ADHUNIK POWER & NATURAL RESOURCES LIMITED

WORKS : Village - Padampur, Behind P.G.C.I.L. Substation,
Adityapur - Kandra Road, Saraikela - Kharsawan, PIN - 832402 Jharkhand
Phone : +91 - 657 - 6628400, Fax : +9[illegible] 6628440
CIN - U40101WB2005PLC[illegible]

Ref: MOE&F, RNC/HYC/KKJ/26521/02

To,

Regional Office (ECZ),
Ministry of Environment, Forest and Climate Change
Bungalow No. A-2, Shyamali Colony,
Ranchi – 834002

Sub:- Submission of Half yearly compliance status report (Unit II) for the period – October 2020 to March 2021 -Reg.

Ref:- MoEF EC letter No.J-13012/8/2009-IA.II(T), Dated 09th May 2011.

Sir,

With reference to the above referred Environmental Clearance, we are pleased to submit herewith the half yearly compliance status report **(Unit II)** for the period of **October 2020 to March 2021.**

This is for your reference and record, please.

Thanking you,

For **Adhunik Power & Natural resources Limited**

(Authorized Signatory)

Encl: As Above

Copy to:

1. Central Pollution Control Board, Kolkata
2. Member Secretary, Jharkhand State Pollution Control Board, Jharkhand
3. Regional Officer, JSPCB, Jamshedpur

CORPORATE OFFICE : "LANSDOWNE TOWER", 2/1A, Sarat Bose Road, Kolkata - 700 020
Ph : +91 - 33 - 30517100 / 7200 / 7300 • Fax : +91 - 33 - 22890285
REGD. OFFICE : 14, N. S. Road, 2nd Floor, Kolkata - 700 001, Phone No. +91 - 33 - 22428551, 22428553
Website : www.adhunikpower.com

o/c

ADHUNIK POWER & NATURAL RESOURCES LIMITED

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Adityapur - Kandra Road, Saraikela - Kharsawan, PIN - 832402 Jharkhand
Phone : +91 - 657 - 6628400, Fax : +91 - 657 - 6628440
CIN - U40101WB2005PLC102935

Ref: MOE&F, RNC/HYC/KKJ/26521/02 **Dated: 26.05.2021**

To,

Regional Office (ECZ),
Ministry of Environment, Forest and Climate Change,
Bungalow No. A-2, Shyamali Colony,
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2. Member Secretary, Jharkhand State Pollution Control Board, Jharkhand
3. Regional Officer, JSPCB, Jamshedpur

REPORT

ENVIRONMENTAL COMPLIANCE STATUS REPORT FOR EXPANSION OF 1X270 MW COAL BASED POWER PLANT

(Unit II)

Adhunik

OCTOBER 2020 – MARCH 2021

Adhunik Power & Natural Resources Limited

Village: Padampur, Behind PGCIL Substation

Kandra Chouka Road, Saraikela-Kharsawan

Jharkhand

Adhunik Power & Natural Resources Limited Vill: Padampur, Behind PGCIL Substation, Kandra Chouka Road, Saraikela-Kharsawan, Jharkhand		
Environmental Clearance Letter No: J13012/8/2009-IA .II (T) dtd 9th May 2011.		
Period Of Compliances: October 2020 to March 2021		
Sl No	EC Conditions	Status as on 31st March 2021
A. Specific Conditions:		
i.	Environmental clearance for the proposed expansion shall be applicable only for addition of 1x270 MW out of proposed addition of 3x270. However at a later stage when firm coal linkage for second and third units of 270 MW are also available, the project proponent may request the Ministry for inclusion of second and third units i.e. 2x270 MW, which the Ministry shall consider appropriately.	Noted
ii.	The Ministry had issued a draft Notification on 30th March, 2011 vide S.O. 691(E) under the Environment (Protection) Act, 1986 notifying the areas upto 5 km from the boundary of the protected area of Dalma Wildlife Sanctuary in the State of Jharkhand as the Eco-sensitive Zone. The necessity of obtaining environmental clearance from the National Board for Wild life would arise only if the proposed project area falls within the boundary of the finally notified eco-sensitive zone.	As per notification date 29th March 2012 project boundary are beyond the stipulated distance from the boundary of the protected area of Dalma Wildlife Sanctuary in the State of Jharkhand as the Eco-sensitive Zone. Notification regarding nearest distance from Dalma wildlife sanctuary enclosed as **Annexure I.** **Complied**
iii.	Wildlife conservation plan shall be implemented during the development of project itself and the status of implementation shall be submitted to the Ministry from time to time.	The Wild Life Management Plan (WLMP) has prepared already been approved by PCCF, Ranchi on May'10.2010.**Complied**
iv.	Vision document specifying prospective plan for the site shall be formulated and submitted to the Ministry within six months.	Vision document report has submitted at MoEF on 30th Dec 2011. **Complied**
v.	Possibility for harnessing solar power within the premises of the plant (particularly at available roof tops) shall be examined and status of implementation shall be submitted.	Installation of solar light system in all vulnerable area are completed.
vi.	Transport of coal shall be by rail only. The project proponent shall accordingly take up the matter with the Railways. Status of implementation shall be submitted to the Regional Office of the Ministry from time to time.	We are transporting most of Materials (Coal) by rail through railway siding at Brirajpur & PAPK, but due to shortage of rack allotment by Railways , we are transporting the materials by road to fulfill the requirement of coal otherwise plant could not run on full capacity.
vii.	A study shall be undertaken by an organization of repute such as RIT, Jamshedpur on source sustainability of water, based on the data of the source of water (Subarnarekha River) for the last 50 years and a report submitted within six months.	Water sustainability report has been prepared by IIT Kharagpur. Report was already submitted to MoEF BBS dated 11.11.11. **Complied**

viii.	Water usage shall be restricted to 30 MCM.	Complied.
x.	The project proponent shall seriously undertake rain water harvesting measures and shall develop water storage capacity for a larger period not less than 30 days storage before commissioning of the plant. Central Groundwater Authority/ Board shall be consulted for finalization of appropriate rainwater harvesting technology/design within a period of three months from the date of this clearance and details shall be furnished. The design of rain water harvesting shall comprise of rain water collection from the built up and open area in the plant premises. Action plan and road map for implementation shall be submitted to the Ministry within six months.	The Rain water harvesting report has already been submitted and approved from CGWA, Ranchi. 13 no Rain water harvesting structures has been constructed in accordance with the approved rain water harvesting plan. **Complied**
x.	Existing de-generated water bodies (if any) in the study area shall be regenerated at the project proponents expenses in consultation with the state govt.	Degenerated pond has been renovated as per request from local people/Gram Panchayat .
xi.	Hydrogeology of the area shall be reviewed annually from an institute/ organization of repute to assess impact of surface water and ground regime (especially around ash dyke). In case and deterioration is observed specific mitigation measures shall be undertaken and reports/ data of water quality monitored regularly and maintained shall be submitted to the Regional Office of the Ministry.	Hydrogeology study is being reviewed annually through reputed institute i.e M/s Anacon Laboratoeies, Nagpur. Copy of Hydrogeology Study are enclosed as **Annexure II.** Regular monitoring of ground water quality in and around ash pond area including heavy metals is being carried out periodically. **Ground water analysis report of upstream & Downstream of Ash pond in compared with baseline data for the month of March 2021 are enclosed as Annexure III.**
xii.	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.	Lean season data has already submitted To MoEF BBS on 19th aug 2011.**Complied**
xiii.	No ground water shall be extracted for use in operation of the power plant even in lean season.	Ground water has not extracted for operation of the Power Plant.
xiv.	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.	Natural drainage system has not been disturbed.
xv.	Minimum required environmental flow suggested by the Competent Authority of the State Govt. shall be maintained in the Channel/ Rivers (as applicable) even in lean season.	We are regular in touch with State Government ,if any suggestion will received from State Government , we shall inform to your good office.
xvi.	COC of 5.0 shall be adopted.	COC 5.0 has been considered for cooling tower design.
xvii.	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	Regular monitoring of ground water in and around ash pond area including heavy metals is being carried out & report submitted to MoEF. **Ground water analysis report of upstream & Downstream of Ash pond compared with baseline data for the month of March 2021 are enclosed as Annexure III.** Regular monitoring of ground water level are

	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.	done through Piezometer installed at following locations: 1. 22°50'20.9"N 86°03'27.4"E 2. 22°50'23.1"N 86°03'39.7"E 3. 22°50'09.5"N 86°03'48.1"E 4. 22°49'50.0"N 86°03'37.9"E Photographs of installed Piezometers are enclosed as **Annexure IV.**
xviii.	Monitoring surface water quality in the area 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.	**Ground water analysis report of upstream & Downstream of Ash pond and Surface Water Analysis report for the month of March 2021 are enclosed as Annexure III & Annexure V respectively.**
xix.	Additional soil for leveling 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 leveling in plant area should be minimum with no or minimal disturbance to the natural drainage of the area.	Complied.
xx.	Provision for installation of FGD shall be provided for future use	FGD space is available on site for future use.
xxi.	The project proponent shall undertake measures and ensure that no fugitive fly ash emissions take place at any point of time.	Effective provision for dust suppression system has been strictly implemented at all dust prone areas such as road, coal stock yard, Truck tippler, Ash pond & others areas. Fugitive emission could not be occurred due to nature of wet condition of bottom ash. However additional arrangement of water sprinkling has been implemented in case of emission occurs. In addition, 03 No Water tankers are deployed for dust suppression.
xxii.	Stacks of 275 m height shall be installed and provided with continuous online monitoring equipments for SO_x, NO_x and $PM_{2.5}$ & PM_{10}. Exit velocity of flue gases shall not be less than 22 m/sec. Mercury emissions from stack may also monitored on periodic basis.	Twin flue chimney of 275m height has constructed for proper dispersion of flue gases. Online monitoring equipment has installed at chimney. Hg concentration is well within prescribed limits. **Complied**
xxiii.	High Efficiency Electrostatic Precipitators (ESPs) shall be installed to ensure that particulate emission does not exceed 50 mg/Nm^3.	High efficient ESPs of 32 fields have installed to ensure control PM emission in flue gas. **Stack Monitoring report from For the month of March 2021 are enclosed as Annexure VI.**
xxiv.	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.	Necessary mitigation measures in accordance with EMP and EC conditions has taken to control fugitive emissions from ash storage/transfer and coal handling plant such as installation and operation of bag filters collectors, use of water spray systems and enclosed conveyors with well designed, extraction and filtration equipment on transfer points. **Complied**

xxv.	Utilization of 100% Fly Ash generated shall be made from 4th year of operation. Status of implementation shall be reported to the Regional Office of the Ministry from time to time.	Agreements made with cement plants, brick plants, etc to ensure optimum utilization of fly ash. Fly Ash generation & Utilization report (April 2020 to March 2021) are enclosed as **Annexure VII.** Utilization of 100% Fly Ash generated has been achieved.
xxvi.	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.	02 No Silos has Constructed to storage of fly ash. Monitoring of mercury and other heavy metals (As, Hg, Cr, Pd etc.) in the bottom ash and also in the effluents emanating from the ash pond is being done periodically. **Bottom ash analysis report & effluent analysis report of ash pond For the month of March 2021 are attached as Annexure VIII & Annexure IX respectively.**
xxvii.	Ash pond shall be lined with HDPE/LDPE 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.	Complied.
xxviii.	For disposal of Bottom Ash in abandoned mines (if proposed to be undertaken) shall be dome after obtaining due permission from DGMS and after ensuring 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	Not Applicable.
xxix.	Sulphur and ash contents in the coal to be used in the project shall not exceed 0.6 % and 34 % respectively at any given time. In case of variation of coal quality at any point of time fresh reference shall be made to MOEF for suitable amendments to environmental clearance condition wherever necessary.	We are purchasing coal from different mines of CCl, a coal India ltd undertaking wherever coal is available. We are using domestic coal & imported coal having Ash content in range of 32% - 46%. Concentration of Sulphur is well within the prescribed norms.
xxx.	Green Belt consisting of 3 tiers of plantations of native species around plant and at least 75 m width shall be raised. The density of tree shall not less than 2500 per ha and survival rate not less than 80 %.	A thick green belt of adequate width is being developed.68123 nos. (Area covered-30.9 Hac) of plantation has been completed in and outside along the periphery of the power plant to arrest any dust emissions and help in attenuation of noise till March 2020. Survival rate of sapling is 85.5%. Total Survived plants are 58245. Name of Plant Species-Neem, , Seesam, Mango, Jamun etc.
xxxi.	Over and above the green belt, as carbon sink, social forestry shall be carried out in close consultation with the Forests Department. The project proponent shall accordingly identify blocks of land / degraded forests and shall undertake regeneration of degraded forests at a large scale. In pursuance to this the project proponent shall formulate time bound action plan along with financial allocation and shall submit status of implementation to	Letter has been submitted to Forest Department for guidance on implementation of social forestry.

	the Ministry within six months.	
xxxii.	At least three nearest village shall be adopted and basic amenities like development of roads, drinking water supply, primary health centre, primary school etc shall be developed in co-ordination with the district administration.	APNRL has adopted villages a. Baraharihарpur b. Padampur c. Srirampur CSR is also providing the facilities in following villages d. Pindrabera e. Chotaharihарpur f. Ramjivanpur g. Bikanipur etc. Details of CSR activity enclosed as **Annexure X.**
xxxiii.	The project proponent shall also adequately contribute in the development of the neighboring villages. Special package with implementation schedule for providing potable drinking water supply in the nearby villages and schools shall be undertaken in a time bound manner.	Details of CSR activity enclosed as **Annexure X.**
xxxiv.	A time bound implementation of the CSR shall be formulated within six months and submitted to the Ministry. CSR schemes shall be undertaken based on need assessment in and around the villages within 5 km of the site and in constant consultation with the village Panchayat and the District Administration. As part of CSR, prior identification of local employable youth and eventual employment in the project after imparting relevant training shall be also undertaken.	List of local employed youth enclosed as **Annexure XI. Complied**
xxxv.	For the tribal families (if any) living in the area within 5.0 Km of site, affected directly or indirectly by the proposed project, specific schemes for upliftment of their sustainable livelihood shall be prepared with time bound implementation and in-built monitoring programme. The status of implementation shall be submitted to the Regional Office of the Ministry from time to time.	CSR activities are being carried out in the surrounding villages keeping in mind the upliftment of tribal families. Details of CSR activity enclosed as **X** .
xxxvi.	An amount of Rs 23.70 Crores shall be earmarked as one time capital cost for CSR programme as committed by the project proponent. Subsequently a recurring expenditure of Rs 4.74 Crores per annum shall be earmarked as recurring expenditure for CSR activities. Details of the activities to be undertaken shall be submitted within six month along with road map for implementation.	We have submitted copy of capital cost & year wise recurring expenditure on CSR activities to MoEF &CC, Ranchi Office on 05.12.2018. **Complied.**
xxxvii.	It shall be ensured that in-built monitoring mechanism for the schemes identified is in place and annual social audit shall be got	All CSR activities are monitored on weekly and monthly basis. We have conducted social audit through renowned

	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	organization who are well aware about Social Audit in Jharkhand region. Copy of Social audit shall be submitted shortly.
B. General Conditions:		
i.	The treated effluents conforming to the prescribed standards only shall be re-circulated and reused within the plant. Arrangements shall be made that effluents and storm water do not do not get mixed.	**Complied.** **Treated effluent analysis report of ETP from For the month of March 2021 are enclosed as Annexure XII.**
		Adequate and separate drainage structures has provided to channel storm water generated onsite into rain water harvesting structures constructed in accordance with the approved rain water harvesting plan.
ii.	A sewage treatment plant shall be provided (as applicable) and the treated sewage shall be used for raising greenbelt/plantation	STP 60 Kl capacity (03 No) has installed within plant premises to treat sewage waste. Photographs enclosed as **Annexure XIII.**
iii.	Adequate safety measures shall be provided in the plant area to check/minimize spontaneous fires in coal yard, especially during summer season. Copy of these measures with full details along with location plant layout shall be submitted to the Ministry as well as to the Regional Office of the Ministry.	The design of coal yard along with provision of fire safety measures viz. fire hydrants, water sprinklers has installed. **Complied**
iv.	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.	Approval received on dated 15/12/2011. License No. P/HQ/JH/15/1065 (P257355), valid upto 31.12.2022 for LDO storage installation (under Petroleum Class "C") for operations. Copy of Approval are enclosed as **Annexure XIV.**
		We are using Sulphur content in the liquid fuel within prescribed limit. Copy of Test report are enclosed as **Annexure XIV (a).**
		Emergency Response Plan (ERP) has prepared as part of the project ESMS to cater to potential emergencies/risks identified.
v.	First Aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.	Plant is in operational condition however A first aid center comprising with necessary medical facilities is made available onsite to provide emergency medical aid to both contract workers and company staff. **Complied.**
vi.	Noise levels emanating from turbines shall be so controlled such that the noise in the work zone shall be limited to 85 dBA from source. For people working in the high noise area, requisite personal protective equipment like earplugs/ear muffs etc. shall be provided. Workers engaged in noisy areas such as turbine area, air compressors	Adequate measures has implemented in consistent with the EMP to control turbine noise levels within stipulated limits. This include installing of sufficient engineering control in turbines as per design specifications, provision of ear plugs/ear muffs for workers exposed to high noise, rotation of workers and carrying out periodic audiometric testing of workers and records is being maintained. **Noise level**

	etc shall be periodically examined to maintain audiometric record and for treatment for any hearing loss including shifting to non noisy/less noisy areas	**monitoring report For the month of March 2021 are enclosed As Annexure XV.**
vii.	Regular monitoring of ambient air ground level concentration of SO_2, NOx, $PM_{2.5}$ & PM_{10} and Hg shall be carried out in the impact zone and records maintained. If at any stage these levels are found to exceed the prescribed limits, necessary control measures shall be provided immediately. The location of the monitoring stations and frequency of monitoring shall be decided in consultation with SPCB. Periodic reports shall be submitted to the Regional Office of this Ministry. The data shall also be put on the website of the company.	**Ambient Air monitoring reports carried out by NABL accredited Laboratory for the month of March 2021 are enclosed As Annexure XVI.** Review of air quality monitoring results revealed compliance to NAAQS. Realtime data of CAAQMS has been uploaded at CPCB & JSPCB website.
viii.	Provision shall be made for the housing of construction labor (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.	Plant is in operational condition and local labors are coming from nearby villages. **Complied**
ix.	The project proponent shall advertise in at least two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned within seven days from the date of this clearance letter, informing that the project has been accorded environmental clearance and copies of clearance letter are available with the State Pollution Control Board/Committee and may also be seen at Website of the Ministry of Environment and Forests at http://envfor.nic.in.	**Complied**
x.	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.	A copy of EC has been submitted in Gram Panchayat & DC office and copy of Environment Clearance has been uploaded on company website.
xi.	An Environmental Cell comprising of at least one expert in environmental science / engineering, occupational health and social scientist, shall be created at the project site itself and shall be headed by an officer of appropriate superiority and qualification. It shall be ensured that the Head of the Cell shall directly report to the head of the organization and he shall be held responsible for implementation of environmental regulations and social impact	A Environmental Management Cell consist high qualified environmental professionals are being operational onsite to ensure effective implementation of specific EMPs. **Organization chart of Environmental Management Cell enclosed as Annexure XVII.**

	improvement/mitigation measures.	
xii.	The proponent shall upload the status of compliance of the stipulated environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MOEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; SPM, RSPM ($PM_{2.5}$ & PM_{10}), SO_2, NO_x (ambient levels as well as stack emissions) shall be displayed at a convenient location near the main gate of the company in the public domain.	The updated compliance status of the stipulated EC conditions along with monitored data has been uploaded on the company website. The monitoring data (SPM, RSPM, SO2, NOx) for both ambient air quality and chimney emissions is being displayed at the main gate of the company. Compliance status of the stipulated EC conditions has been uploaded on company website and hard copy of same has been submitted for the period of April 2020 to September 2020 in office of MoEF, Ranchi & CPCB office, Kolkata along with monitored data.
xiii.	The environment statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company 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 last environmental statement for financial year (2019-20) in Form V has submitted to JSPCB vide E mail dated 25th Sep 2020. **Acknowledgement copy of same attached as Annexure XVIII.** Environment Statement (2019-20) has been uploaded on company website.
xiv.	The project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental safeguards to the Ministry of Environment and Forests, its Regional Office, Central Pollution Control Board and State Pollution Control Board. The project proponent shall upload the status of compliance of the environment of the environmental clearance conditions on their website and update the same periodically and simultaneously send the same by e-mail to the Regional Office, Ministry of Environment and Forests	Last six monthly reports for the project along with environmental monitoring data submitted to MoEF RO at Ranchi office vide letter No MOE&F,RNC/HYC/KKJ/231220/02 ,dated 23TH Dec 2020. **Acknowledgement copy of same attached as Annexure XIX.**
xv.	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 NO_x (from stack & ambient air)	A complete set of documents including Environmental Impact Assessment Report and Environment Management Plan along with the additional information already submitted to the Board. The updated compliance status of the stipulated EC conditions along with monitored data has been uploaded on the company website. The monitoring data (SPM, RSPM, SO2, NOx) for both ambient air quality and chimney emissions is being displayed at the main gate of the company.

	shall be displayed at the main gate of the power plant.	
xvi.	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.	Adequate budgetary provision has been made by the APNRL for execution of environmental management plan.
xvii.	The project authorities shall inform the Regional Office as well as the Ministry regarding the date of financial closure and final approval of the project by the concerned authorities and the dates of start of land development work and commissioning of plant	**Complied**
xviii.	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	We ensure.

कार्यालय :–प्रधान मुख्य वन संरक्षक झारखण्ड, राँची।

पत्रांक:–19एम01(5)29/2008 2574 दिनांक:– 23.7.09

सचिव,
वन एवं पर्यावरण विभाग,
झारखण्ड सरकार, राँची ।

मैसर्स आधुनिक थर्मल एनर्जी लिमिटेड के कान्ड्रा पदमपुर, श्री रामपुर, रामचन्द्रपुर मौजा, जिला–सरायकेला–खरसांवा में स्थापित किये जाने वाले थर्मल पावर प्रोजेक्ट के लिए पर्यावरणीय स्वीकृति के संबंध में।

विभागीय पत्रांक–308, दिनांक–04.02.09

उपर्युक्त विषयक संदर्भ में सूचित करना है कि प्रधान मुख्य वन संरक्षक, जैव विविधता संरक्षण एवं मुख्य वन्यप्राणी प्रतिपालक, झारखण्ड, रांची ने अपने पत्रांक 463, दिनांक–02.07.2009 (छायाप्रति संलग्न) द्वारा संबंधित विषय पर प्रतिवेदन/मंतव्य समर्पित किया है। उक्त प्रतिवेदन एवं उपलब्ध अभिलेखों के आधार पर प्रस्तावित परियोजना स्थल के संबंध में स्थिति निम्नवत् है :–

1. विषयक थर्मल पावर प्रोजेक्ट काण्ड्रा पदमपुर, श्रीरामपुर, रामचन्द्रपुर मौजा की गैर–वन भूमि पर स्थापित किये जाने का प्रस्ताव है।
2. उपरोक्त पावर प्रोजेक्ट दलमा वन्यप्राणी आश्रयणी की निकटतम सीमा से लगभग 7.5 कि0मी0 दूर स्थापित होगा। प्रस्तावित क्षेत्र की 10 कि0मी0 त्रिज्या के अंदर अवस्थित वन भूमि सिंहभूम गज आरक्ष्य का भाग है।
3. वन प्रमण्डल पदाधिकारी, वन्यप्राणी प्रमण्डल, रांची के द्वारा पावर प्रोजेक्ट के लिए प्रस्तावित स्थल को प्रस्तावित इको–सेंसिटिव जोन से सटा हुआ बताया गया है, जबकि दलमा वन्यप्राणी आश्रयणी के लिए प्रस्तावित इको–सेंसिटिव जोन से संबंधित जो प्रस्ताव राज्य सरकार को भेजा गया है उसके अनुसार प्रस्तावित स्थल प्रस्तावित इको–सेंसिटिव जोन की निकटतम सीमा से लगभग 2.5 कि0मी0 दूर अवस्थित है। इस क्रम में अनुलग्नक– 1 पर दो प्रतियों में नक्शा संलग्न है।
4. पावर प्रोजेक्ट के लिए प्रस्तावित स्थल से 8 से 10 कि0मी0 की दूरी पर दलमा–रूगाई गज–कोरीडोर एवं दलमा–चंडिल गज–कोरीडोर अवस्थित है। इस क्षेत्र के पास एक अन्य गज–कोरीडोर चांडिल–माथा कोरीडोर भी है, जो प्रस्तावित स्थल से 10 कि0मी0 से अधिक दूरी पर अवस्थित है। इसके अतिरिक्त कोई अन्य हाथी कोरीडोर प्रस्तावित

क्षेत्र के पास पूर्व चिन्हित नहीं है। उपरोक्त गज–कोरीडोर को दिखाते हुए नक्शा (अनुलग्नक–2) दो प्रतियों में संलग्न है।

5. वन प्रमण्डल पदाधिकारी, वन्यप्राणी प्रमण्डल, रांची के द्वारा अपने प्रतिवेदन में यह उल्लेख किया गया है कि दलमा वन्यप्राणी आश्रयणी की दक्षिणी सीमा पर स्वर्णरेखा नहर की गहरी खोदाई के कारण इस क्षेत्र में हाथियों का आवागमन अनियमित है। उन्होने यह भी वर्णित किया है कि आश्रयणी से हाथियों का आवागमन रामगढ, एन0एच0–33, डोभी, कपालन, तमोलिया होते हुए पुनः आश्रयणी की ओर हो रहा है। पूर्व में यह पलना जलाशय तक होता था, जो वर्तमान में नहर की खोदाई के कारण बाधित है। इस संबंध में नक्शे की समीक्षोपरांत यह पाया गया है कि यदि हाथियों का आवागमन पूर्ववतः आश्रयणी से पलना जलाशय तक होता भी है तब भी प्रस्तावित स्थल ऐसे किसी आवागमन मार्ग के बीच में नहीं आयेगा। पलना जलाशय की लोकेशन को दर्शाते हुए एक नक्शा भी इस पत्र के साथ संलग्न किया जा रहा है जिससे स्पष्ट होगा कि यह जलाशय प्रस्तावित स्थल से लगभग 17 कि0मी0(उत्तर पूर्व) की दूरी पर अवस्थित है। प्रस्तावित स्थल होकर हाथियों का आवागमन होने की या कोई पूर्व–स्थापित गज–कोरीडोर होने की कोई ठोस सूचना/प्रमाण उपलब्ध नहीं है।

6. झारखंड राज्य में गज–कोरीडोर को चिन्हित करने का कार्य एक स्वयंसेवी संस्था "वाइल्ड लाइफ ट्रस्ट ऑफ इंण्डिया, नई दिल्ली" के द्वारा किया गया है। इस कार्य में झारखंड वन विभाग के द्वारा भी सहयोग किया गया था। उपरोक्त स्वयंसेवी संस्था द्वारा प्रकाषित 'Right of Passage- Elephant Corridors of India' नामक पुस्तक में झारखंड राज्य के लिए कुल 14 गज–कोरीडोर वर्णित है तथा इसी सूचना के आधार पर कंडिका चार में वर्णित तीन गज कोरीडोर को नक्शे पर दर्शाया गया है।

7. प्रस्तावित स्थल के आसपास कई अन्य उद्योग, यथा पावर ग्रिड कॉरपोरेशन ऑफ इण्डिया लि0, बी0के0 स्टील आई0ओ0सी0एल0, टी0सी0एस0, उषा मार्टिन, नीलांचल स्टील, आदि स्थापित हैं। यह अनुलग्नक–3 पर दो प्रतियो में उपलब्ध नक्शे से स्पष्ट है। इस क्षेत्र में कई उद्योग होने के कारण भी इसे दलमा वन्यप्राणी आश्रयणी के प्रस्तावित इको–सेंसिटिव जोन से बाहर रखा गया था।

8. वन प्रमण्डल पदाधिकारी, वन्यप्राणी प्रमंडल, रांची ने प्रस्तावित स्थल दलमा आश्रयणी एवं elephant bearing area के समीप होने के कारण हाथियों के आवागमन पर पड़ने वाले प्रतिकूल प्रभाव की संभावना बताते हुए प्रस्तावित परियोजना हेतु अनापत्ति प्रमाण–पत्र निर्गत नहीं करने की अनुशंसा की है। परंतु वन संरक्षक, वन्य प्राणी अंचल, रांची ने वन प्रमण्डल पदाधिकारी द्वारा अपने प्रतिवेदन में उठाए गये विभिन्न विन्दुओं पर

समीक्षात्मक टिप्पणी अंकित करते हुए उनकी अनुशंसा से सहमति व्यक्त नहीं की है, जो उपरोक्त कंडिकाओं में उलेखित तथ्यों एवं संलग्नक मानचित्रों पर आधारित है।प्रधान मुख्य वन संरक्षक, जैव विविधता संरक्षण एवं मुख्य वन्यप्राणी प्रतिपालक, झारखण्ड, रांची, वन संरक्षक के उपर्युक्त मंतव्य से सहमत हैं।

9. प्रधान मुख्य वन संरक्षक, जैव विविधता संरक्षण एवं मुख्य वन्यप्राणी प्रतिपालक, झारखण्ड,रांची द्वारा अग्रलिखित शर्त्त पर संबंधित परियोजना हेतु एन0ओ0सी0 निर्गत करने की अनुशंसा की गई है कि EIA के ToR की शर्त्त V के आलोक में प्रयोक्ता अभिकरण को इस आशय की वचनबद्धता देनी होगी कि प्रयोक्ता अभिकरण वन्य प्राणी विशेषज्ञ की मदद से Wildlife Mitigation and Conservation Plan उक्त क्षेत्र विशेष हेतु तैयार करा कर EIA मे शामिल करेंगे और उक्त योजना का कार्यान्वयन वन विभाग के माध्यम से प्रयोक्ता अभिकरण की लागत पर किया जायेगा।

प्रधान मुख्य वन संरक्षक, जैव विविधता संरक्षण एवं मुख्य वन्यप्राणी प्रतिपालक, झारखण्ड, रांची के उपर्युक्त मंतव्य से अद्योहस्ताक्षरी सहमत हैं।

अनुरोध है कि विषयगत पर्यावरणीय स्वीकृति पर अग्रतर कार्यवाई करने की कृपा की जाय।

अनु0–यथोक्त।

विश्वासभाजन,

21/7

प्रधान मुख्य वन संरक्षक,
झारखण्ड, रांची।

21/7

HYDROGEOLOGICAL STUDY OF PLANT AREA (ESPECIALLY AROUND ASH DYKE) TO ASSESS IMPACT OF SURFACE WATER & GROUND REGIME

OF

ADHUNIK POWER & NATURAL RESOURCES LTD.

AT- PADAMPUR, SARAIKELA-KHARSAWAN DISTRICT, JHARKHAND

PREPARED BY

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FEBRUARY-2021

FOREWORD

The protection and conservation of water plays a crucial role in maintaining the water quality and quantity for industrial activity. Hence monitoring of groundwater regime and submission of comprehensive hydro-geological report is the statutory requirements. Therefore, water conservation and protection is becoming a prerequisite for sustainable development. In line with this requirement, the management of **M/s. Adhunik Power & Natural Resource Ltd.** has adopted a corporate responsibility of water conservation and protection.

In order to Prepare Comprehensive Hydro-geological Report and Rainwater Harvesting potential to fulfil all mandatory requirement of monitoring of ground water regime as per requirement of Environment Clearance conditions laid down by MoEFCC of **M/s. Adhunik Power & Natural Resource Ltd.** as a consultant **Anacon Laboratories Pvt. Ltd., Nagpur** for various environmental issues related to **Adhunik Power.**

This document presents the status of **"Preparation Comprehensive Hydro-geological Study Report of Plant Area (Especially Around Ash Dyke) to Assess Impact of Surface Water & Ground Regimes with Rainwater Harvesting Potential"** .

The timely co-operation extended by the Staff and Management of **Adhunik Power & Natural Resource Ltd.** during the work execution period is gratefully acknowledged.

Place: Nagpur
Date: 05.03.2021

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HYDROGEOLOGICAL STUDY REPORT OF M/s ADHUNIK POWER & NATURAL RESOURCE LTD.

