generation Limited**

Sr. No.	EC Conditions	Compliance Status
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.	The entire plant area is almost flat. There are no 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 CPCB directions vide letter no. B33014/07/2017-18/IPC-II/TPP/15860 dated 11.12.2017. However, as per MoEF&CC's Notification dated 31st March 2021, Raigarh TPP is falling under Category "C" Non- retiring TPPs and the timelines for compliance of SO2 emission is up to December 2024. Accordingly, Plant shall install FGD by March 31, 2024.
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, SOx & NOx. 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 <sup>3</sup> .	A High Efficiency Electrostatic Precipitators has been provided (ESP) to meet particulate emission less than 50 mg/Nm <sup>3</sup> . Monitoring report enclosed as <b>Annexure- I</b>
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 <sup>th</sup> year of operation of the plant. Status of implementation shall be	Fly ash utilization for the FY 2021-2022 is less than 100% due to COVID -19 and NGT banned low lying are filling in Raigarh district. Fly Ash utilization report is attached as <b>Annexure - II.</b>

**Raigarh Energy Generation Limited**

Sr. No.	EC Conditions	Compliance Status
	reported to the Regional Office of the Ministry from time to time.	
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 <b>Annexure – I</b> .
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 a 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. Approximate 216474 trees 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 <b>Annexure - III</b> .
xviii	Two nearest village shall be adopted and basic amenities like development of roads, drinking water supply, primary health	Being Complied Four nearby villages are adopted for development of basic amenities such as

**Raigarh Energy Generation Limited**

Sr. No.	EC Conditions	Compliance Status
	centre, primary school etc. shall be developed in co-ordination with the district administration.	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 Badebhandar and Sarwani. Tailoring training has been started from September 2020, total trained about 110 during the year. The activities carried earlier are being monitored and sustained by the beneficiaries.
xix	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.	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. Detailed CSR report enclosed as <b>Annexure-IV</b> .
xx	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.	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.
xxi	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.	Being Complied. 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-IV.

**Raigarh Energy Generation Limited**

Sr. No.	EC Conditions	Compliance Status
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 enclosed as <b>Annexure-IV</b> .
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 <b>Annexure-IV</b> .
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.  Social audit has been carried out by reputed institute IISWBM, Kolkata. Audit report already submitted with previous compliance reports.
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. 64 Nos Solar streetlights have been installed & Solar geysers are installed in roof top of residential complexes within plant premises.

**Raigarh Energy Generation Limited**

Sr. No.	EC Conditions	Compliance Status
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 <b>Annexure - I.</b>
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.	Noted, Compliance assured, in consultation with State Pollution Control Board & concern department
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 216474 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 <b>Annexure - III.</b>
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	Noted & complied. We have already established an Environmental Management Cell & Environment Head has direct reported to Senior Management.

**Raigarh Energy Generation Limited**

Sr. No.	EC Conditions	Compliance Status
	shall be headed by an officer of appropriate superiority and qualification. It shall be ensured that the Head of the Cell shall 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.	Noted. Complied
<b>B. GENERAL CONDITIONS</b>		
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 <b><u>Annexure - I.</u></b>
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 <b><u>Annexure - I.</u></b>
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 rain water 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	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



**Raigarh Energy Generation Limited**

Sr. No.	EC Conditions	Compliance Status
	submitted to the Ministry as well as to the Regional Office of the Ministry.	preparedness plan is submitted at respective authorities.
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 <b><u>Annexure - I</u></b> .
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	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



**Raigarh Energy Generation Limited**

Sr. No.	EC Conditions	Compliance Status
	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-noisy/less noisy areas.	out regularly. Periodic audiometric check-up is being carried out.
x	Regular monitoring of ground level concentration of SO <sub>2</sub> , NO <sub>x</sub> , PM <sub>2.5</sub> & PM <sub>10</sub> 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.	Regular monitoring of SO <sub>2</sub> , NO <sub>x</sub> , PM <sub>2.5</sub> & PM <sub>10</sub> 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 <b>Annexure – I</b> . 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 <a href="http://envfor.nic.in">http://envfor.nic.in</a> .	Complied. Advertised in three newspapers Hindustan Times, Dainik bhaskar & Nai Duniya on 28.02.2010

**Raigarh Energy Generation Limited**

Sr. No.	EC Conditions	Compliance Status
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. <a href="http://www.adanipower.com">http://www.adanipower.com</a>
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 <sub>2.5</sub> & PM <sub>10</sub> ), SO <sub>2</sub> , NO <sub>x</sub> (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. <a href="http://www.adanipower.com">http://www.adanipower.com</a>
xvi	The environment statement for each financial year ending 31 <sup>st</sup> 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 2020-21 has been submitted to Chhattisgarh Environment Conservation Board (CECB) vide letter no. Ref. No.: REGL/ENV/20-21/ 146, dated-28/09/2021. Copy of Environmental statement report is already submitted with previous EC Compliance report.
xvii	The project proponent shall submit six monthly reports on the status of the implementation of the stipulated	Being Complied. Six monthly Environmental Clearance compliance status report is regularly

**Raigarh Energy Generation Limited**

Sr. No.	EC Conditions	Compliance Status
	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.	submitted to MoEF, CPCB and SPCB. The same is sent by email also. Last compliance report for the period of April'21 – September'21 had been submitted to your good office via our latter no. Ref: APL/REGL/TPP/EMD/MoEFCC/EC/304/11/21 dated- 24.11.2021
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.	Being Complied A separate fund has already been allocated for implementation of environmental protection.
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	Complied.

**Raigarh Energy Generation Limited**

Sr. No.	EC Conditions	Compliance Status
	start of land development work and commissioning of plant.	
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.
<b>Conditions of EC Amendment Letter</b>		
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 21 <sup>st</sup> 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><b>Management of Ash Ponds</b></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 &amp; 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 <b><u>Annexure II</u></b></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 &amp; being complied</p> <p>iv) Noted &amp; will be complied as &amp; when fly ash is disposed in abandoned or working mines</p>
<p>3)</p>	<p><b>Transportation</b></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 conveyor; and</p> <p>b) If transportation by rail or conveyor facility is not available, ensure that the coal is transported out from the Delivery Point of the respective mine in covered trucks (by tarpaulin or other means), or any mechanized closed trucks by roads.</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>

## 3rd 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 Change, 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 provisions 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 27<sup>th</sup> December 2021 to 30<sup>th</sup> December 2021, **i.e. for Third 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: 10/02/2022



A handwritten signature in blue ink, appearing to be "S. S. S.", written over a horizontal line.

Authorized Signatory

**INDEX**

<b>Sr.No.</b>	<b>Contents</b>	<b>Page No.</b>
<b>1.0</b>	Introduction	3
<b>2.0</b>	Project Profile	4
2.1	Topography and Drainage	4
2.2	Location	4
2.3	Climate	4
2.4	Communication	4
2.5	Location Map	5
<b>3.0</b>	Scope of Study and Methodology	6
3.1	Scope of Study	6
3.2	Methodology	6
3.2.1	Air Environment	6
3.2.2	Water Environment	6
3.2.3	Noise Environment	7
3.2.4	Soil	7
<b>4.0</b>	Sampling Location Map and Analysis Reports	8
4.1	Ambient Air Quality Monitoring	9-16
4.2	Noise Level Monitoring	17- 24
4.3	Ground water Quality Analysis	25- 39
4.4	Surface water Quality Analysis	40- 49
4.5	Soil Quality Analysis	50-55
4.6	Effluent Sample Analysis Report	56-60
4.7	Stack Emission Analysis Report	61-62
<b>5.0</b>	Conclusion	63
5.1	Air Environment	63
5.2	Water Environment	63
5.3	Noise Environment	63



## **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 Chhattisgarh. Raigarh Energy Generation Ltd., has recently 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 toposheet 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**

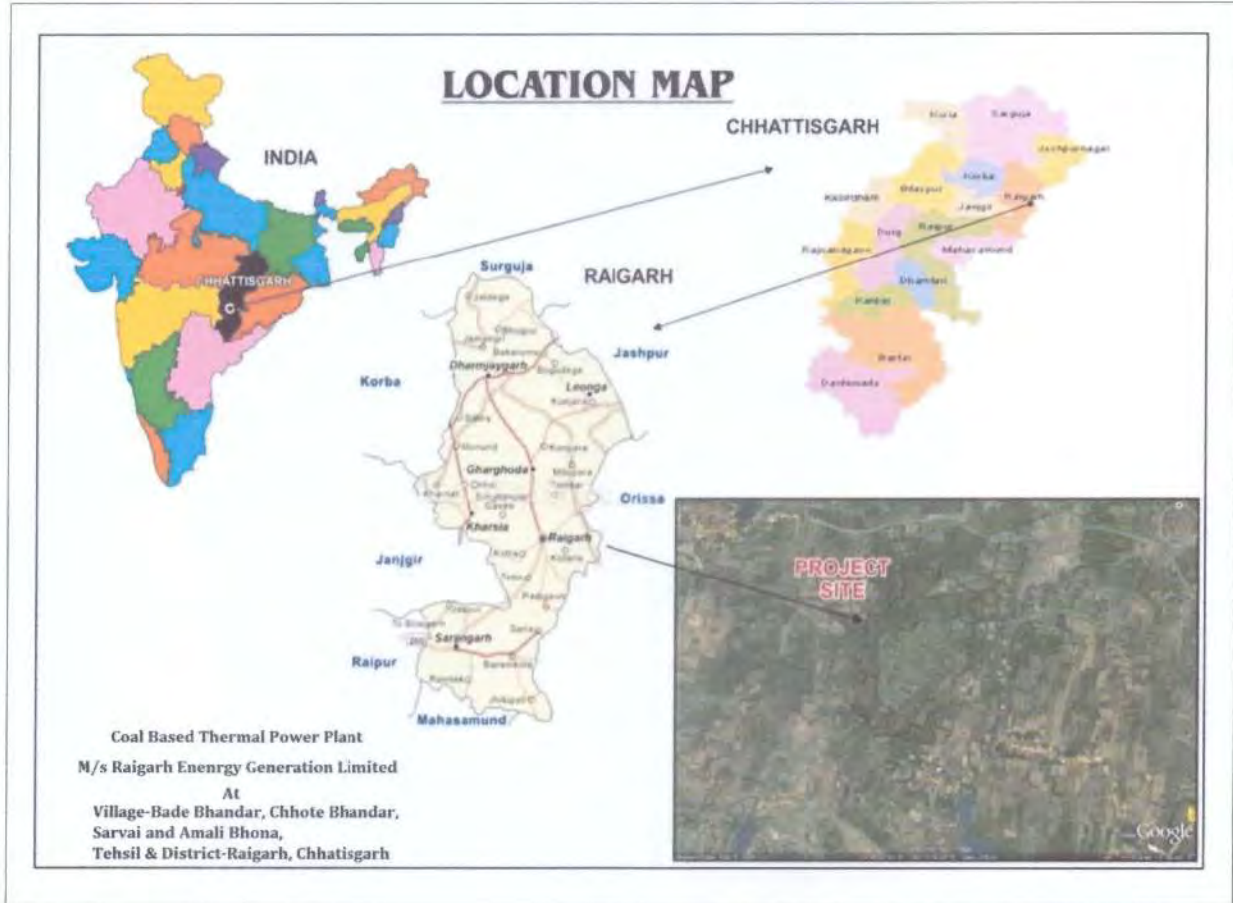
The climate of the area is Sub-tropical type. It is in the zone of humid tropic climate where temperature and humidity of air are very high. The temperature varies from the minimum - maximum temperature range between 29.5°C - 49 °C in summer, and 8°C - 25 °C in winter. The humidity varies from 35% to 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 & Chhattisgarh 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 SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, 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- Palsada Village
  - A3- Kathali Village
  - A4- Chhote Bhandar Village
  - A5- Bade Bhandar Village
  - A6- Konataral Village
  - A7- Chatamura Chowk
  - A8- Supa, Near REGL Plant





# 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  
Bade Bandar, Tehsil Pussore, Dist- Raigarh  
496100 (Chhattisgarh)  
Sample Description: Ambient Air Quality Monitoring

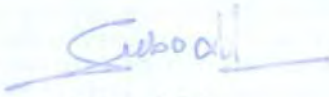
Report No.: VEL/A/2201010004  
Format No.: 7.8 F 01  
Party Reference No.: NIL  
Report Date: 04/01/2022  
Period of Analysis: 01/01/2022 to 04/01/2022  
Receipt Date: 01/01/2022

### General Information:-

Sampling Location : 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 : Cloudy Sky  
Date of Sampling : 28/12/2021 to 29/12/2021  
Time of Sampling : 10:30 AM to 10:30 AM  
Ambient Temperature (°C) : Min.13°C, Max. 26 °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 <sub>2.5</sub> )	IS: 5182 (P-24), 2019	32.33	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS:5182 (P- 23)-2006,RA. 2017	73.10	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS:5182 (P- 6)-2006 RA.2017	23.65	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS:5182 (P- 2)-2001, RA. 2017	12.44	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS:5182 (P- 9)-1974, RA. 2014	0.54	µg/m <sup>3</sup>	4.0
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL(*DL-1.0)	ng/m <sup>3</sup>	--

Note :-\*BDL-Below Detecation Limit,\*\*DL-Detecation 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/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)  
Sample Description: Ambient Air Quality Monitoring

Report No.: VEL/A/2201010005  
Format No.: 7.8 F 01  
Party Reference No.: NIL  
Report Date: 04/01/2022  
Period of Analysis: 01/01/2022 to 04/01/2022  
Receipt Date: 01/01/2022

### General Information:-

Sampling Location : Village - Palsada  
Sample collected by : Vardan EnviroLab Representative  
Sampling Equipment used : RDS & FPS  
Instrument Code : VEL/RDS/FPS/02  
Instrument Calibration Status : Calibrated  
Latitude : 21°44'13"  
Longitude : 83°16'30"  
Meteorological condition during monitoring : Cloudy Sky  
Date of Sampling : 28/12/2021 to 29/12/2021  
Time of Sampling : 10:40AM to 10:40 AM  
Ambient Temperature (°C) : Min.13°C, Max. 26 °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 <sub>2.5</sub> )	IS: 5182 (P-24), 2019	32.12	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS:5182 (P- 23)-2006,RA. 2017	72.80	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS:5182 (P- 6)-2006 RA.2017	18.20	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS:51 82 (P- 2)-2001, RA. 2017	10.35	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS:51 82 (P- 9)-1974, RA. 2014	0.65	µg/m <sup>3</sup>	4.0
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL(*DL-1.0)	ng/m <sup>3</sup>	--

Note :-\*BDL-Below Detecation Limit ,\*\*DL-Detecation Limit.

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Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardanenvironet.com, bd@vardanenvironet.com





# 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/06  
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)  
Sample Description: Ambient Air Quality Monitoring

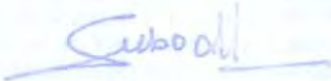
Report No.: VEL/A/2201010006  
Format No.: 7.8 F 01  
Party Reference No.: NIL  
Report Date: 04/01/2022  
Period of Analysis: 01/01/2022 to 04/01/2022  
Receipt Date: 01/01/2022

### General Information:-

Sampling Location : Village - Kathli  
Sample collected by : Vardan EnviroLab Representative  
Sampling Equipment used : RDS & FPS  
Instrument Code : VEL/RDS/FPS/03  
Instrument Calibration Status : Calibrated  
Latitude : 21°44'17"  
Longitude : 83°16'19"  
Meteorological condition during monitoring : Cloudy Sky  
Date of Sampling : 28/12/2021 to 29/12/2021  
Time of Sampling : 11:00 AM to 11:00 AM  
Ambient Temperature (°C) : Min.13°C, Max. 26 °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 <sub>2.5</sub> )	IS: 5182 (P-24), 2019	38.01	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS:5182 (P- 23)-2006, RA. 2017	75.10	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS:5182 (P- 6)-2006 RA.2017	20.31	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS:51 82 (P- 2)-2001, RA. 2017	12.51	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS:51 82 (P- 9)-1974, RA. 2014	0.70	µg/m <sup>3</sup>	4.0
6.	Mercury as (Hg)	Method Of air sampling and analysis, 3rd 1988, Method No.317	BDL(*DL -1.0)	ng/m <sup>3</sup>	--

Note :- \*BDL-Below Detecation Limit, \*\*DL-Detecation 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/07  
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)  
Sample Description: Ambient Air Quality Monitoring

Report No.: VEL/A/2201010007  
Format No.: 7.8 F 01  
Party Reference No.: NIL  
Report Date: 04/01/2022  
Period of Analysis: 01/01/2022 to 04/01/2022  
Receipt Date: 01/01/2022

### General Information:-

Sampling Location : Village - Chhote Bhandar  
Sample collected by : Vardan EnviroLab Representative  
Sampling Equipment used : RDS & FPS  
Instrument Code : VEL/RDS/FPS/02  
Instrument Calibration Status : Calibrated  
Latitude : 21°44'22"  
Longitude : 83°16'43"  
Meteorological condition during monitoring : Cloudy Sky  
Date of Sampling : 29/12/2021 to 30/12/2021  
Time of Sampling : 11:10AM to 11:10 AM  
Ambient Temperature (°C) : Min.14°C, Max. 28 °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 <sub>2.5</sub> )	IS: 5182 (P-24), 2019	33.22	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS:5182 (P- 23)-2006,RA. 2017	76.20	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS:5182 (P- 6)-2006 RA.2017	18.76	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS:51 82 (P- 2)-2001, RA. 2017	10.39	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS:51 82 (P- 9)-1974, RA. 2014	0.73	µg/m <sup>3</sup>	4.0
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL(*DL-1.0)	ng/m <sup>3</sup>	--

Note :-\*BDL-Below Detecation Limit, \*\*DL-Detecation 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/08  
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)  
Sample Description: Ambient Air Quality Monitoring

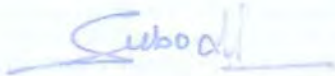
Report No.: VEL/A/2201010008  
Format No.: 7.8 F 01  
Party Reference No.: NIL  
Report Date: 04/01/2022  
Period of Analysis: 01/01/2022 to 04/01/2022  
Receipt Date: 01/01/2022

### General Information:-

Sampling Location : Village - Bade Bhandar  
Sample collected by : Vardan EnviroLab Representative  
Sampling Equipment used : RDS & FPS  
Instrument Code : VEL/RDS/FPS/03  
Instrument Calibration Status : Calibrated  
Latitude : 21°44'29"  
Longitude : 83°17'6"  
Meteorological condition during monitoring : Cloudy Sky  
Date of Sampling : 29/12/2021 to 30/12/2021  
Time of Sampling : 11:30 AM to 11:30 AM  
Ambient Temperature (°C) : Min.14°C, Max. 28 °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 <sub>2.5</sub> )	IS: 5182 (P-24), 2019	37.34	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS:5182 (P- 23)-2006,RA. 2017	79.50	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS:5182 (P- 6)-2006 RA.2017	20.24	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS:51 82 (P- 2)-2001, RA. 2017	11.63	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS:51 82 (P- 9)-1974, RA. 2014	0.78	µg/m <sup>3</sup>	4.0
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL(DL-1.0)	ng/m <sup>3</sup>	--

Note :-\*BDL-Below Detecation Limit,\*\*DL-Detecation 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/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)  
Sample Description: Ambient Air Quality Monitoring

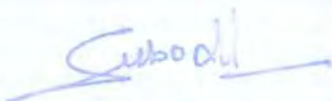
Report No.: VEL/A/2201010001  
Format No.: 7.8 F 01  
Party Reference No.: NIL  
Report Date: 04/01/2022  
Period of Analysis: 01/01/2022 to 04/01/2022  
Receipt Date: 01/01/2022

### General Information:-

Sampling Location : Kondataral  
Sample collected by : Vardan EnviroLab Representative  
Sampling Equipment used : RDS & FPS  
Instrument Code : VEL/RDS/FPS/01  
Instrument Calibration Status : Calibrated  
Latitude : 21°51'52"  
Longitude : 83°22'44"  
Meteorological condition during monitoring : Cloudy Sky  
Date of Sampling : 27/12/2021 to 28/12/2021  
Time of Sampling : 10:15 AM to 10:15 AM  
Ambient Temperature (°C) : Min.13°C, Max. 27 °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 <sub>2.5</sub> )	IS: 5182 (P-24), 2019	37.69	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS:5182 (P- 23)-2006,RA. 2017	74.56	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS:5182 (P- 6)-2006 RA.2017	16.35	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS:51 82 (P- 2)-2001, RA. 2017	9.17	µg/m <sup>3</sup>	80
5.	Ozone (as O <sub>3</sub> )	IS:51 82 (P- 9)-1974, RA. 2014	7.57	µg/m <sup>3</sup>	180
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL(*DL-1.0)	ng/m <sup>3</sup>	--
7.	Suspended Particulate Matter	IS:5182 (P- 4)-1999,RA. 2014	174.20	µg/m <sup>3</sup>	600

Note :-\*BDL-Below Detecation Limit ,\*\*DL-Detecation 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  
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)  
Sample Description: Ambient Air Quality Monitoring

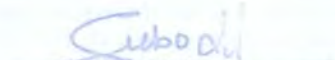
Report No.: VEL/A/2201010002  
Format No.: 7.8 F 01  
Party Reference No.: NIL  
Report Date: 04/01/2022  
Period of Analysis: 01/01/2022 to 04/01/2022  
Receipt Date: 01/01/2022

### General Information:-

Sampling Location : Chatamura Chowk  
Sample collected by : Vardan EnviroLab Representative  
Sampling Equipment used : RDS & FPS  
Instrument Code : VEL/RDS/FPS/02  
Instrument Calibration Status : Calibrated  
Latitude : 21°51'52"  
Longitude : 83°22'44"  
Meteorological condition during monitoring : Cloudy Sky  
Date of Sampling : 27/12/2021 to 28/12/2021  
Time of Sampling : 10:30 AM to 10:30 AM  
Ambient Temperature (°C) : Min.13°C, Max. 27 °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 <sub>2.5</sub> )	IS: 5182 (P-24), 2019	42.86	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS:5182 (P- 23)-2006,RA. 2017	76.50	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS:5182 (P- 6)-2006 RA.2017	21.23	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS:51 82 (P- 2)-2001, RA. 2017	12.88	µg/m <sup>3</sup>	80
5.	Ozone (as O <sub>3</sub> )	IS:51 82 (P- 9)-1974, RA. 2014	15.49	µg/m <sup>3</sup>	180
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL(*DL-1.0)	ng/m <sup>3</sup>	--
7.	Suspended Particulate Matter	IS:5182 (P- 4)-1999,RA. 2014	281.2	µg/m <sup>3</sup>	600

Note :-\*BDL-Below Detecation Limit,\*\*DL-Detecation 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

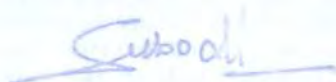
Sample Number:	VEL/REGL/AA/03	Report No.:	VEL/A/2201010003
Name & Address of the Party	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F 01
Sample Description :	Ambient Air Quality Monitoring	Party Reference No.:	NIL
		Report Date:	04/01/2022
		Period of Analysis:	01/01/2022 to 04/01/2022
		Receipt Date	01/01/2022

### General Information:-

Sampling Location	: Supa, Near REGL Plant
Sample collected by	: Vardan EnviroLab Representative
Sampling Equipment used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/03
Instrument Calibration Status	: Calibrated
Latitude	: 21°45'8"
Longitude	: 83°18'4"
Meteorological condition during monitoring	: Cloudy Sky
Date of Sampling	: 27/12/2021 to 28/12/2021
Time of Sampling	: 10:45 AM to 10:45 AM
Ambient Temperature (°C)	: Min.13°C, Max. 27 °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 <sub>2.5</sub> )	IS: 5182 (P-24), 2019	36.99	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS:5182 (P- 23)-2006,RA. 2017	71.20	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS:5182 (P- 6)-2006 RA.2017	20.17	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS:51 82 (P- 2)-2001, RA. 2017	11.59	µg/m <sup>3</sup>	80
5.	Ozone (as O <sub>3</sub> )	IS:51 82 (P- 9)-1974, RA. 2014	10.67	µg/m <sup>3</sup>	180
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL(DL-1.0)	ng/m <sup>3</sup>	--
7.	Suspended Particulate Matter	IS:5182 (P- 4)-1999,RA. 2014	260.3	µg/m <sup>3</sup>	600

Note :-\*BDL-Below Detecation Limit ,\*\*DL-Detecation Limit.



