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/RA/24620/02

Dated: 24.06.2020

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 II) for the period – October 2019 to March 2020-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 2019 to March 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

Received 1.7.20

REPORT

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

(Unit II)

OCTOBER 2019 – MARCH 2020

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 2019 to March 2020		
Sl No	**EC Conditions**	**Status as on 31st March 2020**
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 for are completed. Copy of Work Order with photographs are enclosed as **Annexure II** for your kind reference.
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.
ix.	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 has been reviewed & Report are enclosed as **Annexure III.** 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 2020 are enclosed as Annexure IV.**
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 the Regional Office of this Ministry. The data	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 2020 are enclosed as Annexure IV.** Installation of Piezometer at prominent locations of plant site has been completed.

	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.	Ground water level of three location of plant Premises are enclosed as **Annexure V.**
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 2020 are enclosed as Annexure IV & Annexure VI 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, however concentration of SO2 in flue gas is well within prescribed limit.
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 2020 are enclosed as Annexure VII.**
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 (October 2019 to March 2020) are enclosed as **Annexure VIII.** 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 2020 are attached as Annexure IX & Annexure X 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.67956 nos. (Area covered-30.8 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 85.6%. Total Survived plants are 58170. Plantation done Oct 19 to March 20 is 235 samplings. 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 the Ministry within six months.	Letter has been submitted to Forest Department for guidance on implementation of social forestry.

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. Chotahariharpur f. Ramjivanpur g. Bikanipur etc. Details of CSR activity enclosed as **Annexure XI.**
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 XI.**
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 XII. 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 **XI** .
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 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	All CSR activities are monitored on weekly and monthly basis. We are in process to conduct social audit through renowned organization who are well aware about Social Audit in Jharkhand region.

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 Guard pond from For the month of March 2020 are enclosed as Annexure XIII.**
		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 XIV.**
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 XV.**
		We are using Sulphur content in the liquid fuel within prescribed limit. Copy of Test report are enclosed as **Annexure XV (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 etc shall be periodically examined to maintain audiometric record and for treatment for any hearing loss including shifting to non noisy/less noisy areas	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 monitoring report For the month of March 2020 are enclosed As Annexure XVI.**

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 2020 are enclosed As Annexure XVII.** 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 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 improvement/mitigation measures.	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 XVIII.**

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 2019 to Sep 2019 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 (2018-19) in Form V has submitted to JSPCB vide letter No: APNRL/JSPCB/ES/2018-19/02 dated 20th Sep 2019. **Acknowledgement copy of same attached as Annexure XIX.** Environment Statement (2018-19) 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/RA/251219/02 ,dated 20TH Dec 2019. **Acknowledgement copy of same attached as Annexure XX.**
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) shall be displayed at the main gate of the power plant.	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.

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. Year wise (2019-20) expenditure on Environment measures are enclosed as **Annexure XXI.**
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.

Annexure-I (3)

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 अनियामित है। उन्होने यह भी वर्णित किया है कि आश्रयणी से हाथियों का आवागमन रामगढ़, 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 मंतब्य 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 वचनबद्वता 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।

19/7

Annexure II

ADHUNIK POWER & NATURAL RESOURCES LTD.

Vil-Padampur, PGCILS/S,Kandra - 832402
Phone & Fax : 0657-6628400 6628440

VENDOR CODE : 26627

PURCHASE ORDER

SSK ENTERPRISE 32 EZRA STREET,TODI CORNER,SOUTH BLOCK,ROOM, NO.19,GROUND FLOOR KOLKATA WEST BENGAL PIN - 700001 TEL -33 3985-1405 GSTNO: 19AFMPK2127F1ZI	Purchase Order No. & Date : 3300004954 & 06.03.2019 Quotation No. & Date : E-MAIL &24.01.2019 Other Ref. :
SUPPLIERS CONTACT : MR. ADITYA MUNDHRA 9831431215	PLEASE RETURN TO Contact Person : GENERAL PURCHASE Phone : 0657-6628442 Email : bikashsamanta@adhunikgroup.co.in

FOR SUPPLY OF SYSKA MAKE, 30W SOLAR LED STREET LIGHT.

SL. NO.	MATERIAL DESCRIPTION	UOM	ORDER QTY	UNIT RATE	BASIC AMOUNT	DISC.AMT/ DISC %	DISCOUNTED VALUE(Rs.)
10	**SOLAR LIGHT POWERED BY LI-ION BATTERY** Product Code : SSK-SSL-30W, Power Consumption : 30W, Solar Panel Power Consumption : 35W, Size in mm : 1398 X 277 X 164, Lumens : 3000 Lm, Working Temperature : (-)25oC to (+) 55oC, Battery Type : Lithium battery, Battery Life Span : 36000mah, Led Efficiency : Above 100 Lumens/Watt, CCT : 6500K, CRI : > 80, Beam Angle : 120 deg - 140 deg, Make of LED: CREE, Lamp Housing : Diecast Aluminium, Lens Material : Toughened Glass, Led Lifespan : Minimum 50000 hrs., Ingress Protection : IP 65, Installation Height : 6-8M, Weight : 38KG/PC, Solar Charging Time : 4-5 Hrs Bright Sunlight, Lighting Time : Over 18 Hours, Energy Efficiency arrangement : Nature Switch for Auto ON/OFF, Sensor switch for Auto Dimming. Mounting arrangement : Suitable for Bracket and Clamps, Thermal management : External heat sink of Aluminum housing, aluminum metal-core printed circuit board of thermal conductivity more than than 2.0W/mk and thermal pad with thermal conductivity more than 1.5W/mk. **HSN Code :** **Delivery Date : 31.07.2019** **Delivery At : Saraikela-Kharswan, Jhark** Indent No. & Date : 5000005468 18.01.2019 Cost Center : **APNRL_ELECTRICAL**	PCS	15.000	25,690.00	385,350.00	0.00	385,350.00 GST-(5.00%)

Authorised Signatory

Signature

ADHUNIK POWER & NATURAL RESOURCES LTD.