AT-PADAMPUR, SARAIKELA-KHARSAWAN DISTRICT, JHARKHAND PIN- 495663

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AREA AT A GLANCE

GENERAL FEATURES	
Name of the Project Site	**M/s Adhunik Power & Natural Resource Ltd.**
District Head Quarters	Jamshedpur
Block	Ghamariya
Village	Padampur
Geomorphology	
Major Physiographic Units	
Major Drainages	Subarnarekha
Hydrometeorology	
Annual Rainfall 1971-2020	1401.6 mm
Temperature Maximum	45°C
Temperature Minimum	18°C
Soils	Mixed red & black soil, Red gravelly & sandy soils Light to medium texture Moderately Acidic Poor fertility.
Geology	CGG, Phyllites, schists, Quartzite, Metamorphosed, Lawa, Gray & Clay.
Hydrogeology	
i) Major Water Bearing Formation	Weathered and fractured granite gneiss and metasediments
ii) Pre-monsoon Depth to Water Level During 2020 (mbgl)	1.2 - 6.9 mbgl
iii) Post-monsoon Depth to Water Level During 2020 (mbgl)	0.9 to 6.7 mbgl
v) Depth Range (m)	9.48 to 300.88
vi) Discharge (Cum/hour)	2.7 to 78
Ground Water Quality	
i) Type of Water	Water for potability and & irrigation purpose
Dynamic Ground Water Resources (As on March 2009)- in ham	
i) Net Annual Ground Water Availability	1962
ii) Existing Gross Ground Water Draft for irrigation	11
iii) Existing Gross Ground Water Draft for domestic and industrial water supply	318
iv) Existing Gross Ground Water Draft for All uses	329
v) Allocation for domestic, and industrial requirement supply up to next 25 years	422
vi) Net Ground Water Availability for future irrigation development	1529
vii) Stage of Ground Water Development	17%

(Source CGWB)

1. EXECUTIVE SUMMARY

M/s Adhunik Power and Natural Resources Ltd (APNRL) a leading Electricity generation company was initially proposed to be set up in two phases, i.e. Phase I: 1X270 MW, and Phase II: 3X270 MW. The Ministry of Environment and Forests, Government of India (MoEF) however had provided permission for only two units of TPP (2 x 270 MW) both of which were established and at the site. The two established units of the Thermal Power Plant were commissioned on January 2013 and May 2013, respectively. Disposal of Fly ash generated from the power plant is one of the major concerns of the thermal power plants. In view of this, APNRL has engaged M/s. Anacon Laboratories Pvt. Ltd., Nagpur to undertake detailed study of the area to assess the possible impact of Fly Ash disposal on the ground water and surface water in and around the proposed pond site.

APNRL is situated at about 3.0 Km west of a sub urban area known as Kandra near Jamshedpur. It is spread over the villages Padampur , Srirampur, Kendudih and Birbans under Gamaharia Block of Saraikela-Kharsawan District of Jharkhand. For the purpose of detailed hydrogeological study a square area of 10 km radius has been considered, keeping the plant area at the center.

The physiographic set up as well as drainage of the area is largely controlled by sub surface lithology and slope. The basement is made of Singhbhum Group of rocks. On these rocks, gently undulating and almost flat surface with clay and murrum cover has developed in some areas. The topographic features indicate the stage of maturity and subdued relief. Three major geomorphic units are distinctly identified in the study area, structural hills, weathered pediplains and dissected pediments. The plant area broadly lies in the dissected pediments, however part of structural hills can be seen between the plant area and the Fly Ash Pond area.

The plant area represents rolling topography, sloping towards north east. The general slope is towards Subarnrekha River. The area is drained by Subarnrekha River and its tributaries like Kharkai. There are moderate undulations. The average ground elevation of the plant area is 190 m above mean sea level (amsl), the ash pond area is broadly a saucer shaped valley separated by moderate hills with an average altitude of 200 m amsl.

The larger portion of the study area is drained by large number of sub-parallel drainage, which ultimately joins Subarnarekha River. Most of the drains and rivulets are seasonal. Even during peak

monsoon season, the flows in these rivers are restricted within their banks except the time of very high torrential rains.

The thickness of overlying weathered mantle in the form of top soil plays a significant role in allowing the rain water to percolate downwards and also acts as infiltrating media to allow any contaminant to join ground water.

The average monthly relative humidity of Jamshedpur at 0830 hrs and 1730 hrs is 72 and 61% respectively. The annual average rainfall of the area is 1401.6 mm. A number of Natural & Artificial Pond has been constructed in the study area trapping the overland flow of water during monsoon season. These bunds store the water requirement mainly for local village needs over the study area. There are a few small tanks, which have been constructed to retain rainwater. Most of these tanks get dried up in summer and sustain water for few months only after the rainfall. Within project area, no perennial source of surface water exists.

The plant area and the ash pond area are separated by hill of moderate height and acts as surface water divide, indicated by opposite direction of stream flow. There is one seasonal drain leaching to a seasonal pond within the plant area. In the ash dyke area, there is no identified and fixed water channel but two first order seasonal water channels appears to originate from there.

The digital data on various resolutions available from diverse sources has been subjected to the image processing as well as visual interpretation for feature identifications and demarcating their the different geomorphological and hydrogeological features so as to locate favorable sites for ground water recharge and disposal of fly ash.

The major rock type of the area is mica schist, Schist, phyllites and Quartzite of Singhbhum group. The thickness of top soil including alluvial cover varies widely in the area, at places the rocks are exposed at the surface, however in the lowland areas the thickness of alluvial cover extends up to 10 to 15m. There is a marked difference in the thickness of alluvial cover of the power plant area and the area identified for the Fly ash pond. The thickness of alluvium is comparatively more in the Plant area as compared to ash pond area.

The entire study area is occupied by hard formation; unconfined condition exists in the weathered mantle portion of the rocks. Depth of weathered mantle varies from 15-34 m in general. The water level of this aquifer varies from 4.5- 8.0 meter below ground level (mbgl) in post- monsoon season

and 9 - 11 m bgl in the pre-monsoon season. The general ground water flow is towards south west. The ground water table in the ash pond area varies between 265-285 m amsl. The yield of wells tapping the fractured schistose can yield up to 500 lpm.

The aquifer formed by top weathered zone is not very productive, very often a kankar zone is also encountered along with the weathered mantle. The aquifer is generally tapped through dug wells / open wells, the depth of which varies from 10 to 15 mts, occasionally up to 20 mts. The yield of these wells is moderate and supports drinking water needs. Depending upon the rainfall, some of these wells get dried up during summer.

The deeper fractured formation consisting of schist, constitutes the potential aquifers in the area, the secondary porosity has developed by tectonic activities as fractures and joints. The bore wells drilled up to 150 m deep tapping these fractures (2 to 3 numbers) yield 12 to 20 cubic meter/hrs of discharge having 12 to 30 m of draw down.

During the field visit some of the wells have been inventoried including verification of geographical coordinates, ground elevations with the help of hand held GPS gives to have an good idea of ground water regime conditions in the area. Apparently, it has been observed that the water level in the proposed ash pond area is generally shallow.

In general the ground water quality of the area is good and suitable for all purposes. Total dissolved solids range between 251 to 642 mg/l, which well within the permissible limit.

The project area is part of the Gamhariya block of Saraikela-Kharwasan distcrict. As per the report of CGWB pertaining to block wise ground water assessment, the Gamhariya block has a geographical area of about 243 sq. km, the net ground water availability of the block has been assessed to the tune of 15.29 MCM and the average stage of ground water development is merely 17 %.

As per the design for commissioning of the plant, that there are two numbers of Ash Silos, each with capacity of 2200 MT. Primarily, the fly ash is disposed of using either dry or wet disposal scheme. In dry disposal, the fly ash is transported by covered truck & Bulker for utilized in MoEF prescribed ecofriendly purposes such as for Manufacturing of brick /blocks/tiles, Cement manufacturing, ready mix concrete and Filling up of low lying area. In wet disposal, the fly ash is transported as slurry through pipe and disposed of in impoundment called "ash pond" and further disposed in

reclamation of low lying areas. In the APNRL Power Plant, it was initially designed that 'Fly Ash' will be disposed of in wet system in the 'Ash Ponds'.

Though fly ash is known to be an inert material, there is an apprehension about certain soluble chemicals in the decanted water which can have adverse effect, if such decanted water is let into a river body or ground water. In the Existing proposed ash pond of APNRL, It was designed that bottom ash would be disposed in two numbers of Ash Ponds. Ash Pond No. 1 is having a storage capacity of 7 lakh metric tons. Ash Pond No. 2 having a storage capacity of 4 lakh metric tons of fly ash and both the ash ponds were constructed with HDPE lining at the bottom to ensure impermeability. HDPE sheets were used for construction of both the Ash Ponds of APNRL. Further, cemented dykes all along the dyke to avoid coming out of leachates from the side of the ponds.

Thus, there is hardly any chance of leachates coming out of the ash ponds of APNRL contaminating the groundwater.

The impact on ground water regime is an integral part of the overall environmental impact of the proposed thermal power plant. The impact on ground water may be in terms of quantity and quality. Since there is no proposal for abstraction of ground water in the project area, it is proposed to meet the total requirement of the plant from surface water sources, it is anticipated that there will not be any impact on availability of ground water resource. However, the area provides good opportunity of ground water withdrawal.

2. INTRODUCTION

2.1 BACKGROUND:

In last few decades the industrial and infrastructural development in the country has been very fast resulting in to steady growth in Indian economy. The technological advancement and modern style coupled with affordability has increased the demand of electricity and power harmonically. To meet the growing requirements, various leading Multinational as well as Indian companies are coming forward in the power sector in order to make the country self sufficient in power. Hydro and thermal power constitutes the major sources of power production in India.

M/s. Adhunik Power and Natural Resources Ltd (APNRL) have got the formal clearance for establishing one unit of 270 MW Power Plant at Padampur in Saraikela-Kharsawan District of Jharkhand state. In view of the huge power demand in India as well as in the state of Jharkhand, Subsequently, APNRL applied for obtaining Environmental Clearance for similar three units (3 X 270 MW), but MoEF issued EC for only on such on 09.05.2011. Accordingly, Unit-2 was commissioned which started commercial operation on 19th May, 2013.

Disposal of Fly ash generated from the power plant is one of the major concerns of the thermal power plants, APNRL has undertaken preliminary studies, based on the findings of the study necessary design arrangements and the tentative site for the Ash pond has been demarcated based on the prevailing topographic, geomorphic and hydro-geologic conditions of the area. Planning for water conservation and water harvesting specially in the plant area is another major concern of APNRL. M/s Water Solutions was engaged by APNRL for detailed hydro-geological study of the area, to suggest a practical strategy for water conservation and rainwater harvesting and possible impact of Fly Ash pond on the surface water and ground water in and around the plant area were carryout by Water Solution in previous year by APNRL.

3. OBJECTIVE

The present study deals with brief hydro-geological report on the overall ground water conditions prevailing in & around 10 km radius of the plant area.

The objectives of the present study are :

- To study Hydro-geology, drainage, ground water flow direction of study area.
- To assess impact of due to Fly ash pond on the surface and ground water of the area.
- To assess the ground water availability, quantity, quality and its development.
- Evaluation of storm water availability and required measures for rainwater harvesting and artificial recharge structures and estimation of recharge potential to ameliorate the adverse impact on ground water regime.

4. SCOPE OF WORK

- For achieving the desired objectives it has been decided to undertake following studies and investigations in and around the project area.
- Detailed hydro-geological investigation in and around the project site (within a radius of 10 Km from site) to access the ground water availability, potential of development, yield prospects, geological framework etc.
- Physiographic, Geo-morphological and drainage studies to support the hydro-geological investigations and determine the ground water conditions.
- Collation of Scientific data and aquifer data and aquifer characteristics of the area for sustainable ground water development for utilization.
- Groundwater monitoring of establish observation stations for water level measurements in different seasons & respective maps have been prepared as well as water sample collection for determining the quality aspects.
- Detailed assessment of Rainwater computation, quantum of recharge to aquifer and design of recharge structures within the plant complex as per land use details.

5. LOCATION, EXTENT & ACCESSIBILITY

The Thermal power plant by APNRL is spread over the villages Padampur, Srirampur, Kendudih and Birbans under Gamaharia Block of Saraikela-Kharsawan District of Jharkhand. The district has eight administrative blocks viz. Seraikela, Kharsawan, Gamharia, Kuchai, Ichagarh, Nimdih, Chandil and Rajnagar. The district comprises of 172 numbers of panchayats and 2304 no. of villages. The total population of Saraikela district as per the 2011 census is 10, 65, 056 persons with urban population of 2, 58,746 and the rural population of 8,06,310 persons.

The present study area by considering 10 km of radius which comes about 314 sq. km. has been marked. The said area lies between 22°50' 20.2" N longitude & 86° 03' 38.0" E latitude and falling under the Survey of India Toposheet No. 73 F/13 & 73 J/1 (1:1000 scale). The plant area is situated at about 3.0 Km west of a sub urban area known as Kandra. The plant site is at about 0.8 Km from SH-40 which connects Jamshedpur with Saraikela. The site is accessible by all weather roads from Jamshedpur which is located at a distance of 15 Km approximately. Nearest railway station is Birarajpur which is about 1.5 Km S-SW of the plant site.

The administrative map of the district showing the project area is given in Fig. 1. For the purpose of detailed Hydrogeologial study a square area of 10 km2 has been considered, keeping the plant area at the center. The map of the study area is shown in Fig. 2 The satellite image of the study area the giving aerial view and overall depicting important geographic features such as hills, escarpments, drainages and forest cover is given in Fig. 1.

Saraikela district spreading over an area of 2996 sq.km lies between North latitudes 24°43′30″:25°20′30″ and East longitudes 87°27′36″:87°59′10″ with its district headquarter at Sraikela. The district is divided into 8 blocks namely i) Chandil ii) Gumhariya iii) Ichagarh iv) Khansowan v) Kuchai vi) Nindih vii) Rajnagar and viii) Saraikela.

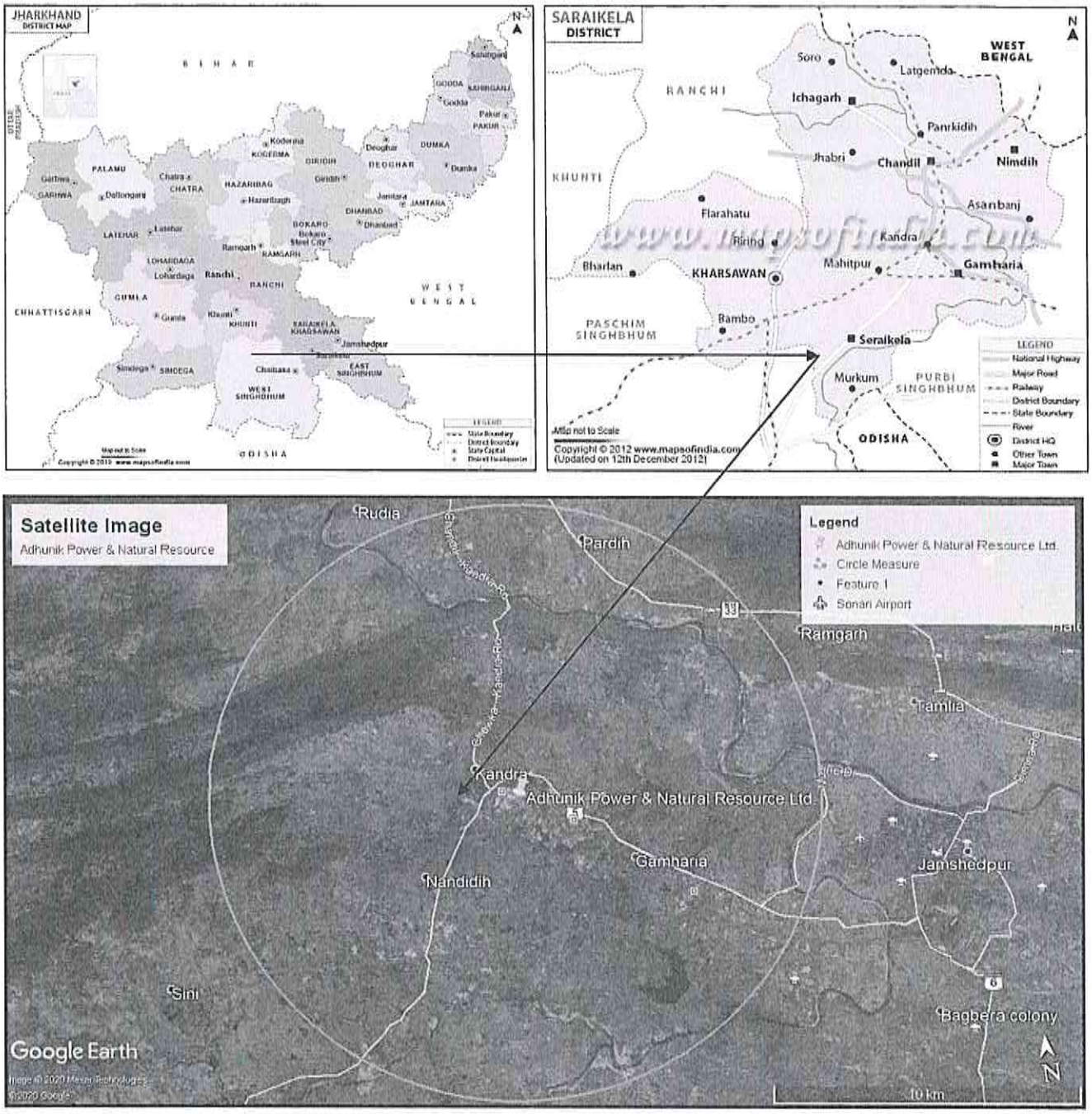


FIGURE 1: SATELLITE MAP SHOWING 10KM RADIUS OF THE STUDY AREA

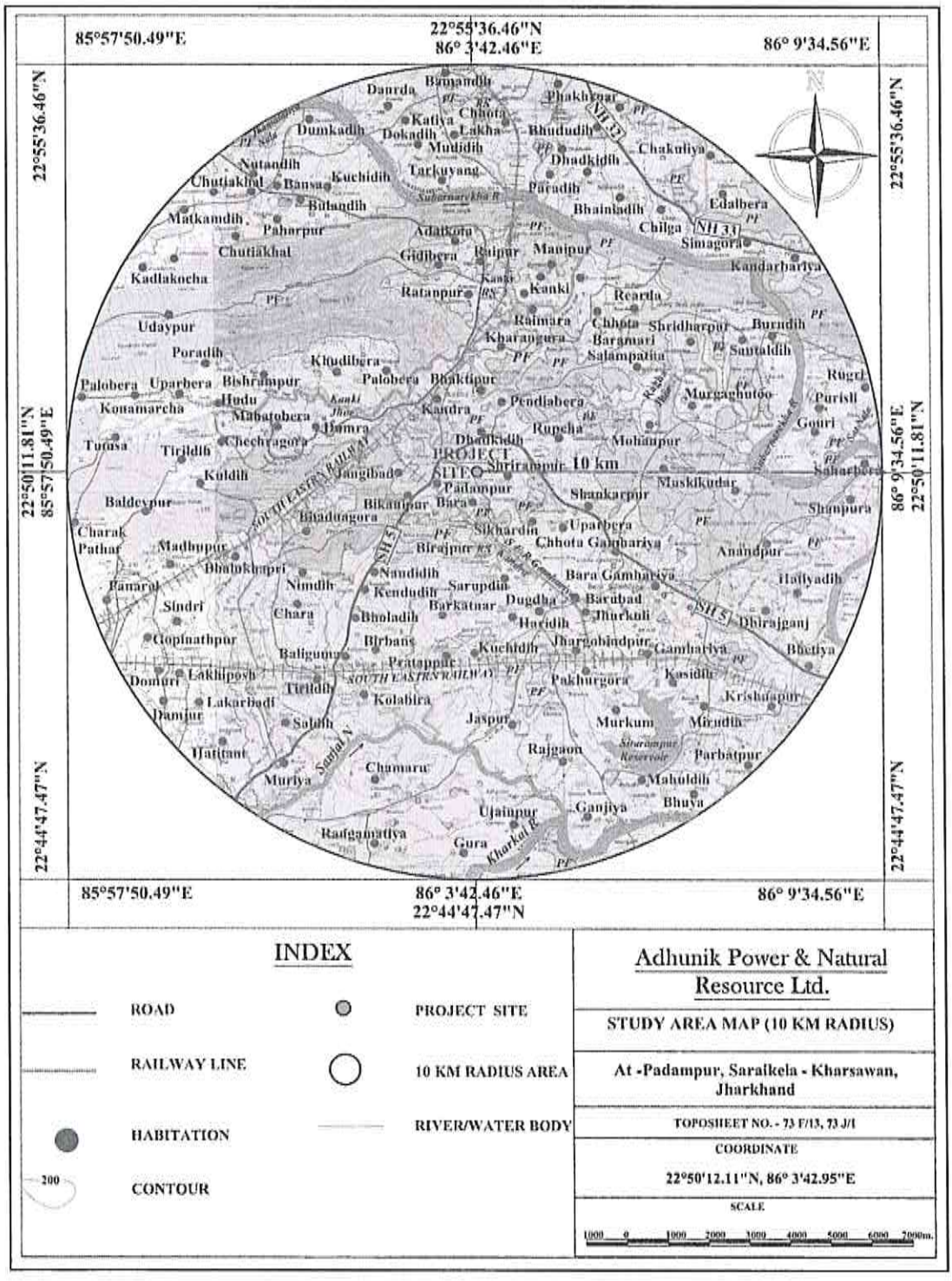


FIGURE 2: TOPOSHEET MAP SHOWING 10KM RADIUS OF THE STUDY AREA

6. SOIL, DRAINAGE AND GEOMORPHOLOGY

The soil is mostly acidic, reddish yellow; light textured and highly permeable with poor water holding capacity.

Geomorphology can be described in terms of several components such as landforms, their nature and characteristics in terms of stability. Geo-morphological set up of the area is surface manifestation of the underlying rock formations and it helps in proper evaluation of the configuration of the bedrock profile when integrated with other hydro-geological parameters. Jamshedpur township area within a periphery of about 20 km radius depicts a mix of flat and undulating topography with flat topped hills and plain areas , the altitude varies from 100-300 m above mean sea level (amsl). The north and south of the township are having hilly areas whose altitudes vary from 150 – 300 mamsl. The general slope is towards Subarnrekha River. The area is drained by Subarnrekha River and its tributaries like Kharkai.

The plant area represents rolling topography, sloping towards north east. There are moderate undulations. The average ground elevation of the plant area is 190 m above mean sea level (amsl), the ash pond area is broadly a saucer shaped valley separated by moderate hills with an average altitude of 200 m amsl. The physiographic set up as well as drainage of the area is largely controlled by sub surface lithology and slope. The basement is made of Singhbhum Group of rocks. On these rocks, gently undulating and almost flat surface with clay and murrum cover has developed in some areas. The topographic features indicate the stage of maturity and subdued relief.

Three major geomorphic units are distinctly identified in the study area, structural hills, weathered pediplains and dissected pediments. The plant area broadly lies in the dissected pediments, however part of structural hills can be seen between the plant area and the Fly Ash Pond area. The Geo-morphological map of the study area is shown in **Fig. 3.** The pediment area is overlain by thin saproloitic material, at places the basement rocks consisting of schists and phylllites are exposed on the surface. The thickness of overlying weathered mantle in the form of top soil plays a significant role in allowing the rain water to percolate downwards and also acts as infiltrating media to allow any contaminant to join ground water.

Subarnarekha River, the main perennial stream, passes through the northern part of the study area, flowing meandering from west to east. Another river, Kharkhahi, passes the study area in the south-eastern direction. The Drainage map of the study area is shown in **Fig. 4.**

Physiographic set up and hydrology of the area would play a significant role in deciding the extent of Fly ash pond dyke, as well as in finalizing the drainage diversions so as to eliminate any adverse impact on the surface water sources due to disposal of fly ash in the area.

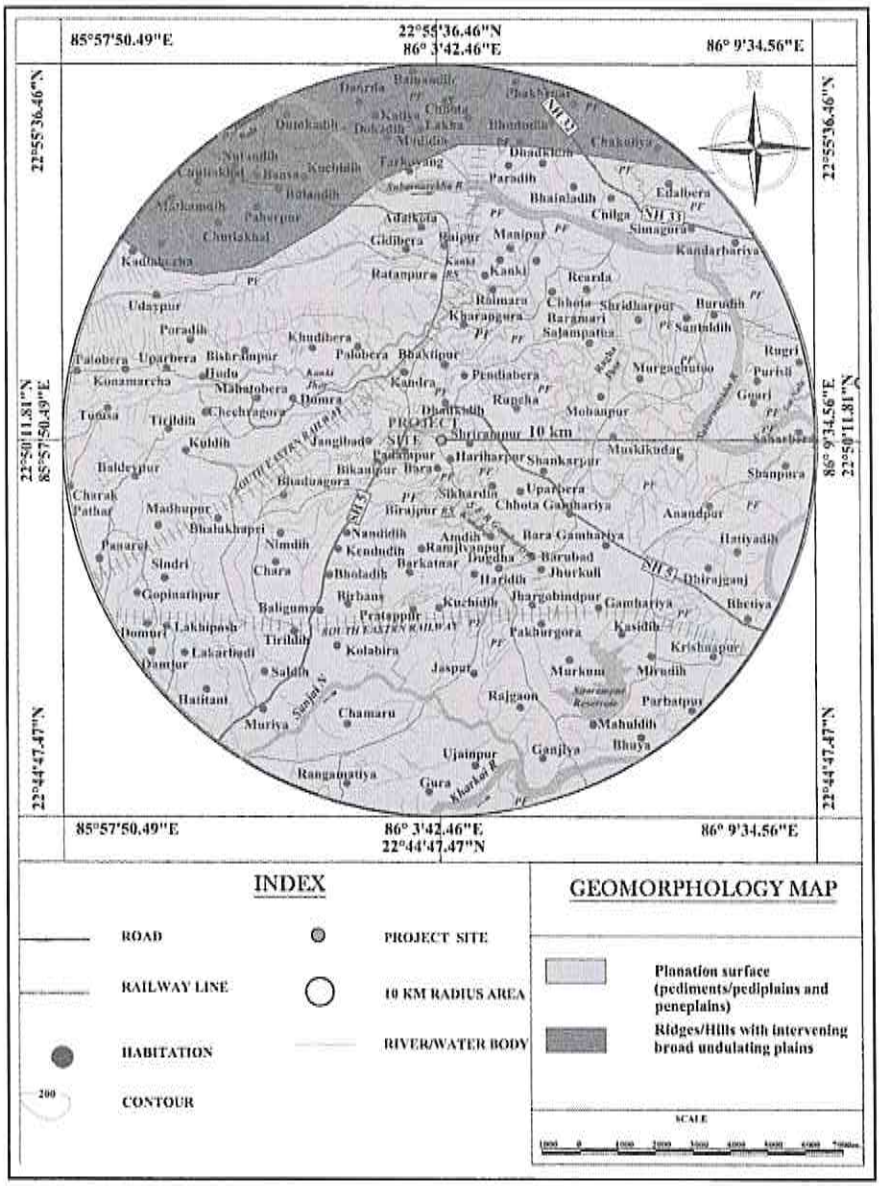


FIG.3 : GEOMORPHOLOGICAL MAP OF THE STUDY AREA

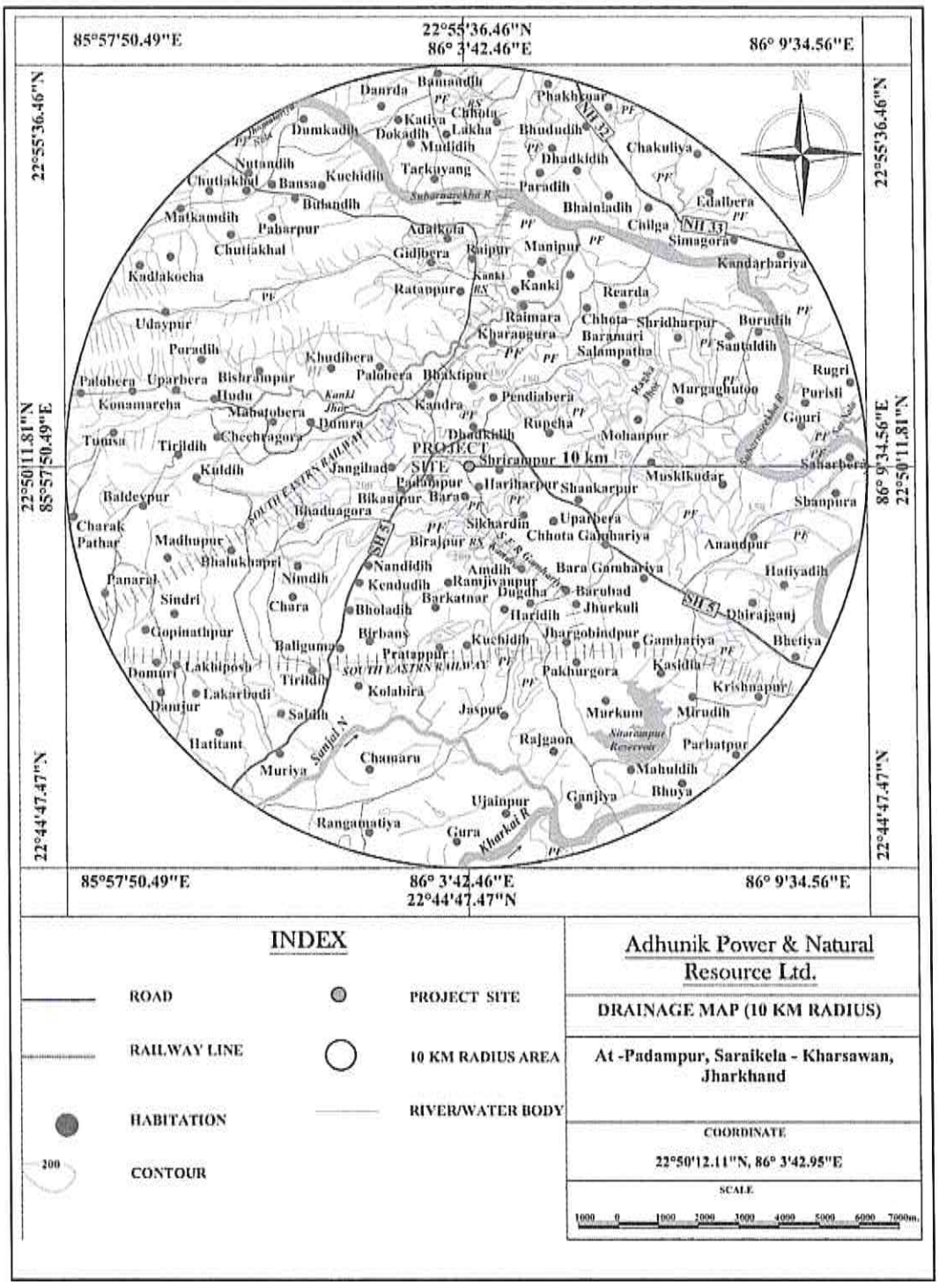


FIG.4: DRAINAGE MAP OF THE STUDY AREA

7. CLIMATE AND RAINFALL

The area represents tropical Climate with three distinct seasons namely winter, summer and rainy seasons. The south-west monsoon is the predominant rainy season of the area; it starts from mid June and extends till mid of October. The climate of the area is also characterized by a hot dry summer, chilling winter and well-distributed rains in the monsoon season. The cold season commences from December and lasts till the end of February. Temperature varies from 40° C in winter to as high as 46° C in summer. The average annual rainfall of East Singhbhum district is 1293 mm. Due to topographic and altitude variations, there is a significant spatial as well as temporal variability in the amount as well as intensity of rainfall in different parts of the district. From the plant area, the nearest meteorological observatory is located at Jamshedpur town, situated at a distance of about 15 km in the east.

In order to assess the regional rainfall pattern, the annual rainfall of Pashchim Singhbhum district from which the Sariakela - Kharsawan district has been carved out for the period 1971 to 2020 is given in table 3.1 along with the graph and histogram (Fig.4) showing the monthly average and annual rainfall variations in last 50 years.

TABLE 1: ANNUAL RAINFALL (MM), (1971-2020)

Year	Rainfall (mm)	Year	Rainfall (mm)	Year	Rainfall (mm)	Year	Rainfall (mm)	Year	Rainfall (mm)
1971	1938.41	1981	1166.84	1991	1338.60	2001	1115.542	2011	1674.63
1972	1191.97	1982	1196.09	1992	953.26	2002	1179.601	2012	1345.63
1973	1239.34	1983	1154.69	1993	1270.06	2003	1997.81	2013	1884.29
1974	1160.65	1984	1385.20	1994	1414.13	2004	1913.90	2014	1667.04
1975	1252.92	1985	1216.80	1995	1123.99	2005	1705.02	2015	1201.16
1976	1267.77	1986	1361.34	1996	1186.85	2006	1878.77	2016	1447.11
1977	1572.49	1987	1248.32	1997	1241.26	2007	2261.56	2017	1493.95
1978	1611.55	1988	1124.34	1998	1236.07	2008	1726.11	2018	1342.13
1979	896.37	1989	1209.58	1999	1254.21	2009	1786.06	2019	1348.05
1980	1358.91	1990	1718.64	2000	997.17	2010	1053.27	2020	1774.10

Meteorological data from 1971 to 2002 from previous report of water solution and from 2003 to 2020 from NASA site (https://power.larc.nasa.gov/).