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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- Field Hostel
  - N2- Palsada Village
  - N3- Kathali Village
  - N4- Chote Bhandar Village
  - N5- Bade Bhandar Village
  - N6- Site Office
  - N7- Behind Switch Yard





# 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/06	Report No.:	VEL/N/2201010006
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - ChhoteBhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh-496100 (Chhattisgarh)	Format No.:	7.8 F 01
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	NIL
Scope of Monitoring	Regulatory Requirement	Reporting Date:	04/01/2022
Protocol Used:	IS 9989: IS 9876	Receipt Date:	01/01/2022
Instrument Used	SLM	Sampling Duration	24 Hrs.
		Sample Collected by	VEL Team
		Instrument	Calibrated
		Calibration Status	

### Ambient Noise Level Monitoring Results

#### General Information:-

Sampling Location	: Field Hostel
Instrument Code	: VEL/SLM/06
Meteorological condition during monitoring	: Cloudy Sky
Date of Monitoring	: 27/12/2021 to 28/12/2021
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min. 13°C, Max. 27 °C
Surrounding Activity	: Human, Vehicular and other Activities
Parameter Required	: As per Work Order

SL.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L max	IS:9989,IS9876:1981	67.1	53.8
2.	L min	IS:9989,IS9876:1981	42.4	37.6
3.	Leq	IS:9989,IS9876:1981	53.70	43.45

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:	VEL/REGL/AN/02	Report No.:	VEL/N/2201010002
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
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	NIL
Scope of Monitoring	Regulatory Requirement	Reporting Date:	04/01/2022
Protocol Used:	IS 9989: IS 9876	Receipt Date:	01/01/2022
Instrument Used	SLM	Sampling Duration	24 Hrs.
		Sample Collected by	VEL Team
		Instrument	Calibrated
		Calibration Status	

### Ambient Noise Level Monitoring Results

#### General Information:-

Sampling Location	: Village- Palsada
Instrument Code	: VEL/SLM/05
Meteorological condition during monitoring	: Cloudy Sky
Date of Monitoring	: 28/12/2021 to 29/12/2021
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min. 13°C, Max. 26 °C
Surrounding Activity	: Human, Vehicular and other Activities
Parameter Required	: As per Work Order

SL.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L max	IS:9989,IS9876:1981	60.8	52.3
2.	L min	IS:9989,IS9876:1981	39.5	36.5
3.	Leq	IS:9989,IS9876:1981	53.97	42.15

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:	VEL/REGL/AN/03	Report No.:	VEL/N/2201010003
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
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	NIL
Scope of Monitoring	Regulatory Requirement	Reporting Date:	04/01/2022
Protocol Used:	IS 9989: IS 9876	Receipt Date:	01/01/2022
Instrument Used	SLM	Sampling Duration	24 Hrs.
		Sample Collected by	VEL Team
		Instrument	Calibrated
		Calibration Status	

### Ambient Noise Level Monitoring Results

#### General Information:-

Sampling Location	: Village-Kathli
Instrument Code	: VEL/SLM/07
Meteorological condition during monitoring	: Cloudy Sky
Date of Monitoring	: 28/12/2021 to 29/12/2021
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min. 13°C, Max. 26 °C
Surrounding Activity	: Human, Vehicular and other Activities
Parameter Required	: As per Work Order

SL.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L max	IS:9989,IS9876:1981	67.1	53.8
2.	L min	IS:9989,IS9876:1981	42.4	37.6
3.	Leq	IS:9989,IS9876:1981	54.77	43.45

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	Report No.:	VEL/N/2201010004
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
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	NIL
Scope of Monitoring	Regulatory Requirement	Reporting Date:	04/01/2022
Protocol Used:	IS 9989: IS 9876	Receipt Date:	01/01/2022
Instrument Used	SLM	Sampling Duration	24 Hrs.
		Sample Collected by	VEL Team
		Instrument	Calibrated
		Calibration Status	

### Ambient Noise Level Monitoring Results

#### General Information:-

Sampling Location	: Chhote Bhandar
Instrument Code	: VEL/SLM/06
Meteorological condition during monitoring	: Cloudy Sky
Date of Monitoring	: 29/12/2021 to 30/12/2021
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min. 14°C, Max. 28 °C
Surrounding Activity	: Human, Vehicular and other Activities
Parameter Required	: As per Work Order

SL.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L max	IS:9989,IS9876:1981	65.1	51.8
2.	L min	IS:9989,IS9876:1981	40.4	35.6
3.	Leq	IS:9989,IS9876:1981	52.77	41.45

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/01	Report No.:	VEL/N/2201010001
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
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	NIL
Scope of Monitoring	Regulatory Requirement	Reporting Date:	04/01/2022
Protocol Used:	IS 9989: IS 9876	Receipt Date:	01/01/2022
Instrument Used	SLM	Sampling Duration	24 Hrs.
		Sample Collected by	VEL Team
		Instrument	Calibrated
		Calibration Status	

### Ambient Noise Level Monitoring Results

#### General Information:-

Sampling Location	: Village- Bade Bhandar
Instrument Code	: VEL/SLM/05
Meteorological condition during monitoring	: Cloudy Sky
Date of Monitoring	: 29/12/2021 to 30/12/2021
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min. 14°C, Max. 28 °C
Surrounding Activity	: Human, Vehicular and other Activities
Parameter Required	: As per Work Order

SL.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L max	IS:9989,IS9876:1981	63.4	52.3
2.	L min	IS:9989,IS9876:1981	42.4	38.1
3.	Leq	IS:9989,IS9876:1981	52.96	43.81

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:	VEL/REGL/AN/05	Report No.:	VEL/N/2201010005
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - ChhoteBhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh-496100 (Chhattisgarh)	Format No.:	7.8 F 01
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	NIL
Scope of Monitoring	Regulatory Requirement	Reporting Date:	04/01/2022
Protocol Used:	IS 9989: IS 9876	Receipt Date:	01/01/2022
Instrument Used	SLM	Sampling Duration	24 Hrs.
		Sample Collected by	VEL Team
		Instrument	Calibrated
		Calibration Status	

### Ambient Noise Level Monitoring Results

#### General Information:-

Sampling Location	: Site office
Instrument Code	: VEL/SLM/06
Meteorological condition during monitoring	: Cloudy Sky
Date of Monitoring	: 28/12/2021 to 29/12/2021
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min. 13°C, Max. 26 °C
Surrounding Activity	: Human, Vehicular and other Activities
Parameter Required	: As per Work Order

SL.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L max	IS:9989,IS9876:1981	65.2	52.3
2.	L min	IS:9989,IS9876:1981	48.4	38.1
3.	Leq	IS:9989,IS9876:1981	58.47	44.51

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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Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardanenvironet.com, bd@vardanenvironet.com





## Test Report

Sample Number:	VEL/REGL/AN/07	Report No.:	VEL/N/2201010007
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - ChhoteBhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh-496100 (Chhattisgarh)	Format No.:	7.8 F 01
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	NIL
Scope of Monitoring	Regulatory Requirement	Reporting Date:	04/01/2022
Protocol Used:	IS 9989: IS 9876	Receipt Date:	01/01/2022
Instrument Used	SLM	Sampling Duration	24 Hrs.
		Sample Collected by	VEL Team
		Instrument	Calibrated
		Calibration Status	

### Ambient Noise Level Monitoring Results

#### General Information:-

Sampling Location	: Behind Switch Yard
Instrument Code	: VEL/SLM/07
Meteorological condition during monitoring	: Cloudy Sky
Date of Monitoring	: 27/12/2021 to 28/12/2021
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min. 13°C, Max. 27 °C
Surrounding Activity	: Human, Vehicular and other Activities
Parameter Required	: As per Work Order

SL.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L max	IS:9989,IS9876:1981	74.1	57.8
2.	L min	IS:9989,IS9876:1981	46.4	41.6
3.	Leq	IS:9989,IS9876:1981	60.22	47.45

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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### 4.3 Ground water Quality Analysis



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

Location Code: -

- GW1- Site Office
- GW2- Palsada Village
- GW3- Kathali Village
- GW4- Chote Bhandar Village
- GW5- Bade Bhandar Village
- GW6- Piezometer Water
- GW7- Mine Water





# 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/W/2201010005
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 01
Sample Description:	Ground Water	Party Reference No.:	NIL
Sampling Location:	Site Office	Reporting Date:	04/01/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	01-01-2022 to 04-01-2022
Preservation:	Refrigerated	Receipt Date:	01/01/2022
Sampling & Analysis Protocol:	IS-10500-2012	Sampling Date:	29/12/2021
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+200 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 23 <sup>rd</sup> Edition, 4500-H <sup>+</sup> B	7.60	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen	5	15
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU	1	5
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	137.7	mg/l	200	600
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	45.10	mg/l	75	200
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	116.6	mg/l	200	600
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl <sup>-</sup> B	47.25	mg/l	250	1000
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017)3500 Cl <sup>-</sup> B	BDL(DL 0.15)	mg/l	0.2	1
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l	0.5	No relaxation
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	6.07	mg/l	30	100
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	282.0	mg/l	500	2000
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	14.16	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

Report No.: VEL/W/2201010005

Sample No.: VEL/REGL/W/05					Limits of IS:10500 -2012	
S. No.	Parameter	Test-Method	Result	Unit	Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
15.	Fluoride as F	APHA 23 <sup>rd</sup> Edition,2017, 4500-F D	0.37	mg/l	1.0	1.5
16.	Nitrate as NO <sub>3</sub>	IS 3025 (P-34) 1988:RA.2019	2.53	mg/l	45	No Relaxation
17.	Iron as Fe	APHA 23 <sup>rd</sup> Ed.,2017, 3500 Fe- B	0.17	mg/l	0.3	No relaxation
18.	Aluminium as Al	APHA 23 <sup>rd</sup> Edition, 3111 D	BDL(DL 0.002)	mg/l	0.03	0.2
19.	Boron	APHA 23 <sup>rd</sup> Edition, 4500 C	BDL(DL 0.01)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 <sup>rd</sup> Edition, 5530 C	BDL(DL 0.0004)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 <sup>rd</sup> Edition,2017, 5540 C	BDL(DL 0.05)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 <sup>rd</sup> Ed. 2017,	BDL(DL 0.01)	mg/l	5	15
24.	Copper as Cu	APHA 23 <sup>rd</sup> Edition2017,3111B	BDL(DL 0.002)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA 23 <sup>rd</sup> Edition, 3111 B	BDL(DL 0.01)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l	0.5	No relaxation
27.	Sulphide	APHA 23 <sup>rd</sup> Edition, 4500 S2 F,2017	BDL(DL 0.02)	mg/l	200	400
28.	Barium	APHA 3111B	BDL(DL 0.01)	mg/l	0.7	No relaxation
29.	Total. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E. Coli	IS:1622:2009	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	NA
31.	Fecal. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 <sup>rd</sup> Edition)3030D,3114C,2017	BDL(DL 0.002)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 <sup>rd</sup> Edition)3114C,2017	BDL(DL 0.001)	mg/l	0.01	No relaxation

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/W/06	Report No.:	VEL/W/2201010006
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 01
Sample Description:	Ground Water	Party Reference No.:	NIL
Sampling Location:	Village- Palsada	Reporting Date:	04/01/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	01-01-2022 to 04-01-2022
Preservation:	Refrigerated	Receipt Date:	01/01/2022
Sampling & Analysis Protocol:	IS-10500-2012	Sampling Date:	29/12/2021
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+200 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 23 <sup>rd</sup> Edition, 4500-H* B	7.30	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen	5	15
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU	1	5
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	190.1	mg/l	200	600
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	45.88	mg/l	75	200
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	183.6	mg/l	200	600
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl* B	49.18	mg/l	250	1000
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017)3500 Cl B	BDL(DL 0.15)	mg/l	0.2	1
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l	0.5	No relaxation
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	18.33	mg/l	30	100
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	309.0	mg/l	500	2000
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	23.88	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/W/2201010006	
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 23 <sup>rd</sup> Edition,2017, 4500-F D	0.39	mg/l	1.0	1.5
16.	Nitrate as NO <sub>3</sub>	IS 3025 (P-34) 1988:RA.2019	2.85	mg/l	45	No Relaxation
17.	Iron as Fe	APHA 23 <sup>rd</sup> Ed.,2017, 3500 Fe- B	0.15	mg/l	0.3	No relaxation
18.	Aluminium as Al	APHA 23 <sup>rd</sup> Edition, 3111 D	BDL(DL 0.002)	mg/l	0.03	0.2
19.	Boron	APHA 23 <sup>rd</sup> Edition, 4500 C	BDL(DL 0.01)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 <sup>rd</sup> Edition, 5530 C	BDL(DL 0.0004)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 <sup>rd</sup> Edition,2017, 5540 C	BDL(DL 0.05)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 <sup>rd</sup> Ed. 2017,	BDL(DL 0.01)	mg/l	5	15
24.	Copper as Cu	APHA 23 <sup>rd</sup> Edition2017,3111B	BDL(DL 0.002)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA 23 <sup>rd</sup> Edition, 3111 B	BDL(DL 0.01)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l	0.5	No relaxation
27.	Sulphide	APHA 23 <sup>rd</sup> Edition, 4500 S2 F,2017	BDL(DL 0.02)	mg/l	200	400
28.	Barium	APHA 3111B	BDL(DL 0.01)	mg/l	0.7	No relaxation
29.	Total. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E. Coli	IS:1622:2009	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	NA
31.	Fecal. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 <sup>rd</sup> Edition)3030D,3114C,2017	BDL(DL 0.002)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 <sup>rd</sup> Edition)3114C,2017	BDL(DL 0.001)	mg/l	0.01	No relaxation

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/W/07	Report No.:	VEL/W/2201010007
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 01
Sample Description:	Ground Water	Party Reference No.:	NIL
Sampling Location:	Village- Kathli	Reporting Date:	04/01/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	01-01-2022 to 04-01-2022
Preservation:	Refrigerated	Receipt Date:	01/01/2022
Sampling & Analysis Protocol:	IS-10500-2012	Sampling Date:	29/12/2021
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+200 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 23 <sup>rd</sup> Edition, 4500-H* B	7.35	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen	5	15
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU	1	5
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	234.7	mg/l	200	600
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	63.76	mg/l	75	200
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	233.3	mg/l	200	600
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl- B	56.89	mg/l	250	1000
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017)3500 Cl B	BDL(DL 0.15)	mg/l	0.2	1
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l	0.5	No relaxation
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	18.31	mg/l	30	100
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	365.0	mg/l	500	2000
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	26.47	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/07					Report No.: VEL/W/2201010007	
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 23 <sup>rd</sup> Edition,2017, 4500-F D	0.42	mg/l	1.0	1.5
16.	Nitrate as NO <sub>3</sub>	IS 3025 (P-34) 1988:RA.2019	3.91	mg/l	45	No Relaxation
17.	Iron as Fe	APHA 23 <sup>rd</sup> Ed.,2017, 3500 Fe- B	0.15	mg/l	0.3	No relaxation
18.	Aluminium as Al	APHA 23 <sup>rd</sup> Edition, 3111 D	BDL(DL 0.002)	mg/l	0.03	0.2
19.	Boron	APHA 23 <sup>rd</sup> Edition, 4500 C	BDL(DL 0.01)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 <sup>rd</sup> Edition, 5530 C	BDL(DL 0.0004)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 <sup>rd</sup> Edition,2017, 5540 C	BDL(DL 0.05)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 <sup>rd</sup> Ed. 2017,	BDL(DL 0.01)	mg/l	5	15
24.	Copper as Cu	APHA 23 <sup>rd</sup> Edition2017,3111B	BDL(DL 0.002)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA 23 <sup>rd</sup> Edition, 3111 B	BDL(DL 0.01)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l	0.5	No relaxation
27.	Sulphide	APHA 23 <sup>rd</sup> Edition, 4500 S2 F,2017	BDL(DL 0.02)	mg/l	200	400
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l	0.7	No relaxation
29.	Total. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E. Coli	IS:1622:2009	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	NA
31.	Fecal. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 <sup>rd</sup> Edition)3030D,3114C,2017	BDL(DL 0.002)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 <sup>rd</sup> Edition)3114C,2017	BDL(DL 0.001)	mg/l	0.01	No relaxation

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/W/08	Report No.:	VEL/W/2201010008
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 01
Sample Description:	Ground Water	Party Reference No.:	NIL
Sampling Location:	Village- Chhote Bhandar	Reporting Date:	04/01/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	01-01-2022 to 04-01-2022
Preservation:	Refrigerated	Receipt Date:	01/01/2022
Sampling & Analysis Protocol:	IS-10500-2012	Sampling Date:	29/12/2021
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+200 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 23 <sup>rd</sup> Edition, 4500-H* B	7.45	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen	5	15
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU	1	5
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	250.3	mg/l	200	600
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	71.53	mg/l	75	200
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	220.3	mg/l	200	600
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl* B	64.60	mg/l	250	1000
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017)3500 Cl B	BDL(DL 0.15)	mg/l	0.2	1
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l	0.5	No relaxation
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	17.36	mg/l	30	100
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	392.0	mg/l	500	2000
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	28.20	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/08					Report No.: VEL/W/2201010008	
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 23 <sup>rd</sup> Edition,2017, 4500-F D	0.39	mg/l	1.0	1.5
16.	Nitrate as NO <sub>3</sub>	IS 3025 (P-34) 1988:RA.2019	3.75	mg/l	45	No Relaxation
17.	Iron as Fe	APHA 23 <sup>rd</sup> Ed.,2017, 3500 Fe- B	0.14	mg/l	0.3	No relaxation
18.	Aluminium as Al	APHA 23 <sup>rd</sup> Edition, 3111 D	BDL(DL 0.002)	mg/l	0.03	0.2
19.	Boron	APHA 23 <sup>rd</sup> Edition, 4500 C	BDL(DL 0.01)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 <sup>rd</sup> Edition, 5530 C	BDL(DL 0.0004)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 <sup>rd</sup> Edition,2017, 5540 C	BDL(DL 0.05)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 <sup>rd</sup> Ed. 2017,	BDL(DL 0.01)	mg/l	5	15
24.	Copper as Cu	APHA 23 <sup>rd</sup> Edition2017,3111B	BDL(DL 0.002)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA 23 <sup>rd</sup> Edition, 3111 B	BDL(DL 0.01)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l	0.5	No relaxation
27.	Sulphide	APHA 23 <sup>rd</sup> Edition, 4500 S2 F,2017	BDL(DL 0.02)	mg/l	200	400
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l	0.7	No relaxation
29.	Total. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E. Coli	IS:1622:2009	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	NA
31.	Fecal. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 <sup>rd</sup> Edition)3030D,3114C,2017	BDL(DL 0.002)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 <sup>rd</sup> Edition)3114C,2017	BDL(DL 0.001)	mg/l	0.01	No relaxation

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/W/09	Report No.:	VEL/W/2201010009
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 01
Sample Description:	Ground Water	Party Reference No.:	NIL
Sampling Location:	Village- Bade Bhandar	Reporting Date:	04/01/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	01-01-2022 to 04-01-2022
Preservation:	Refrigerated	Receipt Date:	01/01/2022
Sampling & Analysis Protocol:	IS-10500-2012	Sampling Date:	29/12/2021
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+200 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 23 <sup>rd</sup> Edition, 4500-H* B	7.52	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen	5	15
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU	1	5
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	296.8	mg/l	200	600
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	78.53	mg/l	75	200
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	181.4	mg/l	200	600
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl* B	69.43	mg/l	250	1000
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017)3500 Cl B	BDL(DL 0.15)	mg/l	0.2	1
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l	0.5	No relaxation
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	29.14	mg/l	30	100
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	420.0	mg/l	500	2000
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	27.88	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/09				Report No.: VEL/W/2201010009		
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 23 <sup>rd</sup> Edition,2017, 4500-F D	0.36	mg/l	1.0	1.5
16.	Nitrate as NO <sub>3</sub>	IS 3025 (P-34) 1988:RA.2019	4.24	mg/l	45	No Relaxation
17.	Iron as Fe	APHA 23 <sup>rd</sup> Ed.,2017, 3500 Fe- B	0.18	mg/l	0.3	No relaxation
18.	Aluminium as Al	APHA 23 <sup>rd</sup> Edition, 3111 D	BDL(DL 0.002)	mg/l	0.03	0.2
19.	Boron	APHA 23 <sup>rd</sup> Edition, 4500 C	BDL(DL 0.01)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 <sup>rd</sup> Edition, 5530 C	BDL(DL 0.0004)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 <sup>rd</sup> Edition,2017, 5540 C	BDL(DL 0.05)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 <sup>rd</sup> Ed. 2017,	BDL(DL 0.01)	mg/l	5	15
24.	Copper as Cu	APHA 23 <sup>rd</sup> Edition2017,3111B	BDL(DL 0.002)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA 23 <sup>rd</sup> Edition, 3111 B	BDL(DL 0.01)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l	0.5	No relaxation
27.	Sulphide	APHA 23 <sup>rd</sup> Edition, 4500 S2 F,2017	BDL(DL 0.02)	mg/l	200	400
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l	0.7	No relaxation
29.	Total. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E. Coli	IS:1622:2009	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	NA
31.	Fecal. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 <sup>rd</sup> Edition)3030D,3114C,2017	BDL(DL 0.002)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 <sup>rd</sup> Edition)3114C,2017	BDL(DL 0.001)	mg/l	0.01	No relaxation

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/W/10	Report No.:	VEL/W/2201010010
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 01
Sample Description:	Ground Water	Party Reference No.:	NIL
Sampling Location:	Piezometer Water	Reporting Date:	04/01/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	01-01-2022 to 04-01-2022
Preservation:	Refrigerated	Receipt Date:	01/01/2022
Sampling & Analysis Protocol:	IS-10500-2012	Sampling Date:	29/12/2021
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+200 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 23 <sup>rd</sup> Edition, 4500-H* B	7.65	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen	5	15
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU	1	5
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	184.3	mg/l	200	600
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	58.32	mg/l	75	200
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	157.7	mg/l	200	600
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl* B	85.82	mg/l	250	1000
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017)3500 Cl B	BDL(DL 0.15)	mg/l	0.2	1
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l	0.5	No relaxation
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	9.36	mg/l	30	100
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	360.0	mg/l	500	2000
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	39.12	mg/l	200	400

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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 River (Up Stream)

2. Mand 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/02	Report No.:	VEL/W/2201010002
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 01
Sample Description:	Surface Water	Party Reference No.:	NIL
Sampling Location:	Mand River (Up Stream)	Reporting Date:	04/01/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	01-01-2022 to 04-01-2022
Preservation:	Refrigerated	Receipt Date:	01/01/2022
Sampling & Analysis Protocol:	IS-2296,IS-3025, APHA	Sampling Date:	29/12/2021
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+200 ml

### TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA 23 <sup>rd</sup> Edition, 4500-H* B	7.55	--
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	104.76	mg/l
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	37.32	mg/l
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	82.08	mg/l
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl- B	44.4	mg/l
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017)3500 Cl B	BDL(DL 0.15)	mg/l
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	2.7	mg/l
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	215.0	mg/l
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	20.21	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/2201010002	
S. No.	Parameter	Test-Method	Result	Unit
15.	Fluoride as F	APHA 23 <sup>rd</sup> Edition,2017, 4500-F·D	0.36	mg/l
16.	Nitrate as NO <sub>3</sub>	IS 3025 (P-34) 1988:RA.2019	4.81	mg/l
17.	Iron as Fe	APHA 23 <sup>rd</sup> Ed.,2017, 3500 Fe- B	0.25	mg/l
18.	Aluminium as Al	APHA 23 <sup>rd</sup> Edition, 3111 D	BDL(DL 0.002)	mg/l
19.	Boron	APHA 23 <sup>rd</sup> Edition, 4500 C	BDL(DL 0.001)	mg/l
20.	Phenolic Compounds	APHA 23 <sup>rd</sup> Edition, 5530 C	BDL(DL 0.0004)	mg/l
21.	Anionic Detergents as MBAS	APHA 23 <sup>rd</sup> Edition,2017, 5540 C	BDL(DL 0.05)	mg/l
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l
23.	Zinc as Zn	APHA 23 <sup>rd</sup> Ed. 2017,	BDL(DL 0.01)	mg/l
24.	Copper as Cu	APHA 23 <sup>rd</sup> Edition2017,3111B	BDL(DL 0.002)	mg/l
25.	Manganese as Mn	APHA 23 <sup>rd</sup> Edition, 3111 B	BDL(DL 0.01)	mg/l
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l
27.	Sulphide	APHA 23 <sup>rd</sup> Edition, 4500 S2 F,2017	2.09	mg/l
28.	Barium	APHA 3111B	BDL(DL 0.01)	mg/l
29.	Total.Coliform	IS:1622:2009	46	MPN/ 100ml
30.	E.Coli	IS:1622:2009	Present	Per 100ml
31.	Fecal.Coliform	IS:1622:2009	28	MPN/ 100ml
32.	Arsenic as As	APHA (23 <sup>rd</sup> Edition)3030D,3114C,2017	BDL(DL 0.002)	mg/l
33.	Selenium as Se	APHA (23 <sup>rd</sup> Edition)3114C,2017	BDL(DL 0.001)	mg/l

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/W/01	Report No.:	VEL/W/2201010001
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 01
Sample Description:	Surface Water	Party Reference No.:	NIL
Sampling Location:	Mand River (Down Stream)	Reporting Date:	04/01/2022
Sample Collected by	Vardan EnviroLab Representative	Period of Analysis:	01-01-2022 to 04-01-2022
Preservation:	Refrigerated	Receipt Date:	01/01/2022
Sampling & Analysis Protocol:	IS-2296, IS-3025, APHA	Sampling Date:	29/12/2021
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+200 ml

### TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA 23 <sup>rd</sup> Edition, 4500-H* B	7.25	--
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	155.2	mg/l
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	46.65	mg/l
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	86.4	mg/l
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl- B	70.4	mg/l
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017)3500 Cl B	BDL(DL 0.15)	mg/l
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	9.37	mg/l
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	265.0	mg/l
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	37.39	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

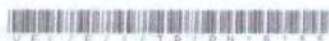
## Test Report

Sample No.: VEL/REGL/W/01			Report No.: VEL/W/2201010001	
S. No.	Parameter	Test-Method	Result	Unit
15.	Fluoride as F	APHA 23 <sup>rd</sup> Edition,2017, 4500-F D	0.37	mg/l
16.	Nitrate as NO <sub>3</sub>	IS 3025 (P-34) 1988:RA.2019	4.73	mg/l
17.	Iron as Fe	APHA 23 <sup>rd</sup> Ed.,2017, 3500 Fe- B	0.29	mg/l
18.	Aluminium as Al	APHA 23 <sup>rd</sup> Edition, 3111 D	BDL(DL 0.002)	mg/l
19.	Boron	APHA 23 <sup>rd</sup> Edition, 4500 C	0.33	mg/l
20.	Phenolic Compounds	APHA 23 <sup>rd</sup> Edition, 5530 C	BDL(DL 0.0004)	mg/l
21.	Anionic Detergents as MBAS	APHA 23 <sup>rd</sup> Edition,2017, 5540 C	BDL(DL 0.05)	mg/l
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l
23.	Zinc as Zn	APHA 23 <sup>rd</sup> Ed. 2017,	BDL(DL 0.01)	mg/l
24.	Copper as Cu	APHA 23 <sup>rd</sup> Edition2017,3111B	BDL(DL 0.002)	mg/l
25.	Manganese as Mn	APHA 23 <sup>rd</sup> Edition, 3111 B	BDL(DL 0.01)	mg/l
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l
27.	Sulphide	APHA 23 <sup>rd</sup> Edition, 4500 S2 F,2017	BDL(DL 0.02)	mg/l
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l
29.	Total. Coliform	IS:1622:2009	70	MPN/ 100ml
30.	E.Coli	IS:1622:2009	Present	Per 100ml
31.	Fecal.Coliform	IS:1622:2009	40	MPN/ 100ml
32.	Arsenic as As	APHA (23 <sup>rd</sup> Edition)3030D,3114C,2017	BDL(DL 0.002)	mg/l
33.	Selenium as Se	APHA (23 <sup>rd</sup> Edition)3114C,2017	BDL(DL 0.001)	mg/l