Vil-Padampur, PGCILS/S,Kandra - 832402
Phone & Fax : 0657-6628400 6628440

CONTD.PURCHASE ORDER NO.3300004954

	31.07.2019	15.000					
Total					385,350.00	0.00	385,350.00
Mode of Transport BY ROAD.	INCO Terms	Freight by IN THE SCOPE OF VENDOR.			IGST **SUB-TOTAL**		19,267.50 **404,617.50**
Insur. by IN THE SCOPE OF VENDOR.	S.Tax Form GST EXTRA AS APPLICABLE.	To be Delivered at OUR APNRL PADAMPUR SITE.					
			15.000		Grand Total(Rs.)		**404,617.50**

FOUR LAKH FOUR THOUSAND SIX HUNDRED SEVENTEEN AND PAISE FIVE ZERO ONLY (Rs.)

*** Please quote PURCHASE ORDER reference in all the correspondence.**
*** Please sign & return the attached copy as a token of Receipt.**
*** Please submit your Bill(s)/ Invoice(s) and Excise Invoice (if any) along with your Delivery Challan.**
*** The Supplier shall comply with provision of the E.H.S. (Environment Health & Safety) related documents, during the supply of the Materials like M.S.D.S (Material Safety Data Sheet) or E.H.S (Environment Health & Safety) guidelines etc.**

*** This is an electronic PO and carries no signature.**

SPECIAL INSTRUCTIONS

DELIVERY : WITHIN 6-8 WEEKS.

PAYMENT TERM

100% WITH TAXES AGAINST PROFORMA INVOICE.

GUARANTEE / WARRANTEE

3 YEARS REPLACEMENT WARRANTY FROM THE DATE OF INVOICE. YOU SHOULD PROVIDE US WARRANTY CERTIFICATE ALONGWITH SUPPLY OF MATERIALS.

OUR DETAILS

Range	: ADITYAPUR-IV,SOURADEEP PLAZA,BISTUPUR,JAMSHEDPUR	Regn. No.	: AAFCA2331JSD002
Ranage Address	: AAFCA2331JSD002	ECC No.	: AAFCA2331JSD002
Division	: JAMSHEDPUR	L.S.T. No.	: 20620905536
C.S.T.No.	: 20620905536-101	VAT / TIN No.	: AAFCA2331J
Div. Address	: ADITYAPUR III, BAIDEHI BHAWAN, ADITYAPUR,JAMSHEDPUR		
Corporate Identity Number	: 040101WB2005PLC102935	Provisional ID No.	: 20AAFCA2331J1ZA
Commissionerate	: 143, NEW BARADWARI, JAMSHEDPUR, JHARKHAND	GST/ARN No.	:
AA200217003246Y			

Created by	Checked by	Checked by	Approved by
APNRL_BAHETY	APNRL_BAHETY	APNRL_PROSAN	APNRL_CHIRAG
06.03.2019	06.03.2019	07.03.2019	07.03.2019

Terms and Condition

1. Address : Unless specifically stated otherwise, all communication(s) in respect of this order shall be made to Adhunik Power & Natural Resources Ltd (Purchase Dept - Tel No. 0657 662 8441)

2. Meaning of Expression : The Purchaser in these conditions means "Adhunik Power & Natural Resources Ltd." The Seller includes all person(s), items, corporation and companies,entity etc, who agree to sell to purchaser.

3. Quantity Ordered : In case of strike, shortage of labor, breakdown, accident or other unforeseen contingencies of whatever nature causing stoppage of production at purchaser's works, the purchaser reserves the right to cancel or modify the order without being liable for any compensation and/or claim of any description. The goods rejected for any reason will be returned to seller with charges for transportation both ways plus labor, re-loading etc. and not to be replaced except upon receipt of written instructions from purchaser.

4. Description : Please refer to item on the face of the Purchase Order along with detailed description below the item.

5. Delivery : The timely delivery of the materials shall be the essence of the contract and any failure on that score will entail the buyer to purchase the material from the market at the prevailing market rate at the cost and risk of the seller without ay prejudice to the right of the buyer to cancel the order. On request of the purchaser, seller will arrange for necessary insurance of the materials. Any loss breakage or any damage during transit due to any cause whatsoever shall be borne by the seller.

6. Packing Instructions : All articles should be packed properly to avoid breakage or pilferage of the material In transit, In addition to the specific advice of the purchaser.

Authorised Signatory

Signature

WORKS : VILL: PADAMPUR, BEHIND PGCIL, SARAIKELA-KHARSWAN,JHARKHAND PIN-832402, PHONE-0657-6628439
REGD.OFFICE : 14, N. S. Road, 2nd Floor, Kolkata - 700 001, Phone : 22428551, 22428553, Fax : 22428551, 22428553.
CORP.OFFICE : 6th Floor, Lansdowne Towers, 2/1A, Sarat Bose Road, KOLKATA - 700 020, Phone : 033 - 30517100

CONTD.PURCHASE ORDER NO.3300004954

7. Challan : The seller must deliver the goods as per the delivery Instruction under their challan having material code, p.o. reference, and their own supplier code as given In relevant order and Its reference no. No goods will accept without proper challan having these Informations.