The average monthly relative humidity of Jamshedpur at 0830 hrs and 1730 hrs is 72 and 61% respectively. The annual average rainfall of the area is 1401.6 mm.

8. GEOLOGY & GROUND WATER SCENARIO

8.1 GEOLOGY

The major rock type of the area is mica schist, Schist, phyllites and Quartzite of Singhbhum group. The thickness of top soil including alluvial cover varies widely in the area, at places the rocks are exposed at the surface, however in the lowland areas the thickness of alluvial cover extends up to 10 to 15m. The area north of Jamshedpur is represented by flat topped hills made up of Dalma volcanic consisting of tuffs, hornblende schist, Carbon phyllites, Quartzite etc. The general geological succession on regional scale is as below.

Geological Succession

Age Group	Lithology
Dalma Volcanics Lower Proterozoic	Epidiorite, Hornblende Schist, Volcanics tuffs, Quartzite, phyllites
Singhbhum group	Mica schist , phyllites, Quartzite

There is a marked difference in the thickness of alluvial cover of the power plant area and the area identified for the Fly ash pond. The thickness of alluvium is comparatively more in the Plant area as compared to ash pond area.

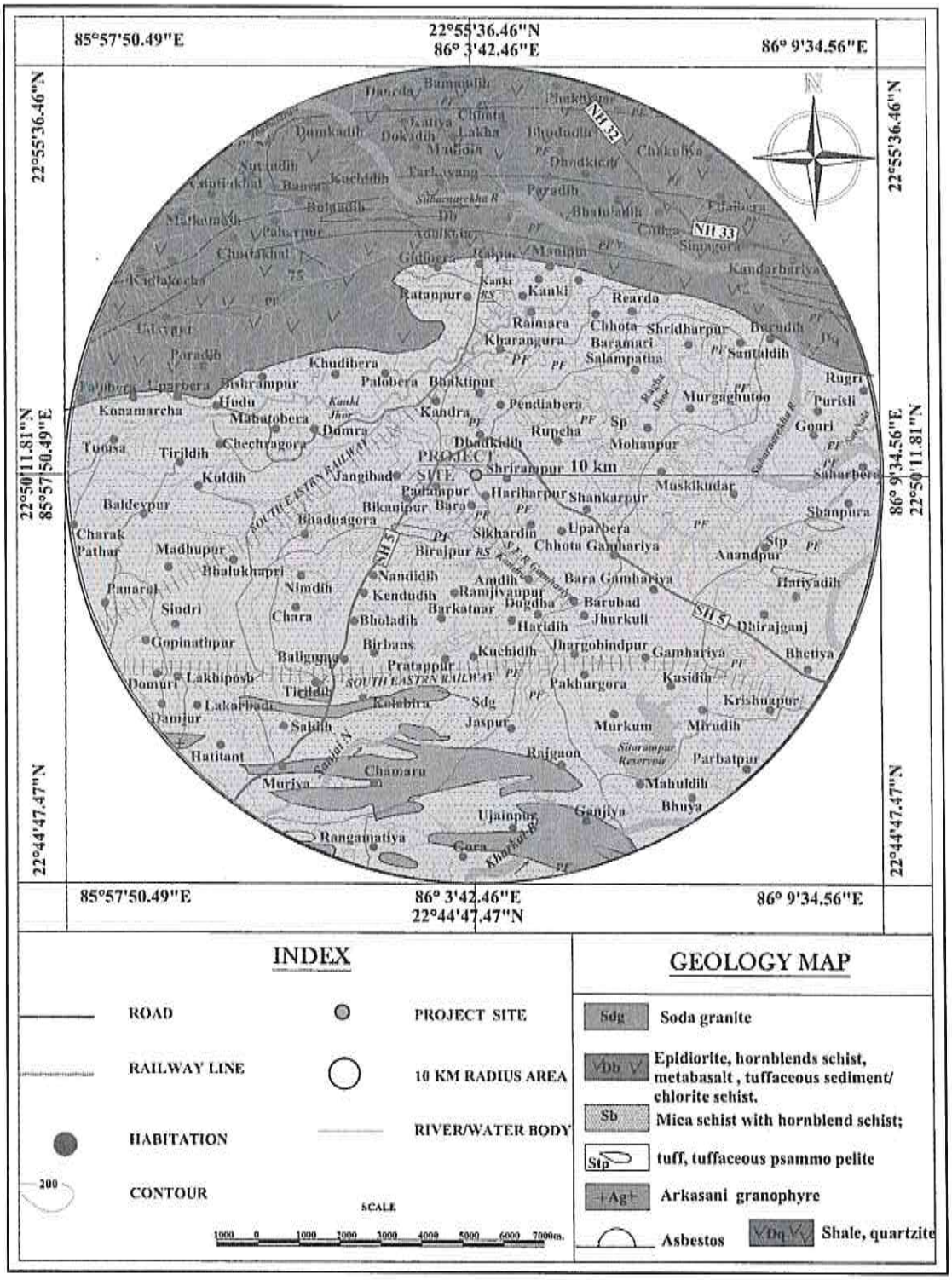


FIGURE 5: GEOLOGICAL MAP OF THE PROJECT AREA

8.2 GROUND WATER SCENARIO

The southern part of the district is underlain by Granite-gneiss of Achaean age forming the basement. These occur as large batholiths and are intruded by basic rocks. In the central and northern part of the district the rocks of Barakar formation consisting of feldspathic sandstones, shales and coal seams overlying the metamorphic are exposed. In the western and northern part of the district alluvial cover of moderate thickness, caps the Archaean crystalline and the Gondwana sedimentaries. The district is underlain by diverse geological formations with complex tectonic framework. The geological formations have been grouped under three main categories;

a) The gneissic complex in the southern and the central part

b) The Rajmahal traps in the eastern and southeastern part

c) Gondwanas overlain by thin mantle of alluvial cover in the northern and central part.

Ground water occurs mostly under phreatic condition in all the lithological units within the shallow aquifers and locally under semi confined and confined condition in deeper aquifers

In the project area, the unconfined condition exists in the weathered mantle portion of the rocks. Depth of weathered mantle varies from 15-34 m in general. The water level of this aquifer varies from 4.30-7.90 m bgl in post- monsoon season and 9.00-10.90 mbgl in the pre-monsoon season. The general ground water flow is towards south west. The ground water table in the ash pond area varies between 265-285 m amsl. The gradient is moderately high in the foot hills and dies down as one move in the plain area. The aquifer formed by top weathered zone is not very productive, very often a kankar zone is also encountered along with the weathered mantle. The aquifer is generally tapped through dug wells / open wells, the depth of which varies from 10 to 15 mts, occasionally up to 20 mts. The yield of these wells is moderate and supports drinking water needs. Depending upon the rainfall, some of these wells get dried up during summer.

8.3 ANALYSIS OF WATER LEVELS

The ground water levels observed over a period provides valuable information on the behavior of the ground water regime, which is constantly subjected to changes due to recharge and discharge phenomenon. A balance between recharge and discharge results in the decline or rise in the ground water storage. When the recharge exceeds discharge, there will be a rise in the ground water storage and vice versa. The decline in water level may be due to increase in draft (for different purposes) or decrease in precipitation (less recharge to ground water). On the other hand, a rise in water level may be due to an increase in rainfall and/or due to changes in irrigation practices. Four times measurements of depth to water level in different seasons give an overall idea regarding the ground water levels in the area during the year of measurement.

The fluctuation in comparison to pre-monsoon & post-monsoon periods gives an idea about the change in the seasonal ground water levels for a particular year gives an idea about the change in the amount of draft and rainfall between the pre-monsoon & post-monsoon periods.

8.4 GROUND WATER MONITORING AND WATER LEVELS

Number of wells has been constructed by M/s. Adhunik Power in the villages within as well as adjoining project area under its Corporate Social Responsibility (CSR) programme so as to provide safe drinking water for the village peasants. The details of which are provided in table 2.

TABLE: 2: DETAILS OF WELLS CONSTRUCTED BY APNRL IN SURROUNDING VILLAGES

Sr. No.	Name of Village	Depth Drill (ft)	Length of Casing Pipe (ft)	Yield
1.	Kendudih	300	45	1/2"
2.	Kendudih	688	48	Dry
3.	Rajiwanpur	300	58	2"
4.	Rajgora (Ramjiwanpur)	226	77	2"
5.	Rajgora (Ramjiwanpur)	466	54	2"
6.	Sri Rampur	466	45	3"
7.	Sri Rampur	207	34	1 ½"
8.	Sri Rampur	559	126	1 ½"
9.	Bara Hariyarpur	466	90	4"
10.	Chhota Hariyarpur	503	20	1"
11	Bikanipur	466	20	2 ½"

The details of wells inventoried during the field visit in and around the project area including the geographical coordinates, ground elevations determined with the help of hand held GPS are given in Table 3. Based on observed water levels in different seasons, the depth to water level maps are prepared. The review of these maps indicated that, the depth to water levels in pre-monsoon season ranges between 1.2-6.9mbgl and post-monsoon season ranges between 0.9 to 6.7mbgl.

In view of the design of ash pond, it is preferable to monitor the performance of the bund throughout its operation. The equipments for such monitoring are same as that used for monitoring of dams. We have installed Piezometer at suitable locations for identified on each side of the dyke and monitor the ground water level and quality on regular basis. The measurements are regularly carried out (every month) and the record is maintained. **(Attached Photographs of Installed Piezometer in Annexure-I)**

TABLE NO: 3 GROUND WATER MONITORING & SAMPLE LOCATIONS

Pre-monsoon ground water monitoring has been done during May 2020 and Post monsoon ground water monitoring done at the end of December 2020.

Sr. No.	Latitude	Longitude	Elevation mt	Village	Type of Well BW / DW	Dia. in Mtrs.	HOP mt	MP mt	Total Depth mt	Pre monsoon mbgl	Post monsoon mbgl	Litho logy Observed	Date
1	22°48'55"	86°4'22"	243.73	Amdih	DW	1.90	0.50	3.00	6.09	2.80	2.50	Unseen	03.12.2020
2	22°48'22"	86°4'12"	228.05	Haridih	DW	2.90	0.85	5.00	8.00	Dry	4.15	Unseen	03.12.2020
3	22°47'51"	86°3'28"	213.25	Kuchidih	DW	2.80	0.60	1.50	7.50	1.20	0.90	Unseen	03.12.2020
4	22°48'13"	86°2'0"	280.00	Pratapur	DW	1.50	0.60	7.20	9.00	6.90	6.60	Unseen	03.12.2020
5	22°48'45"	86°3'19"	226.02	Ramjivanpur	DW	4.00	0.70	4.00	9.75	3.50	3.30	Unseen	03.12.2020
6	22°48'42"	86°2'23"	224.91	Kendudih	DW	2.90	0.60	4.40	15.00	4.00	3.80	Unseen	04.12.2020
7	22°51'40"	86°3'58"	237.47	Pindrabeda	DW	2.80	0.40	7.10	11.00	Dry	6.70	Unseen	04.12.2020
8	22°50'19"	86°3'19"	239.18	Padampur	DW	2.00	0.50	6.00	12.00	5.90	5.52	Unseen	04.12.2020
9	22°49'56"	86°3'25"	249.00	Hariharpur	DW	3.10	1.40	6.30	12.00	5.20	4.90	Unseen	04.12.2020
10	22°50'10"	86°3'52"	235.20	Shrirampur	DW	1.00	0.20	6.60	10.00	5.91	6.40	Unseen	04.12.2020
11	22°49'50"	86°3'38"	254.10	Plant Bore-well Near CHP	BW	0.1524	1.00	2.50	60.96	1.72	1.50	Unseen	04.12.2020
12	22°50'27"	86°3'29"	232.18	Plant Site office	BW	0.1524	0.00	0.69	60.96	0.89	0.69	Unseen	04.12.2020
13	22°48'55"	86°4'22"	233.25	Plant Bore-well Near Ask Dyke (NW Boundary)	BW	0.1524	1.00	2.68	60.96	1.91	1.68	Unseen	04.12.2020
14	22°48'42"	86°3'18"	239.74	Ramjivanpur	Pond (Surface Water)								03.12.2020
15	22°50'3"	86°3'12"	243.69	Padampur	Pond (Surface Water)								04.12.2020
16*	22°49'50"	86°3'47"	238.70	Shrirampur	Pond (Surface Water)								04.12.2020

8.5 STATUS OF GROUND WATER AND SURFACE WATER QUALITY SURROUNDING ASH PONDS

The water quality in the Study area was assessed through physicochemical analysis of ground water samples collected during December 2020. The existing status of ground water quality was assessed by identifying 13 ground water samples (Dug well/Bore well) in different villages and status of surface quality assessed by identifying 3 water samples in different locations.

TABLE NO.4
SAMPLING LOCATIONS FOR WATER QUALITY MONITORING (16 LOCATIONS)

Sr. No.	Latitude	Longitude	Elevation mt	Village	Source & Ground water GW/Surface Water (SW)	Dist (Km) & Direction from Ash Pond
1.	22°48'55"	86°4'22"	243.73	Amdih	Dug Well	2.7 /SE
2.	22°48'22"	86°4'12"	228.05	Haridih	Dug Well	3.6/SSE
3.	22°47'51"	86°3'28"	213.25	Kuchidih	Dug Well	4.4/S
4.	22°48'13"	86°2'0"	280.00	Pratapur	Dug Well	4.7/SW
5.	22°48'45"	86°3'19"	226.02	Ramjivanpur	Dug Well	2.8/SSW
6.	22°48'42"	86°2'23"	224.91	Kendudih	Dug Well	2.9/SSW
7.	22°51'40"	86°3'58"	237.47	Pindrabeda	Dug Well	3.6/SW
8.	22°50'19"	86°3'19"	239.18	Padampur	Dug Well	2.4/N
9.	22°49'56"	86°3'25"	249.00	Hariharpur	Dug Well	0.4/W
10.	22°50'10"	86°3'52"	235.20	Shrirampur	Dug Well	0.8/SW
11.	22°49'50"	86°3'38"	254.10	Plant Bore-well Near CHP	Bore well	0.6/SW
12.	22°50'27"	86°3'29"	232.18	Plant Site office	Bore well	0.8/SSE
13.	22°48'55"	86°4'22"	233.25	Plant Bore-well Near Ask Dyke (NW Boundary)	Bore well	0.2/SSE
14.	22°48'42"	86°3'18"	239.74	Ramjivanpur	Pond (Surface Water)	0.8/S
15.	22°50'3"	86°3'12"	243.69	Padampur	Pond (Surface Water)	0.2/NW
16.	22°49'50"	86°3'47"	238.70	Shrirampur	Pond (Surface Water)	2.7/SE

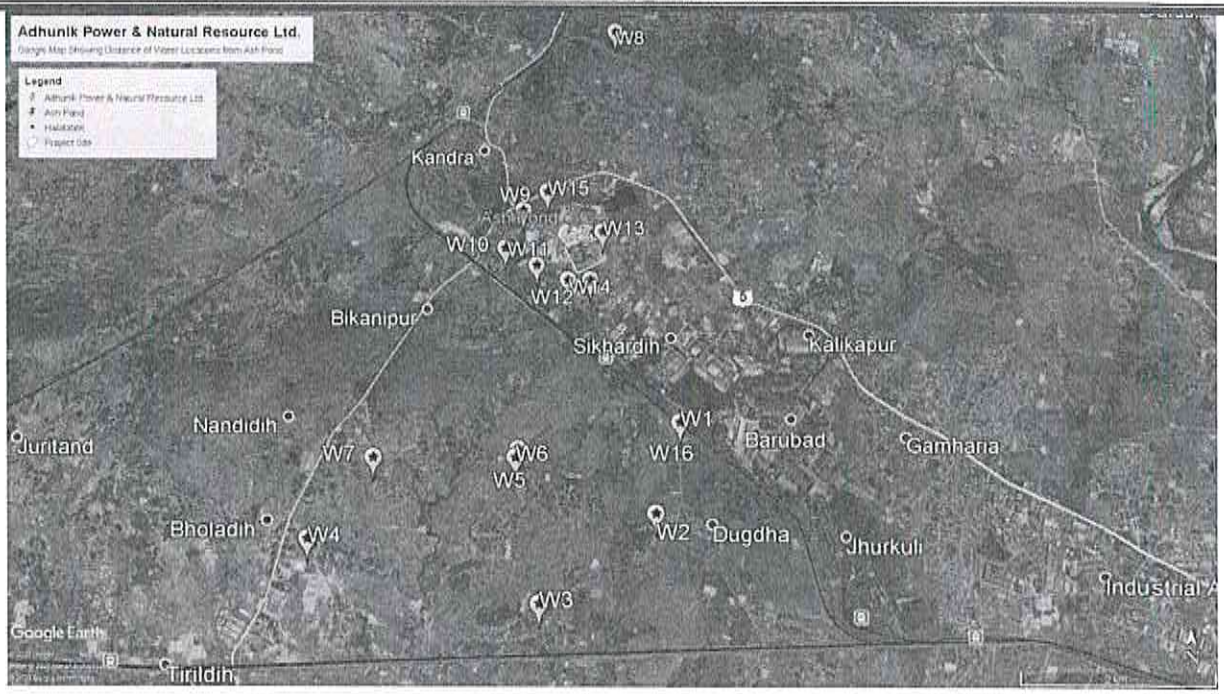


FIGURE 6 : WATER QUALITY MONITORING MAP

8.5.1 Assessment of Ground water Quality

To establish the base line status of water quality in the study area selected water quality sampling were carried out on random sampling basis during the winter season of 2020. **The collected samples were characterized for physico-chemical and bacteriological analysis covering 35 parameters as per IS 10500.** Total number of ground water sampling carried out at thirteen locations, three surface water locations were also covered. Total 16 nos of samples were analyzed. The analysis reports for surface water bodies are presented in Table nos. 8 and ground water sources were presented in Table No.7.

Observations on analysis reports – The physical parameters like colour, odour, taste and turbidity are well within the acceptable limits for Ground water. The observed pH values ranging between 7.37 to 7.78 are well within the desirable range of 6.5 to 8.5 units.

1. Total hardness, as CaCO3 observed in the range between 114.39 to 331.97 mg/l, which exceeds the acceptable limit of 200 mg/l in ground water of Amdih, Haridih and Kendudih village hand pump. However all the results of ground water within the permissible limits of 600 mg/l . Iron

was observed between BDL (DL- 0.01) to 0.24 mg/l, and is within the acceptable limit of 1.0 mg/l. Chloride concentration was observed between the range of 38.74 to 75.02 mg/l, and is well within the acceptable limit of 250 mg/l.

2. Total dissolved solids were observed in the range between 252 to 642 mg/l, out of 13 location TDS is higher at 02 location as compared to acceptable limit of 500 mg/l. However higher value of < 2000 TDS is permissible.
3. Concentration of calcium was observed between 27.29 to 68.31 mg/l, which is well within the acceptable limit of 75 mg/l.
4. Levels of copper, manganese, Aluminium, Boron were observed below the detection limits and are well within the acceptable limits.
5. The concentration of sulphate was observed between 9.06 to 38.17 mg/l, which is well within the acceptable limit of 200 mg/l. The concentration of nitrate, as NO3, was observed between BDL to 30.38 mg/l, which is well within the acceptable limit of 45 mg/l.
6. Fluoride concentration was observed in the range between BDL (DL – 0.1) to 0.42 mg/l, which is within the desirable limit of 1.0 mg/l.
7. Phenolic compounds, cadmium, zinc, nickel, molybdenum, manganese, arsenic, cyanide, aluminium, boron, copper and anionic detergents were below detection limits.
8. Concentration of Barium was observed in the range 0.02 to 0.11 mg/l, which is well within the desirable limit of 0.7 mg/l.
9. Alkalinity was observed between 86.93 to 211.83 mg/l, which is within the permissible limit of 600 mg/l. The observed values exceed the acceptable limit of 200 mg/l at 1 out of 13 stations.
10. It is, therefore, concluded that the ground water is, more or less, suitable for use as potable water.
11. Overall summation – Higher value of TDS at 2 locations is an indication of mineralised water (with higher dissolved solids) and can be used in case of alternate sources.

TABLE NO. 5
COMPARATIVE STUDY OF DESIRED GROUND WATER PARAMETERS (AS PER INPUTS RECEIVED FROM ADHUNIK)

Sl. No.	Test Parameter	Range based on February-2010 study		Range based on December-2020 study	
		Minimum	Maximum	Minimum	Maximum
1	pH	6.9	7.4	7.37	7.78
2	Total hardness, as CaCO3	128	308	114.39	331.97
3	Iron	0.13	0.90	BDL(DL- 0.01)	0.24
4	Total dissolved solids	251	572	252	642
5	Calcium	44	99	27.29	68.31
6	Sulphate	6	28	9.06	38.17
7	Nitrate	3	24	BDL (DL- 2)	30.38
8	Fluoride	0.31	0.50	BDL (DL- 0.1)	0.42
9	Zinc	0.31	0.47	BDL (DL- 0.1)	BDL (DL- 0.1)
10	Alkalinity	147	269	86.93	211.83
11	Phenolic compounds, cadmium, zinc, nickel, molybdenum, manganese, arsenic, cyanide, aluminium, boron, copper and anionic detergents.	BDL		BDL	

Note: In February-2010, ground water quality was studied at seven locations of the study area by Water Solution, New Delhi. Recently in December-2020, ground water quality in the study area was carried out at thirteen locations by M/s Anacon Laboratories Pvt. Ltd., Nagpur, MOEFCC (EPA approved), NABL approved lab with NABET accreditation in Thermal Power Plant Cat A.

8.5.2 Assessment of Surface Water Quality

Water quality of the river water/pond water can be assessed using physical, chemical and biological characteristics of the water. Among the physical and chemical parameters, dissolved oxygen (DO), Bio-chemical Oxygen Demand (BOD), pH and concentration of heavy metal are important parameters for the water quality monitoring. High concentration of DO, low concentration of BOD, non-detectable heavy metal and optimum alkaline range of pH in surface waters indicate a good water quality.

1. Concentration of Dissolved oxygen was observed in the range 6.2 to 6.4 mg/l, which is well within the desirable limit of IS - 2296 class C.
2. Concentration of Biological oxygen demand was observed in the range BDL (DL - 2) to 5.83 mg/l, which is well within the desirable limit of IS - 2296 class C except one location. The observed values exceed the desirable limit of 3 mg/l at Ramjivanpur pond water (22°48'42", 86°3'18")
3. Concentration of pH was observed in the range 6.86 to 7.62 mg/l, which is well within the desirable limit of IS-2296 class C.
4. Phenolic compounds, cadmium, zinc, nickel, manganese, arsenic, cyanide, aluminium, boron and copper were below detection limits.
5. Iron was observed between 0.22 to 0.53 mg/l, and is within the desirable limit of IS-2296 class C.

9. IMPLEMENTATION STATUS OF RAINWATER HARVESTING STRUCTURE

As per the database and evident, a total quantum of 4,23,903 cu.m. (4,239 lakh litres) of rain water are being fruitfully harvested annually by constructing suitable recharge structures. In order to design the recharge structures, hourly runoff of 40 mm/hr has been taken into account. APNRL have constructed 14 No. of Rain water Harvesting Structure as per Approved design from ground water Authority.

TABLE NO. 6 RWH ALONG WITH COORDINATES AND LOCATIONS

RWHP NO	Location	Coordinates	
1	Cooling Tower II	86°03'47.6"E	22°50'06.0"N
2	Front of Civil office	86°03'51.3"E	22°50'10.7"N
3	Near transformer yard	86°03'49.1"E	22°50'12.2"N
4	DG no 02	86°03'47.8"E	22°50'16.3"N
5	DM plant	86°03'52.6"E	22°50'27.5"N
6	Clarifier (DM Plant)	86°03'48.4"E	22°50'29.3"N
7	Admin building	86°03'36.2"E	22°50'22.7"N
8	Nursery	86°03'27.5"E	22°50'26.7"N
9	Sludge pit (DM plant)	86°03'46.6"E	22°50'28.7"N
10	Security barrack	86°03'33.1"E	22°50'10.7"N
11	Canteen(CHP office)	86°03'40.9"E	22°49'49.9"N
12	Switch yard	86°04'04.8"E	22°50'21.9"N
13	Clarifier (AHP Plant)	86°03'33.9"E	22°50'15.4"N
14	Stacker area	86°03'34.9"E	22°50'02.3"N

FIGURE 7: GOOGLE MAP SHOWING 14 RWH STRUCTURES AT ADHUNIK POWER & NATURAL RESOURCES LTD.

9.1 SUGGESTION FOR STRENTHENING THE RAIN WATER HARVESTING SYSTEM

- All the storm water drains should be kept clean and Connection of down spouts should be provided wherever required so as to divert the runoff systematically to the RWH structures.
- Contaminated water should never be diverted into the storm water drains. It should be separately collected and treated before disposal.
- Necessary peripheral drains should be systematically planned constructed to divert the runoff to the recharge structures.
- Before the onset of the monsoon all the catchment area considered for recharge should be thoroughly cleaned in order to avoid possible contamination as a part of preventive action. The recharge structures would be fully operational during the monsoon season, so as to avoid any contamination.
- A mesh should be provided on the mouth of the inlet to discard the debris entering into the recharge pit. A sluice/ shutter should be provided to ensure that no water other than rainwater is diverted to the recharge structure.

- Depth and location of the recharge wells may vary slightly as per the prevailing site conditions.
- As per the ref. letter no.G.W.D.263/Ranchi. Dtd. 01/08/2011. Adhunik Power has constructed 14 No. of Rain water Harvesting Structures.
- The Photographs of recharge structure is as under **Figure 8.**

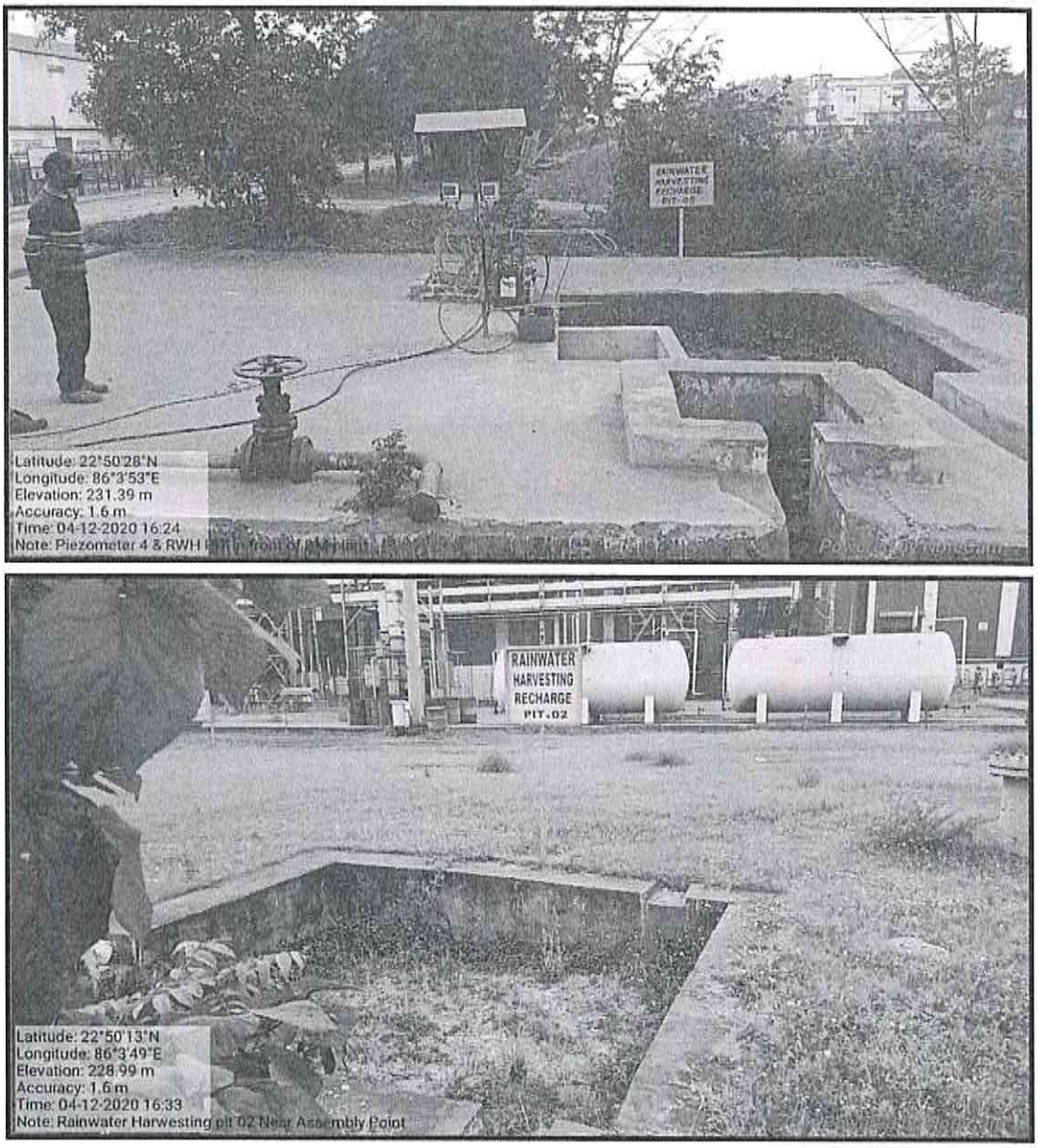


FIGURE 8: PHOTOGRAPHS OF CONSTRUCTED RECHARGE STRUCTURE IN PLANT PREMISES

9.2 RECYCLING AND REUSE OF WATER

Water recycling is an essential component of managing our water resources efficiently and making the most of a resource that is often wasted. Water recycling adopts the concept of using water that is 'fit for purpose'. In practice this means using high quality water for drinking and other personal uses, but not necessarily for purposes where alternative water sources can be safely used, such as toilet flushing, garden watering and crop irrigation.

The world's population is expected to increase manifolds in the couple of decades -and with this growth will come an increased need for water to meet various needs, as well as an increased production of wastewater. Moreover, there has been significant decline in runoff in the surface water catchments and recharge to groundwater resources, in general. This has increased pressure on the water resources in the area.

Many areas throughout the world are approaching, or have already reached, the limits of their available water supplies. This subsection details out the recycle or reuse of wastewater with the sole objective to minimize the water demand during the operation phase of the project.

9.3 REUSE APPLICATION

Quantity and quality requirements are considered for each reuse application, as well as any special considerations necessary when reclaimed water is substituted for more traditional sources of water. The common key elements of water reuse are supply and demand, treatment requirements, storage, and distribution. There are a number of practical options for using recycled water which is as listed below ;

- Industrial Reuse
- Horticulture/Green Belt Development

➢ **Ash Ponds as Designed at APNRL**

❖ Fly ash is known to be an inert material. But, there is always an apprehension about certain soluble chemicals in the decanted water as also leachates from the ash ponds which can have adverse effect if such decanted water or leachate is let into a river body or ground water. Considering the geological as well as hydro-geomorphic set up, following constructed with HDPE Lining to ensure impermeability. High Density

Polythene (HDPE) is a thermoplastic polymer produced from the monomer ethylene. It is sometimes called "alkathene" or „polythene". It has a very high strength to density ratio. The density of HDPE can range from 930 to 970 kg/m3. HDPE is used in the production of many items including geomembranes. HDPE geo-membrane has a lower tendency to exchange ions with leachate constituents and maintains its integrity as a barrier over the time. This application is widely used in power plants, copper/zinc smelters etc. There are standard HDPE lining producers which can install the lining geo-membrane in the fly ash ponds. However, this technology is little expensive but none the less this provides better results and prevention from ground water contamination in the aquifers systems lying below the ash ponds. HDPE sheets were used for construction of both the Ash Ponds of APNRL. Further, cemented dykes were provided all along to avoid coming out of leachates from the side of the ponds.

- Thus, there is hardly any chance of leachates coming out of the ash ponds of APNRL contaminating the groundwater. Four piezometers have been constructed at four prominent spots within the plant. These four piezometers are being monitored on regular basis so as to understand the chances of groundwater contamination through ash disposal and by any other means.