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

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



Location Code: - 1 Mahanadi River Up Stream  
2 Mahanadi 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/2201010004
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 01
Sample Description:	Surface Water	Party Reference No.:	NIL
Sampling Location:	Mahanadi (Up Stream)	Reporting Date:	04/01/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	01-01-2022 to 04-01-2022
Preservation:	Refrigerated	Receipt Date:	01/01/2022
Sampling & Analysis Protocol:	IS-2296, IS-3025, APHA	Sampling Date:	29/12/2021
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+200 ml

### TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA 23 <sup>rd</sup> Edition, 4500-H* B	7.45	--
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	110.6	mg/l
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	28.77	mg/l
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	112.3	mg/l
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl* B	59.78	mg/l
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017)3500 Cl B	BDL(DL 0.15)	mg/l
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	9.39	mg/l
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	245.0	mg/l
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	14.70	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/2201010004		
S. No.	Parameter	Test-Method	Result	Unit
15.	Fluoride as F	APHA 23 <sup>rd</sup> Edition,2017, 4500-F-D	0.23	mg/l
16.	Nitrate as NO <sub>3</sub>	IS 3025 (P-34) 1988:RA.2019	5.54	mg/l
17.	Iron as Fe	APHA 23 <sup>rd</sup> Ed.,2017, 3500 Fe- B	0.21	mg/l
18.	Aluminium as Al	APHA 23 <sup>rd</sup> Edition, 3111 D	BDL(DL 0.002)	mg/l
19.	Boron	APHA 23 <sup>rd</sup> Edition, 4500 C	BDL(DL 0.001)	mg/l
20.	Phenolic Compounds	APHA 23 <sup>rd</sup> Edition, 5530 C	BDL(DL 0.0004)	mg/l
21.	Anionic Detergents as MBAS	APHA 23 <sup>rd</sup> Edition,2017, 5540 C	BDL(DL 0.05)	mg/l
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l
23.	Zinc as Zn	APHA 23 <sup>rd</sup> Ed. 2017,	BDL(DL 0.01)	mg/l
24.	Copper as Cu	APHA 23 <sup>rd</sup> Edition2017,3111B	BDL(DL 0.002)	mg/l
25.	Manganese as Mn	APHA 23 <sup>rd</sup> Edition, 3111 B	BDL(DL 0.01)	mg/l
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l
27.	Sulphide	APHA 23 <sup>rd</sup> Edition, 4500 S2 F,2017	BDL(DL 0.02)	mg/l
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l
29.	Total. Coliform	IS:1622:2009	34	MPN/ 100ml
30.	E.Coli	IS:1622:2009	Present	Per 100ml
31.	Fecal. Coliform	IS:1622:2009	23	MPN/ 100ml
32.	Arsenic as As	APHA (23 <sup>rd</sup> Edition)3030D,3114C,2017	BDL(DL 0.002)	mg/l
33.	Selenium as Se	APHA (23 <sup>rd</sup> Edition)3114C,2017	BDL(DL 0.001)	mg/l

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/W/03	Report No.:	VEL/W/2201010003
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 01
Sample Description:	Surface Water	Party Reference No.:	NIL
Sampling Location:	Mahanadi (Down Stream)	Reporting Date:	04/01/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	01-01-2022 to 04-01-2022
Preservation:	Refrigerated	Receipt Date:	01/01/2022
Sampling & Analysis Protocol:	IS-2296, IS-3025, APHA	Sampling Date:	29/12/2021
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+200 ml

### TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA 23 <sup>rd</sup> Edition, 4500-H• B	7.20	--
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	151.3	mg/l
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	47.43	mg/l
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	127.4	mg/l
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl• B	63.64	mg/l
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017)3500 Cl B	BDL(DL 0.15)	mg/l
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	7.96	mg/l
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	318.0	mg/l
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	36.85	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/03		Report No.: VEL/W/2201010003		
S. No.	Parameter	Test-Method	Result	Unit
15.	Fluoride as F	APHA 23 <sup>rd</sup> Edition,2017, 4500-F D	0.33	mg/l
16.	Nitrate as NO <sub>3</sub>	IS 3025 (P-34) 1988:RA.2019	5.13	mg/l
17.	Iron as Fe	APHA 23 <sup>rd</sup> Ed.,2017, 3500 Fe- B	0.23	mg/l
18.	Aluminium as Al	APHA 23 <sup>rd</sup> Edition, 3111 D	BDL(DL 0.002)	mg/l
19.	Boron	APHA 23 <sup>rd</sup> Edition, 4500 C	BDL(DL 0.001)	mg/l
20.	Phenolic Compounds	APHA 23 <sup>rd</sup> Edition, 5530 C	BDL(DL 0.0004)	mg/l
21.	Anionic Detergents as MBAS	APHA 23 <sup>rd</sup> Edition,2017, 5540 C	BDL(DL 0.05)	mg/l
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l
23.	Zinc as Zn	APHA 23 <sup>rd</sup> Ed. 2017,	BDL(DL 0.01)	mg/l
24.	Copper as Cu	APHA 23 <sup>rd</sup> Edition2017,3111B	BDL(DL 0.002)	mg/l
25.	Manganese as Mn	APHA 23 <sup>rd</sup> Edition, 3111 B	BDL(DL 0.01)	mg/l
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l
27.	Sulphide	APHA 23 <sup>rd</sup> Edition, 4500 S2 F,2017	BDL(DL 0.02)	mg/l
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l
29.	Total. Coliform	IS:1622:2009	70	MPN/ 100ml
30.	E. Coli	IS:1622:2009	Present	Per 100ml
31.	Fecal. Coliform	IS:1622:2009	60	MPN/ 100ml
32.	Arsenic as As	APHA (23 <sup>rd</sup> Edition)3030D,3114C,2017	BDL(DL 0.002)	mg/l
33.	Selenium as Se	APHA (23 <sup>rd</sup> Edition)3114C,2017	BDL(DL 0.001)	mg/l

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

  
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### 4.5 Soil Quality Analysis



**Figure No. 8. Plan Showing Soil Sample Monitoring Location Map**

Location Code: -

- S1- Palsada Village
- S2- Kathli Village
- S3- Chote Bhandar Village
- S4- Bade Bhandar Village
- S5- Nursery (Near Mine Area)





# 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/01	Report No.:	VEL/S0/2201010001
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 01
Sample Description:	SOIL	Party Reference No.:	NIL
Location:	Village- Palsada	Reporting Date:	04/01/2022
Sample Collected By:	Vardan EnviroLab Team	Period of Analysis :	01/01/2022 to 04/01/2022
Parameter Required:	As per work order	Receipt Date:	01/01/2022
Sampling and Analysis Protocol:	IS 2720 & USDA	Sampling Date:	29/12/2021
		Sample Quantity:	2 kg.
		Sampling Type:	Composite
		Packing Status:	Temp. Sealed

### Soil Quality Analysis Results

S. No.	Parameter	Test Method	Result	Units
1.	pH (at 25 °C)	IS:2720(P-26):1987,RA:2016	7.85	--
2.	Conductivity	IS:14767:2000,RA:2016	0.380	(mS/cm)
3.	Soil Texture	IS:2720(P-4)RA:2006	Silty Loam	--
4.	Color	USDA:1954-RA,2010	Yellowish Red	--
5.	Water holding capacity	USDA:1954-RA,2010	38.09	%
6.	Bulk density	USDA:1954(Page-121)RA:2014	1.39	(mg/kg)
7.	Chloride (as Cl)	USDA:1954Method 10A (Page-96)RA:2010	102.36	(mg/kg)
8.	Calcium (as Ca)	Lab SOP No.VEL/STP/01:2018	340.36	(mg/kg)
9.	Sodium (as Na)	USDA:1954Method 10A (Page-96)RA:2010	93.4	(mg/kg)
10.	Potassium (as K)	Lab SOP No.VEL/STP/01:2018	129.05	(Kg/hect.)
11.	Organic Matter	IS:2720(P-22):1972,RA:2015	0.65	%
12.	Magnesium (as Mg)	Lab SOP No.VEL/STP/01:2018	86.57	(mg/kg)
13.	Available Nitrogen(as N)	IS:14684:1999,RA:2015	205.20	(Kg/hect.)
14.	Available Phosphorus	Lab SOP No.VEL/STP/01:2018	39.73	(Kg/hect.)
15.	Zinc (as Zn)	USEPA 3050B:1996	19.20	(mg/kg)
16.	Manganese (as Mn)	USEPA3050	131.08	(mg/kg)
17.	Chromium (as Cr)	USEPA 3050B:1996	1.56	(mg/kg)
18.	Lead (as Pb)	USEPA 3050B:1996	4.18	(mg/kg)
19.	Cadmium (as Cd)	USEPA3050	0.85	(mg/kg)
20.	Copper (as Cu)	USEPA 3050B:1996	21.36	(mg/kg)

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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/02	Report No.:	VEL/S0/2201010002
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 01
Sample Description:	SOIL	Party Reference No.:	NIL
Location	Village- Kathli	Reporting Date:	04/01/2022
Sample Collected By	Vardan EnviroLab Team	Period of Analysis :	01/01/2022 to 04/01/2022
Parameter Required	As per work order	Receipt Date:	01/01/2022
Sampling and Analysis Protocol	IS 2720 & USDA	Sampling Date:	29/12/2021
		Sample Quantity:	2 kg.
		Sampling Type:	Composite
		Packing Status:	Temp. Sealed

### Soil Quality Analysis Results

	Parameter	Test Method	Result	Units
1.	pH (at 25 °C)	IS:2720(P-26):1987,RA:2016	7.35	--
2.	Conductivity	IS:14767:2000,RA:2016	0.425	(mS/cm)
3.	Soil Texture	IS:2720(P-4)RA:2006	Silty Loam	--
4.	Color	USDA:1954-RA,2010	Yellowish Red	--
5.	Water holding capacity	USDA:1954-RA,2010	37.84	%
6.	Bulk density	USDA:1954(Page-121)RA:2014	1.35	(mg/kg)
7.	Chloride (as Cl)	USDA:1954Method 10A (Page-96)RA:2010	95.45	(mg/kg)
8.	Calcium (as Ca)	Lab SOP No.VEL/STP/01:2018	378.53	(mg/kg)
9.	Sodium (as Na)	USDA:1954Method 10A (Page-96)RA:2010	100.9	(mg/kg)
10.	Potassium (as K)	Lab SOP No.VEL/STP/01:2018	138.78	(Kg/hect.)
11.	Organic Matter	IS:2720(P-22):1972,RA:2015	0.83	%
12.	Magnesium (as Mg)	Lab SOP No.VEL/STP/01:2018	92.14	(mg/kg)
13.	Available Nitrogen(as N)	IS:14684:1999,RA:2015	243.09	(Kg/hect.)
14.	Available Phosphorus	Lab SOP No.VEL/STP/01:2018	51.60	(Kg/hect.)
15.	Zinc (as Zn)	USEPA 3050B:1996	19.80	(mg/kg)
16.	Manganese (as Mn)	USEPA3050	135.08	(mg/kg)
17.	Chromium (as Cr)	USEPA 3050B:1996	1.64	(mg/kg)
18.	Lead (as Pb)	USEPA 3050B:1996	3.28	(mg/kg)
19.	Cadmium (as Cd)	USEPA3050	0.51	(mg/kg)
20.	Copper (as Cu)	USEPA 3050B:1996	11.36	(mg/kg)

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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/03	Report No.:	VEL/S0/2201010003
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 01
		Party Reference No.:	NIL
		Reporting Date:	04/01/2022
		Period of Analysis :	01/01/2022 to 04/01/2022
Sample Description:	SOIL	Receipt Date:	01/01/2022
Location	Village- Chhote Bhandar	Sampling Date:	29/12/2021
Sample Collected By	Vardan EnviroLab Team	Sample Quantity:	2 kg.
Parameter Required	As per work order	Sampling Type:	Composite
Sampling and Analysis Protocol	IS 2720 & USDA	Packing Status:	Temp. Sealed

### Soil Quality Analysis Results

	Parameter	Test Method	Result	Units
1.	pH (at 25 °C)	IS:2720(P-26):1987,RA:2016	7.60	--
2.	Conductivity	IS:14767:2000,RA:2016	0.315	(mS/cm)
3.	Soil Texture	IS:2720(P-4)RA:2006	Silty Loam	--
4.	Color	USDA:1954-RA,2010	Yellowish Red	--
5.	Water holding capacity	USDA:1954-RA,2010	35.36	%
6.	Bulk density	USDA:1954(Page-121)RA:2014	1.39	(mg/kg)
7.	Chloride (as Cl)	USDA:1954Method 10A (Page-96)RA:2010	85.25	(mg/kg)
8.	Calcium (as Ca)	Lab SOP No.VEL/STP/01:2018	226.85	(mg/kg)
9.	Sodium (as Na)	USDA:1954Method 10A (Page-96)RA:2010	90.60	(mg/kg)
10.	Potassium (as K)	Lab SOP No.VEL/STP/01:2018	93.68	(Kg/hect.)
11.	Organic Matter	IS:2720(P-22):1972,RA:2015	0.90	%
12.	Magnesium (as Mg)	Lab SOP No.VEL/STP/01:2018	60.71	(mg/kg)
13.	Available Nitrogen(as N)	IS:14684:1999,RA:2015	251.56	(Kg/hect.)
14.	Available Phosphorus	Lab SOP No.VEL/STP/01:2018	45.42	(Kg/hect.)
15.	Zinc (as Zn)	USEPA 3050B:1996	21.10	(mg/kg)
16.	Manganese (as Mn)	USEPA3050	127.05	(mg/kg)
17.	Chromium (as Cr)	USEPA 3050B:1996	1.35	(mg/kg)
18.	Lead (as Pb)	USEPA 3050B:1996	9.28	(mg/kg)
19.	Cadmium (as Cd)	USEPA3050	0.95	(mg/kg)
20.	Copper (as Cu)	USEPA 3050B:1996	16.36	(mg/kg)

  
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# Vardan EnviroLab

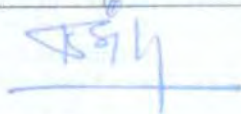
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)  
ISO 9001 | ISO 14001 | ISO 45001

## Test Report

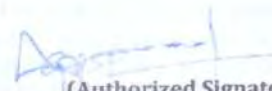
Sample Number:	VEL/REGL/04	Report No.:	VEL/S0/2201010004
Name & Address of the Party:	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh-496100 (Chhattisgarh)	Format No.:	7.8 F 01
Sample Description:	SOIL	Party Reference No.:	NIL
Location	Village- Bade Bhandar	Reporting Date:	04/01/2022
Sample Collected By	Vardan EnviroLab Team	Period of Analysis :	01/01/2022 to 04/01/2022
Parameter Required	As per work order	Receipt Date:	01/01/2022
Sampling and Analysis Protocol	IS 2720 & USDA	Sampling Date:	29/12/2021
		Sample Quantity:	2 kg.
		Sampling Type:	Composite
		Packing Status:	Temp. Sealed

### Soil Quality Analysis Results

S. No.	Parameter	Test Method	Result	Units
1.	pH (at 25 °C)	IS:2720(P-26):1987,RA:2016	7.45	--
2.	Conductivity	IS:14767:2000,RA:2016	0.398	(mS/cm)
3.	Soil Texture	IS:2720(P-4)RA:2006	Silty Loam	--
4.	Color	USDA:1954-RA,2010	Yellowish Red	--
5.	Water holding capacity	USDA:1954-RA,2010	36.85	%
6.	Bulk density	USDA:1954(Page-121)RA:2014	1.36	(mg/kg)
7.	Chloride (as Cl)	USDA:1954Method 10A (Page-96)RA:2010	94.21	(mg/kg)
8.	Calcium (as Ca)	Lab SOP No.VEL/STP/01:2018	315.01	(mg/kg)
9.	Sodium (as Na)	USDA:1954Method 10A (Page-96)RA:2010	95.6	(mg/kg)
10.	Potassium (as K)	Lab SOP No.VEL/STP/01:2018	95.89	(Kg/hect.)
11.	Organic Matter	IS:2720(P-22):1972,RA:2015	0.75	%
12.	Magnesium (as Mg)	Lab SOP No.VEL/STP/01:2018	54.24	(mg/kg)
13.	Available Nitrogen(as N)	IS:14684:1999,RA:2015	263.85	(Kg/hect.)
14.	Available Phosphorus	Lab SOP No.VEL/STP/01:2018	43.64	(Kg/hect.)
15.	Zinc (as Zn)	USEPA 3050B:1996	28.21	(mg/kg)
16.	Manganese (as Mn)	USEPA3050	136.05	(mg/kg)
17.	Chromium (as Cr)	USEPA 3050B:1996	0.68	(mg/kg)
18.	Lead (as Pb)	USEPA 3050B:1996	3.24	(mg/kg)
19.	Cadmium (as Cd)	USEPA3050	0.98	(mg/kg)
20.	Copper (as Cu)	USEPA 3050B:1996	14.18	(mg/kg)



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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/05	Report No.:	VEL/S0/2201010005
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 01
Sample Description:	SOIL	Party Reference No.:	NIL
Location:	Nursery (Near Main area)	Reporting Date:	04/01/2022
Sample Collected By:	Vardan EnviroLab Team	Period of Analysis:	01/01/2022 to 04/01/2022
Parameter Required:	As per work order	Receipt Date:	01/01/2022
Sampling and Analysis Protocol:	IS 2720 & USDA	Sampling Date:	29/12/2021
		Sample Quantity:	2 kg.
		Sampling Type:	Composite
		Packing Status:	Temp. Sealed

### Soil Quality Analysis Results

S.No.	Parameter	Test Method	Result	Units
1.	pH (at 25 °C)	IS:2720(P-26):1987,RA:2016	7.84	--
2.	Conductivity	IS:14767:2000,RA:2016	0.365	(mS/cm)
3.	Soil Texture	IS:2720(P-4)RA:2006	Silty Loam	--
4.	Color	USDA:1954-RA,2010	Yellowish Red	--
5.	Water holding capacity	USDA:1954-RA,2010	38.65	%
6.	Bulk density	USDA:1954(Page-121)RA:2014	1.30	(mg/kg)
7.	Chloride (as Cl)	USDA:1954Method 10A (Page-96)RA:2010	110.24	(mg/kg)
8.	Calcium (as Ca)	Lab SOP No.VEL/STP/01:2018	323.66	(mg/kg)
9.	Sodium (as Na)	USDA:1954Method 10A (Page-96)RA:2010	124.9	(mg/kg)
10.	Potassium (as K)	Lab SOP No.VEL/STP/01:2018	98.51	(Kg/hect.)
11.	Organic Matter	IS:2720(P-22):1972,RA:2015	0.81	%
12.	Magnesium (as Mg)	Lab SOP No.VEL/STP/01:2018	36.85	(mg/kg)
13.	Available Nitrogen(as N)	IS:14684:1999,RA:2015	225.01	(Kg/hect.)
14.	Available Phosphorus	Lab SOP No.VEL/STP/01:2018	52.62	(Kg/hect.)
15.	Zinc (as Zn)	USEPA 3050B:1996	24.16	(mg/kg)
16.	Manganese (as Mn)	USEPA3050	126.05	(mg/kg)
17.	Chromium (as Cr)	USEPA 3050B:1996	1.65	(mg/kg)
18.	Lead (as Pb)	USEPA 3050B:1996	3.84	(mg/kg)
19.	Cadmium (as Cd)	USEPA3050	0.90	(mg/kg)
20.	Copper (as Cu)	USEPA 3050B:1996	15.21	(mg/kg)

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#### **4.6 Waste Water Sample Analysis Report**

##### Locations

1. STP Outlet
2. ETP Outlet
3. Ash Pond Effluent
4. ETP Inlet



# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/REGL/WW/04	<b>Report No.:</b>	VEL/WW/2201010004
<b>Name &amp; Address of Party:</b>	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-01
<b>Sample Description:</b>	Waste Water	<b>Party Reference No.:</b>	NIL
<b>Sampling Location :</b>	STP Outlet	<b>Reporting Date:</b>	04/01/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Period of Analysis:</b>	01/01/2022 to 04/01/2022
		<b>Receipt Date:</b>	01/01/2022
		<b>Sampling Quantity:</b>	3.0 Ltr.
		<b>Sampling Date:</b>	28/12/2021
		<b>Parameter Required:</b>	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limit
1.	pH (at 25 °C)	IS 3025 (P-11):1983 : RA. 2017	7.42	--	5.5-9.0
2.	Oil & Grease	IS 3025(Part 39): 1991 RA 2019	1.8	mg/l	10.0
3.	Total suspended solid (TSS)	IS 3025(Part 17): 1984 RA 2017	17.1	mg/l	100.0
4.	Chemical Oxygen Demand (as COD)	IS:3025(Part 58):2006 RA:2017	122.4	mg/l	250.0
5.	Biochemical Oxygen Demand (as BOD)	IS:3025(Part 44):1993 RA:2019	21.0	mg/l	30.0

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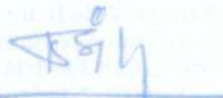
# Vardan EnviroLab


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

## Test Report

<b>Sample Number:</b>	VEL/REGL/WW/03	<b>Report No.:</b>	VEL/WW/2201010003
<b>Name &amp; Address of Party:</b>	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-01
<b>Sample Description:</b>	Waste Water	<b>Party Reference No.:</b>	NIL
<b>Sampling Location :</b>	ETP Outlet	<b>Reporting Date:</b>	04/01/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Period of Analysis:</b>	01/01/2022 to 04/01/2022
		<b>Receipt Date:</b>	01/01/2022
		<b>Sampling Quantity:</b>	3.0 Ltr.
		<b>Sampling Date:</b>	28/12/2021
		<b>Parameter Required:</b>	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limit
1.	pH (at 25 °C)	IS 3025 (P-11):1983 : RA. 2017	7.38	--	5.5-9.0
2.	Oil & Grease	IS 3025(Part 39): 1991 RA 2019	0.4	mg/l	10.0
3.	Total suspended solid (TSS)	IS 3025(Part 17): 1984 RA 2017	22.5	mg/l	100.0
4.	Chemical Oxygen Demand (as COD)	IS:3025(Part 58):2006 RA:2017	73.4	mg/l	250.0
5.	Biochemical Oxygen Demand (as BOD)	IS:3025(Part 44):1993 RA:2019	20.0	mg/l	30.0

  
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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

<b>Sample Number:</b>	VEL/REGL/WW/01	<b>Report No.:</b>	VEL/WW/2201010001
<b>Name &amp; Address of Party:</b>	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-01
<b>Sample Description:</b>	Waste Water	<b>Party Reference No.:</b>	NIL
<b>Sampling Location :</b>	Ash Pond Effluent	<b>Reporting Date:</b>	04/01/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Period of Analysis:</b>	01/01/2022 to 04/01/2022
		<b>Receipt Date:</b>	01/01/2022
		<b>Sampling Quantity:</b>	3.0 Ltr.
		<b>Sampling Date</b>	28/12/2021
		<b>Parameter Required:</b>	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits
1.	pH (at 25 °C)	IS 3025 (P-11):1983 RA: 2017	7.68	--	5.5-9.0
2.	Oil & Grease	IS 3025(P- 39):1991 RA: 2019	1.20	mg/l	10.0
3.	Total suspended solid (TSS)	IS 3025(Part 17): 1984 RA 2017	26.3	mg/l	100.0
4.	Lead as Pb	APHA (23 <sup>rd</sup> edition), 3030D, 3113 B: 2017	0.09	mg/l	0.1
5.	Mercury as Hg	APHA (23 <sup>rd</sup> edition), 3114C: 2017	0.006	mg/l	0.01
6.	Total Chromium as Cr	APHA (23 <sup>rd</sup> edition- 2017), Method No. 3113 B: 2017	0.21	mg/l	2.0
7.	Arsenic as As	APHA (23 <sup>rd</sup> edition- 2017), 3114 C: 2017	*BDL(**DL 0.005)	mg/l	0.2

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

<b>Sample Number:</b>	VEL/REGL/WW/02	<b>Report No.:</b>	VEL/WW/2201010002
<b>Name &amp; Address of Party:</b>	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-01
<b>Sample Description:</b>	Waste Water	<b>Party Reference No.:</b>	NIL
<b>Sampling Location :</b>	ETP Inlet	<b>Reporting Date:</b>	04/01/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Representative	<b>Period of Analysis:</b>	01/01/2022 to 04/01/2022
		<b>Receipt Date:</b>	01/01/2022
		<b>Sampling Quantity:</b>	3.0 Ltr.
		<b>Sampling Date</b>	28/12/2021
		<b>Parameter Required:</b>	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025 (P-11):1983 : RA. 2017	7.80	--
2.	Oil & Grease	IS 3025(Part 39): 1991 RA 2019	2.5	mg/l
3.	Total suspended solid (TSS)	IS 3025(Part 17): 1984 RA 2017	46.8	mg/l
4.	Chemical Oxygen Demand (as COD)	IS:3025(Part 58):2006 RA:2017	248.9	mg/l
5.	Biochemical Oxygen Demand (as BOD)	IS:3025(Part 44):1993 RA:2019	60.0	mg/l

  
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#### **4.7 Stack Emission Analysis Report**

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/S/01 Report No.: VEL /S/2201010001  
 Name & Address of Party: M/s Raigarh Energy Generation Ltd. Format No.: 7.8 F-01  
 Village- Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh) Party Reference No.: NIL  
 Report Date: 04/01/2022  
 Period of Analysis: 01/01/2022 to 04/01/2022  
 Receipt Date: 01/01/2022

Sample Description : STACK EMISSION MONITORING

Sample Collected : VEL Team  
 Date & Time of Sampling : 28/12/2021  
 Location : TPP  
 Sampling duration (Minutes) : 35.0 & 12:00 to 12:35 Hrs.  
 Meteorological Condition : Cloudy Sky  
 Stack Attached : TPP  
 Stack Diameter : 7.5 m  
 Stack Height : 275 m  
 Instrument calibration status : Calibrated  
 Ambient Temperature - Ta (°C) : 24.0  
 Temperature of Stack Gases - Ts (0C) : 125  
 Velocity of Stack Gases (m/sec.) : 19.85  
 Flow rate of PM (LPM) : 28.0  
 Flow rate of Gas (LPM) : 2.0 (876.50 m3/sec)  
 Sampling condition : Isokinetic  
 Protocol used : IS-11255 &EPA

### RESULTS

S. No.	Parameter	Protocol	Results	Units	Limits
1.	Particulate Matter (as PM)	IS 11255 (P-1) :1985,RA,2014	46.61	mg/Nm3	50.0
2.	Sulphur Dioxide (as SO2)	IS: 11255 (p-2)1985, RA. 2014	614.01	mg/Nm3	200.0
3.	Oxide of Nitrogen (as NO2)	IS 11255 (P-7)RA,2017	282.95	mg/Nm3	450.0
4.	Mercury (as Hg)	APHA 3rd ed,2017, 303A (Page No. 365)	BDL(DL0.001)	mg/Nm3	0.03

BDL\*(Below Detection Limit) \*\* (DL Detection Limit)

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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 <sub>2</sub> , NO <sub>2</sub> , PM <sub>10</sub> , PM <sub>2.5</sub> , 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.






# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/ REGL/BA/01	<b>Report No.:</b>	VEL/BA/2201010001
<b>Name &amp; Address of the Party:</b>	M/s Raigarh Energy Generation Ltd. Village -Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-01
<b>Sample Description:</b>	Bottom Ash	<b>Party Reference No.:</b>	NIL
<b>Sample Location:</b>	Bottom Ash	<b>Reporting Date:</b>	04/01/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Team	<b>Period of Analysis:</b>	01/01/2022 to 04/01/2022
<b>Parameter Required:</b>	As per Work Order	<b>Receipt Date:</b>	01/01/2022
		<b>Sampling Date:</b>	28/12/2021
		<b>Sampling Quantity:</b>	250 gm.

S. No.	Parameter	Test-Method	Results	Unit
1.	Arsenic (as As)	BY AAS Method	0.25	mg/kg
2.	Mercury (as Hg)	BY AAS Method	0.65	mg/kg
3.	Chromium (as Cr)	BY AAS Method	13.25	mg/kg
4.	Lead (as Pb)	BY AAS Method	19.10	mg/kg

  
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# Vardan EnviroLab

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

<b>Sample Number:</b>	VEL/ REGL/C/01	<b>Report No.:</b>	VEL/C/2201010001
<b>Name &amp; Address of the Party:</b>	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-01
<b>Sample Description:</b>	Coal	<b>Party Reference No.:</b>	NIL
<b>Sample Location:</b>	--	<b>Reporting Date:</b>	04/01/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Team	<b>Period of Analysis:</b>	01/01/2022 to 04/01/2022
<b>Parameter Required:</b>	As per Work Order	<b>Receipt Date:</b>	01/01/2022
		<b>Sampling Date:</b>	28/12/2021
		<b>Sampling Quantity:</b>	250 gm.

S. No.	Parameter	Test-Method	Results	Unit
1.	Arsenic (as As)	BY AAS Method	BDL	mg/kg
2.	Mercury (as Hg)	BY AAS Method	BDL	mg/kg
3.	Chromium (as Cr)	BY AAS Method	1.06	mg/kg
4.	Lead (as Pb)	BY AAS Method	1.54	mg/kg

  
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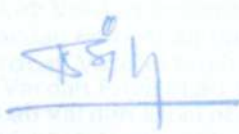
# Vardan EnviroLab

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

## Test Report

<b>Sample Number:</b>	VEL/ REGL/FA/01	<b>Report No.:</b>	VEL/FA/2201010001
<b>Name &amp; Address of the Party:</b>	M/s Raigarh Energy Generation Ltd. Village -Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-01
<b>Sample Description:</b>	FLY ASH	<b>Party Reference No.:</b>	NIL
<b>Sample Location:</b>	FLY ASH	<b>Reporting Date:</b>	04/01/2022
<b>Sample Collected by:</b>	Vardan EnviroLab Team	<b>Period of Analysis:</b>	01/01/2022 to 04/01/2022
<b>Parameter Required:</b>	As per Work Order	<b>Receipt Date:</b>	01/01/2022
		<b>Sampling Date:</b>	28/12/2021
		<b>Sampling Quantity:</b>	250 gm.

S. No.	Parameter	Test-Method	Results	Unit
1.	Arsenic (as As)	BY AAS Method	0.25	mg/kg
2.	Mercury (as Hg)	BY AAS Method	0.72	mg/kg
3.	Chromium (as Cr)	BY AAS Method	0.80	mg/kg
4.	Lead (as Pb)	BY AAS Method	0.89	mg/kg

  
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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/S/02 **Report No.:** VEL /S/2201010002  
**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.:** 5.10 F-01  
**Party Reference No.:** NIL  
**Reporting Date:** 04/01/2022  
**Period of Analysis:** 01/01/2022 to 04/01/2022  
**Sample Description :** STACK EMISSION MONITORING **Receipt Date:** 01/01/2022

Sample Collected : VEL Team  
Date & Time of Sampling : 29/12/2021  
Location : D.G Set -1 (1500 KVA)  
Sampling duration (Minutes) : 48.0 (11:00 to 11:48 Hrs.)  
Meteorological Condition : Cloudy Sky  
Stack Attached : D.G Set  
Stack Diameter : 0.7 m  
Stack Height : 30 m  
Instrument calibration status : Calibrated  
Ambient Temperature - Ta (°C) : 21.0  
Temperature of Stack Gases - Ts (°C) : 84.0  
Velocity of Stack Gases (m/sec.) : 5.79  
Flow rate of PM (LPM) : 21.0  
Flow rate of Gas (LPM) : 2.0  
Sampling condition : Isokinetic  
Protocol used : IS-11255 &EPA

### RESULTS

S. No.	Parameter	Protocol	Results	Units	Limits
1.	Particulate Matter (as PM)	IS 11255 (P-1) :1985,RA,2014	30.38	mg/Nm3	75.0
2.	Sulphur Dioxide (as SO2)	IS: 11255 (p-2)1985, RA. 2014	31.50	mg/Nm3	--
3.	Oxide of Nitrogen (as NO2)	IS 11255 (P-7)RA,2017	47.38	mg/Nm3	710.0
4.	Non Methane Hydrocarbon (NMHC)	IS:5182 (P-21) Based On GC,RA :2012	9.48	mg/Nm3	100.0



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VEL/E/1178/P/15303

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# Vardan EnviroLab

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

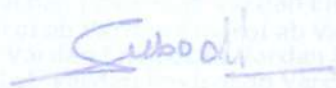
## Test Report

**Sample Number:** VEL/REGL/S/03 **Report No.:** VEL/S/2201010003  
**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.:** 5.10 F-01  
**Party Reference No.:** NIL  
**Reporting Date:** 04/01/2022  
**Period of Analysis:** 01/01/2022 to 04/01/2022  
**Sample Description :** STACK EMISSION MONITORING **Receipt Date:** 01/01/2022

**Sample Collected :** VEL Team  
**Date & Time of Sampling :** 29/12/2021  
**Location :** D.G Set -2 (1500 KVA)  
**Sampling duration (Minutes) :** 45.0 (12:00 to 12:45 Hrs.)  
**Meteorological Condition :** Cloudy Sky  
**Stack Attached :** D.G Set  
**Stack Diameter :** 0.7 m  
**Stack Height :** 30 m  
**Instrument calibration status :** Calibrated  
**Ambient Temperature - Ta (°C) :** 21.0  
**Temperature of Stack Gases - Ts (°C) :** 80.0  
**Velocity of Stack Gases (m/sec.) :** 6.22  
**Flow rate of PM (LPM) :** 22.0  
**Flow rate of Gas (LPM) :** 2.0  
**Sampling condition :** Isokinetic  
**Protocol used :** IS-11255 &EPA

### RESULTS

S. No.	Parameter	Protocol	Results	Units	Limits
1.	Particulate Matter (as PM)	IS 11255 (P-1) :1985,RA,2014	29.57	mg/Nm3	75.0
2.	Sulphur Dioxide (as SO2)	IS: 11255 (p-2)1985, RA. 2014	33.22	mg/Nm3	--
3.	Oxide of Nitrogen (as NO2)	IS 11255 (P-7)RA,2017	46.03	mg/Nm3	710.0
4.	Non Methane Hydrocarbon (NMHC)	IS:5182 (P-21) Based On GC,RA :2012	12.56	mg/Nm3	100.0



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

## Test Report

<b>Sample Number:</b>	VEL/ REGL/WL/01	<b>Report No.:</b>	VEL/WL/2201010001
<b>Name &amp; Address of the Party:</b>	M/s Raigarh Energy Generation Ltd. Village -Chhote Bhandar, Post Office Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	<b>Format No.:</b>	7.8 F-01
<b>Sample Description:</b>	Ground Water Level Monitoring	<b>Party Reference No.:</b>	NIL
		<b>Reporting Date:</b>	04/01/2022
		<b>Receipt Date:</b>	01/01/2022
		<b>Sampling Date:</b>	29/12/2021

S. No.	Location	Latitude & Longitude	Depth (In Meter)
1.	Site Office	21°44'07.3" & 83°15'01.4"	7.3
2.	Village- Palsada	21°44'08.3" & 83°15'10.4"	7.6
3.	Village- Kathli	21°43'27.5" & 83°16'25.2"	8.0
4.	Village- Chhote Bhandar	21°43'48.5" & 83°16'49.3"	6.2
5.	Village- Bade Bhandar	21°44'17.4" & 83°16'49.3"	7.6

  
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# 4th 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 Change, 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 provisions 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 27<sup>th</sup> March 2022 to 30<sup>th</sup> March 2022, i.e. for **4<sup>th</sup> 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: 10/04/2022



A handwritten signature in blue ink, appearing to be "D. S. S.", written over a horizontal line.

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**INDEX**

<b>Sr.No.</b>	<b>Contents</b>	<b>Page No.</b>
<b>1.0</b>	Introduction	3
<b>2.0</b>	Project Profile	4
2.1	Topography and Drainage	4
2.2	Location	4
2.3	Climate	4
2.4	Communication	4
2.5	Location Map	5
<b>3.0</b>	Scope of Study and Methodology	6
3.1	Scope of Study	6
3.2	Methodology	6
3.2.1	Air Environment	6
3.2.2	Water Environment	6
3.2.3	Noise Environment	7
3.2.4	Soil	7
<b>4.0</b>	Sampling Location Map and Analysis Reports	8
4.1	Ambient Air Quality Monitoring	9-16
4.2	Noise Level Monitoring	17- 24
4.3	Ground water Quality Analysis	25- 39
4.4	Surface water Quality Analysis	40- 49
4.5	Soil Quality Analysis	50-55
4.6	Effluent Sample Analysis Report	56-60
4.7	Stack Emission Analysis Report	61-64
<b>5.0</b>	Conclusion	65
5.1	Air Environment	65
5.2	Water Environment	65
5.3	Noise Environment	65

## **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 Chhattisgarh. Raigarh Energy Generation Ltd., has recently 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 toposheet 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

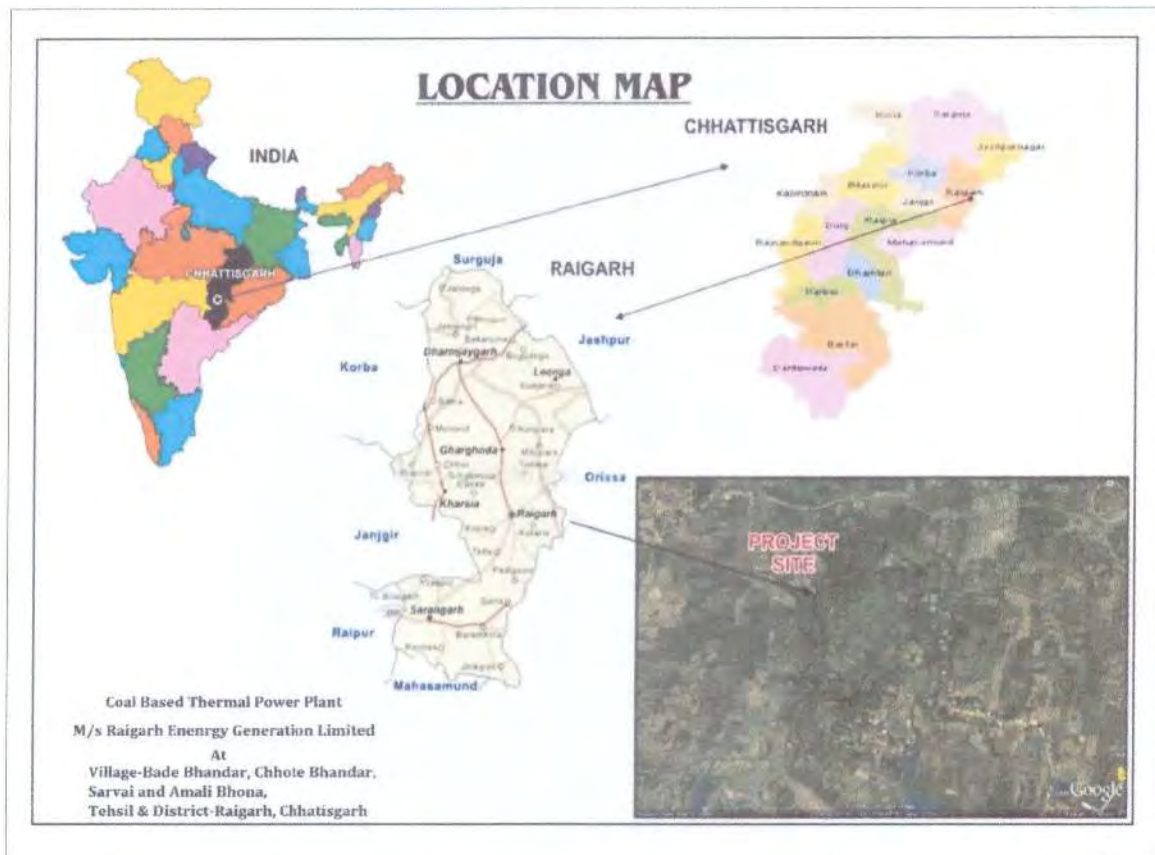


Figure No.2. Location Map



## **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 & Chhattisgarh 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 SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, 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- Palsada Village
  - A3- Kathali Village
  - A4- Chhote Bhandar Village
  - A5- Bade Bhandar Village
  - A6- Konataral Village
  - A7- Chatamura Chowk
  - A8- Supa, Near REGL Plant



# 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	Report No.:	VEL/A/2204010012
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
Sample Description :	Ambient Air Quality Monitoring	Party Reference No.:	NIL
		Report Date:	04/04/2022/2022
		Period of Analysis:	01-04/04/2022
		Receipt Date	01/04/2022

### General Information:-

Sampling Location	: 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	: Clear Sky
Date of Sampling	: 28/03/2021 to 29/03/2021
Time of Sampling	: 10:25 AM to 10:25 AM
Ambient Temperature (°C)	: Min. 24°C, Max. 34 °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 <sub>2.5</sub> )	IS: 5182 (P-24), 2019	29.98	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS:5182 (P- 23)-2006,RA. 2017	70.52	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS:5182 (P- 6)-2006 RA.2017	20.24	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS:51 82 (P- 2)-2001, RA. 2017	10.18	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS:51 82 (P- 9)-1974, RA. 2014	0.52	mg/m <sup>3</sup>	4.0
6.	Mercury as (Hg)	Method Of air sampling and analysis, 3rd 1988, Method No.317	BDL(*DL-1.0)	ng/m <sup>3</sup>	--

Note :-\*BDL-Below Detecation Limit ,\*\*DL-Detecation 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/05	Report No.:	VEL/A/2204010013
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:	04/04/2022/2022
Sample Description :	Ambient Air Quality Monitoring	Period of Analysis:	01-04/04/2022
		Receipt Date	01/04/2022

### General Information:-

Sampling Location	: Village - Palsada
Sample collected by	: Vardan EnviroLab Representative
Sampling Equipment used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/02
Instrument Calibration Status	: Calibrated
Latitude	: 21°44'13"
Longitude	: 83°16'30"
Meteorological condition during monitoring	: Clear Sky
Date of Sampling	: 28/03/2021 to 29/03/2021
Time of Sampling	: 10:45AM to 10:45 AM
Ambient Temperature (°C)	: Min.24°C, Max. 34 °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 <sub>2.5</sub> )	IS: 5182 (P-24), 2019	31.41	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS:5182 (P- 23)-2006,RA. 2017	70.56	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS:5182 (P- 6)-2006 RA.2017	16.52	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS:51 82 (P- 2)-2001, RA. 2017	9.36	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS:51 82 (P- 9)-1974, RA. 2014	0.63	mg/m <sup>3</sup>	4.0
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL(*DL-1.0)	ng/m <sup>3</sup>	--

Note :-\*BDL-Below Detecation Limit ,\*\*DL-Detecation 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/06	Report No.:	VEL/A/2204010014
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:	04/04/2022/2022
Sample Description :	Ambient Air Quality Monitoring	Period of Analysis:	01-04/04/2022
		Receipt Date	01/04/2022

### General Information:-

Sampling Location	: Village - Kathli
Sample collected by	: Vardan EnviroLab Representative
Sampling Equipment used	: RDS &FPS
Instrument Code	: VEL/RDS/FPS/03
Instrument Calibration Status	: Calibrated
Latitude	: 21°44'17"
Longitude	: 83°16'19"
Meteorological condition during monitoring	: Clear Sky
Date of Sampling	: 28/03/2021 to 29/03/2021
Time of Sampling	: 11:00 AM to 11:00 AM
Ambient Temperature (°C)	: Min.24°C, Max. 34 °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 <sub>2.5</sub> )	IS: 5182 (P-24), 2019	36.74	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS:5182 (P- 23)-2006,RA. 2017	74.11	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS:5182 (P- 6)-2006 RA.2017	21.56	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS:51 82 (P- 2)-2001, RA. 2017	13.52	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS:51 82 (P- 9)-1974, RA. 2014	0.68	mg/m <sup>3</sup>	4.0
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL>(*DL -1.0)	ng/m <sup>3</sup>	--

Note :-\*BDL-Below Detecation Limit ,\*\*DL-Detecation 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/07 Report No.: VEL/A/2204010015  
Name & Address of the Party: M/s Raigarh Energy Generation Ltd. Format No.: 7.8 F 01  
Village - Chhote Bhandar, Post Office Bade  
Bade Bandar, Tehsil Pussore, Dist- Raigarh Party Reference No.: NIL  
496100 (Chhattisgarh) Report Date: 04/01/2022  
Sample Description: Ambient Air Quality Monitoring Period of Analysis: 01/01/2022 to 04/01/2022  
Receipt Date: 01/01/2022

### General Information:-

Sampling Location : Village - Chhote Bhandar  
Sample collected by : Vardan EnviroLab Representative  
Sampling Equipment used : RDS & FPS  
Instrument Code : VEL/RDS/FPS/02  
Instrument Calibration Status : Calibrated  
Latitude : 21°44'22"  
Longitude : 83°16'43"  
Meteorological condition during monitoring : Clear Sky  
Date of Sampling : 29/03/2022 to 30/03/2022  
Time of Sampling : 11:10AM to 11:10 AM  
Ambient Temperature (°C) : Min. 23°C, Max. 32 °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 <sub>2.5</sub> )	IS: 5182 (P-24), 2019	33.56	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS:5182 (P- 23)-2006,RA. 2017	75.22	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS:5182 (P- 6)-2006 RA.2017	14.29	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS:51 82 (P- 2)-2001, RA. 2017	9.85	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS:51 82 (P- 9)-1974, RA. 2014	0.72	mg/m <sup>3</sup>	4.0
6.	Mercury as (Hg)	Method Of air sampling and analysis, 3rd 1988, Method No.317	BDL(*DL-1.0)	ng/m <sup>3</sup>	--

Note :- \*BDL-Below Detecation Limit, \*\*DL-Detecation 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/08	Report No.:	VEL/A/2204010016
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:	04/01/2022
Sample Description :	Ambient Air Quality Monitoring	Period of Analysis:	01/01/2022 to 04/01/2022
		Receipt Date	01/01/2022

### General Information:-

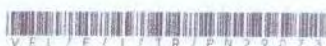
Sampling Location	: Village - Bade Bhandar
Sample collected by	: Vardan EnviroLab Representative
Sampling Equipment used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/03
Instrument Calibration Status	: Calibrated
Latitude	: 21°44'29"
Longitude	: 83°17'6"
Meteorological condition during monitoring	: Clear Sky
Date of Sampling	: 29/03/2022 to 30/03/2022
Time of Sampling	: 11:40AM to 11:40 AM
Ambient Temperature (°C)	: Min.23°C, Max. 32 °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 <sub>2.5</sub> )	IS: 5182 (P-24), 2019	36.41	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS:5182 (P- 23)-2006,RA. 2017	78.05	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS:5182 (P- 6)-2006 RA.2017	16.96	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS:51 82 (P- 2)-2001, RA. 2017	10.11	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS:51 82 (P- 9)-1974, RA. 2014	0.76	mg/m <sup>3</sup>	4.0
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL(DL-1.0)	ng/m <sup>3</sup>	--

Note :-\*BDL-Below Detecation Limit,\*\*DL-Detecation 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/01 Report No.: VEL/A/2204010009  
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: 04/04/2022/2022  
Period of Analysis: 01-04/04/2022  
Sample Description: Ambient Air Quality Monitoring Receipt Date: 01/04/2022

### General Information:-

Sampling Location : Kondataral  
Sample collected by : Vardan EnviroLab Representative  
Sampling Equipment used : RDS &FPS  
Instrument Code : VEL/RDS/FPS/01  
Instrument Calibration Status : Calibrated  
Latitude : 21°51'52"  
Longitude : 83°22'44"  
Meteorological condition during monitoring : Clear Sky  
Date of Sampling : 27/03/2022 to 28/03/2022  
Time of Sampling : 10:00 AM to 10:00 AM  
Ambient Temperature (°C) : Min.23°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 <sub>2.5</sub> )	IS: 5182 (P-24), 2019	35.97	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS:5182 (P- 23)-2006,RA. 2017	73.52	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS:5182 (P- 6)-2006 RA.2017	15.36	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS:51 82 (P- 2)-2001, RA. 2017	8.76	µg/m <sup>3</sup>	80
5.	Ozone (as O <sub>3</sub> )	IS:51 82 (P- 9)-1974, RA. 2014	7.23	µg/m <sup>3</sup>	180
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL(*DL-1.0)	ng/m <sup>3</sup>	--
7.	Suspended Particulate Matter	IS:5182 (P- 4)-1999,RA. 2014	181.40	µg/m <sup>3</sup>	600

Note :-\*BDL-Below Detecation Limit ,\*\*DL-Detecation 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/2204010010  
Name & Address of the Party: M/s Raigarh Energy Generation Ltd. Format No.: 7.8 F 01  
Village - Chhote Bhandar, Post Office Bade  
Bade Bandar, Tehsil Pussore, Dist- Raigarh Party Reference No.: NIL  
496100 (Chhattisgarh) Report Date: 04/04/2022/2022  
Sample Description: Ambient Air Quality Monitoring Period of Analysis: 01-04/04/2022  
Receipt Date: 01/04/2022

### General Information:-

Sampling Location : Chatamura Chowk  
Sample collected by : Vardan EnviroLab Representative  
Sampling Equipment used : RDS & FPS  
Instrument Code : VEL/RDS/FPS/02  
Instrument Calibration Status : Calibrated  
Latitude : 21°51'52"  
Longitude : 83°22'44"  
Meteorological condition during monitoring : Clear Sky  
Date of Sampling : 27/03/2022 to 28/03/2022  
Time of Sampling : 10:30 AM to 10:30 AM  
Ambient Temperature (°C) : Min.23°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 <sub>2.5</sub> )	IS: 5182 (P-24), 2019	40.26	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS:5182 (P- 23)-2006,RA. 2017	75.21	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS:5182 (P- 6)-2006 RA.2017	20.24	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS:51 82 (P- 2)-2001, RA. 2017	13.71	µg/m <sup>3</sup>	80
5.	Ozone (as O <sub>3</sub> )	IS:51 82 (P- 9)-1974, RA. 2014	14.11	µg/m <sup>3</sup>	180
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL(*DL-1.0)	ng/m <sup>3</sup>	--
7.	Suspended Particulate Matter	IS:5182 (P- 4)-1999,RA. 2014	274.2	µg/m <sup>3</sup>	600

Note :-\*BDL-Below Detecation Limit,\*\*DL-Detecation 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

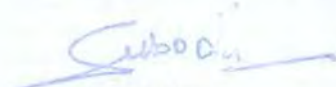
Sample Number:	VEL/REGL/AA/03	Report No.:	VEL/A/2204010011
Name & Address of the Party	M/s Raigarh Energy Generation Ltd. Village - Chhote Bhandar, Post Office Bade Bade Bandar, Tehsil Pussore, Dist- Raigarh 496100 (Chhattisgarh)	Format No.:	7.8 F 01
Sample Description :	Ambient Air Quality Monitoring	Party Reference No.:	NIL
		Report Date:	04/04/2022/2022
		Period of Analysis:	01-04/04/2022
		Receipt Date	01/04/2022

### General Information:-

Sampling Location	: Supa, Near REGL Plant
Sample collected by	: Vardan EnviroLab Representative
Sampling Equipment used	: RDS & FPS
Instrument Code	: VEL/RDS/FPS/03
Instrument Calibration Status	: Calibrated
Latitude	: 21°45'8"
Longitude	: 83°18'4"
Meteorological condition during monitoring	: Clear Sky
Date of Sampling	: 27/03/2022 to 28/03/2022
Time of Sampling	: 10:40 AM to 10:40 AM
Ambient Temperature (°C)	: Min.23°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 <sub>2.5</sub> )	IS: 5182 (P-24), 2019	38.03	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS:5182 (P- 23)-2006,RA. 2017	73.52	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS:5182 (P- 6)-2006 RA.2017	18.20	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS:51 82 (P- 2)-2001, RA. 2017	12.42	µg/m <sup>3</sup>	80
5.	Ozone (as O <sub>3</sub> )	IS:51 82 (P- 9)-1974, RA. 2014	9.29	µg/m <sup>3</sup>	180
6.	Mercury as (Hg)	Method Of air sampling and analysis,3rd 1988,Method No.317	BDL(DL-1.0)	ng/m <sup>3</sup>	--
7.	Suspended Particulate Matter	IS:5182 (P- 4)-1999,RA. 2014	255.1	µg/m <sup>3</sup>	600

Note :-\*BDL-Below Detecation Limit ,\*\*DL-Detecation Limit.