8. Inspection : Inspection of the goods finally will be made by purchaser at their own factory and their report shall be final and binding on both the parties. In case of Forging, Casting etc. If any defect Is detected during the machining operations such casting/ forging will be rejected on seller's account. In Case Inspection at your site, then: 10 days advance information to be given to us for sending our Inspector(S). Inspected material duly approved by our inspector may be dispatched along with Adhunik Power & Natural Resources Ltd. Inspection certificate or joint Inspection report, as the case may be. In case any drawing/ sketch Is Involved In the supply, you should be In the position to present the same to our inspector at the time of inspection for the verification. In case any specific test report by any institute/ laboratory Is required, same shall accompany the dispatch document, failing which the material will be liable for rejection at our end.

9. Invoicing / Billing : Invoice In triplicate accompanied with receipted challan must be sent by the seller to the purchaser, separate invoice should be sent for the each order, order number with prefix letter and date, railway receipt number and date and the wagon number should be shown on each invoice when the supplies are made by rail. All invoices must show and/or, number/unit and rate at which each item or the material Is charged In the invoice and freight paid on the consignment. mode of dispatch should be Indicated In the invoice.

10. Terms of Payment: Payment will be as usual calculated on actual rate and quantity received and accepted by purchaser's works and their records will be considered final and decisive In this respect. Payment will be made only after the goods have been received and approved by the purchaser's inspection dept and found satisfactory in terms of quality and other specification laid down in the order. Payment may be withheld till execution of this order to the purchaser's satisfaction. No interest will be paid on the outstanding(s).

11.Price : All the rates stated in the order are understood to be for purchaser's works unless otherwise expressly agreed. No charge will be allowed for packing or cartage unless specified on order. No revision of the price will be permitted during the period of the contract. If prices are omitted In the order, It Is agreed that seller's price will be the lowest of the prevailing. market price.

12. Penalty : All rejected materials would be returned to the seller immediately on the rejection at the cost of seller In respect of packing freight and insurance etc. In the event of the seller's failure to supply the goods in time. The purchaser reserves the right to purchase goods from the market on seller's account and risk and can hold them liable for any difference in price and / or other incidental expenses arising thereon. If the purchaser finds that the material supplied are not of the contracted quality or not according to the specification required or received in damaged or broken condition or otherwise not satisfactory, owing to any reason thereof. The purchaser shall be sole judge and entitled to reject the material, cancel the contract and buy its requirement in the open market on seller's risk & cost. Purchaser can recover the loss If any. From the seller reserving always the right to forfeit the deposit, (If any) placed by the seller for the due fulfilment of the contract. the seller will make arrangements to remove the rejected materials, Ootherwise they will be lying entirely at seller's risk and responsibility. Any demurrage, wharf age or similar charges which purchaser have to undergo on account of the seller's failure to book the goods in accordance with the order or due to late delivery of the railway receipt, shall be borne by the seller.

13. Disputes : In all cases of dispute(s), the decision of the purchaser shall be final and binding on both the parties.

14. Other Terms : The security deposit if any submitted by the seller for the due fulfilment of the contract will be at no interest and will be returned only after the contract has been completed to the entire satisfaction of the company. purchaser order will be treated open until full purchase order Is supplied and accepted by the purchaser. Disregard of any of the above instruction or conditions will invariably delay the payment of bills.

15. General : Please mention clearly order reference In all the correspondence/ challans / invoices etc. Challan must specify supplier code & item wise code and item line no.(s) in the purchase order. Separate challan in duplicate against each order along with material dispatch advise, excisable gate pass & sales tax registration no. should be sent with materials, invoices in the name of our works office and will be submitted in triplicate along with receipted challan giving order details to our works/ office for payment. A copy of the invoice must be forwarded to this purchase office for the information and co-ordination. Materials, if rejected should be collected within seven days from the date of the receipt of the rejection advice. these terms shall also be applicable to special contracts over and above the terms which are agreed in such cases.

16. On receipt of our purchase order at your end, if NO written order acceptance is given to us within 5 working days from the receipt of the Order, we shall deem that the purchase order has been accepted by you .

17. The jurisdiction in respect of this Order and all disputes of differences in relation thereto shall be at Jamshedpur.

18. The vendor / contractor shall comply with the statutory / regulatory board / pollution control board(s) of respective states or country relating to handling of hazardous chemicals

19. Material procurement is partly evaluated on the basis of Energy Performance.

20. During design of new modification/renovation energy performance improvement opportunity to be considered.

Delivery : The Delivery Date mentioned is the last date of Delivery of Goods in case of Purchase Order(s) and start date of Service in case of Service Order(s).

Payment Terms : The standard payment terms is 30 days credit i.e. within 30 days after Delivery & Acceptance of the Materials / Service and submission of Tax Invoice / Bill unless & otherwise specifically mentioned in the clause "PAYMENT TERMS" of the Order.

Delivery Period Tolerance : The tolerance is 2 / 4 weeks after which the LD clause may be applicable.

Liquidated Damage : The LD shall be charged @ 0.5% per week for the number of weeks of Delay in part or full subject to maximum of @ 5% of Total Order Value, if specifically mentioned in the Order.

Authorised Signatory

Signature

WORKS : VILL: PADAMPUR, BEHIND PGCIL, SARAIKELA-KHARSWAN,JHARKHAND PIN-832402, PHONE-0657-6628439

REGD.OFFICE : 14, N. S. Road, 2nd Floor, Kolkata - 700 001, Phone : 22428551, 22428553, Fax : 22428551, 22428553.

CORP.OFFICE : 6th Floor, Lansdowne Towers, 2/1A, Sarat Bose Road, KOLKATA - 700 020, Phone : 033 - 30517100

Solar Light Mounted in Street light Pole

Annexure III

ADHUNIK POWER & NATURAL RESOURCES LTD

Hydrogeology study of APNRL site especially around the Ash Pond

Village: Padampur, Behind P.G.C.I.L. Substation,
Saraikela – Kharswan | Jharkhand -832402.