- Another important aspect of construction of Ash Ponds is the design of ash dykes is the internal drainage system. This is an important safety aspect. The seepage discharge from internal surfaces must be controlled with filters that permit water to escape freely and also to hold particles in place and the piezometric surface on the downstream of the dyke. The internal drainage system consists of construction of rock toe, 0.5m thick sand blanket and sand chimney. After completion of the final section including earth cover the turfing is developed from sod on the downstream slope. However, since none of these ash ponds were filled up at all during operation and are now being evacuated gradually, there is hardly any chance of decanted water coming out of the Ash Ponds presently. Thus, there is hardly any chance of any surface water contamination due to ash disposal into the ash ponds.

➢ **FLY ASH UTILIZATION**

- It has been observed that during the year 2018-19, , a total amount of 1,997,209.24 Metric Tons of Coal was consumed throughout the year with an average monthly consumption of 166,434.10 tons of coal consumption. This has resulted in Fly Ash generation of 748,441 Metric Tons over the entire year with an average monthly production of 62,370.08 Metric Tons of Fly Ash. As per the report, the entire amount of „Fly Ash", as generated was utilized for different purposes especially for reclamation of low lying areas i.e. „Land Fill" purposes, in making Fly Ash based Bricks / Tiles / Blocks and in manufacture of Portland Pozzolana Cement.

- In the subsequent year of 2019-20, a total amount of 2,10,63,42 Metric Tons of Coal was consumed throughout the year with an average monthly consumption of 1,75,529 Metric tons of coal consumption. This has resulted in Fly Ash generation of 9,45,559 Metric Tons over the entire year with an average monthly production of 7,87,97 Metric Tons of Fly Ash. However, Fly Ash Utilization is 97.8 % i.e. entire amount of fly ash thus generated is getting utilized in various purposes, mostly for reclamation of low lying areas i.e. „Land Fill" purposes. Fly ash produced in the plant was also utilized in making Fly Ash based Bricks / Tiles / Blocks and in manufacture of Portland Pozzolana Cement. Sometimes, Fly Ash was also utilized for raising of „Ash Dykes". *Fly Ash -18391.5 MT & Bottom Ash - 2710.2 MT has been accumulated in ash pond due to Lock down and disposed in the month of April 2020.

- In the current year of 2012-21, it was observed during the fieldtrip that no ash is getting deposited within the „Ash Pond". The entire ash, whatever kind is coming to two silos, already described and from there, the ash is getting poured into polythene bags/ packets through a mechanical process. Once, the bag gets filled up, the mouth of the bags/ packets are also sealed through a mechanical process and transferred to trucks and lorries, also in a mechanical manner. Thereafter, these bags full of fly ash are getting transported to Ready Mix/ Cement Factories and for Land Filling purposes. Even the already accumulated ashes in the ash ponds are getting utilized so as to make the ash

pond empty. Thus, at this moment 100% of the ash produced is getting utilized now. A number of automatic sprinklers are there to arrest the suspended dust to stop the air pollution from the suspended ash in the air from the silo at the time of loading of ash within the bags/ packets from the silo.

- The APNRL Authority has decided that from the year 2020-21, the entire amount of Fly Ash as also the Bottom ash i.e. 100% of the ash that will be produced, will be utilized for various purposes . A quarterly account of „Fly Ash" generations in four quarters of the year as also proposed utilizations of the ash generated have been provided. It has been envisaged that a total amount 1,330,846 MT of ash will be generated in the year 2020-21 and this entire amount of Fly Ash will be utilized for three different purposes, namely Brick Manufacturing, Ready Mix concrete/ Cement Manufacturing and Road Construction. Remaining Fly Ash within the Ash Pond will also be utilized to make the entire ash pond empty. In such a situation, chances for heavy metal contamination of groundwater and/or surface water will be insignificant if not negligible from the leachate or from the decanted water. Thus a permanent and environment friendly solution to the problem for fly ash and bottom ash disposal generated in the Adhunik Power Plant has become available and implemented successfully.

A) FLY ASH GENERATION & UTILIZATION FOR THE PERIOD OF APRIL 2018 TO MARCH 2019

	Ash Generation and Utilization						Mode of Ash Utilization and Utilization In Each Mode					
Sl. No.	Months	Coal Consumed	Ash Contents of Coal (%)	Fly Ash Generation	Fly Ash Utilization	%age Utilization	In Making of Fly Ash Based bricks /Blocks /Tiles etc	In manufacturing of Portland Pozzolana Cement	Part replacement of Cement in Concrete	In Ash Dyke Raising	In Reclamation of Low Lying Area	Others(Bottom Ash disposed in Ash Pond)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1	APRIL	127130.01	38.85	41983	41983	100.0%	2305	1289		2009	36380	
2	MAY	251304.54	41.64	88950	88950	100.0%	1935	1084		35366	50565	
3	JUNE	199618.60	47.31	80271	80271	100.0%	2155	15696		27223	35196	
4	JULY	237372.92	47.25	95344	95344	100.0%	2560	15732		16353	60700	
5	AUGUST	136659.33	47.47	55140	55140	100.0%	4274	16748			34117	
6	SEPTEMBER	150450.15	43.79	55997	55997	100.0%	2566	16484			36947	
7	OCTOBER	174298.55	42.36	62761	62761	100.0%	3721	14737			44304	
8	NOVEMBER	187794.14	42.33	67564	67564	100.0%	3491	10428			53645	
9	DECEMBER	143684.00	45.11	55096	55096	100.0%	6365	10956			37775	
10	JANUARY	87490.00	43.14	32081	32081	100.0%	4225	11003	1334		15519	
11	FEBRUARY	123042.00	47.74	49930	49930	100.0%	6159	17539	1323		24909	
12	MARCH	178365.00	41.77	63324	63324	100.0%	5455	16703	2243		38924	

B) FLY ASH GENERATION & UTILIZATION FOR THE PERIOD OF APRIL 2019 TO MARCH 2020

	Ash Generation and Utilization						Mode of Ash Utilization		
Sl. No.	Months	Coal Consumed	Ash Contents of Coal (%)	Fly Ash Generation	Fly Ash Utilization	%age Utilization	In Making of Fly Ash Based bricks /Blocks /Tiles etc	In manufacturing of Portland Pozzolana Cement	Fly Ash In Reclamation of Low Lying Area
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	APRIL	167555	43.01	72072.61	72072.61	100.0%	5688.52	17360.09	49024.00
2	MAY	160104	44.57	71353.54	71353.54	100.0%	6273.66	18383.01	46696.87
3	JUNE	200528	44.37	88976.30	88976.30	100.0%	5031.01	13583.88	70361.42
4	July	187029	45.69	85444.50	85444.50	100.0%	6772.04	21930.11	56742.34
5	August	220525	40.65	89640.11	89640.11	100.0%	4503.59	22585.10	62551.42

	Ash Generation and Utilization						Mode of Ash Utilization		
Sl. No.	Months	Coal Consumed	Ash Contents of Coal (%)	Fly Ash Generation	Fly Ash Utilization	%age Utilization	In Making of Fly Ash Based bricks /Blocks /Tiles etc	In manufacturing of Portland Pozzolana Cement	Fly Ash In Reclamation of Low Lying Area
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
6	Sep	196408	44.00	86415.82	86415.82	100.0%	5703.61	31611.60	49100.61
7	Oct	160081	42.35	67789.23	67789.23	100.0%	6464.07	27481.76	33843.40
8	Nov	114072	47.24	53889.19	53889.19	100.0%	6847.23	29704.91	17337.05
9	Dec	178892	45.56	81496.96	81496.96	100.0%	11871.56	47089.22	22536.18
10	Jan	199795	46.83	93561.54	93561.54	100.0%	13598.99	63882.14	16080.41
11	Feb	154073	48.61	74902.30	74902.30	100.0%	10688.43	52591.49	11622.38
12	Mar	167281	47.83	80017.39	58915.59	74.0%	6746.99	42876.25	9292.34

*** Fly Ash -18391.5 MT & Bottom Ash -2710.2 MT has been accumulated in ash pond due to Lock down.**

Assumption:

10. POSSIBLE IMPACT ON GROUNDWATER AND SURFACE WATER

The impact on ground water regime is an integral part of the overall environmental impact of the thermal power plant. The impact on ground water and surface water may be in terms of quantity and quality. Since there is no proposal for abstraction of ground water in the project area, it is to meet the total requirement of the plant from surface water sources, it is anticipated that there will not be any impact on availability of ground water resource.

APNRL also conducts ground water level measurement and quality monitoring within 10 km study area surrounding plant site. Periodically ground water and surface water quality monitoring is being carried out in the study area and records are generated and maintained regularly. This ensures evaluation of major impacts if any on ground as well as surface water due to operation of TPP.

However, in all water samples and for all the parameters, observed values are almost similar to those as obtained by M/s Water Solutions before ten years before the setting up of the Thermal Power Plant with a slight variation, may be due to analysis in different set ups. Thus, there is hardly any adverse impact observed on the quality of groundwater & Surface water due to Fly Ash disposal by M/s APNRL.

10.1 INSPECTION AND MONITORING

To limit the potential for failure and reduce the liability associated with environmentally contaminating downstream areas, facility owners should:

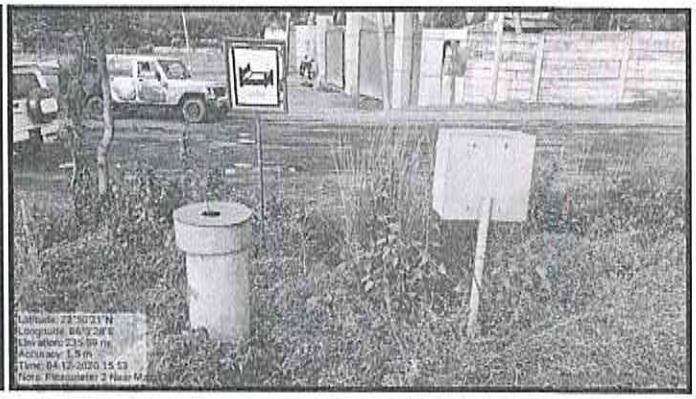
- To Perform periodic inspections of the embankments to assess whether there is erosion or leakage/seepage from the holding ponds that may weaken the embankments. These should be done on an annual basis at a minimum.
- To perform routine chemical analysis of the groundwater to assess whether the pond/landfill is leaching hazardous substances and transporting them beyond the limits of the facility.

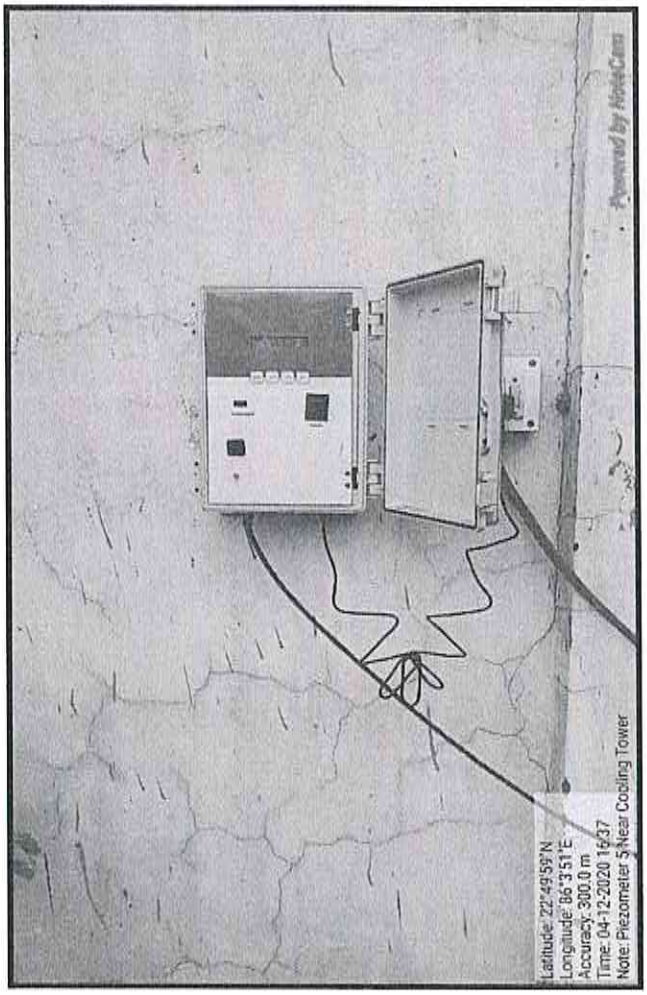
11. CONCLUSION

Ground and surface water quality monitoring is an important tool for evaluation of contaminants due to air and water. Water quality monitored at 16 locations shows that the water is highly mineralized at 2 locations. This may be because of local geological conditions and dissolution of minerals. But in case of alternate sources TDS < 2000 mg/lit is permissible. It is observed that TDS is less than all the 14 locations.

At 14 locations water quality observed is well within the limits.

ANNEXURE-I: PHOTOGRAPHS OF INSTALLED PIEZOMETER





ANNEXURE-II: WATER QUALITY ANALYSIS REPORT

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2	
				Acceptable Limit	Permissible Limit #
1	Total coliform	Per 100 ml	IS 15185 : 2016	Absent	Absent
2	*Escherichia coli*	Per 100 ml	IS 15185 : 2016	Absent	Absent
3	Alkalinity (as $CaCO_3$)	mg/l	IS 3025 (Part 23) : 1986	200	600
4	Anionic surface active agents (as MBAS)	mg/l	IS 13428 : 2005 Annex K	0.2	1.0
5	Colour	Hazen units	IS 3025 (Part 4) : 1983	5	15
6	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	No relaxation
7	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :1988	250	1000
8	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200
9	Free residual chlorine	mg/l	IS 3025 (Part 26) : 1986	Min. 0.2	1
10	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5
11	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100
12	Nitrate (as NO_3)	mg/l	APHA 23rd Edition	45	No relaxation
13	pH	-	IS 3025 (Part 11) : 1983	6.5 to 8.5	No relaxation
14	Phenolic compounds (as C_6H_5OH)	mg/l	IS 3025 (Part 43) : 1992	0.001	0.002
15	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24) : 1986	200	400
16	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000
17	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5
18	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) : 2009	200	600
19	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 1988	0.01	No relaxation
20	Aluminium (as Al)	mg/l	IS 3025 (Part 2) : 2019	0.03	0.2
21	Barium (as Ba)	mg/l	IS 3025 (Part 2) : 2019	0.7	No relaxation
22	Boron (as B)	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4
23	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5
24	Cadmium (as Cd)	mg/l	IS 3025 (Part 2) : 2019	0.003	No relaxation
25	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	No relaxation
26	Lead (as Pb)	mg/l	IS 3025 (Part 2) : 2019	0.01	No relaxation
27	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3
28	Molybdenum (as Mo)	mg/l	IS 3025 (Part 2) : 2019	0.07	No relaxation
29	Nickel (as Ni)	mg/l	IS 3025 (Part 2) : 2019	0.02	No relaxation
30	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation
31	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15
32	Mineral Oil	mg/l	ANqr RES-40	0.5	No relaxation
33	Polynuclear aromatic hydrocarbons				
	Naphthalene	µg/l	ANqr RES - 30	0.1	No relaxation
	Acenaphthylene	µg/l	ANqr RES - 30	0.1	No relaxation
	Acenaphthene	µg/l	ANqr RES - 30	0.1	No relaxation
	Fluorene	µg/l	ANqr RES - 30	0.1	No relaxation
	Anthracene	µg/l	ANqr RES - 30	0.1	No relaxation
	Phenanthrene	µg/l	ANqr RES - 30	0.1	No relaxation
	Fluoranthene	µg/l	ANqr RES - 30	0.1	No relaxation
	Pyrene	µg/l	ANqr RES - 30	0.1	No relaxation
	Benzo(a)anthracene	µg/l	ANqr RES - 30	0.1	No relaxation
	Chrysene	µg/l	ANqr RES - 30	0.1	No relaxation
	Benzo(a)pyrene	µg/l	ANqr RES - 30	0.1	No relaxation
	Benzo(b)fluoranthene	µg/l	ANqr RES - 30	0.1	No relaxation
	Benzo(k)fluoranthene	µg/l	ANqr RES - 30	0.1	No relaxation
	Indeno(123,cd)pyrene	µg/l	ANqr RES - 30	0.1	No relaxation
	Dibenzo(a,h)anthracene	µg/l	ANqr RES - 30	0.1	No relaxation
	Benzo(ghi)perylene	µg/l	ANqr RES - 30	0.1	No relaxation

TABLE NO. 7: GROUND WATER QUALITY ANALYSIS REPORT

Sl. No.	Test Parameters	Unit	Amdih Village	Haridih Village	Kuchidih Village	Pratapur Village
I	**Biological Testing 1.Water**					
1	Total coliform	Per 100 ml	Present	Absent	Absent	Absent
2	*Escherichia coli*	Per 100 ml	Present	Absent	Absent	Absent
II	**Chemical Testing 1.Water**					
3	Alkalinity (as $CaCO_3$)	mg/l	184.36	172.33	132.49	174.38
4	Anionic surface active agents (as MBAS)	mg/l	BDL (DL – 0.01)	BDL (DL – 0.01)	BDL (DL – 0.01)	BDL (DL – 0.01)
5	Colour	Hazen units	1	1	BDL (DL - 1)	2
6	Cyanide (as CN)	mg/l	BDL (DL – 0.005)	BDL (DL – 0.005)	BDL (DL – 0.005)	BDL (DL – 0.005)
7	Chloride (as Cl)	mg/l	59.28	56.32	42.94	58.66
8	Calcium (as Ca)	mg/l	52.36	48.33	34.08	45.22
9	Free residual chlorine	mg/l	BDL (DL – 0.1)	BDL (DL – 0.1)	BDL (DL – 0.1)	BDL (DL – 0.1)
10	Fluoride (as F)	mg/l	0.35	0.28	BDL (DL – 0.1)	0.39
11	Magnesium (as Mg)	mg/l	24.25	25.36	15.74	19.20
12	Nitrate (as NO_3)	mg/l	24.61	22.38	7.44	30.38
13	pH	-	7.61 at 25°C	7.62 at 25°C	7.45 at 25°C	7.58 at 25°C
14	Phenolic compounds (as C_6H_5OH)	mg/l	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)
15	Sulphate (as SO_4)	mg/l	36.42	30.42	10.64	37.02
16	Total dissolved solids	mg/l	235	267	372	588
17	Turbidity	NTU	0.2	0.2	BDL (DL - 0.1)	1.3
18	Total hardness (as $CaCO_3$)	mg/l	230.49	224.97	149.84	191.90
III	**Chemical Testing 2. Residues In Water**					
19	Arsenic (as As)	mg/l	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
20	Aluminium (as Al)	mg/l	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
21	Barium (as Ba)	mg/l	0.04	0.05	0.07	0.08
22	Boron (as B)	mg/l	BDL (DL - 0.1)	BDL (DL - 0.1)	BDL (DL - 0.1)	BDL (DL - 0.1)
23	Copper (as Cu)	mg/l	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
24	Cadmium (as Cd)	mg/l	BDL (DL - 0.001)	BDL (DL - 0.001)	BDL (DL - 0.001)	BDL (DL - 0.001)
25	Iron (as Fe)	mg/l	0.22	0.13	0.13	BDL (DL – 0.01)
26	Lead (as Pb)	mg/l	BDL (DL - 0.001)	BDL (DL - 0.001)	BDL (DL - 0.001)	0.19
27	Manganese (as Mn)	mg/l	BDL (DL – 0.05)	BDL (DL – 0.05)	BDL (DL – 0.05)	BDL (DL – 0.05)
28	Molybdenum (as Mo)	mg/l	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
29	Nickel (as Ni)	mg/l	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
30	Total Chromium (as Cr)	mg/l	0.08	0.04	0.04	0.06
31	Zinc (as Zn)	mg/l	BDL (DL - 0.1)	BDL (DL - 0.1)	BDL (DL - 0.1)	BDL (DL - 0.1)
IV	**Chemical Testing 1.Water**					
32	Mineral Oil		BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)
V	**Chemical Testing 2. Residues In Water**					
33	Polynuclear aromatic hydrocarbons					
	Naphthalene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Acenaphthylene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Acenaphthene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Fluorene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Anthracene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Phenanthrene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Fluoranthene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Pyrene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(a)anthracene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Chrysene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(a)pyrene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(b)fluoranthene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(k)fluoranthene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Indeno(123,cd)pyrene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Dibenzo(a,h)anthracene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(ghi)perylene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)

Sl. No.	Test Parameters	Unit	Ramjivanpur Village	Kendudih Village	PindrabedaVillage	PadampurVillage
I	**Biological Testing 1.Water**					
1	Total coliform	Per 100 ml	Absent	Present	Present	Absent
2	*Escherichia coli*	Per 100 ml	Absent	Absent	Absent	Absent
II	**Chemical Testing 1.Water**					
3	Alkalinity (as $CaCO_3$)	mg/l	166.51	211.83	172.46	187.24
4	Anionic surface active agents (as MBAS)	mg/l	BDL (DL – 0.01)	BDL (DL – 0.01)	BDL (DL – 0.01)	BDL (DL – 0.01)
5	Colour	Hazen units	1	1	1	1
6	Cyanide (as CN)	mg/l	BDL (DL – 0.005)	BDL (DL – 0.005)	BDL (DL – 0.005)	BDL (DL – 0.005)
7	Chloride (as Cl)	mg/l	45.36	75.02	53.24	48.02
8	Calcium (as Ca)	mg/l	37.88	68.31	45.91	44.62
9	Free residual chlorine	mg/l	BDL (DL – 0.1)	BDL (DL – 0.1)	BDL (DL – 0.1)	BDL (DL – 0.1)
10	Fluoride (as F)	mg/l	0.15	0.42	0.2	0.24
11	Magnesium (as Mg)	mg/l	18.36	39.25	17.75	20.59
12	Nitrate (as NO_3)	mg/l	9.42	29.68	12.72	15.83
13	pH	-	7.64 at 25°C	7.37 at 25°C	7.51 at 25°C	7.78 at 25°C
14	Phenolic compounds (as C_6H_5OH)	mg/l	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)
15	Sulphate (as SO_4)	mg/l	15.88	38.17	19.94	22.51
16	Total dissolved solids	mg/l	475	642	301	412
17	Turbidity	NTU	0.2	0.4	0.9	BDL (DL - 0.1)
18	Total hardness (as $CaCO_3$)	mg/l	170.1	331.97	187.67	196.11
III	**Chemical Testing 2. Residues In Water**					
19	Arsenic (as As)	mg/l	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
20	Aluminium (as Al)	mg/l	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
21	Barium (as Ba)	mg/l	0.03	0.08	0.09	0.02
22	Boron (as B)	mg/l	BDL (DL - 0.1)	BDL (DL - 0.1)	BDL (DL - 0.1)	BDL (DL - 0.1)
23	Copper (as Cu)	mg/l	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
24	Cadmium (as Cd)	mg/l	BDL (DL - 0.001)	BDL (DL - 0.001)	BDL (DL - 0.001)	BDL (DL - 0.001)
25	Iron (as Fe)	mg/l	0.17	0.04	0.2	0.04
26	Lead (as Pb)	mg/l	BDL (DL - 0.001)	BDL (DL - 0.001)	BDL (DL - 0.001)	BDL (DL - 0.001)
27	Manganese (as Mn)	mg/l	BDL (DL – 0.05)	BDL (DL – 0.05)	BDL (DL – 0.05)	BDL (DL – 0.05)
28	Molybdenum (as Mo)	mg/l	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
29	Nickel (as Ni)	mg/l	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
30	Total Chromium (as Cr)	mg/l	0.06	BDL (DL - 0.03)	0.04	BDL (DL - 0.03)
31	Zinc (as Zn)	mg/l	BDL (DL - 0.1)	BDL (DL - 0.1)	BDL (DL - 0.1)	BDL (DL - 0.1)
IV	**Chemical Testing 1.Water**					
32	Mineral Oil	mg/l	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)
V	**Chemical Testing 2. Residues In Water**					
33	Polynuclear aromatic hydrocarbons					
	Naphthalene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Acenaphthylene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)

	Acenaphthene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Fluorene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Anthracene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Phenanthrene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Fluoranthene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Pyrene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(a)anthracene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Chrysene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(a)pyrene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(b)fluoranthene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(k)fluoranthene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Indeno(123,cd)pyrene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Dibenzo(a,h)anthracene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(ghi)perylene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)

Sl. No.	Test Parameters	Unit	HariharpurVillage	ShrirampurVillage
I	**Biological Testing 1.Water**			
1	Total coliform	Per 100 ml	Present	Absent
2	*Escherichia coli*	Per 100 ml	Present	Absent
II	**Chemical Testing 1.Water**			
3	Alkalinity (as $CaCO_3$)	mg/l	184.36	172.33
4	Anionic surface active agents (as MBAS)	mg/l	BDL (DL – 0.01)	BDL (DL – 0.01)
5	Colour	Hazen units	1	1
6	Cyanide (as CN)	mg/l	BDL (DL – 0.005)	BDL (DL – 0.005)
7	Chloride (as Cl)	mg/l	59.28	56.32
8	Calcium (as Ca)	mg/l	52.36	48.33
9	Free residual chlorine	mg/l	BDL (DL – 0.1)	BDL (DL – 0.1)
10	Fluoride (as F)	mg/l	0.35	0.28
11	Magnesium (as Mg)	mg/l	24.25	25.36
12	Nitrate (as NO_3)	mg/l	24.61	22.38
13	pH	-	7.61 at 25°C	7.62 at 25°C
14	Phenolic compounds (as C_6H_5OH)	mg/l	BDL (DL – 0.001)	BDL (DL – 0.001)
15	Sulphate (as SO_4)	mg/l	36.42	30.42
16	Total dissolved solids	mg/l	396	285 ~~788~~
17	Turbidity	NTU	0.2	0.2
18	Total hardness (as $CaCO_3$)	mg/l	230.49	224.97
III	**Chemical Testing 2. Residues In Water**			
19	Arsenic (as As)	mg/l	BDL (DL - 0.01)	BDL (DL - 0.01)
20	Aluminium (as Al)	mg/l	BDL (DL - 0.01)	BDL (DL - 0.01)
21	Barium (as Ba)	mg/l	0.04	0.05
22	Boron (as B)	mg/l	BDL (DL - 0.1)	BDL (DL - 0.1)
23	Copper (as Cu)	mg/l	BDL (DL - 0.03)	BDL (DL - 0.03)
24	Cadmium (as Cd)	mg/l	BDL (DL - 0.001)	BDL (DL - 0.001)
25	Iron (as Fe)	mg/l	0.22	0.13
26	Lead (as Pb)	mg/l	BDL (DL - 0.001)	BDL (DL - 0.001)
27	Manganese (as Mn)	mg/l	BDL (DL – 0.05)	BDL (DL – 0.05)
28	Molybdenum (as Mo)	mg/l	BDL (DL - 0.01)	BDL (DL - 0.01)
29	Nickel (as Ni)	mg/l	BDL (DL - 0.01)	BDL (DL - 0.01)
30	Total Chromium (as Cr)	mg/l	0.08	0.04
31	Zinc (as Zn)	mg/l	BDL (DL - 0.1)	BDL (DL - 0.1)
IV	**Chemical Testing 1.Water**			
32	Mineral Oil	mg/l	BDL (DL – 0.001)	BDL (DL – 0.001)
V	**Chemical Testing 2. Residues In Water**			
33	Polynuclear aromatic hydrocarbons			
	Naphthalene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)
	Acenaphthylene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)

	Acenaphthene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)
	Fluorene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)
	Anthracene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)
	Phenanthrene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)
	Fluoranthene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)
	Pyrene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(a)anthracene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)
	Chrysene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(a)pyrene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(b)fluoranthene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(k)fluoranthene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)
	Indeno(123,cd)pyrene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)
	Dibenzo(a,h)anthracene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(ghi)perylene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)

PIEZOMETER-WELL WATER QUALITY ANALYSIS REPORT

Sl. No.	Test Parameters	Unit	Plant Bore-well Near CHP	Plant Site office	Plant Bore-Well Near Ash Dyke
I	**Biological Testing 1.Water**				
1	Total coliform	Per 100 ml	Absent	Absent	Absent
2	*Escherichia coli*	Per 100 ml	Absent	Absent	Absent
II	**Chemical Testing 1.Water**				
3	Alkallnity (as $CaCO_3$)	mg/l	151.34	92.88	86.93
4	Anionic surface active agents (as MBAS)	mg/l	BDL (DL – 0.01)	BDL (DL – 0.01)	BDL (DL – 0.01)
5	Colour	Hazen units	1	1	1
6	Cyanide (as CN)	mg/l	BDL (DL – 0.005)	BDL (DL – 0.005)	BDL (DL – 0.005)
7	Chloride (as Cl)	mg/l	44.63	38.74	39.46
8	Calcium (as Ca)	mg/l	35.67	29.45	27.29
9	Free residual chlorine	mg/l	BDL (DL – 0.1)	BDL (DL – 0.1)	BDL (DL – 0.1)
10	Fluoride (as F)	mg/l	0.13	BDL (DL – 0.1)	BDL (DL – 0.1)
11	Magnesium (as Mg)	mg/l	18.48	12.66	11.24
12	Nitrate (as NO_3)	mg/l	7.98	BDL (DL – 2)	BDL (DL – 2)
13	pH	-	7.42 at 25°C	7.75 at 25°C	7.66 at 25°C
14	Phenolic compounds (as C_6H_5OH)	mg/l	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)
15	Sulphate (as SO_4)	mg/l	12.32	9.37	9.06
16	Total dissolved solids	mg/l	460	258	252
17	Turbidity	NTU	0.3	0.5	0.8
18	Total hardness (as $CaCO_3$)	mg/l	165.07	125.62	114.39
III	**Chemical Testing 2. Residues In Water**				
19	Arsenic (as As)	mg/l	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
20	Aluminium (as Al)	mg/l	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
21	Barium (as Ba)	mg/l	0.04	0.04	0.04
22	Boron (as B)	mg/l	BDL (DL - 0.1)	BDL (DL - 0.1)	BDL (DL - 0.1)
23	Copper (as Cu)	mg/l	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
24	Cadmium (as Cd)	mg/l	BDL (DL - 0.001)	BDL (DL - 0.001)	BDL (DL - 0.001)
25	Iron (as Fe)	mg/l	0.13	0.02	0.24
26	Lead (as Pb)	mg/l	BDL (DL - 0.001)	BDL (DL - 0.001)	BDL (DL - 0.001)
27	Manganese (as Mn)	mg/l	BDL (DL – 0.05)	BDL (DL – 0.05)	BDL (DL – 0.05)
28	Molybdenum (as Mo)	mg/l	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
29	Nickel (as Ni)	mg/l	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
30	Total Chromium (as Cr)	mg/l	0.04	BDL (DL - 0.03)	0.06
31	Zinc (as Zn)	mg/l	BDL (DL - 0.1)	BDL (DL - 0.1)	BDL (DL - 0.1)
IV	**Chemical Testing 1.Water**				
32	Mineral Oil	mg/l	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)
V	**Chemical Testing 2. Residues In Water**				
33	Polynuclear aromatic hydrocarbons				

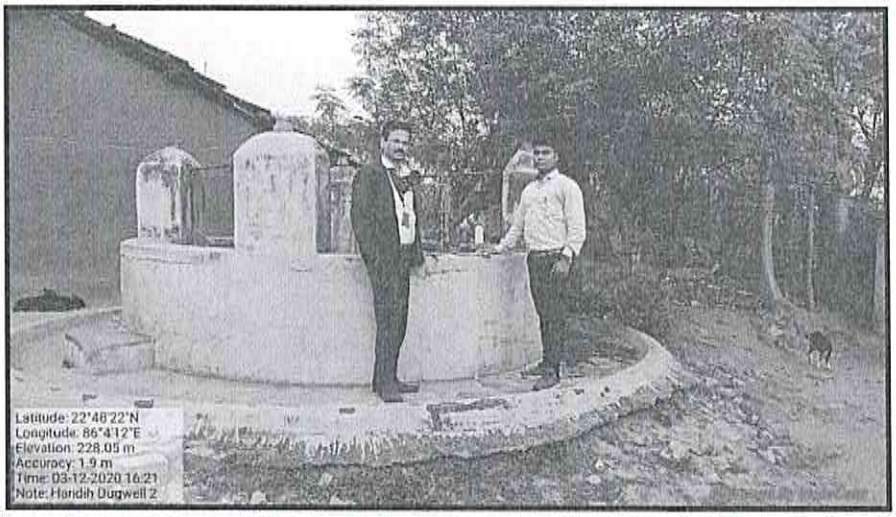
	Naphthalene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Acenaphthylene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Acenaphthene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Fluorene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Anthracene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Phenanthrene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Fluoranthene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Pyrene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(a)anthracene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Chrysene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(a)pyrene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(b)fluoranthene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(k)fluoranthene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Indeno(123,cd)pyrene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Dibenzo(a,h)anthracene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(ghi)perylene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)