  
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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- Field Hostel
  - N2- Palsada Village
  - N3- Kathali Village
  - N4- Chote Bhandar Village
  - N5- Bade Bhandar Village
  - N6- Site Office
  - N7- Behind Switch Yard





# 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/06	Report No.:	VEL/N/2204010012
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
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	NIL
Scope of Monitoring:	Regulatory Requirement	Reporting Date:	04/04/2022
Protocol Used:	IS 9989: IS 9876	Receipt Date:	01/04/2022
Instrument Used:	SLM	Sampling Duration:	24 Hrs.
		Sample Collected by:	VEL Team
		Instrument:	Calibrated
		Calibration Status:	

### Ambient Noise Level Monitoring Results

#### General Information:-

Sampling Location	: Field Hostel
Instrument Code	: VEL/SLM/07
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 28/03/2022 to 29/03/2022
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min.24°C, Max. 34 °C
Surrounding Activity	: Human, Vehicular and other Activities
Parameter Required	: As per Work Order

Sl.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L max	IS:9989,IS9876:1981	66.1	52.8
2.	L min	IS:9989,IS9876:1981	41.4	36.6
3.	Leq	IS:9989,IS9876:1981	52.70	42.45

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:	VEL/REGL/AN/02	Report No.:	VEL/N/2204010008
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
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	NIL
Scope of Monitoring:	Regulatory Requirement	Reporting Date:	04/04/2022
Protocol Used:	IS 9989: IS 9876	Receipt Date:	01/04/2022
Instrument Used:	SLM	Sampling Duration:	24 Hrs.
		Sample Collected by:	VEL Team
		Instrument:	Calibrated
		Calibration Status:	

### Ambient Noise Level Monitoring Results

#### General Information:-

Sampling Location	: Village- Palsada
Instrument Code	: VEL/SLM/05
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 28/03/2022 to 29/03/2022
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min.24°C, Max. 34 °C
Surrounding Activity	: Human, Vehicular and other Activities
Parameter Required	: As per Work Order

SL.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L max	IS:9989,IS9876:1981	59.8	51.3
2.	L min	IS:9989,IS9876:1981	38.5	37.4
3.	Leq	IS:9989,IS9876:1981	52.97	42.67

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: 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)  
Sample Description: Ambient Noise Level Monitoring  
Scope of Monitoring: Regulatory Requirement  
Protocol Used: IS 9989: IS 9876  
Instrument Used: SLM  
Report No.: VEL/N/2204010009  
Format No.: 7.8 F 01  
Party Reference No.: NIL  
Reporting Date: 04/04/2022  
Receipt Date: 01/04/2022  
Sampling Duration: 24 Hrs.  
Sample Collected by: VEL Team  
Instrument Calibration Status: Calibrated

### Ambient Noise Level Monitoring Results

#### General Information:-

Sampling Location : Village-Kathli  
Instrument Code : VEL/SLM/07  
Meteorological condition during monitoring : Clear Sky  
Date of Monitoring : 28/03/2022 to 29/03/2022  
Time of Monitoring : 06:00 AM to 06:00AM  
Ambient Temperature (°C) : Min.24°C, Max. 34 °C  
Surrounding Activity : Human, Vehicular and other Activities  
Parameter Required : As per Work Order

SL.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L max	IS:9989,IS9876:1981	66.3	53.0
2.	L min	IS:9989,IS9876:1981	41.6	36.8
3.	Leq	IS:9989,IS9876:1981	53.97	42.65

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:	VEL/REGL/AN/04	Report No.:	VEL/N/2204010010
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
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	NIL
Scope of Monitoring	Regulatory Requirement	Reporting Date:	04/04/2022
Protocol Used:	IS 9989: IS 9876	Receipt Date:	01/04/2022
Instrument Used	SLM	Sampling Duration	24 Hrs.
		Sample Collected by	VEL Team
		Instrument	
		Calibration Status	Calibrated

### Ambient Noise Level Monitoring Results

#### General Information:-

Sampling Location	: Chhote Bhandar
Instrument Code	: VEL/SLM/06
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 29/03/2022 to 30/03/2022
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min.23°C, Max. 32 °C
Surrounding Activity	: Human, Vehicular and other Activities
Parameter Required	: As per Work Order

Sl.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L max	IS:9989,IS9876:1981	66.1	52.8
2.	L min	IS:9989,IS9876:1981	41.4	36.6
3.	Leq	IS:9989,IS9876:1981	53.77	42.45

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:	VEL/REGL/AN/01	Report No.:	VEL/N/2204010007
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
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	NIL
Scope of Monitoring	Regulatory Requirement	Reporting Date:	04/04/2022
Protocol Used:	IS 9989: IS 9876	Receipt Date:	01/04/2022
Instrument Used	SLM	Sampling Duration	24 Hrs.
		Sample Collected by	VEL Team
		Instrument	Calibrated
		Calibration Status	

### Ambient Noise Level Monitoring Results

#### General Information:-

Sampling Location	: Village- Bade Bhandar
Instrument Code	: VEL/SLM/05
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 29/03/2022 to 30/03/2022
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min.23°C, Max. 32 °C
Surrounding Activity	: Human, Vehicular and other Activities
Parameter Required	: As per Work Order

SL.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L max	IS:9989,IS9876:1981	64.6	53.0
2.	L min	IS:9989,IS9876:1981	43.6	37.3
3.	Leq	IS:9989,IS9876:1981	54.16	44.13

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	Report No.:	VEL/N/2204010011
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
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	NIL
Scope of Monitoring:	Regulatory Requirement	Reporting Date:	04/04/2022
Protocol Used:	IS 9989: IS 9876	Receipt Date:	01/04/2022
Instrument Used:	SLM	Sampling Duration:	24 Hrs.
		Sample Collected by:	VEL Team
		Instrument:	Calibrated
		Calibration Status:	

### Ambient Noise Level Monitoring Results

#### General Information:-

Sampling Location	: Site office
Instrument Code	: VEL/SLM/06
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 28/03/2022 to 29/03/2022
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min. 24°C, Max. 34 °C
Surrounding Activity	: Human, Vehicular and other Activities
Parameter Required	: As per Work Order

Sl.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L max	IS:9989,IS9876:1981	67.2	54.3
2.	L min	IS:9989,IS9876:1981	50.4	40.1
3.	Leq	IS:9989,IS9876:1981	60.47	46.51

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:	VEL/REGL/AN/07	Report No.:	VEL/N/2204010013
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
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	NIL
Scope of Monitoring:	Regulatory Requirement	Reporting Date:	04/04/2022
Protocol Used:	IS 9989: IS 9876	Receipt Date:	01/04/2022
Instrument Used:	SLM	Sampling Duration:	24 Hrs.
		Sample Collected by:	VEL Team
		Instrument:	Calibrated
		Calibration Status:	

### Ambient Noise Level Monitoring Results

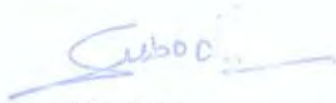
#### General Information:-

Sampling Location	: Behind Switch Yard
Instrument Code	: VEL/SLM/07
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 29/03/2022 to 30/03/2022
Time of Monitoring	: 06:00 AM to 06:00AM
Ambient Temperature (°C)	: Min.24°C, Max. 34 °C
Surrounding Activity	: Human, Vehicular and other Activities
Parameter Required	: As per Work Order

Sl.No.	Test Parameter	Protocol	Test Result dB(A)	
			Day Time	Night Time
1.	L max	IS:9989,IS9876:1981	72.7	56.4
2.	L min	IS:9989,IS9876:1981	45.1	40.2
3.	Leq	IS:9989,IS9876:1981	58.82	46.05

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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### 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
- GW6- Piezometer Water
- GW7- Mine Water





# Vardan EnviroLab

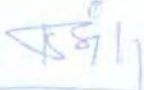
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)  
ISO 9001 | ISO 14001 | ISO 45001

## Test Report

Sample Number:	VEL/REGL/W/05	Report No.:	VEL/W/2204010007
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 01
		Party Reference No.:	NIL
		Reporting Date:	04/04/2022
Sample Description:	Ground Water	Period of Analysis:	01-04/04/2022
Sampling Location:	Site Office	Receipt Date:	01/04/2022
Sample Collected by	Vardan EnviroLab Representative	Sampling Date:	28/03/2022
Preservation:	Refrigerated	Sampling Type:	Grab
Sampling & Analysis Protocol:	IS-10500-2012	Sample Quantity:	2.0 Ltr.+200 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 23 <sup>rd</sup> Edition, 4500-H* B	7.74	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen	5	15
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU	1	5
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	135.80	mg/l	200	600
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	44.32	mg/l	75	200
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	118.74	mg/l	200	600
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl B	49.63	mg/l	250	1000
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017) 3500 Cl B	BDL(DL 0.15)	mg/l	0.2	1
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l	0.5	No relaxation
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	6.07	mg/l	30	100
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	294.0	mg/l	500	2000
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	15.74	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 Number:	VEL/RECL/W/06	Report No.:	VEL/W/2204010008
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 01
Sample Description:	Ground Water	Party Reference No.:	NIL
Sampling Location:	Village- Palsada	Reporting Date:	04/04/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	01-04/04/2022
Preservation:	Refrigerated	Receipt Date:	01/04/2022
Sampling & Analysis Protocol:	IS-10500-2012	Sampling Date:	28/03/2022
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+200 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 23 <sup>rd</sup> Edition, 4500-H* B	7.42	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen	5	15
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU	1	5
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	192.06	mg/l	200	600
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	47.43	mg/l	75	200
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	180.21	mg/l	200	600
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl B	52.69	mg/l	250	1000
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017) 3500 Cl B	BDL(DL 0.15)	mg/l	0.2	1
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l	0.5	No relaxation
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	17.86	mg/l	30	100
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	315.0	mg/l	500	2000
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	22.41	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/W/2204010008			
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 23 <sup>rd</sup> Edition,2017, 4500-F-D	0.35	mg/l	1.0	1.5
16.	Nitrate as NO <sub>3</sub>	IS 3025 (P-34) 1988:RA.2019	2.41	mg/l	45	No Relaxation
17.	Iron as Fe	APHA 23 <sup>rd</sup> Ed.,2017, 3500 Fe-B	0.18	mg/l	0.3	No relaxation
18.	Aluminium as Al	APHA 23 <sup>rd</sup> Edition, 3111 D	BDL(DL 0.002)	mg/l	0.03	0.2
19.	Boron	APHA 23 <sup>rd</sup> Edition, 4500 C	BDL(DL 0.01)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 <sup>rd</sup> Edition, 5530 C	BDL(DL 0.0004)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 <sup>rd</sup> Edition,2017, 5540 C	BDL(DL 0.05)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 <sup>rd</sup> Ed. 2017,	BDL(DL 0.01)	mg/l	5	15
24.	Copper as Cu	APHA 23 <sup>rd</sup> Edition2017,3111B	BDL(DL 0.002)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA 23 <sup>rd</sup> Edition, 3111 B	BDL(DL 0.01)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l	0.5	No relaxation
27.	Sulphide	APHA 23 <sup>rd</sup> Edition, 4500 S2 F,2017	BDL(DL 0.02)	mg/l	200	400
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l	0.7	No relaxation
29.	Total. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E. Coli	IS:1622:2009	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	NA
31.	Fecal. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 <sup>rd</sup> Edition)3030D,3114C,2017	BDL(DL 0.002)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 <sup>rd</sup> Edition)3114C,2017	BDL(DL 0.001)	mg/l	0.01	No relaxation

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

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# Vardan EnviroLab

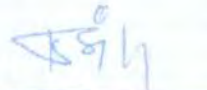
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)  
ISO 9001 | ISO 14001 | ISO 45001

## Test Report

Sample Number:	VEL/REGL/W/07	Report No.:	VEL/W/2204010009
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 01
Sample Description:	Ground Water	Party Reference No.:	NIL
Sampling Location:	Village- Kathli	Reporting Date:	04/04/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	01-04/04/2022
Preservation:	Refrigerated	Receipt Date:	01/04/2022
Sampling & Analysis Protocol:	IS-10500-2012	Sampling Date:	28/03/2022
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+200 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 23 <sup>rd</sup> Edition, 4500-H* B	7.15	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen	5	15
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU	1	5
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	232.80	mg/l	200	600
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	60.65	mg/l	75	200
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	230.41	mg/l	200	600
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl B	54.21	mg/l	250	1000
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017) 3500 Cl B	BDL(DL 0.15)	mg/l	0.2	1
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l	0.5	No relaxation
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	19.73	mg/l	30	100
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	360.0	mg/l	500	2000
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	24.74	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/07			Report No.: VEL/W/2204010009			
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 23 <sup>rd</sup> Edition, 2017, 4500-F-D	0.45	mg/l	1.0	1.5
16.	Nitrate as NO <sub>3</sub>	IS 3025 (P-34) 1988:RA.2019	3.45	mg/l	45	No Relaxation
17.	Iron as Fe	APHA 23 <sup>rd</sup> Ed., 2017, 3500 Fe-B	0.14	mg/l	0.3	No relaxation
18.	Aluminium as Al	APHA 23 <sup>rd</sup> Edition, 3111 D	BDL(DL 0.002)	mg/l	0.03	0.2
19.	Boron	APHA 23 <sup>rd</sup> Edition, 4500 C	BDL(DL 0.01)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 <sup>rd</sup> Edition, 5530 C	BDL(DL 0.0004)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 <sup>rd</sup> Edition, 2017, 5540 C	BDL(DL 0.05)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 <sup>rd</sup> Ed. 2017,	BDL(DL 0.01)	mg/l	5	15
24.	Copper as Cu	APHA 23 <sup>rd</sup> Edition 2017, 3111B	BDL(DL 0.002)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA 23 <sup>rd</sup> Edition, 3111 B	BDL(DL 0.01)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l	0.5	No relaxation
27.	Sulphide	APHA 23 <sup>rd</sup> Edition, 4500 S2 F, 2017	BDL(DL 0.02)	mg/l	200	400
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l	0.7	No relaxation
29.	Total. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E. Coli	IS:1622:2009	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	NA
31.	Fecal. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 <sup>rd</sup> Edition) 3030D, 3114C, 2017	BDL(DL 0.002)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 <sup>rd</sup> Edition) 3114C, 2017	BDL(DL 0.001)	mg/l	0.01	No relaxation

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/W/08	Report No.:	VEL/W/2204010010
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 01
Sample Description:	Ground Water	Party Reference No.:	NIL
Sampling Location:	Village- Chhote Bhandar	Reporting Date:	04/04/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	01-04/04/2022
Preservation:	Refrigerated	Receipt Date:	01/04/2022
Sampling & Analysis Protocol:	IS-10500-2012	Sampling Date:	28/03/2022
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+200 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 23 <sup>rd</sup> Edition, 4500-H* B	7.52	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen	5	15
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU	1	5
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	248.32	mg/l	200	600
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	66.87	mg/l	75	200
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	217.38	mg/l	200	600
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl* B	67.45	mg/l	250	1000
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017)3500 Cl B	BDL(DL 0.15)	mg/l	0.2	1
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l	0.5	No relaxation
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	19.72	mg/l	30	100
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	404.0	mg/l	500	2000
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	29.63	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/08			Report No.: VEL/W/2204010010			
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 23 <sup>rd</sup> Edition,2017, 4500-F D	0.36	mg/l	1.0	1.5
16.	Nitrate as NO <sub>3</sub>	IS 3025 (P-34) 1988:RA.2019	4.12	mg/l	45	No Relaxation
17.	Iron as Fe	APHA 23 <sup>rd</sup> Ed.,2017, 3500 Fe-B	0.16	mg/l	0.3	No relaxation
18.	Aluminium as Al	APHA 23 <sup>rd</sup> Edition, 3111 D	BDL(DL 0.002)	mg/l	0.03	0.2
19.	Boron	APHA 23 <sup>rd</sup> Edition, 4500 C	BDL(DL 0.01)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 <sup>rd</sup> Edition, 5530 C	BDL(DL 0.0004)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 <sup>rd</sup> Edition,2017, 5540 C	BDL(DL 0.05)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 <sup>rd</sup> Ed. 2017,	BDL(DL 0.01)	mg/l	5	15
24.	Copper as Cu	APHA 23 <sup>rd</sup> Edition2017,3111B	BDL(DL 0.002)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA 23 <sup>rd</sup> Edition, 3111 B	BDL(DL 0.01)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l	0.5	No relaxation
27.	Sulphide	APHA 23 <sup>rd</sup> Edition, 4500 S2 F,2017	BDL(DL 0.02)	mg/l	200	400
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l	0.7	No relaxation
29.	Total. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E. Coli	IS:1622:2009	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	NA
31.	Fecal. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 <sup>rd</sup> Edition)3030D,3114C,2017	BDL(DL 0.002)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 <sup>rd</sup> Edition)3114C,2017	BDL(DL 0.001)	mg/l	0.01	No relaxation

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/W/09	Report No.:	VEL/W/2204010011
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 01
Sample Description:	Ground Water	Party Reference No.:	NIL
Sampling Location:	Village- Bade Bhandar	Reporting Date:	04/04/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	01-04/04/2022
Preservation:	Refrigerated	Receipt Date:	01/04/2022
Sampling & Analysis Protocol:	IS-10500-2012	Sampling Date:	28/03/2022
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+200 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 23 <sup>rd</sup> Edition, 4500-H* B	7.60	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen	5	15
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU	1	5
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	291.0	mg/l	200	600
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	72.31	mg/l	75	200
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	175.31	mg/l	200	600
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl B	67.44	mg/l	250	1000
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017)3500 Cl B	BDL(DL 0.15)	mg/l	0.2	1
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l	0.5	No relaxation
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	26.78	mg/l	30	100
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	428.0	mg/l	500	2000
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	25.44	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/09			Report No.: VEL/W/2204010011			
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 23 <sup>rd</sup> Edition,2017, 4500-F-D	0.38	mg/l	1.0	1.5
16.	Nitrate as NO <sub>3</sub>	IS 3025 (P-34) 1988:RA.2019	3.86	mg/l	45	No Relaxation
17.	Iron as Fe	APHA 23 <sup>rd</sup> Ed.,2017, 3500 Fe-B	0.19	mg/l	0.3	No relaxation
18.	Aluminium as Al	APHA 23 <sup>rd</sup> Edition, 3111 D	BDL(DL 0.002)	mg/l	0.03	0.2
19.	Boron	APHA 23 <sup>rd</sup> Edition, 4500 C	BDL(DL 0.01)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 <sup>rd</sup> Edition, 5530 C	BDL(DL 0.0004)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 <sup>rd</sup> Edition,2017, 5540 C	BDL(DL 0.05)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 <sup>rd</sup> Ed. 2017,	BDL(DL 0.01)	mg/l	5	15
24.	Copper as Cu	APHA 23 <sup>rd</sup> Edition2017,3111B	BDL(DL 0.002)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA 23 <sup>rd</sup> Edition, 3111 B	BDL(DL 0.01)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l	0.5	No relaxation
27.	Sulphide	APHA 23 <sup>rd</sup> Edition, 4500 S2 F,2017	BDL(DL 0.02)	mg/l	200	400
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l	0.7	No relaxation
29.	Total. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E. Coli	IS:1622:2009	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	NA
31.	Fecal. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 <sup>rd</sup> Edition)3030D,3114C,2017	BDL(DL 0.002)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 <sup>rd</sup> Edition)3114C,2017	BDL(DL 0.001)	mg/l	0.01	No relaxation

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/W/10	Report No.:	VEL/W/2204010012
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 01
Sample Description:	Ground Water	Party Reference No.:	NIL
Sampling Location:	Piezometer Water	Reporting Date:	04/04/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	01-04/04/2022
Preservation:	Refrigerated	Receipt Date:	01/04/2022
Sampling & Analysis Protocol:	IS-10500-2012	Sampling Date:	28/03/2022
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+200 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 23 <sup>rd</sup> Edition, 4500-H* B	7.35	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen	5	15
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU	1	5
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	182.36	mg/l	200	600
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	60.65	mg/l	75	200
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	160.41	mg/l	200	600
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl B	82.69	mg/l	250	1000
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017) 3500 Cl B	BDL(DL 0.15)	mg/l	0.2	1
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l	0.5	No relaxation
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	7.47	mg/l	30	100
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	368.0	mg/l	500	2000
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	38.11	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/REGL/W/10			Report No.: VEL/W/2204010012			
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 23 <sup>rd</sup> Edition,2017, 4500-F D	0.30	mg/l	1.0	1.5
16.	Nitrate as NO <sub>3</sub>	IS 3025 (P-34) 1988:RA.2019	5.74	mg/l	45	No Relaxation
17.	Iron as Fe	APHA 23 <sup>rd</sup> Ed.,2017, 3500 Fe-B	0.20	mg/l	0.3	No relaxation
18.	Aluminium as Al	APHA 23 <sup>rd</sup> Edition, 3111 D	BDL(DL 0.002)	mg/l	0.03	0.2
19.	Boron	APHA 23 <sup>rd</sup> Edition, 4500 C	BDL(DL 0.01)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 <sup>rd</sup> Edition, 5530 C	BDL(DL 0.0004)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 <sup>rd</sup> Edition,2017, 5540 C	BDL(DL 0.05)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 <sup>rd</sup> Ed. 2017,	BDL(DL 0.01)	mg/l	5	15
24.	Copper as Cu	APHA 23 <sup>rd</sup> Edition2017,3111B	BDL(DL 0.002)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA 23 <sup>rd</sup> Edition, 3111 B	BDL(DL 0.01)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l	0.5	No relaxation
27.	Sulphide	APHA 23 <sup>rd</sup> Edition, 4500 S2 F,2017	BDL(DL 0.02)	mg/l	200	400
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l	0.7	No relaxation
29.	Total. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E. Coli	IS:1622:2009	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	NA
31.	Fecal. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 <sup>rd</sup> Edition)3030D,3114C,2017	BDL(DL 0.002)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 <sup>rd</sup> Edition)3114C,2017	BDL(DL 0.001)	mg/l	0.01	No relaxation

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/W/11	Report No.:	VEL/W/2204010013
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 01
Sample Description:	Ground Water	Party Reference No.:	NIL
Sampling Location:	Mine Water	Reporting Date:	04/04/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	01-04/04/2022
Preservation:	Refrigerated	Receipt Date:	01/04/2022
Sampling & Analysis Protocol:	IS-10500-2012	Sampling Date:	28/03/2022
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+200 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 23 <sup>rd</sup> Edition, 4500-H* B	7.05	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen	5	15
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU	1	5
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	258.02	mg/l	200	600
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	69.98	mg/l	75	200
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	165.85	mg/l	200	600
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl* B	48.11	mg/l	250	1000
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017)3500 Cl B	BDL(DL 0.15)	mg/l	0.2	1
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l	0.5	No relaxation
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	20.19	mg/l	30	100
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	345.0	mg/l	500	2000
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	35.11	mg/l	200	400