January 2020

Envirotech

Envirotech East Pvt. Limited

An ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018 Certified Company
Laboratory Recognised by Ministry of Environment, Forest & Climate Change, Govt. of India
Accredited by NABET, Quality Council of India as an EIA Consultant

Corporate Office: 100 Kalikapur, Madurdaha, Kolkata- 700107, West Bengal
Phone: 033-24438127/28, Fax: 033-24438128
Email: eeplkol@gmail.com, eeplkol2@gmail.com, md.eeplkol@gmail.com
Website: www.envirotecheast.com

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LIST OF PHOTOGRAPH

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For

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CHAPTER 1.0
INTRODUCTION

CHAPTER 1.0: INTRODUCTION

1.1 Background

Adhunik Power and Natural Resources Limited (APNRL) entered into a Memorandum of Understanding (MoU) with the Government of Jharkhand to set up a 1,080 MW coal-based Thermal Power Plant at village Padampur, Dist Saraikela-kharsawan, Jharkhand. As a first step towards this, the Company had commissioned 540 MW (2x270 MW) power plant at villages Padampur and Srirampur in Saraikela-Kharsawan District in the State of Jharkhand. APNRL obtained environmental clearance from Ministry of Environment, Forest & CC for installation of one unit (1 X 270 MW) on 29.08.2009 and accordingly Unit-1 was commissioned which started commercial operation on 21st January 2013. 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. The Power Plant is located at a distance of about 20 Kms from Jamshedpur city in Jharkhand State. Presently the power from the project is being channelized through Central Transmission Utility (CTU) substation i.e. Power Grid Corporation of India Limited (PGCIL), Ramchandrapur located very near to the Power Plant site.

Thus, the two units of this power plant are in operations for last six and half years or so. APNRL is a responsible organization and wants to carry out its activities in an environment friendly manner. APNRL now wants to make a review regarding the extent of impact (if any), which may or may not have occurred on the groundwater reserve due to the operation of this plant especially the fly ash and other ashes disposal and dumping due to operation of these two thermal power units. APNRL has entrusted this review work to Envirotech East Private Limited, Kolkata and accordingly the study was carried out and this report has been prepared.

1.2 Previous Studies

Before commissioning of the Thermal Power Units, APNRL had entrusted M/s Water Solutions, B-84 (GF), Naraina Vihar, New Delhi – 110 028 for carrying out a detailed hydro-geological investigations in and around the proposed location of the Thermal Power Plant. Accordingly, a study entitled "Hydro-Geological Investigations in and around Proposed Thermal Power Plant at Padampur, Saraikela – Kharsawan District, Jharkhand" was carried out by M/s Water Solutions, at the time of obtaining Environmental clearance for both units. The water quality at that time has been considered as the reference. All the locations from where the water samples were collected at that time, were also covered this time also so that a comprehensive idea regarding change in water quality (if any) can be determined which will ultimately depict the impact on the groundwater due to fly ash and other ash disposal from the Thermal Power Plant.

It was pointed out in that report that 'Disposal of Fly ash generated from the power plant is one of the major concerns of the thermal power plants', It has been reported that APNRL made the necessary design arrangements and the tentative site for the Ash ponds based on the findings of some preliminary studies on the prevailing topographic, geomorphic and hydrogeological conditions of the area. Thus, from the very beginning, APNRL was very much conscious about the possibility and potential threat of groundwater contamination due to fly ash and other ash disposal and had taken appropriate measures so as to minimize or stop the contamination.

1.3 Scope and Objectives of this study

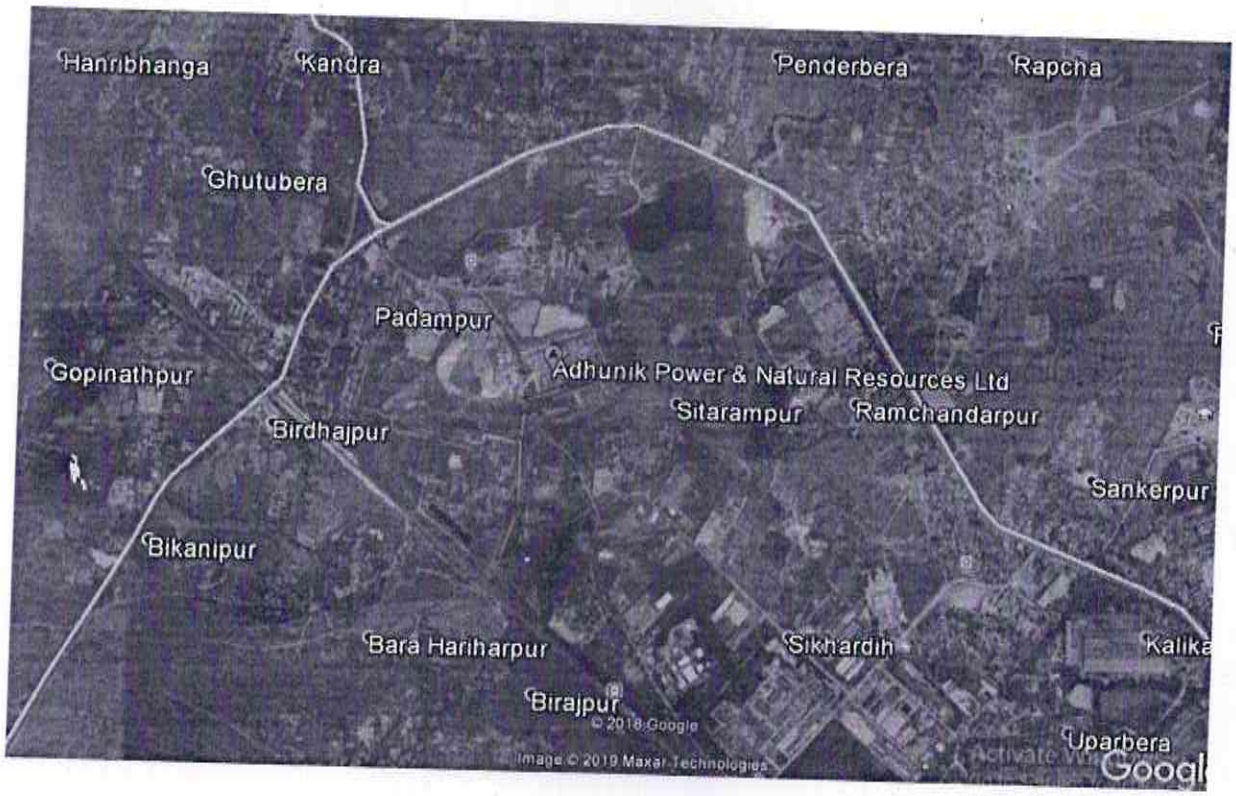
The scope of this study is to document hydrogeological framework of an area with 5 kilometer radius around the APNRL Power Plant site at Padampur through collection of secondary data and generation of limited primary data especially with respect to groundwater quality from the locations from where the water samples were collected and analyzed about 10 (ten) years back by M/s Water Solutions. It has been envisaged that the earlier analysis data will be used for comparison and will act as the reference.