TABLE NO.8
SURFACE WATER QUALITY ANALYSIS REPORT

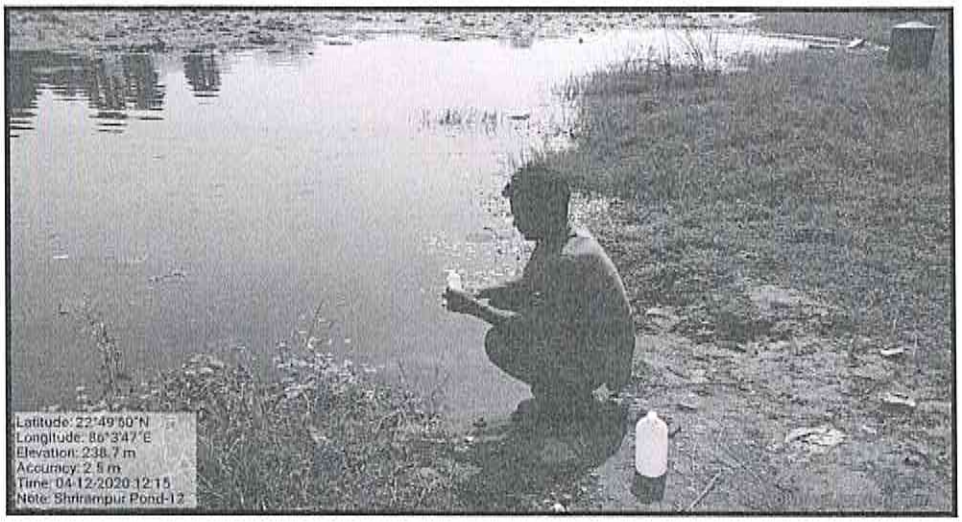
Sl. No.	Test Parameters	Unit	Ramjivanpur Village	Padampur Village	Shrirampur Village
I	**Biological Testing 1.Water**				
1	Total coliform	Per 100 ml	Absent	Present	Absent
2	*Escherichia coli*	Per 100 ml	Absent	Absent	Absent
3	*Feacal Coliform*	Per 100 ml	BDL (DL - 2)	BDL (DL - 2)	BDL (DL - 2)
II	**Chemical Testing 1.Water**				
4	Alkalinity (as $CaCO_3$)	mg/l	96.02	182.91	175.49
5	Colour	mg/l	>25	8	1
6	Cyanide (as CN)	Hazen units	BDL (DL – 0.005)	BDL (DL – 0.005)	BDL (DL – 0.005)
7	Chloride (as Cl)	mg/l	38.21	53.91	48.02
8	Calcium (as Ca)	mg/l	24.36	46.02	39.28
9	Free residual chlorine	mg/l	BDL (DL – 0.1)	BDL (DL – 0.1)	BDL (DL – 0.1)
10	Fluoride (as F)	mg/l	BDL (DL – 0.1)	0.26	0.19
11	Magnesium (as Mg)	mg/l	10.53	22.42	20.88
12	Nitrate (as NO_3)	mg/l	BDL (DL – 2)	22.64	13.66
13	pH	mg/l	6.86 at 25°C	7.55 at 25°C	7.62 at 25°C
14	Phenolic compounds (as C_6H_5OH)	-	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)
15	Sulphate (as SO_4)	mg/l	3.98	28.56	17.64
16	Total dissolved solids	mg/l	230	366	280
17	Turbidity	mg/l	54	7.8	0.6
18	Total hardness (as $CaCO_3$)	NTU	104.14	207.12	183.95
19	Dissolved Oxygen	mg/l	6.3	6.4	6.2
20	BOD (3 days at 27°C)	mg/l	5.83	BDL (DL – 2)	BDL (DL – 2)
21	Chemical oxygen demand	mg/l	18.68	BDL (DL – 4)	BDL (DL – 4)
III	**Chemical Testing 2. Residues In Water**				
22	Arsenic (as As)	mg/l	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
23	Aluminium (as Al)	mg/l	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
24	Barium (as Ba)	mg/l	0.05	0.05	0.08
25	Boron (as B)	mg/l	BDL (DL - 0.1)	BDL (DL - 0.1)	BDL (DL - 0.1)
26	Copper (as Cu)	mg/l	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
27	Cadmium (as Cd)	mg/l	BDL (DL - 0.001)	BDL (DL - 0.001)	BDL (DL - 0.001)
28	Iron (as Fe)	mg/l	0.53	0.4	0.22
29	Lead (as Pb)	mg/l	BDL (DL - 0.001)	BDL (DL - 0.001)	BDL (DL - 0.001)
30	Manganese (as Mn)	mg/l	BDL (DL – 0.05)	BDL (DL – 0.05)	BDL (DL – 0.05)
31	Nickel (as Ni)	mg/l	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
32	Total Chromium (as Cr)	mg/l	0.05	0.05	0.05
33	Zinc (as Zn)	mg/l	BDL (DL - 0.1)	BDL (DL - 0.1)	BDL (DL - 0.1)

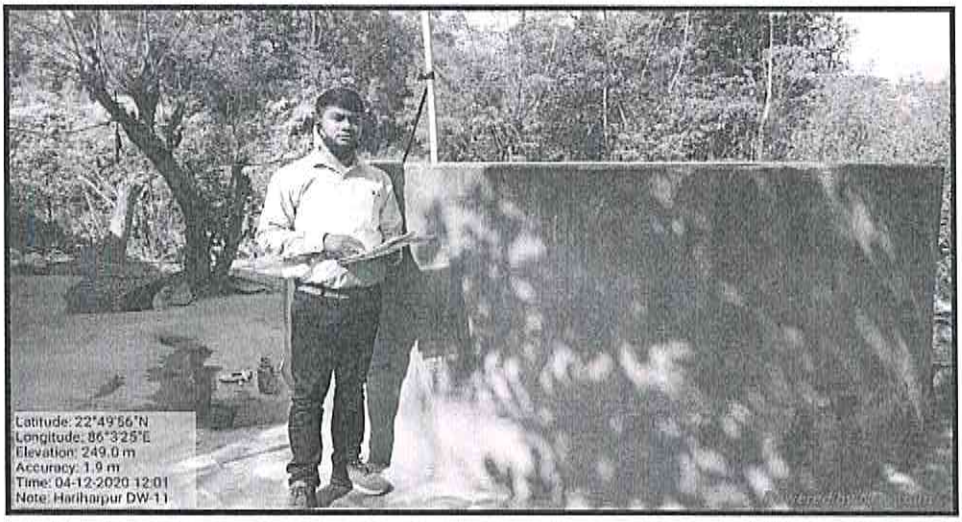
IV	**Chemical Testing 1.Water**				
34	Mineral Oil	mg/l	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)
V	**Chemical Testing 2. Residues In Water**				
35	Polynuclear aromatic hydrocarbons				
	Naphthalene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Acenaphthylene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Acenaphthene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Fluorene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Anthracene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Phenanthrene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Fluoranthene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Pyrene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(a)anthracene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Chrysene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(a)pyrene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(b)fluoranthene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(k)fluoranthene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Indeno(123,cd)pyrene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Dibenzo(a,h)anthracene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)
	Benzo(ghi)perylene	µg/l	BDL (DL – 0.03)	BDL (DL – 0.03)	BDL (DL – 0.03)

ANNEXURE-III: FIELD PHOTOGRAPHS OF WELL MONITORING




Latitude: 22°48'13"N
Longitude: 86°2'0"E
Accuracy: 2800.0 m
Time: 03-12-2020 16:57
Note: Pratapur Dugwell 4


Latitude: 22°49'60"N
Longitude: 86°3'47"E
Elevation: 238.7 m
Accuracy: 2.5 m
Time: 04-12-2020 12:15
Note: Shrirampur Pond-12


Latitude: 22°49'56"N
Longitude: 86°3'25"E
Elevation: 249.0 m
Accuracy: 1.9 m
Time: 04-12-2020 12:01
Note: Hariharpur DW-11

YUGANTAR BHARATI
ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY

Accredited by: - National Accreditation Board for Testing Laboratory (NABL) & Jharkhand State Pollution Control Board (JSPCB)
Certified by :- An ISO 9001:2015 & BS OHSAS 18001 : 2007
Certificate No. - TC 7813

ANALYTICAL TEST REPORT

Baseline Ground Water Quality report

Issued to : -
M/s – Adhunik Power & Natural Resources Ltd.
Vill – Padampur, Behind PGCIL substation,
Jamshedpur-832402,Jharkhand

URL (reference)	TC78132110000069P
Date of Issue	28th March 2021
Type of Industries (* in case of Industrial Effluent)	Thermal Power Plant

Sample Name/Description	Ground Water	Sampling Protocol	YBAEEL/SP/01/00
Sample pkg. Condition	Sealed in plastic bottle	Sampling Date	18th March 2021
Sample Quantity	4000 ml for each Sample	Mode of sample Collection	YBAEEL sampling team
Work allotted date	18th March 2021	Sampling Location	Down stream of Ash pond
Test started on	18th March 2021	Sampling Source	Ground water (Hand pump & Bore well)
Test completed on	24th March 2021	Meteorological cond. (RH%, °C)	39 % / 29°C

Sl. No.	Tested Parameter	Method	Unit	Result	Baseline ground Water quality *	Permissible Limit (As per IS 10500 Specification)
1.	pH value	IS 3025 (Part-11)	--	7.2	6.9-7.4	6.5 to 8.5
2.	Total Dissolved Solid	IS 3025 (Part-16)	mg/l	360.0	251-538	500 - 2000
4.	Colour	IS:3025 (Part-04)	cu	< 5	<5	< 25
5.	Odour*	IS:3025 (Part-05)	-	Agreeable	Unobjectionable	Agreeable
6.	Alkalinity (as $CaCO_3$)	IS:3025 (Part-23)	mg/l	212	147-269	200 to 600
7.	Hardness (as $CaCO_3$)	IS 3025 (Part-21)	mg/l	178	128-308	200 to 600
8.	Nitrate (as NO_3)	APHA 4500 NO_3- B	mg/l	5.6	03-24	45 to no relaxation
9.	Arsenic (as As)	APHA 3112 B	mg/l	ND (MDL 0.01)	**<0.01**	0.01 to 0.05
10.	Calcium (as Ca+)	IS 3025 (Part-40)	mg/l	52	41-99	75 to 200
12.	Iron (as Fe)	APHA 3111 B	mg/l	0.22	0.13-0.90	0.3 to no relaxation
13.	Zinc (as Zn)	APHA 3111 B	mg/l	0.33	0.31-0.47	5 to 15
14.	Turbidity	IS 3025 (Part 10)	NTU	-	<5	1 -5
15.	Taste	IS 3025 (Part 07)	-	Agreeable	**Agreeable**	**Agreeable**
16.	Chlorine Residual	IS 3025 (Part 26)	mg/l	ND (MDL 0.07)	<0.05	-
17.	Chloride as Cl	IS 3025 (Part 32)	mg/l	52	42-74	250-1000
18.	Fluoride as F	APHA 4500 FC	mg/l	0.4	0.31-0.50	1-1.5
19.	Lead as Pb	APHA 3111B	mg/l	ND (MDL 0.05)	**<0.01**	0.01-no relaxation
20.	Chromium as Cr	APHA 3111B	mg/l	ND (MDL 0.01)	**<0.01**	0.05-no relaxation
21.	Copper as cu	APHA 3111B	mg/l	ND (MDL 0.01)	<0.01	0.05-1.5
25.	Cadmium as Cd	APHA 3111 B	mg/l	ND (MDL 0.01)	**<0.01**	0.003-no relaxation
26.	Sulphate as SO4	IS 3025 (Part 24)	mg/l	12.7	06-28	200-400
30.	Mercury (as Hg)	APHA 3112 B	mg/l	ND (MDL 0.01)	**<0.001**	-

* provided by customer

Tested by	Checked by	Issued by
Prem Kumar	Mukesh Kumar	Umesh Das
Lab Analyst	Authorized Signatory	Technical Manager

Authorized Signatory
Chemical Section
Yugantar Bharati Analytical & Environmental Engineering Laboratory

Branch Office : - Jamshedpur | Dhanbad | Hazaribag | Pakur

Main Office : Namkum Post Office, Sidroul, Ranchi - 834010, Jharkhand
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State Pollution Control Board
TÜVRheinland® ISO 9001:2015 BS OHSAS 18001:2007

ANALYTICAL TEST REPORT

Baseline Ground Water Quality report

Issued to : -
M/s – Adhunik Power & Natural Resources Ltd.
Vill – Padampur, Behind PGCIL substation,
Jamshedpur-832402,Jharkhand

URL (reference)	TC78132110000070P
Date of Issue	28th March 2021
Type of Industries (* in case of Industrial Effluent)	Thermal Power Plant

Sample Name/Description	Ground Water	Sampling Protocol	YBAEEL/SP/01/00
Sample pkg. Condition	Sealed in plastic bottle	Sampling Date	18th March 2021
Sample Quantity	4000 ml for each Sample	Mode of sample Collection	YBAEEL sampling team
Work allotted date	18th March 2021	Sampling Location	Up stream of Ash pond
Test started on	18th March 2021	Sampling Source	Ground water (Hand pump & Bore well)
Test completed on	24th March 2021	Meteorological cond. (RH%, °C)	39 % / 29°C

Sl. No.	Tested Parameter	Method	Unit	Result	Baseline ground Water quality *	Permissible Limit (As per IS 10500 Specification)
1.	pH value	IS 3025 (Part-11)	--	7.3	6.9-7.4	6.5 to 8.5
2.	Total Dissolved Solid	IS 3025 (Part-16)	mg/l	410	251-538	500 - 2000
4.	Colour	IS:3025 (Part-04)	cu	< 5	<5	< 25
5.	Odour*	IS:3025 (Part-05)	-	Agreeable	Unobjectionable	Agreeable
6.	Alkalinity (as $CaCO_3$)	IS:3025 (Part-23)	mg/l	244.0	147-269	200 to 600
7.	Hardness (as $CaCO_3$)	IS 3025 (Part-21)	mg/l	212.0	128-308	200 to 600
8.	Nitrate (as NO_3)	APHA 4500 NO_3- B	mg/l	8.61	03-24	45 to no relaxation
9.	Arsenic (as As)	APHA 3112 B	mg/l	ND (MDL 0.003)	**<0.01**	0.01 to 0.05
10.	Calcium (as Ca+)	IS 3025 (Part-40)	mg/l	73.91	41-99	75 to 200
12.	Iron (as Fe)	APHA 3111 B	mg/l	0.26	0.13-0.90	0.3 to no relaxation
13.	Zinc (as Zn)	APHA 3111 B	mg/l	0.44	0.31-0.47	5 to 15
14.	Turbidity	IS 3025 (Part 10)	NTU	-	<5	1 -5
15.	Taste	IS 3025 (Part 07)	-	Agreeable	**Agreeable**	**Agreeable**
16.	Chlorine Residual	IS 3025 (Part 26)	mg/l	ND (MDL 0.07)	<0.05	-
17.	Chloride as Cl	IS 3025 (Part 32)	mg/l	64.0	42-74	250-1000
18.	Fluoride as F	APHA 4500 FC	mg/l	0.5	0.31-0.50	1-1.5
19.	Lead as Pb	APHA 3111B	mg/l	ND (MDL 0.05)	**<0.01**	0.01-no relaxation
20.	Chromium as Cr	APHA 3111B	mg/l	ND (MDL 0.01)	**<0.01**	0.05-no relaxation
21.	Copper as cu	APHA 3111B	mg/l	ND (MDL 0.01)	<0.01	0.05-1.5
25.	Cadmium as Cd	APHA 3111 B	mg/l	ND (MDL 0.01)	**<0.01**	0.003-no relaxation
26.	Sulphate as SO4	IS 3025 (Part 24)	mg/l	22.4	06-28	200-400
30.	Mercury (as Hg)	APHA 3112 B	mg/l	ND (MDL 0.001)	**<0.001**	-

* provided by customer

Tested by	Checked by	Issued by
Prem Kumar	Mukesh Kumar	Umesh Das
Lab Analyst	Authorized Signatory	Technical Manager

Authorized Signatory
Chemical Section
Yugantar Bharati Analytical & Environmental Engineering Laboratory

Branch Office : - Jamshedpur | Dhanbad | Hazaribag | Pakur

Main Office : Namkum Post Office, Sidroul, Ranchi - 834010, Jharkhand
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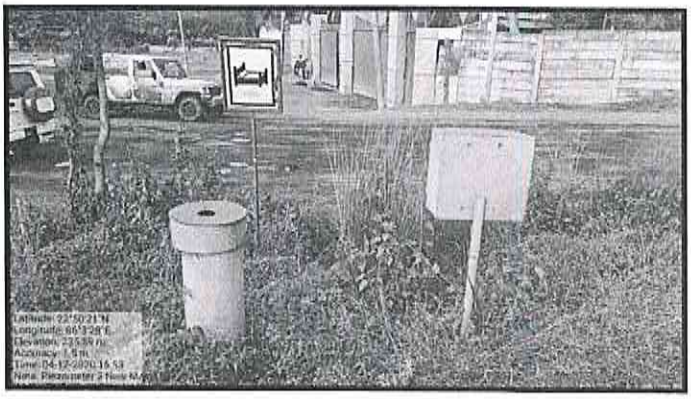
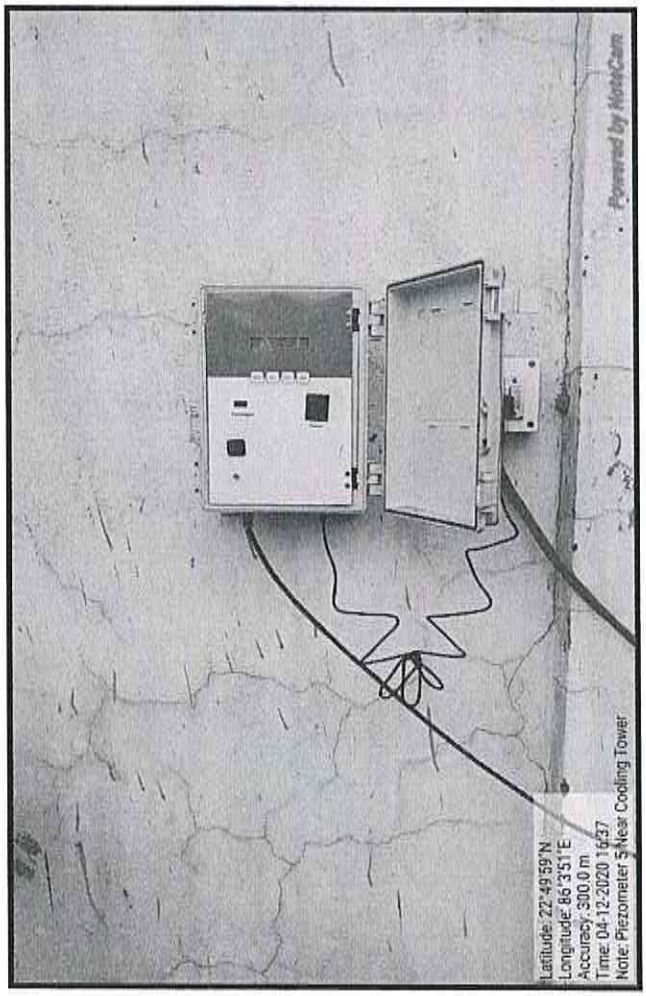
Piezometer At Plant premises





Water Test Report		URL(Unique Lab Report) No.	TC78132110000067P
Date of Issue	27th March 2021	Report ID	YBAEEL-210308 -122658 -SW01
Sample Description	Surface Water	Job code / Ref. no.	YBAEEL/WA/L/C/Mar.-21/08
Type of Industries	Thermal Power Plant	Work Order No./ Date	3030005309 - 27/02/2021
Issued to : -	M/s Adhunik Power & Natural Resources Limited Vill.- Padampur, Behind PGCIL Sub-station, Jamshedpur-832402, Jharkhand.		

Sampling date	18/03/2021		Mode of sample Collection	By YBAEEL Team	
Sampling Protocol	IS : 3025 (Part-1) 1987, R-2003		Sample Code	210318 – SW – E01	
Sampling Location	Shrirampur Village		Sampling Source	Pond Water	
Sample pkg. Condition	Sealed Pack in PP Bottle		Sample Quantity	3000 ml	
Meteorological cond.	W.C. – Clear		RH – 39 %	Temp. – 29°C	
Work allotted date	18/03/2021	Test started on	18/03/2021	Test completed on	24/03/2021

Test Result

Sl	Parameter	Test Method	Units	Results	Limits
1.	pH value	IS 3025 (P-11):2002	pH	8.01	6.5-8.5
2.	Colour	IS 3025 (P-04):1983	Hazen	15.0	300
3.	Odour*	IS 3025 (P-05):	--	Agree.	Agreeable
4.	Alkalinity (as $CaCO_3$)	IS 3025 (P-23):2003	mg/l	318.0	--
5.	Total Hardness (as $CaCO_3$)	IS 3025 (P-21):2009	mg/l	144.0	--
6.	Conductivity	IS 3025 (P-14):2013	µs/cm	1138.0	--
7.	Total dissolved solids	IS 3025 (P-16):2006	mg/l	546.0	1500
8.	Total suspended solids	IS 3025 (P-17):2012	mg/l	162.0	--
9.	Chloride (as Cl^-)	IS 3025 (P-32):2003	mg/l	152.3	600
10.	Fluoride (as F^-)	APHA 4500 F-C 23rd edition 2017	mg/l	0.80	1.5
11.	Nitrate (as NO_3^-)	APHA 4500 NO_3^- (B) 23rd edition 2017	mg/l	1.17	45
12.	BOD	IS 3025 (P-44):2009	mg/l	2.4	3.0
13.	COD	IS 3025 (P-58):2006	mg/l	48.0	--
14.	Oil and grease	IS 3025 (P-39):2003	mg/l	3.6	--
15.	Aluminium (as Al)*	IS 3025 (P-55)	mg/l	ND (DL 0.001)	--
16.	Arsenic (as As)	APHA 3114 B 23rd edition 2017	mg/l	ND (DL 0.003)	0.2
17.	Calcium (as $CaCO_3$)	IS 3025 (P-40): 2003	mg/l	86.0	--
18.	Chromium (as Cr)	APHA 3111 B 23rd edition 2017	mg/l	ND (DL 0.02)	0.05
19.	Copper (as Cu)	APHA 3111 B 23rd edition 2017	mg/l	ND (DL 0.01)	1.5
20.	Iron (as Fe)	APHA 3111 B 23rd edition 2017	mg/l	ND (DL 0.01)	50
21.	Lead (as Pb)	APHA 3111 B 23rd edition 2017	mg/l	ND (DL 0.05)	0.1

Tested by	Checked by	Issued by
Prem Kumar	Mukesh Kumar	Umesh Das
Lab Analyst	Authorized Signatory	Technical Manager

Authorized Signatory
Chemical Section
Yugantar Bharati Analytical & Environmental Engineering Laboratory

Branch Office : - Jamshedpur | Dhanbad | Hazaribag | Pakur

Main Office : Namkum Post Office, Sidroul, Ranchi - 834010, Jharkhand
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State Pollution Control Board
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Water Test Report		URL(Unique Lab Report) No.	TC78132110000067P
Date of Issue	27th March 2021	Report ID	YBAEEL-210308 -122658 -SW01
Sample Description	Surface Water	Job code / Ref. no.	YBAEEL/WA/LC/Mar.-21/08
Type of Industries	Thermal Power Plant	Work Order No./ Date	3030005309 - 27/02/2021
Issued to : -	M/s Adhunik Power & Natural Resources Limited Vill.- Padampur, Behind PGCIL Sub-station, Jamshedpur-832402, Jharkhand.		

Sampling date	18/03/2021		Mode of sample Collection		By YBAEEL Team
Sampling Protocol	IS : 3025 (Part-1) 1987, R-2003		Sample Code		210318 – SW – E01
Sampling Location	Shrirampur Village		Sampling Source		Pond Water
Sample pkg. Condition	Sealed Pack in PP Bottle		Sample Quantity		3000 ml
Meteorological cond.	W.C. – Clear		RH – 39 %		Temp. – 29°C
Work allotted date	18/03/2021	Test started on	18/03/2021	Test completed on	24/03/2021

Test Result

22.	Magnesium (as $CaCO_3$)	IS 3025 (P-46):2003	mg/l	57.70	--
23.	Potassium (as K^+)	APHA 3111 B 23rd edition 2017	mg/l	1.05	--
24.	Sodium (as Na^+)	APHA 3111 B 23rd edition 2017	mg/l	34.60	--
25.	Zinc (as Zn)	APHA 3111 B 23rd edition 2017	mg/l	0.03	15
26.	Cadmium (as Cd)	APHA 3111 B 23rd edition 2017	mg/l	ND (DL 0.01)	0.01
27.	Sulphate (as SO_4^{2-})	IS 3025 (P-24):2003	mg/l	12.40	400
28.	Phosphate (as PO_4^{3-})*	IS 3025 (P-31)	mg/l	0.025	--
29.	Nickel (as Ni)	APHA 3111 B 23rd edition 2017	mg/l	ND (DL 0.02)	--
30.	Cobalt (CO)	APHA 3111 B 23rd edition 2017	mg/l	ND (DL 0.03)	--
31.	Phenols (C_6H_5OH)*	IS 3025 (P-43)	mg/l	ND (DL 0.001)	0.005
32.	Mercury (as Hg)	APHA 3112 B 23rd edition 2017	mg/l	ND (DL 0.001)	--

******End of Test******

Remarks :-Samples **Comply** with the prescribed Specification as per IS: 2296:1982 (Class – C)
Note : The parameters marked with * are not accredited by NABL.

Specific contractual notes: -

- The results listed refer only to the tested sample and applicable parameter.
- This report, in full or in part, shall not be used for advertising or as evidence in any court of law.
- This report cannot be reproduced, except when in full, without the written permission of the Lab In-charge
- The samples received shall be destroyed after two month from the date of issue of the certificate unless specified otherwise and sample for biological testing will be destroyed after one two week of testing.
- The liability of the laboratory is limited to the invoiced amount.
- All disputes are subjected to the Ranchi Jurisdiction.
- ND – not detected, DL – detectable limit

Tested by	Checked by	Issued by
Prem Kumar	Mukesh Kumar	Umesh Das
Lab Analyst	Authorized Signatory	Technical Manager

Authorized Signatory
Chemical Section
Yugantar Bharati Analytical & Environmental Engineering Laboratory

Branch Office : - Jamshedpur | Dhanbad | Hazaribag | Pakur

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JHARKHAND State Pollution Control Board

TÜVRheinland® ISO 9001:2015 BS OHSAS 18001:2007

Water Test Report		URL(Unique Lab Report) No.	TC78132110000068P
Date of Issue	27th March 2021	Report ID	YBAEEL-210308 -122658 -SW02
Sample Description	Surface Water	Job code / Ref. no.	YBAEEL/WA/L/C/Mar.-21/08
Type of Industries	Thermal Power Plant	Work Order No./ Date	3030005309 - 27/02/2021
Issued to : -	M/s Adhunik Power & Natural Resources Limited Vill.- Padampur, Behind PGCIL Sub-station, Jamshedpur-832402, Jharkhand.		

Sampling date	18/03/2021		Mode of sample Collection	By YBAEEL Team	
Sampling Protocol	IS : 3025 (Part-1) 1987, R-2003		Sample Code	210318 – SW – E02	
Sampling Location	Padampur Village		Sampling Source	Pond water	
Sample pkg. Condition	Sealed Pack in PP Bottle		Sample Quantity	3000 ml	
Meteorological cond.	W.C. – Clear		RH – 39 %	Temp. – 29°C	
Work allotted date	18/03/2021	Test started on	18/03/2021	Test completed on	24/03/2021

Test Result

Sl	Parameter	Test Method	Units	Results	Limits
1.	pH value	IS 3025 (P-11):2002	pH	6.76	6.5-8.5
2.	Colour	IS 3025 (P-04):1983	Hazen	40.0	300
3.	Odour*	IS 3025 (P-05):	--	Agree.	Agreeable
4.	Alkalinity (as $CaCO_3$)	IS 3025 (P-23):2003	mg/l	106.0	--
5.	Total Hardness (as $CaCO_3$)	IS 3025 (P-21):2009	mg/l	142.0	--
6.	Conductivity	IS 3025 (P-14):2013	µs/cm	502.0	--
7.	Total dissolved solids	IS 3025 (P-16):2006	mg/l	246.0	1500
8.	Total suspended solids	IS 3025 (P-17):2012	mg/l	86.0	--
9.	Chloride (as Cl^-)	IS 3025 (P-32):2003	mg/l	42.4	600
10.	Fluoride (as F^-)	APHA 4500 F-C 23rd edition 2017	mg/l	0.07	1.5
11.	Nitrate (as NO_3^-)	APHA 4500 NO_3- (B) 23rd edition 2017	mg/l	0.73	45
12.	BOD	IS 3025 (P-44):2009	mg/l	2.8	3.0
13.	COD	IS 3025 (P-58):2006	mg/l	56.0	--
14.	Oil and grease	IS 3025 (P-39):2003	mg/l	4.8	--
15.	Aluminium (as Al)*	IS 3025 (P-55)	mg/l	ND (DL 0.001)	--
16.	Arsenic (as As)	APHA 3114 B 23rd edition 2017	mg/l	ND (DL 0.003)	0.2
17.	Calcium (as $CaCO_3$)	IS 3025 (P-40): 2003	mg/l	118.0	--
18.	Chromium (as Cr)	APHA 3111 B 23rd edition 2017	mg/l	ND (DL 0.02)	0.05
19.	Copper (as Cu)	APHA 3111 B 23rd edition 2017	mg/l	0.02	1.5
20.	Iron (as Fe)	APHA 3111 B 23rd edition 2017	mg/l	ND (DL 0.01)	50
21.	Lead (as Pb)	APHA 3111 B 23rd edition 2017	mg/l	ND (DL 0.05)	0.1

Tested by	Checked by	Issued by
Prem Kumar	Mukesh Kumar	Umesh Das
Lab Analyst	Authorized Signatory	Technical Manager

Authorized Signatory
Chemical Section
Yugantar Bharati Analytical & Environmental Engineering Laboratory

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Water Test Report		URL (Unique Lab Report) No.	TC78132110000068P
Date of Issue	27th March 2021	Report ID	YBAEEL-210308 -122658 -SW02
Sample Description	Surface Water	Job code / Ref. no.	YBAEEL/WA/L/C/Mar.-21/08
Type of Industries	Thermal Power Plant	Work Order No./ Date	3030005309 - 27/02/2021
Issued to : -	M/s Adhunik Power & Natural Resources Limited Vill.- Padampur, Behind PGCIL Sub-station, Jamshedpur-832402, Jharkhand.		

Sampling date	18/03/2021		Mode of sample Collection		By YBAEEL Team
Sampling Protocol	IS : 3025 (Part-1) 1987, R-2003		Sample Code		210318 – SW – E02
Sampling Location	Padampur Village		Sampling Source		Pond water
Sample pkg. Condition	Sealed Pack in PP Bottle		Sample Quantity		3000 ml
Meteorological cond.	W.C. – Clear		RH – 39 %		Temp. – 29°C
Work allotted date	18/03/2021	Test started on	18/03/2021	Test completed on	24/03/2021

Test Result

22.	Magnesium(as $CaCO_3$)	IS 3025 (P-46):2003	mg/l	24.0	--
23.	Potassium (as K^+)	APHA 3111 B 23rd edition 2017	mg/l	5.5	--
24.	Sodium (as Na^+)	APHA 3111 B 23rd edition 2017	mg/l	94.60	--
25.	Zinc (as Zn)	APHA 3111 B 23rd edition 2017	mg/l	ND (DL 0.1)	15
26.	Cadmium (as Cd)	APHA 3111 B 23rd edition 2017	mg/l	ND (DL 0.01)	0.01
27.	Sulphate (as SO_4^{2-})	IS 3025 (P-24):2003	mg/l	22.90	400
28.	Phosphate (as PO_4^{3-})*	IS 3025 (P-31)	mg/l	0.130	--
29.	Nickel (as Ni)	APHA 3111 B 23rd edition 2017	mg/l	ND (DL 0.02)	--
30.	Cobalt (CO)	APHA 3111 B 23rd edition 2017	mg/l	ND (DL 0.03)	--
31.	Phenols (C_6H_5OH)*	IS 3025 (P-43)	mg/l	ND (DL 0.001)	0.005
32.	Mercury (as Hg)	APHA 3112 B 23rd edition 2017	mg/l	ND (DL 0.001)	--

******End of Test******

Remarks :-Samples **Comply** with the prescribed Specification as per IS:2296:1982 (Class – C)
Note : The parameters marked with * are not accredited by NABL.