  
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## Test Report

Sample No.: VEL/REGL/W/11			Report No.: VEL/W/2204010013			
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 23 <sup>rd</sup> Edition,2017, 4500-F-D	0.35	mg/l	1.0	1.5
16.	Nitrate as NO <sub>3</sub>	IS 3025 (P-34) 1988:RA.2019	3.85	mg/l	45	No Relaxation
17.	Iron as Fe	APHA 23 <sup>rd</sup> Ed.,2017, 3500 Fe-B	0.14	mg/l	0.3	No relaxation
18.	Aluminium as Al	APHA 23 <sup>rd</sup> Edition, 3111 D	BDL(DL 0.002)	mg/l	0.03	0.2
19.	Boron	APHA 23 <sup>rd</sup> Edition, 4500 C	BDL(DL 0.01)	mg/l	0.5	1
20.	Phenolic Compounds	APHA 23 <sup>rd</sup> Edition, 5530 C	BDL(DL 0.0004)	mg/l	0.001	0.002
21.	Anionic Detergents as MBAS	APHA 23 <sup>rd</sup> Edition,2017, 5540 C	BDL(DL 0.05)	mg/l	0.2	1.0
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l	0.05	No relaxation
23.	Zinc as Zn	APHA 23 <sup>rd</sup> Ed. 2017,	BDL(DL 0.01)	mg/l	5	15
24.	Copper as Cu	APHA 23 <sup>rd</sup> Edition2017,3111B	BDL(DL 0.002)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA 23 <sup>rd</sup> Edition, 3111 B	BDL(DL 0.01)	mg/l	0.1	0.3
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l	0.5	No relaxation
27.	Sulphide	APHA 23 <sup>rd</sup> Edition, 4500 S2 F,2017	BDL(DL 0.02)	mg/l	200	400
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l	0.7	No relaxation
29.	Total. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
30.	E. Coli	IS:1622:2009	Absent	Per 100ml	Shall Not Be detectable in 100 ml Sample	NA
31.	Fecal. Coliform	IS:1622:2009	Absent	MPN/ 100ml	Shall Not Be detectable in 100 ml Sample	NA
32.	Arsenic as As	APHA (23 <sup>rd</sup> Edition)3030D,3114C,2017	BDL(DL 0.002)	mg/l	0.01	0.05
33.	Selenium as Se	APHA (23 <sup>rd</sup> Edition)3114C,2017	BDL(DL 0.001)	mg/l	0.01	No relaxation

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

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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 River (Up Stream)

2. Mand River (Down Stream)





# Vardan EnviroLab

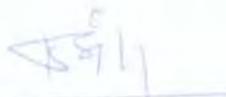
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)  
ISO 9001 | ISO 14001 | ISO 45001

## Test Report

Sample Number:	VEL/REGL/W/02	Report No.:	VEL/W/2204010004
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 01
		Party Reference No.:	NIL
		Reporting Date:	04/04/2022
Sample Description:	Surface Water	Period of Analysis:	01-04/04/2022
Sampling Location:	Mand River (Up Stream)	Receipt Date:	01/04/2022
Sample Collected by	Vardan EnviroLab Representative	Sampling Date:	28/03/2022
Preservation:	Refrigerated	Sampling Type:	Grab
Sampling & Analysis Protocol:	IS-2296, IS-3025, APHA	Sample Quantity:	2.0 Ltr.+200 ml

### TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA 23 <sup>rd</sup> Edition, 4500-H <sup>+</sup> B	7.65	--
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	108.64	mg/l
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	39.66	mg/l
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	80.45	mg/l
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl <sup>-</sup> B	47.63	mg/l
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017) 3500 Cl B	BDL(DL 0.15)	mg/l
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	2.31	mg/l
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	210	mg/l
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	22.45	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/2204010004	
S. No.	Parameter	Test-Method	Result	Unit
15.	Fluoride as F	APHA 23 <sup>rd</sup> Edition, 2017, 4500-F-D	0.34	mg/l
16.	Nitrate as NO <sub>3</sub>	IS 3025 (P-34) 1988:RA.2019	5.12	mg/l
17.	Iron as Fe	APHA 23 <sup>rd</sup> Ed., 2017, 3500 Fe-B	0.28	mg/l
18.	Aluminium as Al	APHA 23 <sup>rd</sup> Edition, 3111 D	BDL(DL 0.002)	mg/l
19.	Boron	APHA 23 <sup>rd</sup> Edition, 4500 C	BDL(DL 0.001)	mg/l
20.	Phenolic Compounds	APHA 23 <sup>rd</sup> Edition, 5530 C	BDL(DL 0.0004)	mg/l
21.	Anionic Detergents as MBAS	APHA 23 <sup>rd</sup> Edition, 2017, 5540 C	BDL(DL 0.05)	mg/l
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l
23.	Zinc as Zn	APHA 23 <sup>rd</sup> Ed. 2017,	BDL(DL 0.01)	mg/l
24.	Copper as Cu	APHA 23 <sup>rd</sup> Edition 2017, 3111B	BDL(DL 0.002)	mg/l
25.	Manganese as Mn	APHA 23 <sup>rd</sup> Edition, 3111 B	BDL(DL 0.01)	mg/l
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l
27.	Sulphide	APHA 23 <sup>rd</sup> Edition, 4500 S2 F, 2017	2.10	mg/l
28.	Barium	APHA 3111B	BDL(DL 0.01)	mg/l
29.	Total. Coliform	IS:1622:2009	48	MPN/ 100ml
30.	E.Coli	IS:1622:2009	Present	Per 100ml
31.	Fecal. Coliform	IS:1622:2009	25	MPN/ 100ml
32.	Arsenic as As	APHA (23 <sup>rd</sup> Edition) 3030D, 3114C, 2017	BDL(DL 0.002)	mg/l
33.	Selenium as Se	APHA (23 <sup>rd</sup> Edition) 3114C, 2017	BDL(DL 0.001)	mg/l

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/W/01	Report No.:	VEL/W/2204010003
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 01
Sample Description:	Surface Water	Party Reference No.:	NIL
Sampling Location:	Mand River (Down Stream)	Reporting Date:	04/04/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	01-04/04/2022
Preservation:	Refrigerated	Receipt Date:	01/04/2022
Sampling & Analysis Protocol:	IS-2296, IS-3025, APHA	Sampling Date:	28/03/2022
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+200 ml

### TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA 23 <sup>rd</sup> Edition, 4500-H <sup>+</sup> B	7.45	--
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	157.14	mg/l
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	47.43	mg/l
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	82.4	mg/l
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl- B	75.3	mg/l
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017)3500 Cl B	BDL(DL 0.15)	mg/l
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	9.37	mg/l
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	274.0	mg/l
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	36.45	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/01			Report No.: VEL/W/2204010003	
S. No.	Parameter	Test-Method	Result	Unit
15.	Fluoride as F	APHA 23 <sup>rd</sup> Edition, 2017, 4500-F-D	0.36	mg/l
16.	Nitrate as NO <sub>3</sub>	IS 3025 (P-34) 1988:RA.2019	4.85	mg/l
17.	Iron as Fe	APHA 23 <sup>rd</sup> Ed., 2017, 3500 Fe-B	0.26	mg/l
18.	Aluminium as Al	APHA 23 <sup>rd</sup> Edition, 3111 D	BDL(DL 0.002)	mg/l
19.	Boron	APHA 23 <sup>rd</sup> Edition, 4500 C	0.33	mg/l
20.	Phenolic Compounds	APHA 23 <sup>rd</sup> Edition, 5530 C	BDL(DL 0.0004)	mg/l
21.	Anionic Detergents as MBAS	APHA 23 <sup>rd</sup> Edition, 2017, 5540 C	BDL(DL 0.05)	mg/l
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l
23.	Zinc as Zn	APHA 23 <sup>rd</sup> Ed. 2017,	BDL(DL 0.01)	mg/l
24.	Copper as Cu	APHA 23 <sup>rd</sup> Edition 2017, 3111B	BDL(DL 0.002)	mg/l
25.	Manganese as Mn	APHA 23 <sup>rd</sup> Edition, 3111 B	BDL(DL 0.01)	mg/l
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l
27.	Sulphide	APHA 23 <sup>rd</sup> Edition, 4500 S2 F, 2017	BDL(DL 0.02)	mg/l
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l
29.	Total. Coliform	IS:1622:2009	75	MPN/ 100ml
30.	E.Coli	IS:1622:2009	Present	Per 100ml
31.	Fecal.Coliform	IS:1622:2009	50	MPN/ 100ml
32.	Arsenic as As	APHA (23 <sup>rd</sup> Edition) 3030D, 3114C, 2017	BDL(DL 0.002)	mg/l
33.	Selenium as Se	APHA (23 <sup>rd</sup> Edition) 3114C, 2017	BDL(DL 0.001)	mg/l

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

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



Location Code: - 1 Mahanadi River Up Stream  
2 Mahanadi 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/2204010006
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 01
Sample Description:	Surface Water	Party Reference No.:	NIL
Sampling Location:	Mahanadi (Up Stream)	Reporting Date:	04/04/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	01-04/04/2022
Preservation:	Refrigerated	Receipt Date:	01/04/2022
Sampling & Analysis Protocol:	IS-2296, IS-3025, APHA	Sampling Date:	28/03/2022
		Sampling Type:	Grab
		Sample Quantity:	2.0 Ltr.+200 ml

### TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA 23 <sup>rd</sup> Edition, 4500-H <sup>+</sup> B	7.28	--
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	118.34	mg/l
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	34.99	mg/l
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	115.24	mg/l
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl <sup>-</sup> B	62.74	mg/l
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017)3500 Cl B	BDL(DL 0.15)	mg/l
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	7.50	mg/l
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	257.0	mg/l
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	13.21	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/2204010006	
S. No.	Parameter	Test-Method	Result	Unit
15.	Fluoride as F	APHA 23 <sup>rd</sup> Edition,2017, 4500-F-D	0.25	mg/l
16.	Nitrate as NO <sub>3</sub>	IS 3025 (P-34) 1988:RA.2019	4.85	mg/l
17.	Iron as Fe	APHA 23 <sup>rd</sup> Ed.,2017, 3500 Fe-B	0.19	mg/l
18.	Aluminium as Al	APHA 23 <sup>rd</sup> Edition, 3111 D	BDL(DL 0.002)	mg/l
19.	Boron	APHA 23 <sup>rd</sup> Edition, 4500 C	BDL(DL 0.001)	mg/l
20.	Phenolic Compounds	APHA 23 <sup>rd</sup> Edition, 5530 C	BDL(DL 0.0004)	mg/l
21.	Anionic Detergents as MBAS	APHA 23 <sup>rd</sup> Edition,2017, 5540 C	BDL(DL 0.05)	mg/l
22.	Cyanide as CN	APHA 4500CN-D	BDL(DL 0.02)	mg/l
23.	Zinc as Zn	APHA 23 <sup>rd</sup> Ed. 2017,	BDL(DL 0.01)	mg/l
24.	Copper as Cu	APHA 23 <sup>rd</sup> Edition2017,3111B	BDL(DL 0.002)	mg/l
25.	Manganese as Mn	APHA 23 <sup>rd</sup> Edition, 3111 B	BDL(DL 0.01)	mg/l
26.	Mineral Oil	IS 3025 (P-39)	BDL(DL 0.05)	mg/l
27.	Sulphide	APHA 23 <sup>rd</sup> Edition, 4500 S2 F,2017	BDL(DL 0.02)	mg/l
28.	Barium	APHA 31111B	BDL(DL 0.01)	mg/l
29.	Total. Coliform	IS:1622:2009	43	MPN/ 100ml
30.	E.Coli	IS:1622:2009	Present	Per 100ml
31.	Fecal. Coliform	IS:1622:2009	26	MPN/ 100ml
32.	Arsenic as As	APHA (23 <sup>rd</sup> Edition)3030D,3114C,2017	BDL(DL 0.002)	mg/l
33.	Selenium as Se	APHA (23 <sup>rd</sup> Edition)3114C,2017	BDL(DL 0.001)	mg/l

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/W/03	Report No.:	VEL/W/2204010005
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 01
		Party Reference No.:	NIL
		Reporting Date:	04/04/2022
Sample Description:	Surface Water	Period of Analysis:	01-04/04/2022
Sampling Location:	Mahanadi (Down Stream)	Receipt Date:	01/04/2022
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	28/03/2022
Preservation:	Refrigerated	Sampling Type:	Grab
Sampling & Analysis Protocol:	IS-2296,IS-3025, APHA	Sample Quantity:	2.0 Ltr.+200 ml

### TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA 23 <sup>rd</sup> Edition, 4500-H* B	7.25	--
2.	Colour	APHA 23 <sup>rd</sup> Edition, 2120 B	BDL(DL 1.0)	Hazen
3.	Turbidity	APHA 23 <sup>rd</sup> Edition, 2130 B	BDL(DL 1.0)	NTU
4.	Odour	APHA 23 <sup>rd</sup> Edition, 2150 B	Agreeable	--
5.	Taste	APHA 23 <sup>rd</sup> Edition, 2160 B	Agreeable	--
6.	Total Hardness as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2340 C	149.38	mg/l
7.	Calcium as Ca	APHA 23 <sup>rd</sup> Edition, 3500 Ca B	45.10	mg/l
8.	Alkalinity as CaCO <sub>3</sub>	APHA 23 <sup>rd</sup> Edition, 2320 B	131.41	mg/l
9.	Chloride as Cl	APHA 23 <sup>rd</sup> Edition, 4500-Cl* B	65.85	mg/l
10.	Residual Free Chlorine	APHA (23 <sup>rd</sup> Edition 2017)3500 Cl B	BDL(DL 0.15)	mg/l
11.	Ammonia (as NH <sub>3</sub> )	IS 3025(P-34):1988, RA 2019	BDL(DL 0.3)	mg/l
12.	Magnesium as Mg	APHA 23 <sup>rd</sup> Edition, 2340 B	8.90	mg/l
13.	Total Dissolved Solids	APHA 23 <sup>rd</sup> Edition, 2540 C	345.0	mg/l
14.	Sulphate as SO <sub>4</sub>	APHA 23 <sup>rd</sup> Edition, 4500 E	33.89	mg/l



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### 4.5 Soil Quality Analysis



**Figure No. 8. Plan Showing Soil Sample Monitoring Location Map**

Location Code: -

- S1- Palsada Village
- S2- Kathli Village
- S3- Chote Bhandar Village
- S4- Bade Bhandar Village
- S5- Nursery (Near Mine Area)





# 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/01	Report No.:	VEL/S0/2204010001
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 01
Sample Description:	SOIL	Party Reference No.:	NIL
Location:	Village- Palsada	Reporting Date:	04/04/2022
Sample Collected By:	Vardan EnviroLab Team	Period of Analysis :	01/04/2022 to 04/04/2022
Parameter Required:	As per work order	Receipt Date:	01/04/2022
Sampling and Analysis Protocol:	IS 2720 & USDA	Sampling Date:	29/03/2022
		Sample Quantity:	2 kg.
		Sampling Type:	Composite
		Packing Status:	Temp. Sealed

### Soil Quality Analysis Results

S. No.	Parameter	Test Method	Result	Units
1.	pH (at 25 °C)	IS:2720(P-26):1987,RA:2016	7.95	--
2.	Conductivity	IS:14767:2000,RA:2016	0.389	(mS/cm)
3.	Soil Texture	IS:2720(P-4)RA:2006	Silty Loam	--
4.	Color	USDA:1954-RA,2010	Yellowish Red	--
5.	Water holding capacity	USDA:1954-RA,2010	40.25	%
6.	Bulk density	USDA:1954(Page-121)RA:2014	1.36	(mg/kg)
7.	Chloride (as Cl)	USDA:1954Method 10A (Page-96)RA:2010	105.25	(mg/kg)
8.	Calcium (as Ca)	Lab SOP No.VEL/STP/01:2018	345.21	(mg/kg)
9.	Sodium (as Na)	USDA:1954Method 10A (Page-96)RA:2010	95.45	(mg/kg)
10.	Potassium (as K)	Lab SOP No.VEL/STP/01:2018	125.05	(Kg/hect.)
11.	Organic Matter	IS:2720(P-22):1972,RA:2015	0.68	%
12.	Magnesium (as Mg)	Lab SOP No.VEL/STP/01:2018	87.52	(mg/kg)
13.	Available Nitrogen(as N)	IS:14684:1999,RA:2015	201.20	(Kg/hect.)
14.	Available Phosphorus	Lab SOP No.VEL/STP/01:2018	38.95	(Kg/hect.)
15.	Zinc (as Zn)	USEPA 3050B:1996	20.11	(mg/kg)
16.	Manganese (as Mn)	USEPA3050	135.08	(mg/kg)
17.	Chromium (as Cr)	USEPA 3050B:1996	1.59	(mg/kg)
18.	Lead (as Pb)	USEPA 3050B:1996	4.25	(mg/kg)
19.	Cadmium (as Cd)	USEPA3050	0.82	(mg/kg)
20.	Copper (as Cu)	USEPA 3050B:1996	20.45	(mg/kg)

  
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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/02	Report No.:	VEL/SO/2204010002
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 01
Sample Description:	SOIL	Party Reference No.:	NIL
Location:	Village- Kathli	Reporting Date:	04/04/2022
Sample Collected By:	Vardan EnviroLab Team	Period of Analysis :	01/04/2022 to 04/04/2022
Parameter Required:	As per work order	Receipt Date:	01/04/2022
Sampling and Analysis Protocol:	IS 2720 & USDA	Sampling Date:	29/03/2022
		Sample Quantity:	2 kg.
		Sampling Type:	Composite
		Packing Status:	Temp. Sealed

### Soil Quality Analysis Results

S.No.	Parameter	Test Method	Result	Units
1.	pH (at 25 °C)	IS:2720(P-26):1987,RA:2016	7.30	--
2.	Conductivity	IS:14767:2000,RA:2016	0.474	(mS/cm)
3.	Soil Texture	IS:2720(P-4)RA:2006	Silty Loam	--
4.	Color	USDA:1954-RA,2010	Yellowish Red	--
5.	Water holding capacity	USDA:1954-RA,2010	38.45	%
6.	Bulk density	USDA:1954(Page-121)RA:2014	1.32	(mg/kg)
7.	Chloride (as Cl)	USDA:1954Method 10A (Page-96)RA:2010	92.41	(mg/kg)
8.	Calcium (as Ca)	Lab SOP No.VEL/STP/01:2018	381.21	(mg/kg)
9.	Sodium (as Na)	USDA:1954Method 10A (Page-96)RA:2010	102.9	(mg/kg)
10.	Potassium (as K)	Lab SOP No.VEL/STP/01:2018	136.78	(Kg/hect.)
11.	Organic Matter	IS:2720(P-22):1972,RA:2015	0.81	%
12.	Magnesium (as Mg)	Lab SOP No.VEL/STP/01:2018	93.45	(mg/kg)
13.	Available Nitrogen(as N)	IS:14684:1999,RA:2015	242.09	(Kg/hect.)
14.	Available Phosphorus	Lab SOP No.VEL/STP/01:2018	52.60	(Kg/hect.)
15.	Zinc (as Zn)	USEPA 3050B:1996	18.45	(mg/kg)
16.	Manganese (as Mn)	USEPA3050	132.08	(mg/kg)
17.	Chromium (as Cr)	USEPA 3050B:1996	1.68	(mg/kg)
18.	Lead (as Pb)	USEPA 3050B:1996	3.96	(mg/kg)
19.	Cadmium (as Cd)	USEPA3050	0.55	(mg/kg)
20.	Copper (as Cu)	USEPA 3050B:1996	10.52	(mg/kg)

  
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## Test Report

Sample Number:	VEL/REGL/03	Report No.:	VEL/SO/2204010003
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 01
		Party Reference No.:	NIL
		Reporting Date:	04/04/2022
		Period of Analysis :	01/04/2022 to 04/04/2022
Sample Description:	SOIL	Receipt Date:	01/04/2022
Location	Village- Chhote Bhandar	Sampling Date:	29/03/2022
Sample Collected By	Vardan EnviroLab Team	Sample Quantity:	2 kg.
Parameter Required	As per work order	Sampling Type:	Composite
Sampling and Analysis Protocol	IS 2720 & USDA	Packing Status:	Temp. Sealed

### Soil Quality Analysis Results

S.No.	Parameter	Test Method	Result	Units
1.	pH (at 25 °C)	IS:2720(P-26):1987,RA:2016	7.78	--
2.	Conductivity	IS:14767:2000,RA:2016	0.362	(mS/cm)
3.	Soil Texture	IS:2720(P-4)RA:2006	Silty Loam	--
4.	Color	USDA:1954-RA,2010	Yellowish Red	--
5.	Water holding capacity	USDA:1954-RA,2010	35.89	%
6.	Bulk density	USDA:1954(Page-121)RA:2014	1.36	(mg/kg)
7.	Chloride (as Cl)	USDA:1954Method 10A (Page-96)RA:2010	86.85	(mg/kg)
8.	Calcium (as Ca)	Lab SOP No.VEL/STP/01:2018	224.85	(mg/kg)
9.	Sodium (as Na)	USDA:1954Method 10A (Page-96)RA:2010	92.41	(mg/kg)
10.	Potassium (as K)	Lab SOP No.VEL/STP/01:2018	90.68	(Kg/hect.)
11.	Organic Matter	IS:2720(P-22):1972,RA:2015	0.84	%
12.	Magnesium (as Mg)	Lab SOP No.VEL/STP/01:2018	62.45	(mg/kg)
13.	Available Nitrogen(as N)	IS:14684:1999,RA:2015	253.11	(Kg/hect.)
14.	Available Phosphorus	Lab SOP No.VEL/STP/01:2018	43.74	(Kg/hect.)
15.	Zinc (as Zn)	USEPA 3050B:1996	20.85	(mg/kg)
16.	Manganese (as Mn)	USEPA3050	130.42	(mg/kg)
17.	Chromium (as Cr)	USEPA 3050B:1996	1.24	(mg/kg)
18.	Lead (as Pb)	USEPA 3050B:1996	10.11	(mg/kg)
19.	Cadmium (as Cd)	USEPA3050	0.99	(mg/kg)
20.	Copper (as Cu)	USEPA 3050B:1996	17.25	(mg/kg)

  
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# Vardan EnviroLab

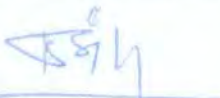
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)  
ISO 9001 | ISO 14001 | ISO 45001

## Test Report

Sample Number:	VEL/REGL/04	Report No.:	VEL/S0/2204010004
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 01
Sample Description:	SOIL	Party Reference No.:	NIL
Location	Village- Bade Bhandar	Reporting Date:	04/04/2022
Sample Collected By	Vardan EnviroLab Team	Period of Analysis :	01/04/2022 to 04/04/2022
Parameter Required	As per work order	Receipt Date:	01/04/2022
Sampling and Analysis Protocol	IS 2720 & USDA	Sampling Date:	29/03/2022
		Sample Quantity:	2 kg.
		Sampling Type:	Composite
		Packing Status:	Temp. Sealed

### Soil Quality Analysis Results

S. No.	Parameter	Test Method	Result	Units
1.	pH (at 25 °C)	IS:2720(P-26):1987,RA:2016	7.28	--
2.	Conductivity	IS:14767:2000,RA:2016	0.425	(mS/cm)
3.	Soil Texture	IS:2720(P-4)RA:2006	Silty Loam	--
4.	Color	USDA:1954-RA,2010	Yellowish Red	--
5.	Water holding capacity	USDA:1954-RA,2010	38.12	%
6.	Bulk density	USDA:1954(Page-121)RA:2014	1.37	(mg/kg)
7.	Chloride (as Cl)	USDA:1954Method 10A (Page-96)RA:2010	92.74	(mg/kg)
8.	Calcium (as Ca)	Lab SOP No.VEL/STP/01:2018	317.25	(mg/kg)
9.	Sodium (as Na)	USDA:1954Method 10A (Page-96)RA:2010	93.74	(mg/kg)
10.	Potassium (as K)	Lab SOP No.VEL/STP/01:2018	98.63	(Kg/hect.)
11.	Organic Matter	IS:2720(P-22):1972,RA:2015	0.78	%
12.	Magnesium (as Mg)	Lab SOP No.VEL/STP/01:2018	52.74	(mg/kg)
13.	Available Nitrogen(as N)	IS:14684:1999,RA:2015	265.33	(Kg/hect.)
14.	Available Phosphorus	Lab SOP No.VEL/STP/01:2018	42.11	(Kg/hect.)
15.	Zinc (as Zn)	USEPA 3050B:1996	26.52	(mg/kg)
16.	Manganese (as Mn)	USEPA3050	134.74	(mg/kg)
17.	Chromium (as Cr)	USEPA 3050B:1996	0.65	(mg/kg)
18.	Lead (as Pb)	USEPA 3050B:1996	3.89	(mg/kg)
19.	Cadmium (as Cd)	USEPA3050	0.90	(mg/kg)
20.	Copper (as Cu)	USEPA 3050B:1996	13.11	(mg/kg)

  
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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/05	Report No.:	VEL/SO/2204010005
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 01
Sample Description:	SOIL	Party Reference No.:	NIL
Location	Nursery (Near Main area)	Reporting Date:	04/04/2022
Sample Collected By	Vardan EnviroLab Team	Period of Analysis :	01/04/2022 to 04/04/2022
Parameter Required	As per work order	Receipt Date:	01/04/2022
Sampling and Analysis Protocol	IS 2720 & USDA	Sampling Date:	29/03/2022
		Sample Quantity:	2 kg.
		Sampling Type:	Composite
		Packing Status:	Temp. Sealed

### Soil Quality Analysis Results

S.No.	Parameter	Test Method	Result	Units
1.	pH (at 25 °C)	IS:2720(P-26):1987,RA:2016	7.56	--
2.	Conductivity	IS:14767:2000,RA:2016	0.386	(mS/cm)
3.	Soil Texture	IS:2720(P-4)RA:2006	Silty Loam	--
4.	Color	USDA:1954-RA,2010	Yellowish Red	--
5.	Water holding capacity	USDA:1954-RA,2010	37.41	%
6.	Bulk density	USDA:1954(Page-121)RA:2014	1.32	(mg/kg)
7.	Chloride (as Cl)	USDA:1954Method 10A (Page-96)RA:2010	108.44	(mg/kg)
8.	Calcium (as Ca)	Lab SOP No.VEL/STP/01:2018	325.33	(mg/kg)
9.	Sodium (as Na)	USDA:1954Method 10A (Page-96)RA:2010	125.74	(mg/kg)
10.	Potassium (as K)	Lab SOP No.VEL/STP/01:2018	96.35	(Kg/hect.)
11.	Organic Matter	IS:2720(P-22):1972,RA:2015	0.82	%
12.	Magnesium (as Mg)	Lab SOP No.VEL/STP/01:2018	35.21	(mg/kg)
13.	Available Nitrogen(as N)	IS:14684:1999,RA:2015	228.63	(Kg/hect.)
14.	Available Phosphorus	Lab SOP No.VEL/STP/01:2018	50.21	(Kg/hect.)
15.	Zinc (as Zn)	USEPA 3050B:1996	22.11	(mg/kg)
16.	Manganese (as Mn)	USEPA3050	125.39	(mg/kg)
17.	Chromium (as Cr)	USEPA 3050B:1996	1.74	(mg/kg)
18.	Lead (as Pb)	USEPA 3050B:1996	4.25	(mg/kg)
19.	Cadmium (as Cd)	USEPA3050	0.88	(mg/kg)
20.	Copper (as Cu)	USEPA 3050B:1996	14.18	(mg/kg)