The objective of this study is to understand and determine whether there is appreciable impact on the groundwater regime within the study area for disposal and dumping of the fly ash and other ash from the thermal power units.

1.4 Location of the Power Plant

APNRL Thermal Power Plant falls under several villages namely Padampur, Srirampur, Kendudih, Bada Hariharpur and Birbans, Block-Gamharia, PS-Kandra, District- Sraiekela- Kharswan, Jharkhand. The plant area is situated at about 3.0 Km west of a sub-urban area known as Kandra. The proposed plant site is at about 0.8 Km from SH-40 which connects Jamshedpur with Saraikela. The exact location of the plant as identified by the locations of the four corners of this plant, as measured from the Google Earth, are as follows:

	East	West	North	South
Latitude	22°50'35.2"N	22°49'46.0"N	22°50'16.7"N	22°50'07.5"N
Longitude	86°03'56.1"E	86°03'41.8"E	86°03'24.0"E	86°03'47.3"E



Photograph – 1 : APNRL Thermal Power Plant at The distance along Tata-Kandra Road from Jamshedpur to the plant site is about 20 kilometers and takes only 25 minutes by car to reach the plant site. Nearest Padampur, Sraiekela-Kharswan, Jharkhand

The plant site is well connected with road networks. Nearest town is Jamshedpur, which is located at an aerial distance of about 15 kilometers. railway station is Birarajpur which is about 1.5 Km S-SW of the plant site. Tatanagar Junction is located at a distance of about 16 kilometers from the APNRL Thermal Power Station. Nearest airport is Sonari Airport which is located at an aerial distance of 12 kilometers from APNRL Plant. Although, there is limited air service from this airport, but recently a number of flights have resumed their services from this airport. Thus, the APNRL Plant is well connected. By all three means namely railways, roadways as also by air, it is well connected.

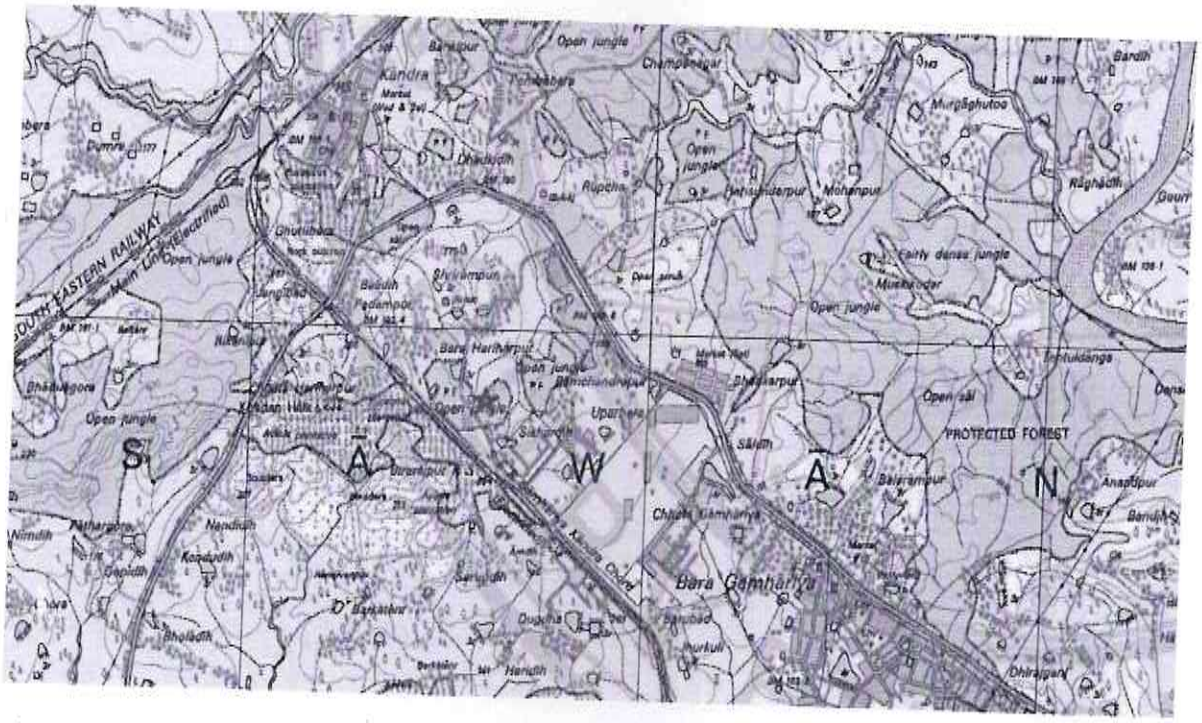
Photograph – 2 : Five kilometer area around APNRL Thermal Power Plant at Padampur

Jamshedpur is connected with other main cities of India by railways and road. The National Highway – 33 connects the place with Kolkata. Jamshedpur is connected with Adityapur city by bus. It takes 20 minutes from Jamshedpur to reach Adityapur City by bus. Jamshedpur is about 225 kms from Kolkata. It takes 4 hours by train to reach Jamshedpur by road.