Specific contractual notes: -

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- All disputes are subjected to the Ranchi Jurisdiction.
- ND – not detected, DL – detectable limit

Tested by	Checked by	Issued by
Prem Kumar	Mukesh Kumar	Umesh Das
Lab Analyst	Authorized Signatory	Technical Manager

Authorized Signatory
Chemical Section
Yugantar Bharati Analytical & Environmental Engineering Laboratory

Branch Office : - Jamshedpur | Dhanbad | Hazaribag | Pakur
Main Office : Namkum Post Office, Sidroul, Ranchi - 834010, Jharkhand
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State Pollution Control Board
TÜVRheinland® ISO 9001:2015 BS OHSAS 18001:2007

Atmospheric Pollution Test Report			URL(Unique Lab Report) No.		TC78132120000294P
Report Release Date	28th March 2021		Report ID		YBAEEL-210308 -122658 – S2
Sample Description	Stationary Source Emission		Job code/ Ref. no.		YBAEEL/WA/L/A/Mar. - 21/30
Type of Industry	Thermal Power Plant		Work Order No./ Date		3030005309 - 27/02/2021
Issue to	M/s Adhunik Power & Natural Resources Limited Vill.- Padampur, Behind PGCIL Substation, Jamshedpur-832402, Jharkhand.				
Sampling Period	16th March, 2021		Mode of sample collection		Sampling team of YBAEEL
Sampling Protocol	IS: 11255 & CPCB Guideline (Lats/80/2013-14)				
Meteorological Cond.	W.C.– Clear		RH % - 38 %		Temp.–29°C
Sample receipt Date	18/03/2021	Analysis Started on	18/03/2021	Analysis completed on	26/03/2021

General Information

As observed while sampling		As reported by customer	
Location	Sampling port hole	Type of fuel Used	Coal
Platform	Permanent	Quantity of Fuel Used	151 Ton/Hr.
Stack Description (Shape & Material)	Circular / RCC	Total production Capacity	270 MW
Sampling port	Available	Height of Stack from ground level	275 mtr.
Stack Identification	Unit - II	Inner Diameter of Stack	4.2 mtr.
Height of port hole from Ground level	90 mtr.	Pollution Controlling Device	ESP (for PM)

**Test Results **

Sl	Parameter s	Test Method	Units	Results	Limits
1.	Stack gas Temperature	IS 11255 (Part 3)2008	k	390.0	-
2.	Stack gas Velocity	IS 11255 (Part 3)2008	m/s	25.5	-
3.	Volumetric Flow Rate	IS 11255 (Part 3)2008	Nm^3/hr	947157.6	-
3.	Particulate Matter (PM) (at 6 % O_2)	IS 11255 (Part 1)2009	mg/Nm^3	36.4	50
4.	Sulphure Dioxide (SO_2) (at 6 % O_2)	IS 11255 (Part 2)2009	mg/Nm^3	544.8	600
5.	Oxide of Nitrogen (as NO_x) (at 6 % O_2)	IS 11255 (Part 7)2005 RA 2012	mg/Nm^3	408.5	450
6.	Carbon Monoxide (as CO)	IS 13270: 1992 (RA 2009)	%	< 0.2	-
7.	Mercury (as Hg)	Lat's/80/2013-14	mg/Nm^3	< 0.003 ppm	0.03

Emission Rate

1.	Particulate Matter (PM)	IS 11255 (Part 1)2009	Kg/hr	34.5	-
2.	Sulphure Dioxide (SO_2)	IS 11255 (Part 2)2009	Kg/hr	516.0	-
3.	Oxide of Nitrogen (as NO_x)	IS 11255 (Part 7)2005 RA 2012	Kg/hr	387.0	-

End of Report

Remarks	Samples Comply with the prescribed specification of as per Thermal Power Plant.
Abbreviation	MDL : Minimum detection limit, BDL : Below detection limit,
Note	The parameters marked with * are not accredited by NABL.
Specific contractual notes	All values are expressed in as unit.
	The results listed refer only to the tested sample and applicable parameter.
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	The samples collected shall be destroyed after 15 days from the date of issue of the certificate unless specified otherwise
	The liability of the laboratory is limited to the invoiced amount
	All disputes are subjected to the Ranchi Jurisdiction

Tested by	Verified by	Issued by
Amit Kumar Sinha	Brij Nandan Kumar	Umesh Das
Lab Analyst	Section In-charge	Technical Manager

Authorized Signatory
Atmospheric Pollution
Yugantar Bharati Analytical & Environmental Engineering Laboratory

Adhunik Power & Natural Resource Limited

FLY ASH GENERATION & UTILIZATION FOR THE PERIOD OF APRIL 2020 TO MARCH 2021

	Ash Generation and Utilization						Mode of Ash Utilization		
Sl. No.	Months	Coal Consumed	Ash Contents of Coal (%)	Fly Ash Generation	Fly Ash Utilization	%age Utilization	In Making of Fly Ash Based bricks /Blocks /Tiles etc	In manufacturing of Portland Pozzolana Cement	Fly Ash In Reclamation of Low Lying Area
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	APRIL	115606	52.34	60503.94	72530.05	119.9%	1065.52	4096.41	67368.12
2	MAY	168525	41.99	70767.29	70767.29	100.0%	13442.08	35367.59	21957.62
3	JUNE	142338	47.37	67418.74	76494.34	113.5%	6335.44	43916.56	26242.34
4	July	176651	45.49	80354.38	80354.38	100.0%	4258.77	52619.45	23476.15
5	August	196856	43.51	85643.37	85643.37	100.0%	7378.28	39827.46	38437.63
6	Sep	182193	41.54	75682.63	75682.63	100.0%	11921.23	35653.46	28107.94
7	Oct	186803	45.70	85363.24	85363.24	100.0%	15428.16	43844.578	26090.50
8	Nov	115343	46.81	53995.48	53995.48	100.0%	5725.84	38839.23	9430.41
9	Dec	179820	44.08	79267.25	79267.25	100.0%	14704.15	51324.67	13238.43
10	Jan	135612	43.96	59620.41	59620.41	100.0%	10050.71	40177.21	9392.49
11	Feb	190205	36.57	69563.93	69563.929	100.0%	14964.66	44164.68	10434.59
12	Mar	226995	36.76	83435.53	83435.533	100.0%	13801.64	55698.08	13935.82

YUGANTAR BHARATI

ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY

Reaching Out for a Brighter Tomorrow

Accredited by: - National Accreditation Board for Testing Laboratory (NABL) & Jharkhand State Pollution Control Board (JSPCB)
Certified by : - An ISO 9001:2015 & BS OHSAS 18001 : 2007
Certificate No. - TC 7813

ANALYTICAL TEST REPORT

Water Test Report		URL(Unique Lab Report) No.	TC78132130000027P
Date of Issue	28th March 2021	Report ID	YBAEEL-210308 -122658 - S- 02
Sample Description	Bottom Ash	Job code / Ref. no.	YBAEEL/WA/L/S/Mar.- 21/01
Type of Industries	Thermal Power Plant	Work Order No./ Date	3030005309 - 27/02/2021
Issued to : -	M/s Adhunik Power & Natural Resources Limited Vill.- Padampur, Behind PGCIL Sub-station, Jamshedpur-832402, Jharkhand.		

Sampling date	17/03/2021		Mode of sample Collection	By YBAEEL Team	
Sampling Protocol	YBAEEL/SP/01/00		Sample Code	210318 – S – E02	
Sampling Location	Hopper		Sampling Source	Bottom Ash	
Sample pkg. Condition	Sealed Pack in Zipper Bag		Sample Quantity	1 Kg Approx.	
Meteorological cond.	W.C. – Clear		RH – 39 %	Temp. – 29°C	
Work allotted date	18/03/2021	Test started on	18/03/2021	Test completed on	26/03/2021

Test Result

Sl. No.	Tested Parameter	Method	Unit	Result
1.	Arsenic	Method 31114(B) APHA 23rd Edition, 2017	ppm	0.09
2.	Mercury	Method 31112(B) APHA 23rd Edition, 2017	ppm	0.03
3.	Chromium	Method 3111(B) APHA 23rd Edition, 2017	ppm	0.61
4.	Lead	Method 3111(B) APHA 23rd Edition, 2017	ppm	0.84
5.	Iron	Method 3111(B) APHA 23rd Edition, 2017	ppm	9.33
6.	Cadmium	Method 3111(B) APHA 23rd Edition, 2017	ppm	0.07
7.	Copper	Method 3111(B) APHA 23rd Edition, 2017	ppm	0.16
8.	Nickel	Method 3111(B) APHA 23rd Edition, 2017	ppm	0.72
9.	Selenium	Method 3111(B) APHA 23rd Edition, 2017	ppm	0.03
10.	Zinc	Method 3111(B) APHA 23rd Edition, 2017	ppm	0.11
11.	Unbom carbon	IS : 1350 (P- 2)	%	2.3

******End of Test******

Remarks : - Sample test results have found above.
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Tested by	Checked by	Issued by
Prem Kumar	Brij Nandan Kumar	Umesh Das
Lab Analyst	In-Charge Pollution & Environment	Technical Manager

Authorized Signatory
Pollution & Environment
Yugantar Bharati Analytical & Environmental Engineering Laboratory

Branch Office : - Jamshedpur | Dhanbad | Hazaribag | Pakur
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State Pollution Control Board

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ANALYTICAL TEST REPORT

Water Test Report		URL(Unique Lab Report) No.	TC78132130000030P
Date of Issue	28th March 2021	Report ID	YBAEEL-210308 -122658 -WW03
Sample Description	Waste Water	Job code / Ref. no.	YBAEEL/WA/L/C/Mar.-21/11
Type of Industries	Thermal Power Plant	Work Order No./ Date	3030005309 - 27/02/2021
Issued to : -	M/s Adhunik Power & Natural Resources Limited Vill.- Padampur, Behind PGCIL Sub-station, Jamshedpur-832402, Jharkhand.		

Sampling date	18/03/2021		Mode of sample Collection		By YBAEEL Team
Sampling Protocol	IS : 3025 (Part-1) 1987, R-2003		Sample Code		210318 – WW – E03
Sampling Location	Ash Pond outlet		Sampling Source		Effluent Water
Sample pkg. Condition	Sealed Pack in PP Bottle		Sample Quantity		3000 ml
Meteorological cond.	W.C. – Clear		RH – 39 %		Temp. – 29^{0}C
Work allotted date	18/03/2021	Test started on	18/03/2021	Test completed on	26/03/2021

Test Result

Sl	Parameter	Test Method	Units	Results	Limits
1.	pH value	IS 3025 (P-11):2002	pH	7.59	5.5-9.0
2.	Temperature*	IS 3025 (P-09)	^{0}C	27	40
3.	Total suspended solids	IS 3025 (P-17):2012	mg/l	96.0	100
4.	Oil and grease	IS 3025 (P-39):2003	mg/l	3.6	10
5.	Arsenic (as As)	APHA 3114 B 23rd edition 2017	mg/l	ND (DL 0.003)	0.2
6.	Chromium (as Cr)	APHA 3111 B 23rd edition 2017	mg/l	ND (DL 0.02)	--
7.	Lead (as Pb)	APHA 3111 B 23rd edition 2017	mg/l	0.07	0.1
8.	Mercury (as Hg)	APHA 3112 B 23rd edition 2017	mg/l	ND (DL 0.001)	0.01

******End of Test******

Remarks :-Samples **Comply** with the prescribed Specification as per IS:2490:1974
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Prem Kumar	BrijNandan Kumar	Umesh Das
Lab Analyst	In-Charge Pollution & Environment	Technical Manager

Authorized Signatory
Pollution & Environment
Yugantar Bharati Analytical & Environmental Engineering Laboratory

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State Pollution Control Board

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ADHUNIK POWER & NATURAL RESOURCES LTD.

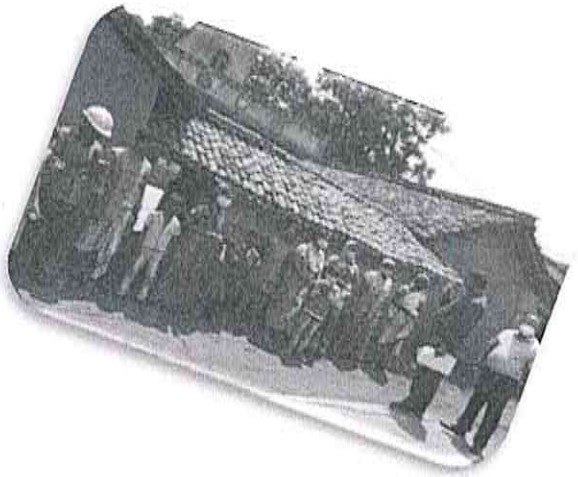
(Formerly Adhunik Thermal Energy Limited)

Report

on

Corporate Social Responsibilities

(April 2020- March 2021)



Village-Padampur, P.O.-Kandra, District-Saraikela-Kharsawan

ADHUNIK POWER & NATURAL RESOURCES LTD.

(Formerly Adhunik Thermal Energy Limited)

Introduction:

Adhunik Power & Natural Resources Limited is a 2 x 270 MW coal based thermal power Generating Company. Corporate Social Responsibility (CSR) of Adhunik Power commitment to its stakeholders to conduct business in an economically, socially and environmentally sustainable manner that is transparent and ethical. As a Corporate Citizen receiving various benefits out of society, it is our co-extensive responsibility to pay back in return to the society in terms of helping needy people by providing health ,education, skill development etc.

Adhunik Power & Natural Resource Limited (APNRL), Padampur, in partnership with Rapcha Gram Panchayat, Kandra Gram Panchayat & Dugdha Gram Panchayat had taken up community development projects as a part of corporate social responsibility and executed the development projects in partnership approach. The focus areas of development projects were Health, Education, Women Empowerment, Sports, Culture and Infrastructure Development. The community development initiatives were implemented in the villages of Srirampur, Pindrabera, Barahariharpur, Chotahariharpur, Padampur, Bikanipur, Ghutbera, Ramjivanpur, Nandidih, Barkatand, Dhatkidih, Rapcha, Ramchandrapur, of Dugdha, Kandra & Rapcha Gram-Panchayats during the period. (Villagers with the repetitive chance for the same person to benefit from the various activities as mentioned below):

Health & Sanitation:

1. **Ambulance Services Available (24x7):** 24 X 7 ambulance facility has been providing to the villagers of peripheral village for higher treatment.

No. of Villagers availed free ambulance facility, month wise-

Month	Male	Female	Total No.	Village Covered
April 20	18	07	25	Badahariharpur, Dhatkidih, Rapcha, Srirampur, Dumra, Padampur , Kandra, Gamharia, Amdih, Pindrabera
May 20	12	6	18	
June 20	19	11	30	
July20	16	08	24	
Aug20	18	07	25	
Sept 20	17	09	26	
Oct.20	9	8	17	

Nov.20	3	6	09
Dec.20	10	11	21
Jan.21	3	4	7
Feb.21	2	5	7
March 21	7	11	18

Medical Facilities: Provide free medical treatment at Dispensary , APNRL, Padampur. Following villagers availed the facilities during the period.

No. of Villagers availed free treatment facility, month wise-

Month	Male	Female	Total No.	Village Covered
April 20	68	53	121	Balidih, Badahariharpur, Srirampur, Dhatkidih, Padampur ,Pindrabera, Kandra, Gamharia, Virdhwajpur
May 20	80	65	145	
June 20	105	58	163	
July 20	49	81	130	
Aug 20*	359	71	430	
Sept 20*	397	84	471	
Oct.20	140	93	233	
Nov.20	105	60	165	
Dec.20	88	55	143	
Jan.21	81	61	142	
Feb.21	63	64	127	
March 21	69	77	146	

*Including Antibody test of villager and employees.

2. **Disability Awareness cum Assessment at Gamharia:** The Disability awareness cum Assessment and Distribution of aids & appliances camp organized on 30.1.2021 by the District Disability Rehabilitation Centre (DDRC), Social Welfare Department (ICDS) in collaboration Health Dept., Child & Family Welfare Department,

Government of Jharkhand. The camp was attended by villagers of different villages like Badahariharpur, Chotahariharpur, Padampur Srirampur etc of Gamharia block and other persons with disabilities. During the assessment camp, persons with disabilities were issued disability Identity Card as per the degree of disability and provided aids and appliances to suit their requirement. In the camps the following categories were identified:

1. Orthopedic Impairment
2. Speech Impairment
3. Hearing Impairment
4. Mental Retardation
5. Visual Impairment
6. Cerebral Palsy
7. Autism
8. Multiple Disability

During Disability awareness cum Assessment camp CSR team of APNRL met with the management and provides the ambulance services for carrying disabilities persons from different village. Person those who were availing the facilities they were very happy and thankful to APNRL, Padampur.

3. **Drinking Water Supply:** Drinking water was supplied through water tanker towards meeting the need of drinking water and other related work, use during social functions. The **objectives** of supply of drinking water to the villagers were as follows:
   i. To meet the drinking need of villagers
   ii. To meet the needs of water related other use(s) during water scarcity situation in villages.

The detailed status of drinking water supply is as below:

Month	No. of Drinking Water Supply Services Provided through Water Tanker	Purpose
July 20	03	Meeting the need of drinking water for the villagers during family function etc.
Aug 20	02	
Sept 20	02	
July 20	03	
Aug 20	02	
Sept 20	02	
Oct.20	00	
Nov.20	04	
Dec.20	03	

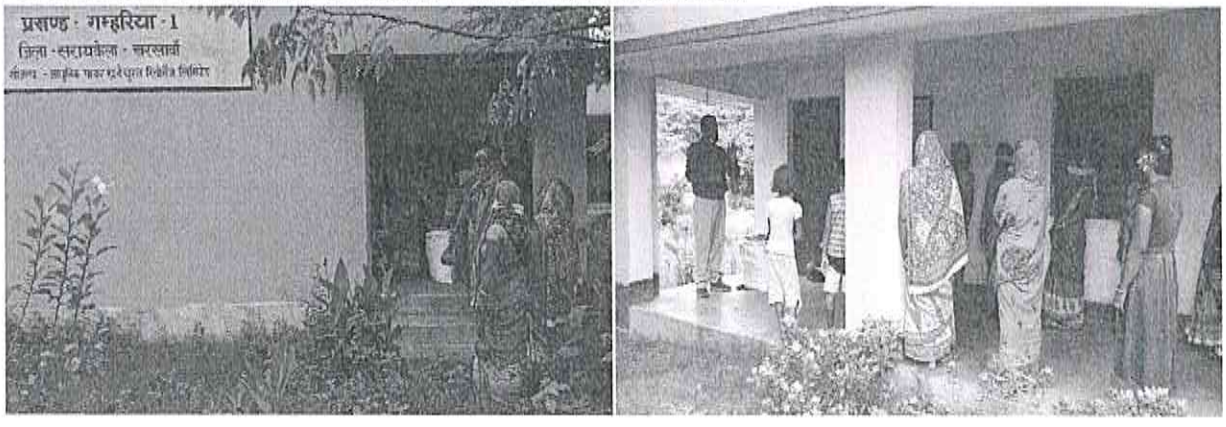
Jan.21	00	
Feb.21	06	
March 21	04	

4. **World Anti-Tobacco Day**: World Anti-Tobacco Day is observed annually on May 31. The theme of World Anti-Tobacco Day 2020 is **'Protecting youth from industry manipulation and preventing them from tobacco and nicotine use'**.

According to WHO, tobacco use kills more than 8 million people around the world each year. Smoking any kind of tobacco reduces lung capacity and increases the severity of respiratory diseases. Covid19 is an infectious disease that primarily attacks the lungs. Due to which, research suggests that smokers are at higher risk of developing severe Covid-19 outcomes and death.

In this regard CSR team organized 2-days signature campaign and awareness program in plant premises from 30th May to 31st May 2020 at 8.30 AM to 6.00PM to raise awareness among the workers/employees against bad effect of tobacco in human body. A signature campaign initiated by the Mr. R. K. Singh- MD, APNRL and Mr. Rakesh Gupta –CEO, APNRL with message writing on display board. It revealed that the people are very enthusiastic and coming forward to take part in the signature campaign to reduce the use of the tobacco in our plant as well as in the country. Others senior officers and employees also signed and gave the massage for all.

5. **<u>Distribution & Spraying Bleaching Powder at village level</u>:**



APNRL's corporate social responsibility (CSR) activities reflect its philosophy of helping to build a better, more sustainable society through sound business practices, which earn the trust of stakeholders. APNRL believes that its CSR activities and those of its employees will not only help to contribute to the realization of a sustainable society but also enhance APNRL's corporate value. The Company has always been empowering the village women through various training events to lead their life with sustainable social recognition.




The CSR activities at APNRL have shown its solidarity by initiation of **Health Awareness Drive** in the villages starting from Badahariharpur on 30.7.2020 which will be continued in peripheral village too, with objective of cleanliness and control of the diarrhea, malaria etc. In continuation, we have distributed and sprayed bleaching powder in drainages, wells and water logging area to stop mosquito breeding and to prevent from various diseases caused by dirt & mosquitoes etc. with the support of volunteers from Villages under the **Project of Swachh Gram Swasth Gram**. The persons who actively participated were Kali Charan Sardar, Anil Sardar, Kali pada Sardar etc.

6. **Seminar and Distribution of mosquito net**: The Adhunik Company empowers women through different activities which help them to live an independent life with dignity and social recognition. On the occasion of National Nutritional Week 2020, a program was organized at conference hall, Aganwadi Center Badahariharpur and Srirampur under the social responsibilities, CSR Department, APNRL, Padampur on 3rd& 4th Sept' 2020 respectively. Dr.

G.P.Murmu, OHC-APNRL, Mr. Anil Kumar Soni-DGM-HR , Sanjeet Kumar Sinha-CSR, APNRL, ANM, Anganbadi Sevikas and approximately 50 women participated in the programme.

About 100 mosquito nets distributed among the pregnant and lactating mothers of Badahariharpur, Chotahariharpur, Padampur and Srirampur which has an impact on development, productivity, economic growth and ultimately National development.Women were very happy and thankful to Adhunik CSR team for organising such awareness program

7. **<u>One day orientation training on HIV /AIDS:</u>** A HIV awareness program organized for our female employees including contractual employees on 25.3.2021 at 11.00 am at Sram Shakti Bhawan APNRL with the support of Jharkhand State AIDS Control Society, Ranchi with **the Objective as follows:**

- To raise awareness of the global AIDS epidemic
- To support the millions that are living with HIV & AIDS
- To remember those who have died from HIV & AIDS

About 45 individuals participated from different Departments of APNRL including Ms. Vaishali Kale, Mr. Anil Kumar Soni (Head- HR & Admin), Dr. G. P. Murmu (Head-Medical Services), Ms. Esha Choudhury - IT, Mr. Sanjeet Kumar Sinha and Mr. Ujawal Kumar Program Officer – JSACS, Ranchi (as the resources person).

Mr. Sanjeet Sinha proceeded with the welcome speech followed by the introduction of the guests. Mr. Anil Kumar Soni addressed all the guests and the participants with a briefing on the topic of HIV. Ms. Vaishali Kale said that the knowledge on such sensitive issues HIV needs to spread far and wide. Dr. G. P. Murmu also provided everyone with vital information on HIV – Preventions and Precautions advising everyone to practice the same.

Mr. Ujawal Kumar, Program Officer, JSACS, Ranchi explained in details with Power Point Presentation & advised the women as follows - HIV, or Human Immunodeficiency Virus, weakens your immune system by destroying important cells that fight disease and infection. Over time, HIV can destroy so

many of your T-cells or CD4 cells, a key part of your immune system, that your body can't fight infections and disease anymore. When this happens, HIV infection can lead to AIDS.

Ms. Esha summarized the session with the points that such awareness programs need to be held in future for the benefit and betterment of one. The program closed with the Vote of Thanks by Esha.

8. **Campaign & Distribution of Masks and soaps:** Door to door campaign was organized by the CSR team of the Adhunik Power and Natural Resources Limited (APNRL), Padampur. During the campaign in Badahariharpur, Srirampur,Bikanipur and Padampur, villagers were made aware of

Covid- 19 . 1000 no. of face masks and 1000 no. of soaps bar were distributed among Villagers. **Dr. G. P. Murmu suggested villagers to** wash their hands with soap and water after coming from outside and to maintain at least 2 meter (6 feet) social distance so that they can avoid this disease. He also suggested avoiding touching eyes, nose and mouth and making sure that they and the people around them follow hygiene. Further he suggested the villagers to stay home if they feel unwell or having fever, cough and if they feel any difficulty in breathing then immediately consult a physician/ Doctor.

Gobind Majhi, Bangal Tudu and Sonu Hansda were actively involved in distribution of masks and soaps.

9. Covid-19 Pandemic: Massive sanitization drive

Disinfectant spraying activities were organized at Badahariharpur, Padampur, Bikanipur and Srirampur of Dugdha and Rapcha gram Panchayat, Motorized sprayers has been done by tractors and fire bridged vehicle in above mentioned villages. The comprehensive sanitizations drives have been taken on timely manners so that its impact should remain.
Apart from that, Adhunik power & Natural Resources Limited, Padampur also distributed masks & hand sanitizer in different govt. department and near villages.

APNRL Preventive measure against COVID-19 impact –

1) In house sanitizer consists of Aloe Vera gel/ Fresh Aloe Vera, Alcohol, Essential oil & water has been prepared and placed in every department including canteen, Main Gate, security gate & other conspicuous places etc.

2) To avoid social distancing, employees have been requested to come in different shifts and in alternate manner. Also, we are trying for effective manpower engagement during the lock-out period. We are operating with almost half no. of Manpower in regular and Contractual roll.

3) Vehicle have been cleaned with sanitizer & minimum No. of employees have been allowed in vehicle & Buses. If required, additional vehicle will also be put to avoid gathering.

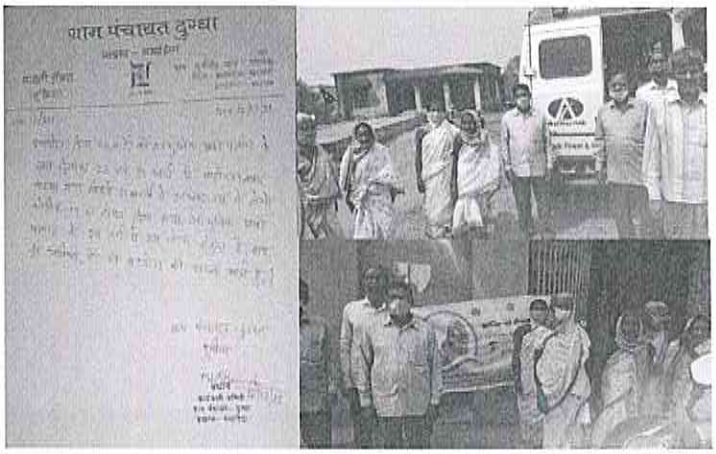
Guideline while preventing Covid-19, have been informed to the employees:

- To cover mouth & nose with handkerchief or disposable tissue while coughing, sneezing.
- To wash hand with alcohol-based sanitizer in every half & hour.
- To avoid crowded places & maintain at least 2-3 meter distance with every individual.
- To drink plenty of water and eat nutritional food.

- To Isolate in case of any COVID-19 symptoms and consult the doctors.

4) To maintain cleanliness, housekeeping & Hygiene in the workplace, a special care has been made by spraying the disinfectant periodically to plant premises. Additionally sanitization of entire plant premises on a daily basis has been contracted to an agency.

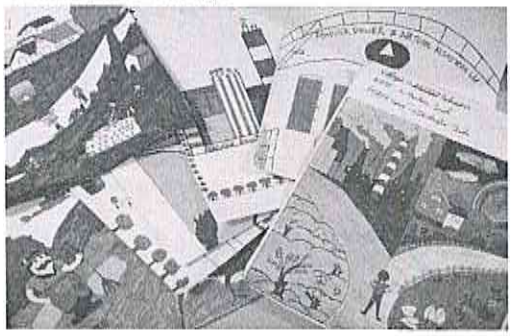
10. <u>Covid-19 vaccination camp- 23.3.2021 and 24.3.2021:</u> Adhunik power and Natural Resources Limited supported govt. Covid-19 vaccination camp on 23.3.2021 and 24.3.2021 at Dugdha for motivating and carrying villagers (Above 60 yrs. old) from village to camp and dropped.



EDUCATION

<u>Drawing competition</u>: Skill development among the local children is the prime objective of the company under CSR. Drawing competition were organized on the occasion of Environment day 2020 at two age- group, first one was age from 5 yrs to 10 yrs i.e. class I to V and another one was 11 yrs and above i.e. Class VI to Above. The aim for this completion was to develop the creativity in village candidates Drawing competition organized following dates in different Village-

Name of the Village	**Date**
Padampur -	2.6.2020
Badahariharpur-	2.6.2020
Srirampur -	2.6.2020



After that 3 best village candidates are selected in each group from respective village. Drawing competition started with the sharing of rules and regulation of competition by Mr. Anil Sardar.

At the end they come up with final results and best 3 candidates are selected in each group for prize. Prize distribution function organized on 5.6.2020 at APNRL Campus. During the prize distribution Sri Raghvendra Kumar Singh, Managing Director congratulated each of the participants for their participation as well as their effort. He said that this kind of competition to improve the skill as well as develop their positive thinking regarding our society.

School sanitization and Mask distribution: Adhunik power & Natural Resources Limited, Padampur organized a disinfectant spraying and cleanliness drive in peripheral Govt. school - Padampur & Badahariharpur before re-opening of the VIII class and also distributed masks & Soaps in respective village school during class.

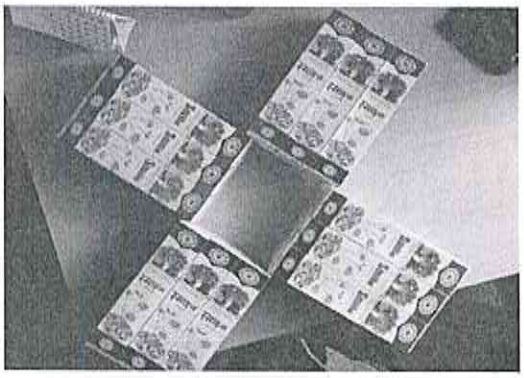
WOMEN EMPOWERMENT & LIVELIHOOD

1. **Self Help Group (SHG) Meeting :** - Monthly meetings of SHG held every month in follows villages -
Srirampur, Padampur, Badahariharpur, Pindrabera, Rapcha, Chotahariharpur. SHG members participated in regular basis and discussed regarding repayment of loan, trading, business and other issues.

The **objectives** of Self Help group meeting were as under:

i) To explore the functional aspects of SHGs in promoting micro saving and inter loaning activities.
ii) To increase social cohesiveness among the members of women Self-Help-Group.

2. **Workshop on Marketing & Networking**-11.8.2020: A self-help group is a homogenous gathering of usually not more than 20 persons who join on a voluntary basis in order to undertake some common activity through mutual trust and mutual help .It is mainly concerned with the poor and it is for the people and of the people. Apart from inculcating socially desirable habits and ethics among members, SHGs serve the purpose of a moneylender, a development bank, a cooperative and a voluntary agency.



We organized a workshop on 11.8.2020 with the members of Vinapani mahila SHG at Chotahariharpur for promotion of Agarbatti production. Mr. Sanjeet Kumar Sinha-CSR motivated the SHG members to engage themselves in Agarbatti making as their livelihood. He said that CSR-Team will facilitate the group in marketing of Agarbatti which will enhance their income. Mr. Vinay Kumar Mahato Gram Pradhan appreciated the members of SHG Group for their efforts for taking up such project and advised the CSR team of Adhunik Power to provide continue support to the SHG team members to achieve their aim. They include this activity in their livelihood.