  
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## **4.6 Waste Water Sample Analysis Report**

### **Locations**

1. STP Outlet
2. ETP Outlet
3. Ash Pond Effluent
4. ETP Inlet




# 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/04	Report No.:	VEL/WW/2204010005
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-01
Sample Description:	Waste Water	Party Reference No.:	NIL
Sampling Location :	STP Outlet	Reporting Date:	04/04/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	01-04/04/2022
		Receipt Date:	01/04/2022
		Sampling Quantity:	3.0 Ltr.
		Sampling Date:	28/12/2021
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limit
1.	pH (at 25 °C)	IS 3025 (P-11):1983 : RA. 2017	7.56	--	5.5-9.0
2.	Oil & Grease	IS 3025(Part 39): 1991 RA 2019	1.5	mg/l	10.0
3.	Total suspended solid (TSS)	IS 3025(Part 17): 1984 RA 2017	19.8	mg/l	100.0
4.	Chemical Oxygen Demand (as COD)	IS:3025(Part 58):2006 RA:2017	121.6	mg/l	250.0
5.	Biochemical Oxygen Demand (as BOD)	IS:3025(Part 44):1993 RA:2019	23.5	mg/l	30.0

  
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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/03	Report No.:	VEL/WW/2204010004
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-01
Sample Description:	Waste Water	Party Reference No.:	NIL
Sampling Location :	ETP Outlet	Reporting Date:	04/04/2022
Sample Collected by:	Vardan EnviroLab Representative	Period of Analysis:	01-04/04/2022
		Receipt Date:	01/04/2022
		Sampling Quantity:	3.0 Ltr.
		Sampling Date	28/12/2021
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limit
1.	pH (at 25 °C)	IS 3025 (P-11):1983 : RA. 2017	7.25	--	5.5-9.0
2.	Oil & Grease	IS 3025(Part 39): 1991 RA 2019	0.5	mg/l	10.0
3.	Total suspended solid (TSS)	IS 3025(Part 17): 1984 RA 2017	24.5	mg/l	100.0
4.	Chemical Oxygen Demand (as COD)	IS:3025(Part 58):2006 RA:2017	71.0	mg/l	250.0
5.	Biochemical Oxygen Demand (as BOD)	IS:3025(Part 44):1993 RA:2019	15.5	mg/l	30.0

  
(Checked By)

  
(Authorized Signatory)



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# Vardan EnviroLab

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

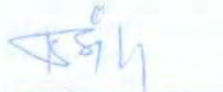
## Test Report

Sample Number: VEL/REGL/WW/01  
Name & Address of Party: M/s Raigarh Energy Generation Ltd.  
Village - Chhote Bhandar, Post Office Bade  
Bandar, Tehsil Pussore, Dist- Raigarh  
496100 (Chhattisgarh)  
Sample Description: Waste Water  
Sampling Location: Ash Pond Effluent  
Sample Collected by: Vardan EnviroLab Representative

Report No.: VEL/WW/2204010002  
Format No.: 7.8 F-01  
Party Reference No.: NIL  
Reporting Date: 04/04/2022  
Period of Analysis: 01-04/04/2022  
Receipt Date: 01/04/2022  
Sampling Quantity: 3.0 Ltr.  
Sampling Date: 29/03/2022  
Parameter Required: As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits
1.	pH (at 25 °C)	IS 3025 (P-11):1983 RA: 2017	7.74	--	5.5-9.0
2.	Oil & Grease	IS 3025(P- 39):1991 RA: 2019	1.3	mg/l	10.0
3.	Total suspended solid (TSS)	IS 3025(Part 17): 1984 RA 2017	28.4	mg/l	100.0
4.	Lead as Pb	APHA (23 <sup>rd</sup> edition), 3030D, 3113 B: 2017	0.08	mg/l	0.1
5.	Mercury as Hg	APHA (23 <sup>rd</sup> edition), 3114C: 2017	0.007	mg/l	0.01
6.	Total Chromium as Cr	APHA (23 <sup>rd</sup> edition- 2017), Method No. 3113 B: 2017	0.20	mg/l	2.0
7.	Arsenic as As	APHA (23 <sup>rd</sup> edition- 2017), 3114 C: 2017	*BDL(**DL 0.005)	mg/l	0.2

Note :-BDL= Below Detection limit.\*\*DL= Detection Limit

  
(Checked By)

  
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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  
Name & Address of Party: M/s Raigarh Energy Generation Ltd.  
Village - Chhote Bhandar, Post Office Bade  
Bandar, Tehsil Pussore, Dist- Raigarh  
496100 (Chhattisgarh)  
Sample Description: Waste Water  
Sampling Location: ETP Inlet  
Sample Collected by: Vardan EnviroLab Representative

Report No.: VEL/WW/2204010003  
Format No.: 7.8 F-01  
Party Reference No.: NIL  
Reporting Date: 04/04/2022  
Period of Analysis: 01-04/04/2022  
Receipt Date: 01/04/2022  
Sampling Quantity: 3.0 Ltr.  
Sampling Date: 28/12/2021  
Parameter Required: As per Work Order

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 3025 (P-11):1983 : RA. 2017	7.94	--
2.	Oil & Grease	IS 3025(Part 39): 1991 RA 2019	2.6	mg/l
3.	Total suspended solid (TSS)	IS 3025(Part 17): 1984 RA 2017	48.7	mg/l
4.	Chemical Oxygen Demand (as COD)	IS:3025(Part 58):2006 RA:2017	243.3	mg/l
5.	Biochemical Oxygen Demand (as BOD)	IS:3025(Part 44):1993 RA:2019	54.5	mg/l

  
(Checked By)

  
(Authorized Signatory)



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#### **4.7 Stack Emission Analysis Report**

##### **Locations**

1. TPP
2. D.G Set -1 (1500 KVA)
3. D.G Set -2 (1500 KVA)





# 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/S/01 Report No.: VEL/S/2202220001  
Name & Address of Party: M/s Raigarh Energy Generation Ltd. Format No.: 5.10 F-01  
Village- Chhote Bhandar, Post Office Party Reference No.: NIL  
Bade Bandar, Tehsil Pussore, Dist- Report Date: 27/02/2022  
Raigarh 496100 (Chhattisgarh) Period of Analysis: 22-27/02/2022  
Receipt Date: 22/02/2022

Sample Description : STACK EMISSION MONITORING

Sample Collected : VEL Team  
Date & Time of Sampling : 19/02/2022  
Location : TPP  
Sampling duration (Minutes) : 39.0 & (11:00 to 11:39 Hrs.)  
Meteorological Condition : Clear Sky  
Stack Attached : TPP  
Stack Diameter : 7.5 m  
Stack Height : 275 m  
Instrument calibration status : Calibrated  
Ambient Temperature - Ta (°C) : 28.0  
Temperature of Stack Gases - Ts (°C) : 125  
Velocity of Stack Gases (m/sec.) : 18.21  
Flow rate of PM (LPM) : 26.0  
Flow rate of Gas (LPM) : 2.0 (812.9 m3/sec)  
Sampling condition : Isokinetic  
Protocol used : IS-11255 & EPA

### RESULTS

S. No.	Parameter	Protocol	Results	Units	Limits
1.	Particulate Matter (as PM)	IS 11255 (P-1) :1985,RA,2014	42.45	mg/Nm3	50.0
2.	Sulphur Dioxide (as SO2)	IS: 11255 (p-2)1985, RA. 2014	618.79	mg/Nm3	200.0
3.	Oxide of Nitrogen (as NO2)	IS 11255 (P-7)RA,2017	256.09	mg/Nm3	450.0
4.	Mercury (as Hg)	APHA 3rd ed,2017, 303A (Page No. 365)	BDL(DL0.001)	mg/Nm3	0.03

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/S/02 Report No.: VEL/S/22040100041  
Name & Address of Party: M/s Raigarh Energy Generation Ltd. Format No.: 5.10 F-01  
Village- Chhote Bhandar, Post Office Party Reference No.: NIL  
Bade Bandar, Tehsil Pussore, Dist- Reporting Date: 04/04/2022  
Raigarh 496100 (Chhattisgarh) Period of Analysis: 01/04/2022 to 04/04/2022  
Sample Description : STACK EMISSION MONITORING Receipt Date: 01/04/2022

Sample Collected : VEL Team  
Date & Time of Sampling : 29/03/2022  
Location : D.G Set -1 (1500 KVA)  
Sampling duration (Minutes) : 46.0 (14:00 to 14:46 Hrs.)  
Meteorological Condition : Clear Sky  
Stack Attached : D.G Set  
Stack Diameter : 0.7 m  
Stack Height : 30 m  
Instrument calibration status : Calibrated  
Ambient Temperature - Ta (°C) : 28  
Temperature of Stack Gases - Ts (°C) : 86  
Velocity of Stack Gases (m/sec.) : 6.12  
Flow rate of PM (LPM) : 22  
Flow rate of Gas (LPM) : 2.0  
Sampling condition : Isokinetic  
Protocol used : IS-11255 & EPA

### RESULTS

S. No.	Parameter	Protocol	Results	Units	Limits
1.	Particulate Matter (as PM)	IS 11255 (P-1):1985,RA,2014	31.11	mg/Nm <sup>3</sup>	75.0
2.	Sulphur Dioxide (as SO <sub>2</sub> )	IS: 11255 (p-2)1985, RA, 2014	33.07	mg/Nm <sup>3</sup>	--
3.	Oxide of Nitrogen (as NO <sub>2</sub> )	IS 11255 (P-7)RA,2017	48.74	mg/Nm <sup>3</sup>	710.0
4.	Non Methane Hydrocarbon (NMHC)	IS:5182 (P-21) Based On GC, RA :2012	10.22	mg/Nm <sup>3</sup>	100.0

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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/S/03 Report No.: VEL /S/22040100042  
Name & Address of Party: M/s Raigarh Energy Generation Ltd. Format No.: 5.10 F-01  
Village- Chhote Bhandar, Post Office Party Reference No.: NIL  
Bade Bandar, Tehsil Pussore, Dist- Reporting Date: 04/04/2022  
Raigarh 496100 (Chhattisgarh) Period of Analysis: 01/04/2022 to 04/04/2022  
Sample Description : STACK EMISSION MONITORING Receipt Date: 01/04/2022

Sample Collected : VEL Team  
Date & Time of Sampling : 29/03/2022  
Location : D.G Set -2 (1500 KVA)  
Sampling duration (Minutes) : 41 (15:00 to 15:41 Hrs.)  
Meteorological Condition : Clear Sky  
Stack Attached : D.G Set  
Stack Diameter : 0.7 m  
Stack Height : 30 m  
Instrument calibration status : Calibrated  
Ambient Temperature - Ta (°C) : 28  
Temperature of Stack Gases - Ts (°C) : 82  
Velocity of Stack Gases (m/sec.) : 6.74  
Flow rate of PM (LPM) : 24  
Flow rate of Gas (LPM) : 2.0  
Sampling condition : Isokinetic  
Protocol used : IS-11255 &EPA

### RESULTS

S. No.	Parameter	Protocol	Results	Units	Limits
1.	Particulate Matter (as PM)	IS 11255 (P-1):1985,RA,2014	32.77	mg/Nm <sup>3</sup>	75.0
2.	Sulphur Dioxide (as SO <sub>2</sub> )	IS: 11255 (p-2)1985, RA. 2014	34.05	mg/Nm <sup>3</sup>	--
3.	Oxide of Nitrogen (as NO <sub>2</sub> )	IS 11255 (P-7)RA,2017	47.38	mg/Nm <sup>3</sup>	710.0
4.	Non Methane Hydrocarbon (NMHC)	IS:5182 (P-21) Based On GC ,RA :2012	11.58	mg/Nm <sup>3</sup>	100.0

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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.

<b>Sr. No.</b>	<b>Environmental Parameters</b>	<b>Conclusion</b>
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 <sub>2</sub> , NO <sub>2</sub> , PM <sub>10</sub> , PM <sub>2.5</sub> , 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.





## ANNUAL REPORT 2021- 22

Corporate Social Responsibility

## Annual Report Adani Foundation, REGL - Raigarh

Year- 2021-22

### Introduction: -

Raigarh Energy Generation Limited erstwhile Korba West Power company Ltd. is in Pussore tehsil of Raigarh district, Chhattisgarh State. The tehsil headquarter is situated 15 km from the power plant, comprised of 86 Panchayats covering 148 villages. The project villages are Bade Bhandar, Chhote Bhandar, Amalibhouna and Sarwani, Kalma is Raw Water Pump house village in Dabhra block of Janjgir-Champa district, land acquisition for railway project is under progress. It is a 1 X 600 MW coal based thermal power plant commissioned in the year 2014. CSR projects implemented through Adani Foundation. CSR projects are operational in 15 villages including Raw water pump house village. All CSR initiatives are aligned with Sustainable Development Goals (SDGs)

### Program Thrust Area: -

1. Community Health
2. Education Support Program
3. Sustainable Livelihood Development
4. Community Infrastructure Development
5. Promotion of Rural Sport
6. Response to Emergencies and relief

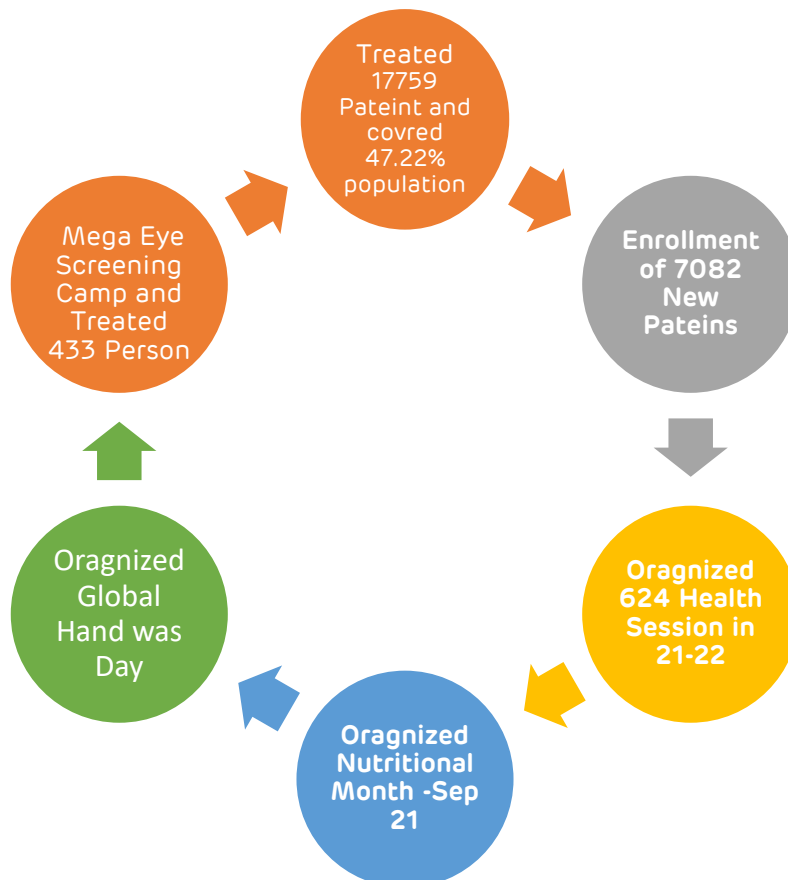




### Village wise population – REGL

Sr. No.	Panchayat Name	Village Name	Total House Hold	ST	SC	Others	Total
1	Bade Bhandar	Bade Bhandar	316	116	329	753	1198
2	Chhote Bhandar	Chhote Bhandar	166	58	28	479	565
3	Chhote Bhandar	Amlibhouna	149	0	532	45	577
4	Chhote Bhandar	Jevridih	107	197	42	186	425
5	Barpali	Sarwani	133	25	384	51	460
6	Barpali	Barpali	210	422	112	268	802
7	Taparda	Taparda	301	440	90	479	1009
8	Taparda	Kathli	152	61	24	524	609
9	Taparda	Tupkadhar	51	13	10	180	203
10	Bunga	Bunga	695	245	453	1962	2660
11	Ranbhata	Ranbhatha	298	206	373	642	1221
12	Supa	Supa	465	668	278	839	1785
13	Kotmara	Kotmara	340	41	411	681	1133
14	Kalma	Kalma	297	66	601	513	1180
15	Chandli	Chandli	312	103	70	998	1171
		<b>Grand Total</b>	<b>3992</b>	<b>2661</b>	<b>3737</b>	<b>8600</b>	<b>14998</b>

### Community Health



## Community Health

### Mobile Health Care Unit

Good health is central to human happiness and well-being that contributes significantly to prosperity and wealth and even economic progress, as healthy populations are more productive, save more and live longer. Swasthya Sewa Tuhar Dwar Project- free medical check up and treatment at the door steps of the villagers is operational through Mobile Health Care Unit (MHCU)/ Mobile Medical Van daily as per the fixed roaster in the vicinity villages of the plant located at Pussore Block- Bade Bhandar, Chhote, Bhandar, Sarwani, Jevrideeh, Amlibhouna, Barpali, Kotmra, Supa, Taprda, Tupakdhar, Kathli, Bunga, Ranbhata, and Kalma & Chandli villages from Dabhra block of Janjgir Champa district. During the year from April 21 to March 2022 health check up and treatment were given to **17759** persons (8812- male and female 8947). Major disease treated were :-

1. Generalized weakness – (14.08%),
2. Cold, Fever & Cough – (12.08%),
3. Back pain- (8.71%),
4. Gastro Problem (8.66%),
5. Hypertension – (8.00%)
6. Skin Disorder- (6.61%)
7. Diabetes mellitus- (6.10%)

During the health check up medicines has been distributed free to the patients. Total **7082** new patients were registered during this year. The MHCU team consists of 01 MBBS Doctor, 01 Pharmacist and 01 Social Protection Officer.

Village wise health camp details (F.Y. 21-22)				
Sr. No.	Name of Villages	Male	Female	Total
1	Bade Bhandar	675	550	1225
2	Chhote Bhandar	838	922	1760
3	Amlibhouna	392	424	816
4	Jevridih	256	459	715
5	Sarwani	709	866	1575
6	Barpali	838	578	1416
7	Kathli	714	548	1262
8	Tupakdhar	354	323	677
9	Bunga	1004	1096	2100
10	Ranbhatha	737	752	1489
11	Taparda	749	901	1650
12	Supa	445	405	850
13	Kotmara	478	378	856
14	Kalma	351	380	731
15	Chandli	272	365	637
	<b>Total</b>	<b>8812</b>	<b>8947</b>	<b>17759</b>





## Community Health

### Covered Population By MHCU During FY 2021-22

Sr. No.	Name of Villages	Village Population	Total New Enrolled During 21-22	Total Covered Population in %
1	Bade Bhandar	1198	572	47.75%
2	Chhote Bhandar	565	353	62.48%
3	Amlibhouna	577	347	60.14%
4	Jevridih	425	312	73.41%
5	Sarwani	460	343	74.57%
6	Barpali	802	595	74.19%
7	Kathli	609	429	70.44%
8	Tupkadhar	203	203	100.00%
9	Bunga	2660	908	34.14%
10	Ranbhatha	1221	594	48.65%
11	Taparda	1009	703	69.67%
12	Supa	1785	496	27.79%
13	Kotmara	1133	458	40.42%
14	Kalma	1180	412	34.92%
15	Chandli	1171	357	30.49%
	<b>Total Population</b>	<b>14998</b>	<b>7082</b>	<b>47.22%</b>



Treated 17759 Patient and covered 47.22% population of 15 villages



40 Home visit for patient unable to reach



Oragnized 46 Health Awareness Session Covid -19, Fungal Infection & water Born Disease



Oragnized Nutritional Month - Sep 21 covered all AWC in 15 villages



Oragnized Global Hand Wash Day - 15th Oct. 21 in 06 Govt. School



Oragnized Eye Care Camp and treated 433 people



## Community Health

### Poshan Abhiyan

Organized Nutritional Week (Poshan Saptah) in our 15 peripheral villages from 1st to 7th September 2021 in coordination with ICDS and Health Department. Reached to more than 800 women and children in 15 villages through Aganwadi workers, Mitanin, ANM and SHGs. launched Nutritional Chariot (Suposhan Rath) to create awareness relating to malnutrition & reduce the incidence of anaemia among child, pregnant women & lactating Mothers and were organized various activities like Anna Prashan, God Bharai (Baby Shower), Rangoli, display of nutrition diet in Anganwadi Centre of 15 villages to improve nutritional outcomes for children, pregnant women & Lactating mothers.



### Covid Care

During the covid transit period support extended to 06 quarantine center at Raigarh for Safe Drinking Water facility. Similarly support to district administration to district administration for providing lifesaving facilities at Govt. COVID treatment centers, Organized awareness sessions on coronavirus vaccination to increase confidence in COVID-19 vaccines among communities and address issues of hesitancy and approx. 10000 mask distributed to the service providers, communities and plant workers.

### रायगढ़ एनर्जी जनरेशन लिमिटेड की कोविड की रोकथाम के लिए अनेक पहल

रायगढ़। जलपान के लिए सुरक्षित पानी की आवश्यकता को लेकर रायगढ़ में अनेक पहलें चलाई जा रही हैं। एनर्जी जनरेशन लिमिटेड की कोविड रोकथाम के लिए अनेक पहलें चलाई जा रही हैं। एनर्जी जनरेशन लिमिटेड की कोविड रोकथाम के लिए अनेक पहलें चलाई जा रही हैं। एनर्जी जनरेशन लिमिटेड की कोविड रोकथाम के लिए अनेक पहलें चलाई जा रही हैं।



## Community Health- Eye Care Camp

Organized Mega Eye Screening Camp at Govt. Hr. Sec. School campus, village Bade Bhandar on 27.02.2022 in assistance with Siddheshwar Hospital, Raigarh. Dr. Shiv Kumar Nayak (Eye Specialist) and his team examined were **433 patients** (Male- 257 & Female -176). At eye examination camp free medicines and reading glasses (306 nos.) distributed to the patients and **68 Cataract patients** identified during the camp to whom referred for further treatment. Similarly, N-95 Mask distributed to patients, volunteers, and medical support staff for prevention against Covid -19. Camp was successfully organized in guidance of Govt. Health Department, Bade Bhandar and Pussoure.

Village Wise Patient Details (Eye Screening Camp)				
Sr. No.	Village Name	Male	Female	Total
1	Bade Bhandar	48	42	90
2	Chhote Bhandar	10	8	18
3	Amlibhauna	6	4	10
4	Jevridih	2	3	5
5	Sarwani	1	3	4
6	Barpali	10	4	14
7	Kathli	7	12	19
8	Tupakdhar	3	1	4
9	Bunga	40	21	61
10	Ranbhatha	15	20	35
11	Taparda	15	7	22
12	Supa	18	18	36
13	Kotmara	11	2	13
14	Kalma	3	2	5
15	Chandli	1	1	2
16	Other Villages	67	28	95
	<b>Grand Total</b>	<b>257</b>	<b>176</b>	<b>433</b>



## Education Support Program

### Observed Global Hand Day 2021 -

Worldwide, diarrhea and pneumonia are leading causes of death for children under the age of five. Handwashing with soap is among the most effective and inexpensive ways to prevent these diseases. In this sequence organized "Global Hand Washing Day (GHD) 15 October" in 06 Govt. School. On this day, essay and slogan writing competition was organized in Govt. Hr. Sec. and Govt. Middle School of Bade Bhandar. Simultaneously, painting competitions were also organized in Govt. Pri. schools of Chhote Bhandar, Amlibhauna, Jevridih and Sarwani. Along with this, the students studying in all these schools were given the message of cleanliness by washing their hands with soap and clean water and Wall painting work has also been done at selected places of the village to bring awareness about hand wash and cleanliness.

Sr. No.	Village	School Name	Participated Student's	Event Details
1	Bade Bhandar	Govt. Hr. Sec. School	45	Essay and Slogan Writing
2	Bade Bhandar	Govt. Middle School	44	Essay and Slogan Writing
3	Chhote Bhandar	Govt. Primary School	20	Drawing competition
4	Jevridih	Govt. Primary School	33	Drawing competition
5	Amlibhauna	Govt. Primary School	45	Drawing competition
6	Sarwani	Govt. Primary School	62	Drawing competition
<b>Total</b>			<b>249</b>	





## Education Support Program

### Drinking Water Facility at School

Installed one 80 Liter RO water filter to provide safe and clean drinking water facility in Government Higher Secondary School- Bade Bhandar and More than 600 students and school staffs are accessing clean and safe drinking water.



### Online Coaching Classes

Total 16 students were enrolled for Online Coaching Classes in collaboration with Toppr, which has customized content for board curriculum, competitive, entrance and scholarship examinations like- JEE, NEET, NTSE, NSO, IMO, KVPY and so on for the school students. All 16 enrolled students appeared in the Base Line Test conducted by Topper during the December 21.