CHAPTER 2.0
GEO-MORPHOLOGICAL SET UP

CHAPTER 2.0: GEO-MORPHOLOGICAL SET UP

2.1 Physiography



★ Location of the APNRL Thermal Power Plant

Photograph – 3: Part of the 73 J/01 Survey of India Topographic Sheet covering the plant site (Surveyed in the year 2005)

The area is located at the southern part of the Survey of India topographic sheet no. 73 J/01. Topographical set up of the area is actually the manifestation of the underlying rock formations and also and it helps in proper evaluation of the configuration of the bedrock profile when integrated with other hydrogeological 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 (msl). The north and south of the township are having hilly areas whose altitudes vary from 150 – 300 above msl.

Adityapur town is situated at an altitude of 140 meters from the mean sea level. The topography of the area is generally flat with some undulations. There are some small hillocks and scattered ridges. These could be the product of differential weathering where the resistant rock is quartzite. Mica schist is the main rock type of the study area, but small quartzite outcrops are also present. The vegetation of this area is sparse, with arid plants like Acacia and Butea at places. The major crop of the area is Rice, Maize and Millet. The general slope is towards eastern side i.e. towards the Subarnrekha River, as can be seen from the topographic sheet 73 J/1. The area is drained by Subarnrekha River and its tributaries like Kharkai.

2.2 Geomorphology

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 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.

2.3 Drainage Pattern

Drainage pattern of the study area in and around Adityapur has been studied by different authors. Subernarekha 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.

Stream processes in any terrain are controlled not only by the climatic conditions, but also the lithology of the area. Geologic structures have

great control as they influence the nature of flow, erosion and sediment transportation. The degree of dependence varies with physical and chemical properties of the rocks. The permeability, the structural characteristics and the degree of jointing / fractures also affect the extent to which the materials can be detached by fluvial processes. Thus the role of rock types and geologic structure in the development of stream networks can be better understood by studying the nature and type of drainage pattern. The drainage basin is a fundamental geomorphic unit and the watershed acts as a source area for precipitation that eventually provide to the stream channels by various paths. Several authors have also taken the help of Remote Sensing Techniques for identification the drainage channels as also drainage basin analysis. A specific study on drainage basis analysis in and around Adityapur Area was carried out by Centre for Ground Water Studies (CGWS), Kolkata.

2.4 Stream Order Identification and drainage mapping

Stream and basin order can be determined according to the scheme proposed by Hortom and modified by Strahler. In this procedure, each unbranched headwater channel is designated as a first-order channel and channel order is increased in the downstream direction by one order each time two channels with the same order intersect. Thus, the intersection of two first-order channels gives rise to a second-order channel, two second-order channels produce a third- order channel, and so on downstream. For the stream order to increase, two like orders must meet, i.e. two 2^{nd} order streams must meet to make a 3^{rd} order stream and so on. However, if a stream order 1^{st} meets a stream order 2^{nd}, it remains a 2^{nd} order stream. Major rivers following this scheme often end up being sixth or seventh-order. The maximum channel order at the mouth of the basin is often referred to as basin order.

Geomorphic parameters obtainable from Survey of India topographic maps are often useful in comparing basins hydrologically. For example, basins with larger drainage density, relief ratio, basin circularity or basin

slopes, other factors being equal normally convey rainwater more quickly to the mouth of the basin. Stream order characterizes the basin in rank from extremely small, first-order streams to the major, high order streams in complex drainage networks. Physical parameters for watersheds and the evolution of landscapes vary widely across large land areas. This study is extremely interesting from the point of interface between hydrology and geomorphology.

The streams of the study area were identified from the SOI topographic sheet 73 J/1 and then compared with the historical remote sensing data of different years to confirm whether these are permanent or temporary in nature. The streamlines were also updated using the Google Earth image.

The streams present within the study area are mostly 2nd order streams. However, since the area of study is comparatively small and the river Kharkai runs outside the Study Area, no attempt has been made to determine the order of Kharkai River present near the Thermal Power Plant.

The drainage pattern is 'Dendritic' in nature. This indicates that the stream channel pattern present within the study area is completely random in nature and resembles the branching pattern of blood vessels or tree branches. It also indicates that the underlying rock structures are uniform in nature but at the same time not influencing the horizontal pattern, which has been developed due to the topography of the area. However, such a pattern is not unexpected in case the country rock is massive igneous rock in nature. It also indicates that the flow of rainwater along individual channel depends on the slope along which the individual channel flows. Although there is an overall regional gradient / slope of the study area towards east, however flows of rainwater along these individual channels are hardly influenced by the regional slope at the time of their initiation. Rather, they are guided by the small slopes along the mounds and hillocks creating different watersheds.