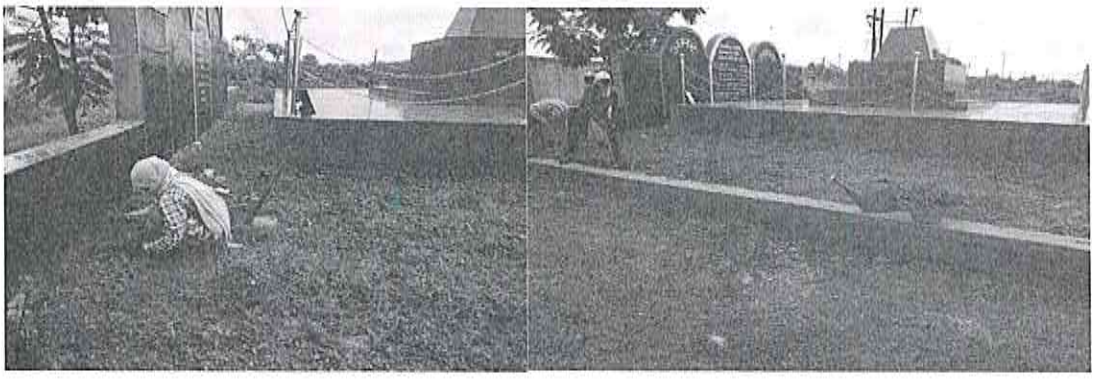
3. **Murhi and spice production at Pindrabera:** 15 – members of Jahir Ayo Mahila Samiti Self-help group of Rapcha engaged in Murhi packaging and selling (trading) and spice production. This has helped them in increasing corpus fund for their group. They have made this activity as their livelihood.

4. **Agarabatti production:** 14 members of Vina Pani SHG of Chotahariharpur village initiated in Agarabatti making, packaging and selling. This has helped them in increasing corpus fund for their group. They have made this activity as their livelihood. Every month they sold about 300-500 packets of Agarbatti. They earned Rs. 3000.00 to 5000.

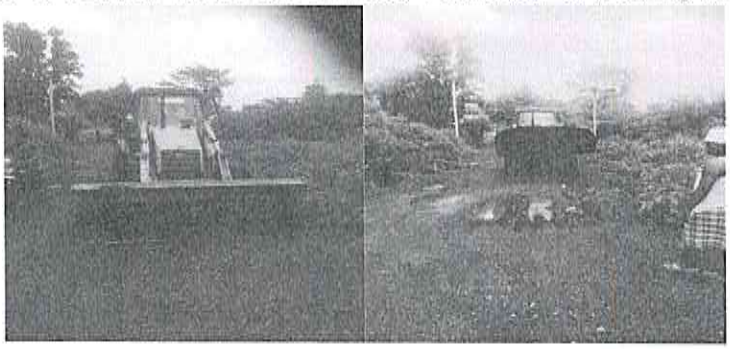
Infrastructure

Provide basic infrastructure to the villagers like construction/repairing of road, culverts, development of proper drainage system at village level, development of community centers, renovation of school buildings, electrification, provide safe drinking water facility are the major requirements of village area. We have focused for the development of basic amenities in the periphery villages, as per the need and requirement of the villages.

1. **Built AMAR JAWAN asthal at Dugani & Planted 1000+ saplings inside CRPF campus, Dugani**



2. **Repairing of Village Road:** Adhunik Power & Natural Resources Limited, Padampur is playing an important role in improving the socio-economics conditions of local communities around which the company is operative.



In this background, a meeting was convened by villagers of Bikanipur with the CSR team. During the meeting, the status of developmental projects being executed under Adhunik's CSR was discussed where the villagers requested for company interventions towards repairing of Virdhwajpur -Bikanipur village road which is in pitiable condition. The villagers told that the condition of village road is so bad that an accident may occur any time due to the ditches it has i.e. there is a high risk of accident.

CSR team paid a visit to the site along with the villagers and found that the condition of the road is damaged severely. On 23.6.2020 the company provided the JCB to fill up the ditches and repaired the village road. Now, the road has been repaired about 300 meters and villagers are very happy for this work.

3. **Repairing of Village Road:** Adhunik Power & Natural Resources Limited, Padampur has been instrumental in improving socio-economic conditions of local communities around which the company operates.

In this background, a meeting was organized with the villagers of Bikanipur-Birdhwajpur and CSR team. During this meeting, the status of developmental projects being executed under Adhunik's CSR was discussed where the villagers requested for company interventions in repairing of Bikanipur-Mahadeopuram road near pond. The road was damaged due to soil erosion during rainy season for which the villagers have submitted the request letter to CSR dept., APNRL on 24.7.2020 for providing the rejected stone for protection of soil erosion of road.

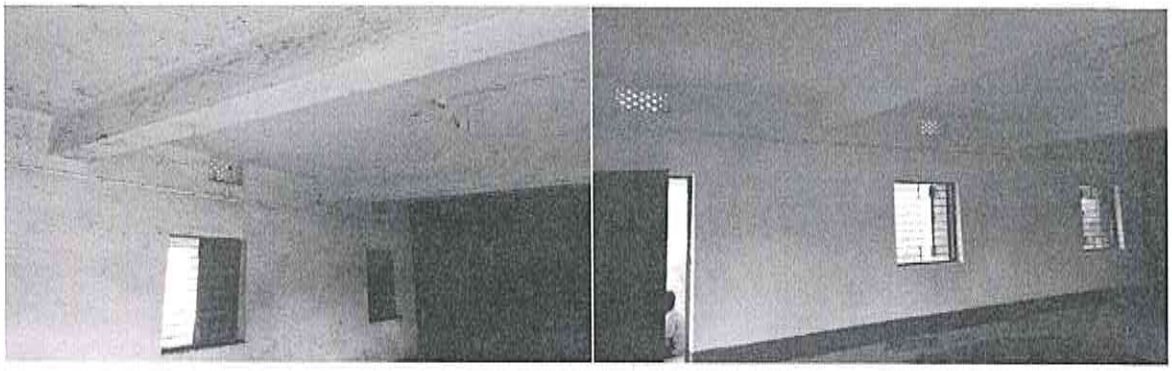
The villagers told that the condition of village road is so bad there is a high risk of accident. In rainy season accident may occur any time due to the soil erosion. CSR team had visited the site along with the villagers and found that the road was severely damaged and hence arranged the rejected stone (waste material of plant) on 4.8.2020 to fill up the ditches. Villagers were so excited that they manually started leveling up the stone on road without waiting for the company's JCB/labours which

showed a good example of community participation for a noble cause. Now, the road is repaired with the help of villagers.

4. **Renovation of Community building, Badahariharpur**: A well-established fact is that infrastructure development accelerates the pace of human development and economic growth. Hence, infrastructure development is identified as a key focus area of Community development in Adhunik

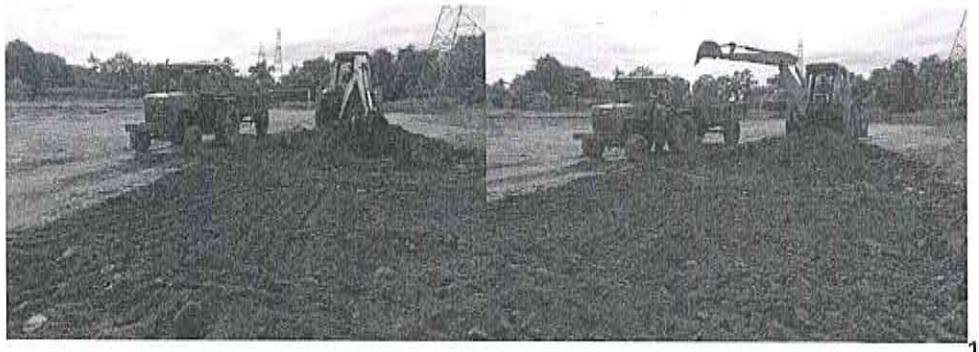
Power & Natural Resources Limited (APNRL), Padampur.

Renovation work completed of Community building, Badahariharpur by local person under the



supervision of the company including doors and windows. **Outside and Inside Painting of Samudayak Bhawan**

5. **Leveling of Football ground, Pindrabera:** Adhunik Power & Natural Resources Limited, Padampur is playing an important role in improving the socio-economic conditions of local communities.



In this background, a meeting was convened by villagers of Pindrabera with the CSR team. During the meeting, the status of developmental projects being executed under Adhunik's CSR was discussed where the villagers requested for company interventions towards leveling of football ground.

CSR team paid a visit to the site along with the villagers and found that the condition of the football ground is severely damaged. On 13 Sept.2020 the company provided the JCB for leveling the ground and villagers are very happy with the work.

Renovation of Sarna asthal and jaira asthan: White washing, painting and cleaning work done in

the **Jahira/Sarnaasthal and Majhya Asthan** of Padampur, where the cultural program, rituals and traditional culture organized in the month of March 2021.

Sports and Culture

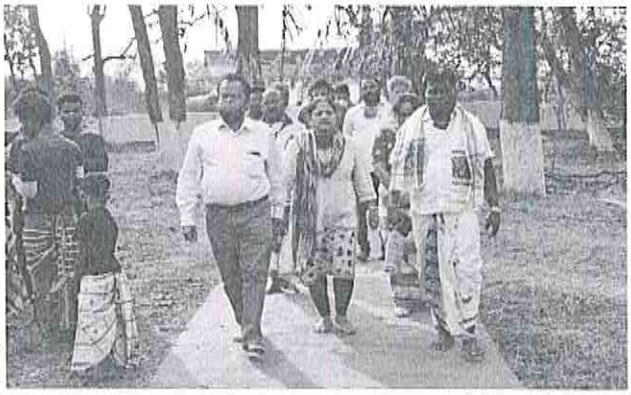
1. **Sports and Culture program, Badahariharpur 2021:** Every Year Adiwasi Avan Akhara, Hariharpur-Srirampur committee organizes 4 days Sports and culture program on the occasion of Republic Day at Badahariharpur Ground. The programme motivates the local youths to gather at a place with team spirit and it promotes the rural sports activity in the area. Similarly, this year the major events were Football Tournament, folk dance, MurgaLarai, Mena Bazar etc.

Adhunik Power & Natural Resources Limited, Padampur facilitated with financial support and other required resources like medical team, ambulance service, preparations for making playground ready, cleaning of sites etc.

APNRL also provided a running trophy to Adiwasi Aven Akharah Hariharpur- Srirampur, Badahariharpur for Winner and Runner position.

The organizers were happy and praised about the company's contribution towards successful conduction of the 4-day (26, 27, 28 & 28 Jan 2021) event and specially thanked to the plant management for the same.

2. **Baha Bonga- Sarhul festival**: Adhunik Group strongly believes in promotion of traditional culture. Every year we have given financial assistance and other supports to tribal



community. This year Sarhul Puja organized on **19.3.2021** at Padampur. Approx. 300 villagers including company employees from Padampur, Balidih, Bikanipur were participated in this festival and its show our traditional culture. Sarhul is celebrated during spring season and the Saal trees get new flowers on their branches. It is a worship of the village deity who is considered to be the protector of the tribes. People sing and dance a lot when the new flowers appear. The deities are worshiped with saal flowers.

Other:

World Environment Day' 2020 : World Environment Day (WED) has been started celebrating as an annual event on every 5th of June from 1974 in order to raise the global awareness about the importance of the healthy and green environment in the human lives, to solve the environmental issues. The theme for the year 2020 is - 'Converse Biodiversity' (Time for Nature) with a focus on its role in providing the essential infrastructure that supports life on Earth and human development. According to the UN, it is a concern that is both urgent and existential. Biodiversity supports all life on land and below water or we can say it is the

foundation that supports all this. Every aspect of human health is affected by it. It provides clean air, water, food, and is a source of medicines, etc. Human actions like deforestation, encroachment on wildlife habitats, intensified agriculture, and acceleration of global climate change, have disturbed nature and pushed it beyond its limit. According to the UN, it would take 1.6 Earths to meet the demands that humans make of nature every year. If this will continue, it poses a huge biodiversity loss that will have severe implications for humanity as a result of the loss of food and health systems.

APNRL observed the World Environment Day (WED) on 5.6.2020 at plant premises. The World Environment Day celebrated by creating awareness about importance of environment and plantation of Saplings in different area of the plant by company officials. The programme was initiated through the plantation of saplings by MD inside the premises of the company.

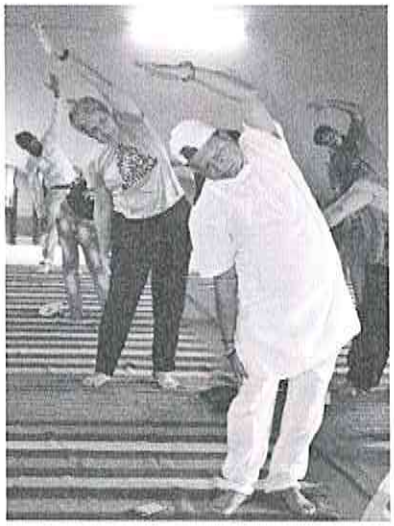
Kolhan Nari Shakti also observed World Environment Day. Mrs. Renu Singh - President of Kolhan Nari Shakti initiated plantation work in Chitakoot Apartment, Ramchandrapur. Various competitions were also organized by Kolhan Nari Shakti in Chitrakoot Apartment on the occasion of World Environment Day.

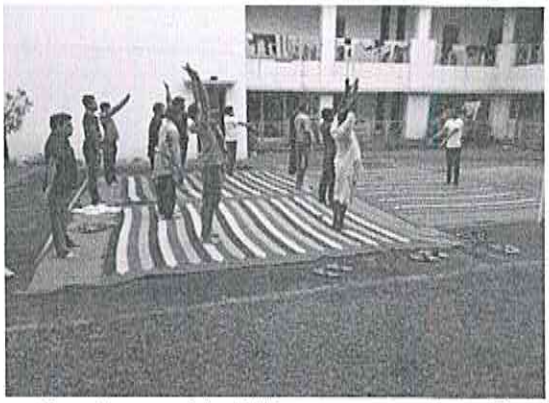
A "Seminar on World Environment Day" jointly facilitated by APNRL and Kolhan Nari Shakti at Sramshakti Hall, APNRL with objective of creating awareness among the Employees & villagers. 150 Approx people participated in this program. Snake Catcher Mr. N. K. Singh was a guest of honor. Workshop began with the welcome note by Mr. Kamlesh Kumar Jha, Manager-Envi., APNRL. It was very informative and motivating to all. CEO Mr. Rakesh Gupta and President, Kolhan Nari Shakti shared their views. At the end of event Mr. R. K. Singh, MD administered oath to participate on environmental conservation. Vote of thanks was given by Dharni Dhar Singh.

International Yoga Day 2020: Adhunik Power & Natural Recourses Limited, Padampur and Kolhan Nari Shakti,

Ramchandrapur jointly organized a yoga class on 21.6.2020 on the occasion of International Yoga Day. International Yoga Day is celebrated by world on 21 June every year. About 60 employees including ward members from the different Department were performed yoga asanas at sramshkti hall APNRL.

The event was inaugurated by the Mr. R. K. Singh MD-APNRL. The sessions which started at 8.00 am was carried out under the guidance of the yoga instructors Mr. Ashish Ranjan and Akanchha Bharti. All the participants followed the instructions enthusiastically with the objective of incorporating the goodness of Yoga into their own lives. Asanas in standing, sitting as well as laying postures were performed. Pranayam and other breathing exercises were performed followed by the prayer. Our Honorable MD announced on Yoga Day that Yoga class will be organized in three different places like Chitrakoot Apartment, Shwarrekha Bachelor hostel, APNRL and Shramshakti Hall, APNRL which helps us to keep physical and mental fitness. It also reduces the mental stress.





In amid corvid-19 period, Yoga class has an important role to play for human being to develop immune system. Every alternate days yoga classes have been organized in plant area which helps us to keep physical and mental fitness. All the participants followed the instructions enthusiastically with the objective of incorporating the goodness of Yoga into their own lives. Asanas in standing, sitting as well as laying postures were performed. Pranayam and other breathing exercises were performed followed by the prayer under the guidance of Instructor Mr. Ashish Ranjan. Every weekend, especial Yoga classes are organized at Chitrakut apartment and Swanrekha Bhawan(bachelor Hostel).

Covid-19 Anti Body Test: An awareness camp regarding testing of covid-19 anti-body was organized in the premises of Occupational Health Center of Adhunik power & Natural Resources Limited, Padampur. In the camp about 1300 people including employees and villagers were examined. The objective of the camp was to make the Company employees & villagers aware of the preventive and curative measures of corona virus and to help them in understanding whether antibody has developed against covid-19 or not (Exposed to covid-19 or not).

ADHUNIK POWER & NATURAL RESOURCES LTD.

(Formerly Adhunik Thermal Energy Limited)

Media:

News clippings of the various newspapers.

HINDUSTAN-1.6.2020	ANENUE MAIL -1.6.2020	KHABAR MANTRA-1.6.2020
		
ANENUE MAIL-6.6.2020	**NEWISPAT -6.6.2020**	**CHAMKTA AINA -6.6.2020**
		
PRABHAT KHABAR- 22.6.2020	**PRABHAT MANTRA-22.6.2020**	**HINDUSTAN-22.6.2020**
		

Prepared By - Sanjeet Kumar Sinha

DETAILS OF LOCAL EMPLOYEMENT TILL 30.09.2020

S. No.	Emp. Code	E.Name	Department
1	00302223	Mr. Arun Mahato	Electrical
2	00302236	Mr. Rajen Kumar Tudu	WTP, Utilities
3	00302237	Mr. Bangal Majhi	Civil
4	00302384	Mr. Lal Mohan Mahato	Horticulture
5	00302386	Mr. Budhram Baskey	Operation
6	00302387	Mr. Ajit Mahato	Operation
7	00302393	Mr. Bijay Baskey	Civil
8	00302430	Mr. Laxman Baskey	Medical Services
9	00302436	Mr. Raja Ram Baskey	Automobile
10	00302453	Ms. Paneshwari Kumari	Civil
11	00302454	Mr. Sunil Baskey	Coal Logistics
12	00302458	Mr. Nuna Baskey	Automobile
13	00302462	Mr. Rajesh Kumar Mahato	Operation
14	00302463	Mrs. Sonia Baskey	Electrical
15	00302493	Mrs. Surajmani Baskey	EMD
16	00302494	Mrs. Saraswati Devi	Medical Services
17	00302495	Mrs. Anita Mahato	Maintenance
18	00302501	Mrs. Bangi Baskey	AHP
19	00302503	Mr. Raju Tudu	Electrical
20	00302506	Mr. Ruhi Ram Majhi	Maintenance
21	00302507	Mr. Dilip Mahato	DM Plant
22	00302508	Mr. Dulal Mahato	Fire
23	00302509	Mr. Raju Mahato	DM Plant
24	00302510	Mr. Santosh Mardi	Electrical
25	00302516	Mr. Rajesh Mahato	Electrical
26	00302517	Mr. Mohan Lal Mahato	Electrical
27	00302518	Mr. Sumit Kumar Mahato	Electrical
28	00302519	Mr. Tapan Kumar Mahato	Electrical
29	00302520	Mr. Bibhishan Mahato	Automobile
30	00302521	Mr. Suku Murmu	Automobile
31	00302522	Mr. Bimal Kumar Mandal	Operation
32	00302523	Mr. Bablu Besra	Operation
33	00302524	Mr. Vikram Baskey	Maintenance
34	00302525	Mr. Mangal Besra	Operation
35	00302526	Mr. Bir Singh Hembram	Maintenance
36	00302527	Mr. Gopal Hembrom	Operation
37	00302528	Ms. Chhatamuni Baskey	Stores
38	00302529	Mr. Durga Hembrom	Operation
39	00302530	Mr. Suren Baskey	Operation
40	00302531	Mr. Dasmath Hembrom	Operation
41	00302532	Mr. Budheswar Baskey	Operation
42	00302533	Mr. Karan Hembrom	Operation
43	00302534	Mr. Umesh Tudu	Operation
44	00302540	Mr. Birendranath Baskey	Medical Services
45	00302541	Mr. Shailendra Tudu	Medical Services
46	00302550	Mr. Birdhan Baskey	Civil
47	00302574	Mr. Anil Sardar	Civil
48	00302602	Mrs. Sarla Majhi	Administration

49	00302604	Mr. Sohan Kisku	Electrical
50	00302605	Mr. Dilip Kisku	Electrical
51	00302606	Mr. Rabindra Nath Majhi	Operation
52	00302607	Mr. Mokra Murmu	Electrical
53	00302608	Mr. Lakhiram Tudu	Maintenance
54	00302609	Mr. Durga Baskey	Maintenance
55	00302610	Mr. Jiten Hansda	Operation
56	00302611	Mr. Jiten Sardar	Operation
57	00302612	Mr. Ashok Kumar Mahato	Operation
58	00302613	Mr. Mangal Majhi	Electrical
59	00302614	Mr. Sagram Tudu	Electrical
60	00302615	Mr. Sunil Kumar Tudu	Operation
61	00302616	Mr. Ganesh Mahato	Electrical
62	00302617	Mr. Sachin Kumar Tudu	Operation
63	00302618	Mr. Alok Mahato	Electrical
64	00302619	Mr. Rakesh Kumar Mahato	Operation
65	00302620	Mr. Chhotray Majhi	Operation
66	00302621	Mr. Devi Lal Majhi	Ash Loading
67	00302622	Mr. Govind Majhi	Electrical
68	00302628	Mr. Kalipada Singh Sardar	CHP
69	00302644	Mr. Vikram Singh Sardar	Intake Well
70	00302645	Mr. Manik Singh Sardar	Intake Well
71	00302646	Mr. Jagannath Singh Sardar	Intake Well
72	00302647	Mr. Budheshwar Mahato	Intake Well
73	00302659	Mr. Krishna Manjhi	CHP Lab
74	00302660	Mr. Sakla Hembrom	CHP Lab
75	00302661	Mr. Uttam Kumar Mahato	Maintenance
76	00302662	Mr. Shikar Hembrom	C&I
77	00302663	Mr. Ranjit Besra	CHP Lab
78	00302664	Mr. Hopna Baskey	Operation
79	00302665	Mr. Sona Ram Baskey	Operation
80	00302666	Mr. Suku Majhi	AHP
81	00302667	Mr. Gopal Majhi	Operation
82	00302668	Mr. Ramdas Kisku	Operation
83	00302669	Mr. Som Murmu	Operation
84	00302670	Mr. Khirod Chandra Mahato	C&I
85	00302671	Mr. Sona Ram Hembrom	C&I
86	00302672	Mr. Ram Hembrom	CHP Lab
87	00302673	Mr. Rajesh Mahato	C&I
88	00302674	Mr. Nimay Mahato	DM Plant
89	00302676	Mr. Peeton Baskey	CHP Lab
90	00302677	Mr. Raju Baskey	CHP Lab
91	00302678	Mr. Bablu Baskey	CHP Lab
92	00302679	Mr. Baijnath Mardi	Planning & Monitoring
93	00302680	Mr. Nitai Sardar	Planning & Monitoring
94	00302681	Mr. Baliram Murmu	Planning & Monitoring
95	00302682	Mr. Karu Tilka Majhi	C&I
96	00302683	Mr. Rajendra Hembrom	Maintenance
97	00302684	Mr. Jitu Hembrom	CHP Lab
98	00302687	Mr. Soken Tudu	C&I

99	00302688	Mr. Umesh Baskey	AHP
100	00302690	Mr. Anil Tudu	CHP Lab
101	00302694	Mr. Akash Tudu	Stores
102	00302695	Mr. Sushil Kumar Tudu	CHP Lab
103	00302696	Mr. Mahendra Tantubai	Electrical
104	00302697	Mr. Prakash Tudu	Stores
105	00302698	Mr. Karu Besra	C&I
106	00302699	Mr. Bangal Tudu	CHP Lab
107	00302700	Mr. Ravindra Nath Tudu	Electrical
108	00302701	Mr. Som Majhi	CHP Lab
109	00302702	Mr. Salku Tudu	AHP
110	00302707	Mr. Sukram Tudu	CHP Lab
111	00302708	Mr. Jeevan Manjhi	CHP Lab
112	00302709	Mr. Birsa Hansda	Operation
113	00302710	Mr. Surja Hansda	CHP Lab
114	00302711	Mr. Sanjay Mandal	C&I
115	00302712	Mr. Budhadev Mahato	C&I
116	00302713	Mr. Narayan Mahato	Operation
117	00302714	Mr. Jai Chand Mahato	Maintenance
118	00302715	Mr. Mithun Majhi	C&I
119	00302716	Mr. Sumit Kumar Mahato	DM Plant
120	00302717	Mr. Mantu Mahato	CHP Lab
121	00302718	Mr. Santosh Sardar	CHP Lab
122	00302719	Mr. Ranjit Singh Sardar	CHP Lab
123	00302720	Mr. Lal Mohan Mahato	CHP Lab
124	00302721	Mr. Sohan Sardar	CHP Lab
125	00302722	Mr. Paga Sardar	Maintenance
126	00302773	Mr. Shibanath Singh Sardar	Horticulture
127	00302774	Ms. Basanti Singh Sardar	Electrical
128	00302775	Mr. Kali Pado Sardar	Horticulture

YUGANTAR BHARATI

ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY

Reaching Out for a Brighter Tomorrow

Accredited by: - National Accreditation Board for Testing Laboratory (NABL) & Jharkhand State Pollution Control Board (JSPCB)

Certified by: - An ISO 9001:2015 & BS OHSAS 18001 : 2007

Certificate No. - TC 7813

ANALYTICAL TEST REPORT

Water Test Report		URL(Unique Lab Report) No.	TC78132130000028P
Date of Issue	28th March 2021	Report ID	YBAEEL-210308 -122658 -WW01
Sample Description	Waste Water	Job code / Ref. no.	YBAEEL/WA/L/C/Mar.-21/09
Type of Industries	Thermal Power Plant	Work Order No./ Date	3030005309 - 27/02/2021
Issued to : -	M/s Adhunik Power & Natural Resources Limited Vill.- Padampur, Behind PGCIL Sub-station, Jamshedpur-832402, Jharkhand.		

Sampling date	18/03/2021		Mode of sample Collection	By YBAEEL Team	
Sampling Protocol	IS : 3025 (Part-1) 1987, R-2003		Sample Code	210318 – WW – E01	
Sampling Location	Final Outlet of ETP		Sampling Source	Effluent Water	
Sample pkg. Condition	Sealed Pack in PP Bottle		Sample Quantity	3000 ml	
Meteorological cond.	W.C. – Clear		RH – 39 %	Temp. – 29°C	
Work allotted date	18/03/2021	Test started on	18/03/2021	Test completed on	26/03/2021

Test Result

Sl	Parameter	Test Method	Units	Results	Limits
1.	pH value	IS 3025 (P-11):2002	pH	7.85	5.5 -9.0
2.	Temperature*	IS 3025 (P-09)	°C	27.2	40
3.	Total suspended solids	IS 3025 (P-17):2012	mg/l	38.0	100
4.	Chloride (as Cl--)	IS 3025 (P-32):2003	mg/l	11.6	1000
5.	BOD	IS 3025 (P-44):2009	mg/l	18.0	30
6.	COD	IS 3025 (P-58):2006	mg/l	100.0	250
7.	Chromium (as Cr)	APHA 3111 B 23rd edition 2017	mg/l	ND (DL 0.02)	--
8.	Copper (as Cu)	APHA 3111 B 23rd edition 2017	mg/l	0.03	3
9.	Lead (as Pb)	APHA 3111 B 23rd edition 2017	mg/l	0.03	0.1
10.	Zinc (as Zn)	APHA 3111 B 23rd edition 2017	mg/l	ND (DL 0.1)	5
11.	Sulphate (as SO_4^{2-})	IS 3025 (P-24):2003	mg/l	9.4	1000

******End of Test******

Remarks :-Samples **Comply** with the prescribed Specification as per IS:2490:1974

Note : The parameters marked with * are not accredited by NABL.

Specific contractual notes: -

- The results listed refer only to the tested sample and applicable parameter.
- This report, in full or in part, shall not be used for advertising or as evidence in any court of law.
- This report cannot be reproduced, except when in full, without the written permission of the Lab In-charge
- The samples received shall be destroyed after two month from the date of issue of the certificate unless specified otherwise and sample for biological testing will be destroyed after one two week of testing.
- The liability of the laboratory is limited to the invoiced amount.
- All disputes are subjected to the Ranchi Jurisdiction.
- ND – not detected, DL – detectable limit

Tested by	Checked by	Issued by
Prem Kumar	Brij Nandan Kumar	Umesh Das
Lab Analyst	In-Charge Pollution & Environment	Technical Manager

Authorized Signatory
Pollution & Environment
Yugantar Bharati Analytical & Environmental Engineering Laboratory

Branch Office : - Jamshedpur | Dhanbad | Hazaribag | Pakur

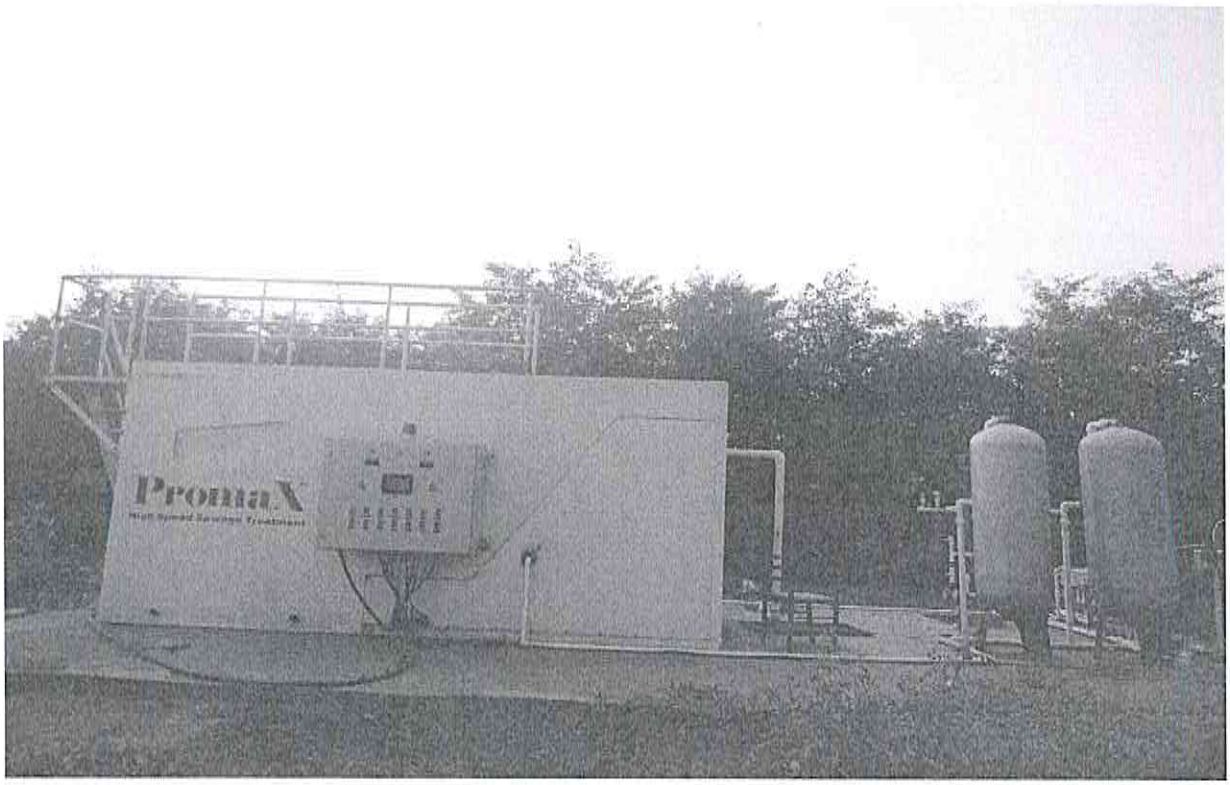
Main Office : Namkum Post Office, Sidroul, Ranchi - 834010, Jharkhand

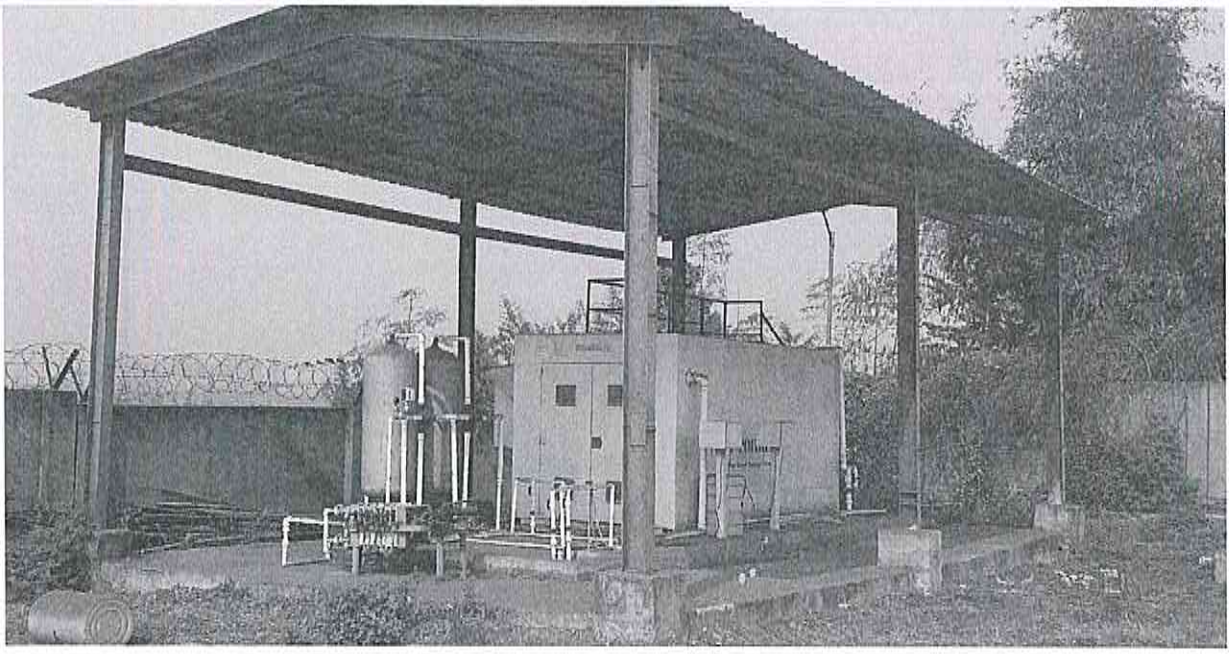
Ph : 098351-97960, 098357-86677, Email - ybaeel@gmail.com, Web - https://ybaeel.in

State Pollution Control Board

TÜVRheinland® ISO 9001:2015 BS OHSAS 18001:2007

Sewage Treatment Plant





प्ररूप XV
(प्रथम अनुसूची का अनुच्छेद 6 देखिए)
FORM XV
(see Article 6 of the First Schedule)

अधिष्ठापनों में पेट्रोलियम के आयात और भंडारकरण के लिए अनुज्ञप्ति
LICENCE TO IMPORT AND STORE PETROLEUM IN AN INSTALLATION

अनुज्ञप्ति सं. (Licence No.) : P/HQ/JH/15/1065(P257355)

फीस रुपए (Fee Rs.) 50000/- per year

M/s. Adhunik Power & Natural Resources Ltd., Village-Padampur,Behind PGCIL Substation,, Adityapur-Kandra Road,, Taluka: Adityapur(Gamharia), District: SARAIKELLA KHARSWAN, State: Jharkhand, PIN: 832105 को केवल इसमें यथा विनिर्दिष्ट वर्ग और मात्राओं में पेट्रोलियम 5000.00 KL आयात करने के लिए और उसका, नीचे वर्णित और अनुमोदित नक्शा संख्या P/HQ/JH/15/1065(P257355) तारीख 23/12/2011 जो कि इससे उपाबद्ध है, में दिखाए गए स्थान पर भण्डारकरण के लिए पेट्रोलियम अधिनियम, 1934 के उपबंधों या उसके अधीन बनाए गए नियमों तथा इस अनुज्ञप्ति की अतिरिक्त शर्तों के अधीन रहते हुए, यह अनुज्ञप्ति अनुदत्त की जाती है ।

Licence is hereby granted to M/s. Adhunik Power & Natural Resources Ltd., Village-Padampur,Behind PGCIL Substation,, Adityapur-Kandra Road,, Taluka: Adityapur(Gamharia), District: SARAIKELLA KHARSWAN, State: Jharkhand, PIN: 832105 valid only for the importation and storage of 5000.00 KL Petroleum of the class and quantities as herein specified and storage thereof in the place described below and shown on the approved plan No P/HQ/JH/15/1065 (P257355) dated 23/12/2011 attached hereto subject to the provisions of the Petroleum Act, 1934 and the rule made thereunder and to the further conditions of this Licence.