## Industry Partner for ITI Sariya

Organized power plant exposure to 40 students and teachers of electrical and fitter trade from Government Industrial Training Institute (ITI) Sariya, Baramkela, Raigarh and held 02 nos. meetings of Institute Management Committee (IMC) during the year where various decisions taken for improvement of ITI, welder trade approved as a new course. Awareness session organized with students and teachers on workplace management -5S.



## Sustainable Livelihood Development

### Training workshop on Book and Record Keeping of 155 Women SHG

Organized three days training workshop for 155 SHG from 11 villages during the year 2021-22. Total 358 SHG members were trained in various book and record keeping SHG level like- Minutes Book/ Proceeding Book, Attendance Register, Saving Ledger, Loan Ledger, Cash Book, Individual Passbook and Ledger books. The training workshop was successfully organized under the joint guidance of Chhattisgarh State Rural Livelihood Promotion Committee (BIHAN) and PRADAN.

Training Workshop on Book/Record Keeping, F.Y. -2021-22			
Sr. No.	Village Name	Participated SHG	Trained Member
1	Bunga	31	74
2	Ranbhatta	13	28
3	Taparda	20	47
4	Bade Bhandar	10	27
5	Barpali	2	4
6	Chhote Bhandar	12	32
7	Amlibhauna & Tupakdhar	12	23
8	Jevridih	6	17
9	Kathli	3	4
10	Supa	19	58
11	Chandli & nearby villages	27	44
<b>Total</b>		<b>155</b>	<b>358</b>





## Sustainable Livelihood Development

### Mushroom Farming

Organized training workshop in 02 batches (04 Days) for **65 women** of **23 SHGs** from Bade Bhandar, Chhote Bhandar, Jevridih, Ranbhata and Bunga villages during the year 21-22. The SHG members were trained in whole process and methodology of Oyster Mushroom farming. In presence of Mr. Nilesh Upadhyay (CEO-Pussoure Block), distributed mushroom



**Material distributed to SHG for Mushroom Farming by CEO -Pussoure**

spawn and other raw materials to the members of 13 SHG from 05 villages during the Gothan Mela in Supa village. On this occasions Mrs. Chhaya Iswar (BPM-Bihan), Mr. Praveen Gupta (ADO-Bihan), Mr. Rishikesh Patel (ADO), Mr. Lekhrum Patel (Nodal officer Gothan –Supa), Mr. Phirtu Ram Ratre (Sarpanch Representative –Supa), Mrs. Satrupa Chauhan (Sarpanch-Chhote Bhandar) and villagers present were. Raw material support provided by AF-REGL. **13 SHG** have started production of **oyster mushroom** at their identified places during the month of February and March 2022.



Training on Mushroom Farming -2021-22			
Sr. No.	Village Name	Participated SHG	Trained Member
1	Bade Bhandar	1	4
2	Ranbhata	3	5
3	Bunga	5	12
4	Chhote Bhandar	7	18
5	Jevridih	7	26
	<b>Total</b>	<b>23</b>	<b>65</b>

## Sustainable Livelihood Development Vegetable Cultivation

Organized three-day training workshop of total **23 women SHG** from 04 villages. Total **77 SHG members** were trained in Vegetable Cultivation cum organic farming. Training was provided by Mrs. Anusuiya Sao (BTO- Agriculture Department- Pussoure). During the training session detail information given about the type of modern methodology for vegetable cultivation, utilization of organic fertilizers in vegetable cultivation and health benefits from organic farming. Also explained about the process and requirement of making organic manure at home. Mrs. Chhaya Ishwar (BPM, Bihan-Pussoure Block), distributed hybrid vegetable seed packet to the members of 05 SHG from Kathli, Bunga, Sarwani and Jevridih villages. On this occasions Mrs. Satrupa Chauhan (Sarpanch Chhote Bhandar), Mr. Sanat Sidar (Area Coordinator-Bihan), Mr. Bhuvneshwar Sidar, Mr. S. Kumar Sarthi and SHG members present were. At present 05 SHG are planning for vegetable farming in 3 acre of land.

Training on Vegetable Cultivation - F.Y. -2021-22			
Sr. No.	Village Name	Participated SHG	Trained Member
1	Kathli	4	20
2	Jevridih	2	6
3	Supa	16	48
4	Bunga	1	3
<b>Total</b>		<b>23</b>	<b>77</b>



Support to SHG's for Vegetable Cultivation



## Sustainable Livelihood Development Exposure visits for Team Capacity Building

A three-day (10 to 12 March 2022) exposure visit was organized to the members of women SHG- REGL at Surguja AF Site. Total 16 (8 women from SHGs, 4 from ASDC Bhandar and 4 REGL CSR team members visited to RRVUNL-Parsa Kente Basan, Surguja, Chhattisgarh. During the visit got opportunities to understand and learn implementation process with well-planned marketing strategy in various developed



livelihood projects in Parsa and Salhi village by Mahila Udyami Bahuudysiy Sahkari Samiti (MUBSS) like Sanitary Pad Production Unit, Project Jevan Amrit, Swasthya Suwidha Kendra, Production of wheat grass, Mid-day meal team at AVMS, Potato Chips making & spice production unit, Rainwater harvest tank & Kanya Upwan project, Model Organic & Green Fodder Farm, Gokul Dham dairy project and vermicompost making unit, organic manure production center (POFCAL) & also visited in ASDC center & Adani Vidya Mandir.

AF- REGL team visited on 23<sup>rd</sup> December at Tamnar (GP - II) AF Site, interacted with CSR team members and know about implementation process and challenges of CSR works at ground level, documentation process, budget and bill related discussion. participated in Green Talk Session, visited free online coaching classes for preparation of Medical and Engineering entrance exams. Met to Gauri Women SHG and learn about collective farming methodology by women SHG.



## Skill Development -SAKSHAM Tailoring Training Course (SET)

Total 110 women / girls are under tailoring training to skilled in cutting and stitching of cloths under SET trade under SAKSHAM Project of Adani Skill Development Center (ASDC). Organized various co-curricular activities at center to enhance communication skills, presentation skills, self-esteem, and confidence of the candidates his training period. 31 women and girls started working as tailor at their home and are earning average an amount Rs 2000 to 5000 per month depending upon seasons





## Livestock Development Program Livestock Health and Infertility Camp

Livestock plays an important role in rural economy. people depend upon livestock for their livelihood. Livestock helps on food supply, family nutrition, family income, asset savings, soil productivity, livelihoods, transport, agricultural traction, agricultural diversification and sustainable agricultural production, family, and community employment. The lack of awareness about livestock health care and support to health services AF REGL has conducted total 14 nos. livestock health and infertility Prevention Camps were organized in 09 vicinity villages. During the camp, nine hundred seventy-two (972) animals were treated for different medical, surgical, and infertility ailments like FMD, Diarrhea, Deworming, infertility repeat breeding, Internal Worm, weakness, lice worm infection, Coughing, fever etc. Total two hundred three (284) livestock owners were directly benefited from the camp during the year 2021-22 with following were the objective: -



- To provide veterinary services at the farmers' doorstep through Livestock health camp.
- To enhance productivity of livestock.
- To provide service on infertility and pregnancy cases.
- To create awareness in vicinity villages.
- Vaccination and deworming of livestock in local area.



## Livestock Development Program

### Training on Livestock Health Management

Total 03 nos. training program organized on livestock health management at Chhote Bhandar (29 Farmers) , Taparda (28 Farmers) & Amlibhouna (17 Farmers) village. Trained 74 dairy farmers on improved feeding and cattle health care practices. During the program Dr. C.S Patel (Asst. Surgeon – Veterinary Hospital, Pussoure) discussed about scientific livestock keeping technologies, role



of nutrients for enhanced production and improving reproduction status of livestock, Common animal health problems, importance of vaccination and artificial insemination of livestock.





## Livestock Development Program

### Home Visit for Preventive Health Care Facility of Livestock

Total 09 nos. home visit conducted in village Bade Bhandar, Chhote Bhandar, Jevridih and Taparda villages. Treated were **79 nos. livestock** and benefitted **23 nos. livestock farmers**. During the visit veterinary doctor has provided treatment of infertility, FMD, pregnancy cases and diarrhea cases.



Sr. No.	Village Name	Benefitted Livestock Owner	Benefitted Livestock	Description of the disease treated
1	Bade Bhandar	8	23	Diarrhea & infertility cases,
2	Chhote Bhandar	7	24	Pregnancy, infertility, FMD
3	Jevridih	6	25	Pregnancy, infertility
4	Taparda	2	7	Pregnancy, infertility
	<b>Total</b>	<b>23</b>	<b>79</b>	

## Community Infrastructure Development

### Construction of Community Building – Bade Bhandar

Construction of community center work is inaugurated on 15<sup>th</sup> February 2022 and work is being done by M/s Krishna Construction and plaster work of outer and inner wall has done by the vender and as per order term and condition total 15% work is completed on till date and the remaining 85% of the work will be completed by the vendor on dated 31st May 2022. One hall & two rooms are being constructed in this building, which will be used for community functions, meeting, training program in the village.



## Observation of special days



### Rajya Utasav - Raigarh 2021

- Participated in Chhattisgarh Rajyotsava (Chhattisgarh Foundation Day - 01 November 2021) by the District Administration.



### Adani Foundation Day

- Organized Rangoli & motivational singing competition for trainee of SET trade
- Plantation drive by Women SHG
- MHUC marked this day in villages.



### International Womens Day

- Honors to Sarpanch of Chhote Bhandar, Chandli and 65 SHG members from 03 village.
- Women constitute major participants to our CSR programs

## Promotion of Rural Sports



Support has been provided to 20 girls and boys representing Chhattisgarh State for the National Softball Championship held at Anantpur (Andra Pradesh)



Support extended to 20 youths in india Rope Skipping Fedration Cup 2021-22 at Utrkhand on dated 20 to 22nd December 2021.



Support has been provided to state level Kabaddi Tournament held at Chadrapur from 24 to 26th February 2022.



Community connect by participating in local religious function at Bade Bhandar village



## International Women's Day

Celebrated international women's day on **8 March 2022** at community center in Chhote Bhandar village. The theme for International Women's Day 2022 was "gender equality today for a sustainable tomorrow". The purpose of the day is to uphold women's achievements, recognize challenges and focus greater attention on women's rights and gender. Program was inaugurated by Mrs. Kamala Sidar (Sarpanch Chandli), after which all the women from SHG present were honored by Shriphal. The chief guests motivated all the women to be aware of their rights and to be empowered to other women's. women participated in our CSR program. Total 65 women SHG members were participated from 03 villages.



## Adani Foundation Day

Celebrated 25 years of serving communities by organizing various activities. On this special day, Rangoli and singing competition was organized for the girls of SET in which they participated. MHCU team marked the day during health camp and village visit. Women from SHG were participated in local games and plantation activities.



## Chhattisgarh Rajya Utsav – 2021

November 1<sup>st</sup> of every year is celebrated as Chhattisgarh Rajya utsava (Chhattisgarh Foundation Day) by the District Administration. This festival serves as the ideal platform



for exhibitors to generate outstanding sales and services in diverse categories like Electronics, Computers and Software, Automobiles, Décor, Beauty, Real Estate, Healthcare, Communications & IT, Banking & Insurance, Educational Institutions, FMCG Companies, States, Industrial houses, Mining equipment manufacturers, Handicraft etc. During Rajyotsava festival, famous folk artists of Chhattisgarh and school students will present traditional Sua dance, Panthi dance, Karma dance, and other dance forms.





## **Celebrated World Environment Day**

Tree plantation is one of the key focus areas, every member of REGL is conscious towards the Environment conservation. The team actively participated in plantation drive on World environment day on 5th June 2021, approx. 10,000 trees planted during the year. The survival rate of plants is 81% in REGL .

## **Response to emergency**

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:

### **Support extended for fire cases: -**

Our safety and fire team extended support during fire calls from the nearby villages and local administration, during the year responded 11 times for fire cases and control the situation and succeeded in preventing loss of people lives and money.

### **Support extended Emergency Ambulance Service: -**

Ambulance sent to villages and incident locations during road accidents and critical illness to shift patients to hospital and saved lives of the people, Ambulance was sent 49 times during the year and pro-actively undertook various activities during COVID-19 pandemic

Photo Gallery



Industrial Visit of Student – ITI Sariya



Participated in Rajya Utsav- 2021 – Raigarh



COO AF visited to Gothan of Kathli village and interact with SHG Member



COO AF meeting with SET Student and Dairy Farmers



COO AF meeting with SHG Members at Community Buliding , Chhote Bhandar,



Photo Gallery



Meeting with SHG Members



Training and Support to SHG for Mushroom Farming



Training on Book and Record Keeping to SHG members



Training and support to SHG for Vegetable Cultivation



Exposure visit - Gare Palma Mines and Rajsthan Rajya Vidyut Utpadan Nigam Ltd. Surguja



Media Gallery

**रायगढ़ एनर्जी जनरेशन लिमिटेड मना रहा सुपोषण सप्ताह**

सुपोषण रथ को हरी लकड़ी दिखाकर किया गया था। रायगढ़ में जागरूकता लाने हेतु विविध आयोजन



रायगढ़ एनर्जी जनरेशन लिमिटेड (रायगढ़ एनर्जी) ने सुपोषण सप्ताह मनाया। इस अवसर पर सुपोषण रथ को हरी लकड़ी दिखाकर किया गया था। रायगढ़ में जागरूकता लाने हेतु विविध आयोजन

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**सरिया आईटीआई के विद्यार्थियों को कराया गया औद्योगिक भ्रमण**



सरिया आईटीआई के विद्यार्थियों को कराया गया औद्योगिक भ्रमण। इस अवसर पर विद्यार्थियों को औद्योगिक प्रक्रियाओं का अवसर मिला।

**आरईजीएल ने महिला स्व-सहायता समूहों के लिए तीन दिवसीय प्रशिक्षण कार्यशाला का किया आयोजन**

आरईजीएल ने महिला स्व-सहायता समूहों के लिए तीन दिवसीय प्रशिक्षण कार्यशाला का किया आयोजन। इस अवसर पर महिलाओं को प्रशिक्षण मिला।



**आरईजीएल ने नेत्र जांच शिविर का किया आयोजन, 15 गांवों के 400 से अधिक मरीजों का हुआ नेत्र परीक्षण, दी गई दवा**

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**आलपास के 15 गांवों के लोगों को मिला शिविर का लाभ बड़े मंडार में आरईजीएल का नेत्र जांच शिविर, 4 सौ ने कराई जांच**

आलपास के 15 गांवों के लोगों को मिला शिविर का लाभ बड़े मंडार में आरईजीएल का नेत्र जांच शिविर, 4 सौ ने कराई जांच। इस अवसर पर लोगों को नेत्र परीक्षण कराया गया।





Media Gallery

### आरईजीएल ने किया पशुचिकित्सा शिविर का आयोजन

रायगढ़। रायगढ़ एनर्जी जनरेशन लिमिटेड (आरईजीएल) के सीनियर से अदानी फाउंडेशन द्वारा रायगढ़ जिले के प्रमुख क्षेत्रों में आयोजित, अर्द्ध-दिनांक की 40 घण्टी तक चलने वाले पशु चिकित्सा शिविर कार्यक्रम का शुभारंभ किया गया। कार्यक्रम का शुभारंभ 10 से 12 नवम्बर तक किया गया।



कार्यक्रम का शुभारंभ करीब 10 घण्टी के बाद हुआ। कार्यक्रम के प्रतिभागियों का शुभारंभ कार्यक्रम का शुभारंभ किया गया। कार्यक्रम का शुभारंभ किया गया। कार्यक्रम का शुभारंभ किया गया।

### आरईजीएल ने किया पशुचिकित्सा शिविर का आयोजन

रायगढ़। रायगढ़ एनर्जी जनरेशन लिमिटेड (आरईजीएल) के सीनियर से अदानी फाउंडेशन द्वारा रायगढ़ जिले के प्रमुख क्षेत्रों में आयोजित, अर्द्ध-दिनांक की 40 घण्टी तक चलने वाले पशु चिकित्सा शिविर कार्यक्रम का शुभारंभ किया गया। कार्यक्रम का शुभारंभ किया गया।



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## आरईजीएल ने महिला स्व-सहायता समूहों को दिया प्रशिक्षण

दरबंग रिपोर्टर ३ रायगढ़

रायगढ़ एनर्जी जनरेशन लिमिटेड (आरईजीएल) के सीनियर से अदानी फाउंडेशन द्वारा स्व-सहायता समूहों के लिए तीन दिवसीय प्रशिक्षण कार्यशाला का आयोजन रायगढ़ जिले के पुरौर ब्लॉक में दिनांक 10 से 12 नवम्बर तक किया गया। उत्तमसुंदर राय्य ग्रामीण आजीविका संवर्धन समिति (बिहान) के संयुक्त मार्गदर्शन में यह कार्यशाला ग्राम बुनगा, तपरदा और रनघाटा के समुदायिक स्तर में अलग-अलग आयोजित की गयी। इस कार्यशाला में 45 स्व-सहायता समूह के लेखापाल एवं अन्य सहयोगी सहित कुल 100 सदस्यों ने भाग लिया। कार्यशाला में पुस्तक एवं लेखा संधारण करने के उचित तरीकों और वित्तीय सूचनाओं के अंकन, वर्गीकरण एवं संक्षेपण से सम्बंधित गतिविधियों पर विस्तार से



जानकारी दी गयी। कार्यक्रम का शुभारंभ ग्राम पंचायत रनघाटा स्मरपंच श्रीमती ममता छत्तर, श्रीमती छाया देवकर एवं साइट हेड -सी.एस.अर. पूर्णेंद्र कुमार के द्वारा किया गया। प्रशिक्षण का मुख्य उद्देश्य परिषीय गांवों के महिला स्व-सहायता समूहों में किये जा रहे वित्तीय लेन देन को प्रभावी रूप से लेखांकन को पुलाकों में दर्ज करना और समूह के सदस्यों के बीच विश्वास को मजबूत करना है, जिससे सदस्यों के मध्य वित्तीय प्रबंधन के प्रति समझ विकसित हो सके। साथ ही व्यवस्थित लेखांकन

के माध्यम से सभी समूहों को सामाजिक व आर्थिक तौर पर समृद्ध एवं स्वावलंबी भी बनाया जा सके। इससे उन्हें भविष्य में सरकारी एवं गैर-सरकारी संस्थाओं से वित्तीय सहायता प्राप्त होने में आसानी हो सकेगी। कार्यशाला में प्रशिक्षकों के द्वारा समूहों के लिए नियमित अंतराल पर अभ्यास सत्र का भी आयोजन सफलतापूर्वक किया गया। कार्यक्रम में आरईजीएल की ओर से विवेक पाण्डेय, परमेश्वर गुप्ता, मोलेश महुना एवं गणमान्य ग्रामवार्डी उपस्थित थे।

## लेखा संधारण के साथ वित्तीय सूचनाओं के अंकन की महिलाओं को दी जानकारी



अदानी फाउंडेशन ने स्व-सहायता समूहों के लिए त्रैदिवसीय इस कार्यक्रम का शुभारंभ किया।

रायगढ़ (नरसुनिया प्रान्तोन्धी)। रायगढ़ एनर्जी जनरेशन लिमिटेड (आरईजीएल) के सीनियर से अदानी फाउंडेशन द्वारा स्व-सहायता समूहों के लिए तीन दिवसीय प्रशिक्षण कार्यशाला का आयोजन रायगढ़ जिले के पुरौर ब्लॉक में 10 से 12 नवम्बर तक किया गया। उत्तमसुंदर राय्य ग्रामीण आजीविका संवर्धन समिति (बिहान) के संयुक्त मार्गदर्शन में यह कार्यशाला ग्राम बुनगा, तपरदा और रनघाटा के समुदायिक स्तर में अलग-अलग आयोजित की गयी। इस कार्यशाला में 45 स्व-सहायता समूह के लेखापाल एवं अन्य सहयोगी सहित कुल 100 सदस्यों ने भाग लिया। कार्यशाला में पुस्तक एवं लेखा संधारण करने के उचित तरीकों और वित्तीय सूचनाओं के अंकन, वर्गीकरण एवं संक्षेपण से सम्बंधित गतिविधियों पर विस्तार से जानकारी दी गयी।

प्रशिक्षण कार्यशाला में प्रशिक्षकों द्वारा स्व-सहायता समूहों के उपयोग किये जाने वाली पुस्तकों के प्रकार, लेखांकन, लेखांकन एवं संधारण, वित्तीय सूचनाओं के अंकन, वर्गीकरण एवं संक्षेपण से सम्बंधित गतिविधियों पर विस्तार से जानकारी दी गयी। कार्यक्रम का शुभारंभ ग्राम पंचायत रनघाटा स्मरपंच ममता छत्तर, छाया देवकर एवं साइट हेड सी.एस.अर. पूर्णेंद्र कुमार के द्वारा किया गया। प्रशिक्षण का मुख्य उद्देश्य परिषीय गांवों के महिला स्व-सहायता समूहों में किये जा रहे वित्तीय लेन देन को प्रभावी रूप से लेखांकन को पुलाकों में दर्ज करना और समूह के सदस्यों के बीच विश्वास को मजबूत करना है, जिससे सदस्यों के मध्य वित्तीय प्रबंधन के प्रति समझ विकसित हो सकेगी।

## 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	216474 Nos.	
2020-21	12,600 Nos.	
2021-22	4426 Nos.	
Survival rate maintained	< 70%	



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**Power**

Ref: REGL/ENV/CEA/FLYASH/119/04/22  
Date: 11/04/2022

**To,**

**The Director  
Central Electricity Authority  
Thermal Civil Design Division  
9<sup>th</sup> Floor, North Wing,  
Sewa Bhawan, R.K.Puram,  
New Delhi-110066**

**Sub: Submission of Annual data on Fly Ash Generation & Utilisation for the period of April'2021 to March'2022 for Korba Thermal Power Plant, Korba Raigarh, Chhattisgarh**

**Ref:** Your Letter No- 1/8/1/DATA/2018/TCD/ 1071-1179, mail dated 01/04/2022.

Dear Sir,

With reference to the above-mentioned subject, we are furnishing herewith annual Fly Ash data pertaining to fly ash Generation & its Utilization during the year 2021-22 (April'2021 to March'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 **Raipur Energen Ltd.**



**(R N Shukla)**

**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, 2021 to March, 2022

(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)
1.00	Raigarh Energy Generation Ltd, P.O: Bade Bhandar, Tehsil: Pussore, Raigarh, Chattisgarh, PIN : 496100	Raigarh	Chhattisgarh	"C"	1.00	600.00	31.03.2014	Rambhav Gattu	Station Head	07762-218374	rambhav.gattu@adani.com	SECL (Bijari, Jampali, Chhal, New Kusmunda), MCL (Lakhanpur, Belpahad, Kulda, Garjanmahal)	110 KM	29.85	--	39.56%

Abbreviations:-

MW-Mega Watt

TPS- Thermal Power Station

KM- Kilometre

LMT- Lakh Metric Tonne

Kcal- Kilocalories



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 Ltd, P.O: Bade Bhandar, Tehsil: Pussore, Raigarh, Chattisgarh, PIN : 496100

Name of Thermal Power Plant: Raigarh Energy Generation Ltd, P.O: Bade Bhandar, Tehsil: Pussore, Raigarh, Chattisgarh, PIN : 496100

PERIOD OF REPORT- April ,2021 to March,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 31.03.2022		
		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, Internal Low lying area, Timerlaga, Gudeli	Ash Dyke	Inside/Outside Plant Boundary 3-18 Kms	52.99	15 Years	0	4.49	0.72	0.0000	0.000	19.07

Abbreviations:-

MW-Mega Watt

TPS- Thermal Power Station

KM- Kilometre

LMT- Lakh Metric Tonne

Ha- Hectare

MINISTRY OF POWER  
CENTRAL ELECTRICITY AUTHORITY  
THERMAL CIVIL DESIGN DIVISION

Monthly Abstract of Ash Generation and Utilization

(For the Period from April, 2021 to March, 2022)

Name of Power Utility: Raigarh Energy Generation Ltd, P.O: Bade Bhandar, Tehsil: Pussore, Raigarh, Chattisgarh, PIN : 496100

Name of Thermal Power Plant: Raigarh Energy Generation Ltd, P.O: Bade Bhandar, Tehsil: Pussore, Raigarh, Chattisgarh, PIN : 496100

Installed Capacity (Total): 600 MW

PERIOD OF REPORT- April 2021 to March,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-2021	2.733	36.97	1.01	0.63	61.980							0.63	-	-	-
2	MAY-2021	2.593	35.23	0.91	0.29	32.240							0.29	-	-	-
3	JUNE-2021	2.363	37.23	0.88	0.23	25.850							0.23	-	-	-
4	JULY-2021	2.761	37.42	1.03	0.43	41.860							0.43	-	-	-
5	AUGUST-2021	2.712	37.60	1.02	0.60	59.110							0.60	-	-	-
6	SEPTEMBER-2021	1.612	36.21	0.58	0.42	72.260							0.42	-	-	-
7	OCTOBER-2021	2.330	44.19	1.03	0.53	51.25	-	-	-	-	-	-	0.53	-	-	-
8	NOVEMBER-2021	2.370	44.13	1.05	0.45	42.82	-	-	-	-	-	-	0.45	-	-	-
9	DECEMBER-2021	3.090	42.02	1.30	0.05	3.99	-	-	-	-	-	-	0.05	-	-	-
10	JANUARY-2022	0.010	31.23	0.00	0.00	0.00	-	-	-	-	-	-	0.00	-	-	-
11	FEBRUARY-2022	1.960	38.69	0.76	0.15	20.36	-	-	-	-	-	0.11	0.05	-	-	-
12	MARCH-2022	3.150	43.80	1.38	0.32	23.03	-	-	-	-	-	0.30	0.02	-	-	-
	TOTAL	27.68	39.56	10.95	4.10	37.48	-	-	-	-	-	0.41	3.70	-	-	-

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

Kcal- Kilocalories