2.5 Drainage Density Map

Some scientists in recent past have looked at the geomorphologic setup of the area and thrown light on this particular aspect. Theoretically, the area drained by a single stream segment (in other words, the area enclosed by a single drainage basin) is known as drainage area. Drainage density is total length of stream channel versus the entire area of the drainage basin. High drainage densities usually reduce the discharge in any single stream; more evenly distribute the runoff and speeding runoff into secondary and tertiary streams. Usually, in case of a high drainage density basin, there is little basin lag between rainfall initiation and rise of water in all stream segments. Generally, in such cases, there is a moderate rise followed by a decline that usually stretches over several days. An area with high drainage density means that it takes a while for water to drain the runoff to a primary stream and time to arrive at secondary streams so that there is basin lag. This 'lag' time between rainfall and corresponding discharge is referred as 'Basin Lag'. Basin lag is a natural means of regulating the flow of water through a system and effectively "slows" flooding downstream. Flooding still occurs downstream, but there is a "time buffer" before floodwaters crests in downstream portions of stream systems.

Hydrographs of basins with dense stream channels are rounded in shape and hydrographs of larger basins and 'downstream' portions of basins tend to be more broadly rounded in shape. Where drainage density is very low, intense rainfall events are more likely to result in high discharge to a few streams and therefore greater likelihood of "flashy" discharge and flooding in humid areas of low drainage densities (such as 3 – 4 kilometers per square kilometer) suggest resistant bedrock in humid areas. High drainage densities (such as hundreds of kilometers per sq. km) suggest highly erodible surficial materials. However, for small areas, drainage density also indicates the porosity and permeability of surface layers and thereby indicates the probability of groundwater recharge from that area.

Drainage desity can be expressed numerically, such as 1:25, where 25 refer to the area of the drainage basin and 1 refers to the length of the streams. Drainage density is calculated:

$$\frac{\text{Total Stream Length}}{\text{Total Drainage Basin Area}}$$

A density of 1:100 i.e. a ratio of 0.01 would mean low density/ coarse texture area. A density of 1:20 i.e. a ratio of 0.05 would represent medium texture/ medium density area. High density area would be represented by higher value of the fraction.

Drainage density of the area beside Adityapur was calculated by Centre for Ground Water Studies (CGWS). The drainage density of that area, which is similar to this study area in physiographic setup, was calculated to vary from 1.02 to 2.19 in different watersheds. Since, the present study area is contiguous with the area being studied by earlier workers of CGWS in Adityapur, it is expected that a similar drainage condition also exists in the present study area also.

Thus, it can be considered that all the watersheds in the study area represent high-density drainage area and drainage texture is extremely fine. Extremely Fine drainage texture represents that most of the rainwater is being discharged through different channels directly into the Kharkai River leading to increment of length of the streamline. It is evident from the above discussion that the surface layers hardly supports any percolation of the rainwater and thereby absorption into the groundwater. Thus, groundwater contamination due to leachate in such situation is minimal.

CHAPTER 3.0
CLIMATE AND RAINFALL
EXECUTIVE SUMMARY

CHAPTER 3.0 : 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. Average temperature on annual basis varies from 24 ° C in winter to as high as 46° C in summer. The average annual rainfall of Saraikela – Kharsawan district is around 1100 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.

(The district rainfall in millimeters shown below are the arithmetic averages of all the Rainfall Stations under the Seraikela – Kharsawan District, Jharkhand)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual Rainfall
2014	0	8.2	16.1	0	46.5	165.6	321.3	291.9	105.6	66.2	0	0	1021.4
2015	13.3	0	14	64.5	39.3	109.3	507.9	116.5	79.5	13.6	0	0	957.9
2016	9.9	4.8	1.4	3.9	93.5	77.2	271.7	445.7	272.6	13.4	0	0	1194.1
2017	0	0	0	31.4	120.1	119.4	539.3	304.8	87.5	124.1	2.7	0	1329.3
2018	0	0	0	142.7	41.6	41.6	262.9	200.4	131.7	15.2	0	19.6	855.7
Average	**4.64**	**2.6**	**6.3**	**48.5**	**68.2**	**102.62**	**380.6**	**271.86**	**135.38**	**46.5**	**0.54**	**3.92**	**1071.68**

(Source: Customized Rainfall Information System (CRIS), Hydromet Division, IMD, Govt. of India)

CHAPTER 4.0
GEOLOGY AND HYDROGEOLOGY

CHAPTER 4.0 : GEOLOGY AND HYDROGEOLOGY

4.1 Geological set up

The study area is located in the southern part of the Survey of India topographic sheet no. 73 J/I on 1:50,000 scale bounded by Latitude 85^0 95' – 86^0 00' E and longitude 22^0 45' – 23^0 00' N in Sraiekela-Kharswan District, Jharkhand which was carved out from West Singhbhum district of Jhgarkhand in the year 2001. It shares Border with West Bengal State to the East. Seraikela Kharsawan district comprises of two subdivisions namely Seraikela and Chandil and nine blocks/circles namely Seraikella, Kharsawan, Gamharia, Rajnagar, Kuchai, Chandil, Ichagarh, Nimdih, Kukru. It occupies an area of approximately 2724.55 square kilometres. . Its in the 209 meters to 178 meters elevation range.

Different rock types encountered in the study area include mica schist, quartz-mica schist, quartzite, schistose amphibolites of Precambrian age etc. These bodies are trend mainly in WNW-ESE with high dips of 65^0 to 85^0 towards north. While quartzite bodies are frequent in the northern side, it is less frequent to the southern part.

Mafic, ultramafic rock bodies have been found in Nagar Dungri, Mirudih, Sitarampur area. These are intrusive into mica schist and quartz- mica schists. Vein quartz are intrusive into quartizite and mica schists and traceable over some distances as detached but low reefs.