यह अनुज्ञप्ति 31st day of December 2022 तक प्रवृत रहेगी ।
The Licence shall remain in force till the 31st day of December 2022

पेट्रोलियम का विवरण /Description of Petroleum	अनुज्ञप्त मात्रा (किलोलीटरों में) /Quantity licenced in KL
वर्ग क प्रपुंज पेट्रोलियम /Petroleum Class A in bulk	NIL
वर्ग क प्रपुंज पेट्रोलियम से भिन्न /Petroleum Class A, otherwise than in bulk	NIL
वर्ग ख प्रपुंज पेट्रोलियम /Petroleum Class B in bulk	NIL
वर्ग ख प्रपुंज पेट्रोलियम से भिन्न /Petroleum Class B, otherwise than in bulk	NIL
वर्ग ग प्रपुंज पेट्रोलियम /Petroleum Class C in bulk	5000.00 KL
वर्ग ग प्रपुंज पेट्रोलियम से भिन्न /Petroleum Class C,otherwise than in bulk	NIL
कुल क्षमता /Total Capacity	5000.00 KL

December 15, 2011

Chief Controller of Explosives

1). Amendment dated - 23/12/2011

अनुज्ञप्त परिसरों का विवरण और अवस्थान
DESCRIPTION AND LOCATION OF THE LICENSED PREMISES

अनुज्ञप्त परिसर जिसकी विन्यास सीमाएं अन्य विशिष्टयां संलग्न अनुमोदित नक्शे में दिखाई गई हैं Plot No: Plot No. 161,, Behind PGCIL.Substation adityapur, Kandra Road, Village- Padampur, District: SARAIKELLA KHARSWAN, State: Jharkhand, PIN: 999999 स्थान पर अवस्थित है तथा उसमें निम्नलिखित Two Petroleum ClassCAboveground storage tanks,togetherwith other connected facilities. सम्मिलित हैं ।

The licensed premises, the layout , boundaries and other particulars of which are shown in the attached approved plan are situated at Plot No: Plot No. 161,, Behind PGCIL.Substation adityapur, Kandra Road, Village- Padampur, District: SARAIKELLA KHARSWAN, State: Jharkhand, PIN: 999999 and consists of Two Petroleum ClassCAboveground storage tanks,togetherwith other connected facilities. together with connected facilities.

पेज सं. 2

अनुज्ञप्ति संख्या-(Licence No.) P/HQ/JH/15/1065 (P257355)

नवीनीकरण के पृष्ठांकन के लिए स्थान
SPACE FOR ENDORSEMENT OF RENEWALS

पेट्रोलियम अधिनियम, १९३४ के उपबन्धों या उनके अधीन बनाए गए नियमों या इस अनुज्ञप्ति की शर्तों का उल्लंघन न होने की दशा में यह अनुज्ञप्ति फ़ीस में बिना किसी छूट के दस वर्ष तक नवीकृत की जा सकेगी | This licence shall be renewable without any concession in fee for ten years in the absence of contravention of any provisions of the Petroleum Act, 1934 or of the rules framed thereunder or of any of the conditions of this licence.	नवीकरण की तारीख Date of Renewal	समाप्ति की तारीख Date of Expiry of license	अनुज्ञापन प्राधिकारी के हस्ताक्षर और स्टाम्प Signature and office stamp of the licencing authority.
1).		31/12/2013	Sd/- PESO ADMIN
2).	23/09/2013	31/12/2018	Sd/- R.P.Singh Jt. Chief Controller of Explosives For Dy. Chief Controller of Explosives Ranchi
3).	18/02/2019	31/12/2022	K. Thiagarajan Dy. Chief Controller of Explosives Ranchi उप मुख्य विस्फोटक नियंत्रक, राँची Dy. Chief Controller of Explosives, Ranchi

यदि अनुज्ञप्ति परिसर इसमें उपावद्ध विवरण और शर्तों के अनुरूप नहीं पाए जाते है और जिन नियमों और शर्तों के अधीन यह अनुज्ञप्ति मंजूर की गई है उनमें से किसी का उल्लंघन होने की दशा में यह अनुज्ञप्ति रद्द की जा सकती है और अनुज्ञप्तिधारी प्रथम अपराध के लिए साधारण कारावास से, जो एक मास तक हो सकता है, या जुर्माने से, जो एक हजार रुपये तक हो सकता है, या दोनों से, और प्रत्येक पश्चातवर्ती अपराध के लिए साधारण कारावास से जो तीन मास तक हो सकता है, या जुर्माने से, जो पांच हजार रुपये तक हो सकता है, या दोनों से, दण्डनीय होगा \|

This licence is liable to be cancelled if the licensed premises are not found conforming to the description given on the approved plan attached hereto and contravention of any of the rules and conditions under which this licence is granted and the holder of this licence is also punishable for the first offence with simple imprisonment which may be extend to one month, or with fine which may extend to one thousand rupees, or with both and for every subsequent offence with simple imprisonment which may extend to three months, or with fine which may extend to five thousand rupees or with both.

HINDUSTAN PETROLEUM CORPORATION LIMITED

(A Government of India Enterprise)

QUALITY CONTROL LABORATORY

Visakha New Terminal

CONVENT JN.-SHEELANAGAR ROAD, BEHIND AIRPORT,

VISAKHAPATNAM- 530014

TEST REPORT

Product : HP INDUSTRIAL DIESEL OIL

Customer / Supplier / Branch Plant	: NBOT-BONDED TANKS-PSD	Test Report No.	: BFT/10839
Source of Sample	: TK105	Date of Sample Drawn	: 20/07/19
Tank No	: TK105	Date of Sample Receipt	: 21/07/19
Qty of Sample/ Density/Type of Sample	: 1ltr uml / tk70/868.3 b.no.36/2019	Date of Sample Testing	: 22/07/19
Catg /Evnt / Actvty	: Aft Receipt thru Dedicated P/L	Date of Report	: 22/07/19
Receipt/Despatch Mode	:	Date of Printing	: 22/07/19
Sample Drawn by	: RAMAKRISHNA	JDE Sample Number	: 865213
		Batch No	:

Test Line Number	Characteristics	Units	Test Method	Specifications Min	Specifications Max	Result Value
5	DENSITY@ 15°C	Kg/m3	IS 1448 [P :16]	-	-	867.8
6	KINEMATIC VISCOSITY @ 40° C	cSt	IS 1448 P :25	2.500	15.000	4.860
7	FLASH POINT - PMCC	°C	IS 1448 P :21	66	-	79
8	WATER CONTENT	% Vol	IS 1448 P :40	-	.250	100
9	TOTAL SULPHUR	% Mass	ASTM D 4294	-	1.50	.47
10	POUR POINT SUMMER	°C	IS 1448 P :10	-	21	3

Remarks:

Sample S.No.BFT/271 meets specification as per IS-15770:2008(Reaffirmed2014) in the above parameters

Appearance : Light Brown

Notes :. 1) The sample is drawn by client and results relate to sample tested
2) The test report shall not be reproduced except in full without prior written approval of the Lab Incharge
3) This test report shall not be used in any advertising media or as evidence in the Court of Law without prior written consent of Laboratory
4) Test results reported are valid at the time of testing
5) This is a system generated test report and hence does not require signature

Tested By : 35323320
VELAMURI DATTATREYA

Reviewed and Approved By : 35323320
VELAMURI DATTATREYA

*** END OF TEST REPORT ***

ANALYTICAL TEST REPORT

Atmospheric Pollution Test Report			URL(Unique Lab Report) No.		TC78132120000291F
Report Release Date	28th March 2021		Report ID		YBAEEL-210308 -122658 -N01
Sample Description	Ambient Noise		Job code/ Ref. no.		YBAEEL/WA/L/A/Mar. - 21/30
Type of Industry	Thermal Power Plant		Work Order No./ Date		3030005309 - 27/02/2021
Issue to	M/s Adhunik Power & Natural Resources Limited Vill.- Padampur, Behind PGCIL Substation, Jamshedpur-832402, Jharkhand.				
Sampling Period	15/03/2021 – 16/03/2021		Mode of sample collection		By YBAEEL Team
Sampling Protocol	IS 9876:1981 (RA 2007) & CPCB Method S.O.50 (E) dated 11/01/2010				
Meteorological Cond.	Temp.– 31°C	RH % - 35%			W.C.– Clear
Sample receipt Date	18/03/2021	Analysis Started on	18/03/2021	Analysis completed on	26/03/2021

**Test Results **

Sl.NO.	Locations	Parameters	Units	Day Time	Night Time	Limits
1.	Near Main Gate	Leq	dB (A)	68.5	65.7	Day Time -75 Night Time-70
2.	Occupation Health Centre	Leq	dB (A)	58.2	58.9	
3.	Sati Steel (CHP Area)	Leq	dB (A)	61.5	52.6	
4.	Near Reservoir Area	Leq	dB (A)	63.4	55.3	

End of Report

- Day time shall mean from 6.00 a.m. to 10.00 p.m.
- Night time shall mean from 10.00 p.m. to 6.00 a.m.
- Silence zone is an area comprising not less than 100 meters around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.
- dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale(A) which is relatable to human hearing.

Remarks	Samples Comply with the prescribed specification as per Noise Pollution (Regulation & Control) Rules, 2000
Abbreviation	MDL : Minimum detection limit, BDL : Below detection limit,
Note	The parameters marked with * are not accredited by NABL.
Specific contractual notes	All values are expressed in as unit.
	The results listed refer only to the tested sample and applicable parameter.
	This report, in full or in part, shall not be used for advertising or as evidence in any court of law
	This report cannot be reproduced, except when in full, without the written permission of the Lab In-charge
	The samples collected shall be destroyed after 15 days from the date of issue of the certificate unless specified otherwise
	The liability of the laboratory is limited to the invoiced amount
	All disputes are subjected to the Ranchi Jurisdiction

Tested by	Verified by	Issued by
'Amit Kumar Sinha	Brij Nandan Kumar	Umesh Das
Lab Analyst	Section In-Charge	Technical Manager

28/03/2021 28/3/21

Authorized Signatory
Atmospheric Pollution
Yugantar Bharati Analytical &
Environmental Engineering Laboratory

YUGANTAR BHARATI

ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY

Accredited by: - National Accreditation Board for Testing Laboratory (NABL) & Jharkhand State Pollution Control Board (JSPCB)
Certified by : - An ISO 9001:2015 & BS OHSAS 18001 : 2007
Certificate No. - TC 7813

Reaching Out for a Brighter Tomorrow

ANALYTICAL TEST REPORT

Atmospheric Pollution Test Report				URL(Unique Lab Report) No.	TC78132120000292F
Report Release Date	28th March 2021			Report ID	YBAEEL-210308 -122658 -N02
Sample Description	Work Zone Noise			Job code/ Ref. no.	YBAEEL/WA/L/A/Mar. - 21/31
Type of Industry	Thermal Power Plant			Work Order No./ Date	3030005309 - 27/02/2021
Issue to	M/s Adhunik Power & Natural Resources Limited Vill.- Padampur, Behind PGCIL Substation, Jamshedpur-832402, Jharkhand.				
Sampling Period	15/03/2021 – 16/03/2021			Mode of sample collection	By YBAEEL Team
Sampling Protocol	IS 9876:1981 (RA 2007) & CPCB Method S.O.50 (E) dated 11/01/2010				
Meteorological Cond.	Temp.– 31°C		RH % - 35%		W.C.– Clear
Sample receipt Date	18/03/2021	Analysis Started on	18/03/2021	Analysis completed on	26/03/2021

**Test Results **

Sl.NO.	Locations	Parameters	Units	Day Time	Night Time	Factory Act. 1948
1.	Turbine Floor	Leq	dB (A)	82.4	83.3	85 dB
2.	Coal Crusher	Leq	dB (A)	82.2	80.5	
3.	Cooling Tower	Leq	dB (A)	79.3	75.7	
4.	Compressor House	Leq	dB (A)	83.5	81.3	
5.	Boiler Feed Pump Area	Leq	dB (A)	79.2	79.1	

End of Report

- Day time shall mean from 6.00 a.m. to 10.00 p.m.
- Night time shall mean from 10.00 p.m. to 6.00 a.m.
- Silence zone is an area comprising not less than 100 meters around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.
- dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale(A) which is relatable to human hearing.

Remarks	Samples Comply with the prescribed specification as per factory act 1948.
Abbreviation	MDL : Minimum detection limit, BDL : Below detection limit,
Note	The parameters marked with * are not accredited by NABL.
Specific contractual notes	All values are expressed in as unit.
	The results listed refer only to the tested sample and applicable parameter.
	This report, in full or in part, shall not be used for advertising or as evidence in any court of law
	This report cannot be reproduced, except when in full, without the written permission of the Lab In-charge
	The samples collected shall be destroyed after 15 days from the date of issue of the certificate unless specified otherwise
	The liability of the laboratory is limited to the invoiced amount
	All disputes are subjected to the Ranchi Jurisdiction

Tested by	Verified by	Issued by
Amit Kumar Sinha	Brij Nandan Kumar	Umesh Das
Lab Analyst	Section In-Charge	Technical Manager

28/03/2021 28/3/21

Authorized Signatory
Atmospheric Pollution
Yugantar Bharati Analytical & Environmental Engineering Laboratory

ANALYTICAL TEST REPORT

Atmospheric Pollution Test Report			URL (Unique Lab Report) No.	TC78132120000290P
Report Release Date	28th March 2021		Report ID	YBAEEL-210308 -122658 -A02
Sample Description	Ambient Air Quality (Buffer Zone)		Job code/ Ref. no.	YBAEEL/WA/L/A/Mar. - 21/31
Type of Industry	Thermal Power Plant		Work Order No./ Date	3030005309 - 27/02/2021
Issue to	M/s Adhunik Power & Natural Resources Limited Vill.- Padampur, Behind PGCIL Substation, Jamshedpur-832402, Jharkhand.			
Sampling Period	16/03/2021 – 17/03/2021		Mode of sample collection	By YBAEEL Team
Sampling Protocol	IS:5182 and CPCB Air Manual Volume-1(NAAQM/36/2012-13)			
Sampling Locations	A. Padampur Village	B. Srirampur Village		C. Pindrabera Village
Meteorological Cond.	W.C.– Clear	RH % - 30%	Temp. - 32°C	W.D.– South - North
Sample receipt Date	18/03/2021	Analysis Started on	18/03/2021	Analysis completed on 26/03/2021

**Test Results **

Parameters	Test Method	Units	Sampling Location			NAAQS (2009)
			Site A	Site B	Site C	
Particulate matter (PM_{10})	IS:5182 (P-23) 2006	$\mu g/m^3$	78.4	69.9	75.6	100
Particulate matter ($PM_{2.5}$)	USEPA -40 CFR (PART 50) (50.7)	$\mu g/m^3$	48.3	37.4	45.4	60
Sulphure Dioxide (SO_2)	IS:5182 (P-2) 2001 RA 2012	$\mu g/m^3$	48.4	54.3	38.9	80
Nitrogen Dioxide (NO_2)	IS:5182 (P-6) 2006 RA 2012	$\mu g/m^3$	61.1	76.1	53.5	80
Ammonia (NH3)	SOP No. YBAEEL/SOP/AIR/01	$\mu g/m^3$	50.8	83.1	45.9	400
Ozone (O3)*	IS:5182 (P-09) 1974	$\mu g/m^3$	84.5	85.9	65.4	180
Carbon Monoxide (CO)*	IS:5182 (P-10) 1999 RA 2003	mg/m^3	1.8	2.16	1.98	04
Lead (Pb)	IS:5182 (P-22) 2004	$\mu g/m^3$	0.22	0.21	0.23	01
Nickel (Ni)*	SOP No. YBAEEL/SOP/AIR/01	ng/m^3	BDL (MDL 8.3)	BDL (MDL 8.3)	BDL (MDL 8.3)	20
Arsenic (As)*	SOP No. YBAEEL/SOP/AIR/01	ng/m^3	BDL (MDL 1.0)	BDL (MDL 1.0)	BDL (MDL 1.0)	06
Benzene (C6H6)*	IS:5182 (P-11) 2006	$\mu g/m^3$	BDL (MDL 0.06)	BDL (MDL 0.06)	BDL (MDL 0.06)	05
Benzo (a) pyrene (BaP)* Particulate Phase Only	IS:5182 (P-12) 2004 RA 2017	ng/m^3	BDL (MDL 0.2)	BDL (MDL 0.2)	BDL (MDL 0.2)	01

End of Report

Remarks	Samples Comply with the prescribed specification as per NAAQS 2009.
Abbreviation	MDL : Minimum detection limit, BDL : Below detection limit,
Note	The parameters marked with * are not accredited by NABL.
Specific contractual notes	All values are expressed in as unit.
	The results listed refer only to the tested sample and applicable parameter.
	This report, in full or in part, shall not be used for advertising or as evidence in any court of law
	This report cannot be reproduced, except when in full, without the written permission of the Lab In-charge
	The samples collected shall be destroyed after 15 days from the date of issue of the certificate unless specified otherwise
	The liability of the laboratory is limited to the invoiced amount
	All disputes are subjected to the Ranchi Jurisdiction

Tested by	Verified by	Issued by
Amit Kumar Sinha	Brij Nandan Kumar	Umesh Das
Lab Analyst	Section In-Charge	Technical Manager

Authorized Signatory
Atmospheric Pollution
Yugantar Bharati Analytical & Environmental Engineering Laboratory

YUGANTAR BHARATI
ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY

Accredited by: - National Accreditation Board for Testing Laboratory (NABL) & Jharkhand State Pollution Control Board (JSPCB)
Certified by :- An ISO 9001:2015 & BS OHSAS 18001 : 2007
Certificate No. - TC 7813

Reaching Out for a Brighter Tomorrow

ANALYTICAL TEST REPORT

Atmospheric Pollution Test Report						URL(Unique Lab Report) No.	TC78132120000289P
Report Release Date	28th March 2021					Report ID	YBAEEL-210308 -122658 - A01
Sample Description	Ambient Air Quality (Core Zone)					Job code/ Ref. no.	YBAEEL/WA/L/A/Mar. -21/30
Type of Industry	Thermal Power Plant					Work Order No./ Date	3030005309 - 27/02/2021
Issue to	M/s Adhunik Power & Natural Resources Limited Vill.- Padampur, Behind PGCIL Substation, Jamshedpur-832402, Jharkhand.						
Sampling Period	15/03/2021 – 16/03/2021					Mode of sample collection	By YBAEEL Team
Sampling Protocol	IS:5182 and CPCB Air Manual Volume-1(NAAQM/36/2012-13)						
Sampling Locations	A. Bachelor Hostel		B. Switch Yard			C. Sati Steel	
Meteorological Cond.	W.C.– Clear	RH % - 35%		Temp. - 31°C		W.D.– East - West	
Sample receipt Date	18/03/2021	Analysis Started on	18/03/2021		Analysis completed on	26/03/2021	

**Test Results **

Parameters	Test Method	Units	Sampling Location			NAAQS (2009)
			Site A	Site B	Site C	
Particulate matter (PM_{10})	IS:5182 (P-23) 2006	$\mu g/m^3$	81.5	86.7	94.6	100
Particulate matter ($PM_{2.5}$)	USEPA -40 CFR (PART 50) (50.7)	$\mu g/m^3$	52.1	54.6	58.4	60
Sulphure Dioxide (SO_2)	IS:5182 (P-2) 2001 RA 2012	$\mu g/m^3$	46.1	50.8	36.6	80
Nitrogen Dioxide (NO_2)	IS:5182 (P-6) 2006 RA 2012	$\mu g/m^3$	56.4	62.9	55.4	80
Ammonia (NH3)	SOP No. YBAEEL/SOP/AIR/01	$\mu g/m^3$	39.6	40.2	50.2	400
Ozone (O3)*	IS:5182 (P-09) 1974	$\mu g/m^3$	63.4	73.3	51.1	180
Carbon Monoxide (CO)*	IS:5182 (P-10) 1999 RA 2003	mg/m^3	BDL (MDL 1.8)	BDL (MDL 1.8)	BDL (MDL 1.8)	04
Lead (Pb)	IS:5182 (P-22) 2004	$\mu g/m^3$	0.21	0.34	0.47	01
Nickel (Ni)*	SOP No. YBAEEL/SOP/AIR/01	ng/m^3	BDL (MDL 8.3)	BDL (MDL 8.3)	BDL (MDL 8.3)	20
Arsenic (As)*	SOP No. YBAEEL/SOP/AIR/01	ng/m^3	BDL (MDL 1.0)	BDL (MDL 1.0)	BDL (MDL 1.0)	06
Benzene (C6H6)*	IS:5182 (P-11) 2006	$\mu g/m^3$	BDL (MDL 0.06)	BDL (MDL 0.06)	BDL (MDL 0.06)	05
Benzo (a) pyrene (BaP)* Particulate Phase Only	IS:5182 (P-12) 2004 RA 2017	ng/m^3	BDL (MDL 0.2)	BDL (MDL 0.2)	BDL (MDL 0.2)	01

End of Report

Remarks	Samples Comply with the prescribed specification as per NAAQS 2009.
Abbreviation	MDL : Minimum detection limit, BDL : Below detection limit,
Note	The parameters marked with * are not accredited by NABL.
Specific contractual notes	All values are expressed in as unit.
	The results listed refer only to the tested sample and applicable parameter.
	This report, in full or in part, shall not be used for advertising or as evidence in any court of law
	This report cannot be reproduced, except when in full, without the written permission of the Lab In-charge
	The samples collected shall be destroyed after 15 days from the date of issue of the certificate unless specified otherwise
	The liability of the laboratory is limited to the invoiced amount
	All disputes are subjected to the Ranchi Jurisdiction

Tested by	Verified by	Issued by
Amit Kumar Sinha	Brij Nandan Kumar	Umesh Das
Lab Analyst	Section In-Charge	Technical Manager

28/03/2021 28/3/21

Authorized Signatory
Atmospheric Pollution
Yugantar Bharati Analytical Laboratory

State Pollution Control Board JHARKHAND

TÜVRheinland ISO 9001:2015 BS OHSAS 18001:2007

Adhunik
GROUP OF INDUSTRIES

ADHUNIK POWER & NATURAL RESOURCES LIMITED

WORKS : Village - Padampur, Behind P.G.C.I.L. Substation,
Adityapur - Kandra Road, Saraikela - Kharsawan, PIN - 832402 Jharkhand
Phone : +91 - 657 - 6628400, Fax : +91 - 657 - 6628440
CIN - U40101WB2005PLC102935

APNRL/HR/Office Order/10
5th August'2016

Office Order

As per the directions of the Ministry of Environment & Forest, Government of India while granting the Environment Clearances vide letter no **J-13011/8/2009-IA.II(T), dated 29th Aug 2009 (Unit I) & Letter No :J13012/8/2009-IA .II (T) dtd 9th May 2011** to our 2x270 MW Power Plant, the Management considering the importance of Environmental concerns and set up the Environment Cell under the chair of Plant In charge who is directly reporting the Managing Director of Organization. The Cell is functional since 2009 and is equipped with qualified professionals of the fields.

Roles & Responsibility of Environment Cell

Following the broad scope of the Cell

- Understanding Environment issues in Adhunik power & Natural Resources Ltd during Construction & Operation and Maintenance Phase.
- Framing appropriate scope of work for requisite environment management, EIA & various other complex issues to address those with tailor made solutions,
- Awarding the consultancy tasks for environmental management & EIAs, Modeling,Monitoring etc & other complex studies to the appropriate agency and also sometimes In-house work of Monitoring,
- Dealing with JSPCB/CPCB/MoEF &CC for various aspects including obtaining clearances for Plant and Plant led development and policy makings at State and National level,
- The meeting of the management of M/s APNRL shall be conducted in which the budgetary allocation for the EMP shall be discussed and finalized and comprehensive EMP shall be prepared as per the guidelines of CPCB.
- Preparation of Environmental Management Plans- Basically Assisting Engineering Section for preparation Master Plan for existing plant to address policy regulations issued by MOEF& CC from time to time,
- Operating and upgrading the existing Hazardous Waste Management Facilities for Plant Area as per latest regulations.- (Development and Operation of TSDF at APNRL),
- Initiating dialogs, meeting & developing participatory approach with the key stakeholders for solving any typical pollution related problems.
- Review of EMP for various sections of plant and suggest modifications if any for better Env Management,
- Representing APNRL at the State and National level platform for Environment Management
- Comments & advice on draft amendment, notifications on Environmental Laws.
- Imparting knowledge and raising awareness for Environment Protections among APNRL key officers and other related stakeholders,
- The Plant Incharge will be responsible for environmental issues at plant.

The responsibilities of the various members of the environment management cell are enclosed as Annexure I.

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CIN - U40101WB2005PLC102935

05.08.2016

Annexure I

Responsibilities of the members of the environment management cell

S. No.	Designation	Responsibility	Reporting to
01	Managing Director	Environmental policy and directions	
02	Plant Incharge	Overall responsibility for environmental management and decision making for all environmental issues	Managing Director
03	Environment Manager	Overall in-charge of operation of environmental management facilities of respective sections. Ensure environmental monitoring as per appropriate procedures, Ensure correct records of generation, handling, storage, transportation and disposal of solid hazardous wastes. Ensuring legal compliance by properly undertaking activities as laid down by various regulatory agencies from time to time and interacting with the same and arranging awareness programme among the workers.	Plant Incharge
04	CSR Manager	Responsibility to implement social impact improvement /mitigation measures.	Plant Incharge
05	Safety Manager	Participating in workplace safety and health planning meetings. Ensuring managers and supervisors have the appropriate safety and health; Accident prevention; and investigation & training Ensure safety and health hazards are corrected, eliminated or guarded.	Plant Incharge
06	Medical Officer	Attend all types of OPD and Emergency Patients. First Aid Treatment to all Cases. Routine Medical Examination of Company Employees. Performing & Conducting various training & awareness programs in company.	Plant Incharge
06	Chemist	To initiate environmental monitoring as per approved schedule. Prepare & Submit the monitored results and corrective measures in case monitored results are above the specified limit.	Environment Manager
07	Horticulture officer	Responsible for development of Green belt & Land Scape on vacant land of Plant premises.	Environment Manager

Sr. Manager (HR)

CORPORATE OFFICE : "LANSDOWNE TOWER", 2nd Floor, 2/1A, Sarat Bose Road, Kolkata - 700 020
Ph : +91 - 33 - 30517100 / 7200 / 7300 • Fax : +91 - 33 - 22890285
REGD. OFFICE : 14, N. S. Road, 2nd Floor, Kolkata - 700 001, Phone No. +91 - 33 - 22428551, 22428553
Website : www.adhunikgroup.com

Kamlesh Kr Jha

From:	Kamlesh Kr Jha
Sent:	25 September 2020 15:33
To:	'ranchijspcb@gmail.com'; 'ro.ranchi-mef@gov.in'; 'JSPCB, Jamshedpur'
Subject:	Submission of Environmental Statement (Form V) for Unit I (2019-2020) of M/s Adhunik Power & Natural Resources Limited,Village-Padampur, Dist-Saraikela-Kharswan, Jharkhand.
Attachments:	APNRL-Environment Statement (2019-2020)-Unit I.pdf

Ref No : Environment Clearance file No: J-13011/8/2009-IA.II(T), Dated 29th Aug 2009

Dear Sir,

In compliance with the above general condition no XXX of environmental clearance, please find the attached environmental statement (Form V) for the financial year 2019-2020.

This is for your kind information & record please.

Thanking You

Your's faithfully

Kamlesh Kumar
Manager-Environment
Adhunik power & natural resources Ltd
Vill-Padampur,District-Sariekela,Jharkhand
Mobile no-7763818994

O/C

ADHUNIK POWER & NATURAL RESOURCES LTD.

(Formerly Adhunik Thermal Energy Limited)

Office : Village Padampur, Behind PGCIL Substation, Adityapur, Kandra Road, P.O: Kandra Saraikela-Kharsawan, Jharkhand-832 402 ✆ PHONE : 0657 6628400 ✆ FAX : 0657 6628440

Website : www.adhunikgroup.com

Ref: MOE&F, RNC/HYC/KKJ/231220/01 **Dated: 23.12.2020**

To,

Regional Office (ECZ),
Ministry of Environment, Forest and Climate Change,
Bungalow No. A-2, Shyamali Colony,
Ranchi – 834002

Sub:- Submission of Half yearly compliance status report (Unit I) for the period – April 2020 to September 2020 -Reg.

Ref:- MoEF letter No.J-13011/8/2009-IA.II(T), dated 29th Aug 2009.

Sir,

With reference to the above referred Environmental Clearance, we are pleased to submit herewith the half yearly compliance status report **(Unit I)** for the period of **April 2020 to September 2020.**

This is for your reference and record, please.

Thanking you,

For **Adhunik Power & Natural resources Limited**

(Authorized Signatory)

Encl: As Above

Copy to:

1) Central Pollution Control Board, Kolkata
2) Member Secretary, Jharkhand State Pollution Control Board, Jharkhand
3) Regional Officer, JSPCB, Jamshedpur