The quartizites, quartz-mica schists and amphibolites are highly jointed, brecciated and fractured. The mafic and ultramafic bodies are also fractured and sheared. It may be mentioned that the area falls within the broad belt of volcano-sedimentary regime of the South Shear zone in the Southern part of Dalma Volcanics with distinct sedimentary facies (covering Jamshedpur – Tamar – Porapahar – Rakha Mines region). i.e. pelites-psammopelitic rocks (quartzites – mica schists) with acid, mafic – ultramafic intrusives. These meta – sedimentary rocks in and around

Adityapur has been assigned to the Singhbhum Group by the geologists. These area intruded by mafic-ultramafic group of rocks and quartz veins.

Detail Geological mapping of this area has been carried out by different researchers which have been published in number of scientific literature. It has been mentioned that there exists WNW – ESE trend of quartzites and schistosity of mica schist, quartz mica schists. These trends are parallel to the WNW – ESE/ E – W trend of the Regional foliation of the Singhbhum shear zone of Jharkhand in a regional scale.

Geological studies indicate the following stratigraphy of the area:

	Laterite
Intrusives	Quartz Veins
	Mafic, uktramafic
	Quartzite
Singhbhum Group	Mica-schist/ quartzite and Schistose amphibolites

The geological studies also indicate that there are two potential aquifer zones: (i) the upper one is restricted within the weathered mica-schist and the other the fractured brecciated zones of quartzite/ meta basic rocks in semi-confined condition.

Recharge of groundwater in the upper zone is quite high and the lower zone i.e. deeper one under semi-confined condition is repository of limited groundwater.

4.2 Hydrogeological Set Up

Extensive literature survey regarding the hydrogeological set up of this region points to the fact that groundwater occurs here in two distinct aquifers – the upper one is weathered residuum of mica-schists and associated rocks, restricted within 15 meters below ground level. The deeper one is represented by fractures occurring at varying depth between 30m to 150m below ground level. Both the aquifers are the repositories of groundwater within secondary porosities developed due to geological processes. The first aquifer is developed by dug wells and solely used for drinking and other domestic purposes. During the fieldtrip in the study area in Bikanipur, Padampur, Badhariharpur, Ramchandrapur, Kandra, Pindrabera etc villages, the project team came across a number of such dug wells where the water table was a depth of around 10 meters. The second aquifer (fracture zones) is normally tapped by bore wells and is being exploited for both industrial water supplies as also for drinking water supply.

4.3 Groundwater Modelling and Assumptions Made during this study

Rules or models for spatially and temporally generalizing monitoring (sample) data across the groundwater system are inherent and essential to hydrogeological science. Our understanding of groundwater is the product of a long history of hypothesis and model development, testing and refinement. The position of the water table is the product of a wide range of static and dynamic environmental conditions and processes affecting the rate at which water enters and leaves the saturated zone of aquifer. The water table rises if the rate of water added (recharge) exceeds the rate of water leaving (discharge); conversely, the water table falls if discharge exceeds recharge. The water table surface is therefore not static, nor flat (as the name implies), but responsive to climatic, vegetative, geomorphic and geologic conditions.

Primary use of groundwater level data is to understand and predict water level changes and to assess the direction of flow beneath an area. The

usual procedure is to plot the location of wells on a base map, convert the depth-to-water measurements to elevations and plot the water level elevations on the base map and then construct a groundwater elevation contour map. Constructing a water level change map over a period of time actually indicate the extent and severity of water level declines (if any at all), resulting from a variety of factors, including industrial use, human development, drought, decline in rainfall over a period of time etc. The direction of groundwater flow is estimated by drawing groundwater flow lines perpendicular to the groundwater elevation contours, from higher level contours to lower one, if the aquifer be considered as homogenous and isotopic. In the present study, we have considered the aquifer to be homogeneous and isotopic in nature.

4.4 Positions of aquifers within the study area

The positions of two aquifers in the regional scale have already been mentioned. However, since both water table and piezometric surfaces are neither static nor flat, even within a small area, particularly in case of undulating topography like the present one may vary considerably. Several reports indicate that through hydrogeological studies and geophysical investigations, the position of the two potential aquifers in and around Padampur village have been ascertained.

The first one, which is restricted within weathered residuum of mica schists occurs within a depth of around 05 meters below ground level (bgl), while the other one, which occurs within fractured rocks, occur within a depth a depth span of 75 meters to 110 meters below ground level. The upper aquifer is in a state of unconfined condition while the deeper one occurs in a semi-confined to confined condition. The upper aquifer is tapped by open dug wells and mainly used for domestic consumption. But, the deeper aquifer is tapped by bore wells of, different industries also, which is being used even for industrial uses (Not in APNRL Thermal Power Plant – already mentioned).

CHAPTER 5.0
LAND USE LAND COVER OF THE STUDY AREA

CHAPTER 5.0 : LAND USE LAND COVER OF THE STUDY AREA

5.1 Importance of Land Use Land Cover Changes in the study area

Detail Land Use Land Cover mapping and study of change in Land Use Land Cover pattern in the study area is beyond the scope of this study. However, land use land cover of any area is extremely important from the point of groundwater resources since it can influence carbon fluxes and greenhouse gas emission, modifies land surface characteristics, groundwater percolation into the aquifer etc. and as a consequence weather and climatic processes, recharging of the aquifer etc. The land cover modification and conversion may alter the properties of ecosystem, biodiversity and their vulnerability to climate change. Changes such as clearing of forests for use in agriculture or as industry or as settlements are associated with clear changes in land cover and carbon stocks. However, in a small area like Padampur – adjoining to a small city like Adityapur, the changes in land use patterns are mostly due to growth in population and increase in settlement as well as setting up of different industries. In all cases, water is a primary demand of area. Hence no study on water and groundwater of any area can be considered as complete, unless there is a look into the changes in land use land cover pattern of the study area.

5.2 Land Use Land Cover Change in the study area

An extensive field survey was made during the study. The observations from the field survey was compared with the land use land cover as depicted in the Survey of India topographic sheet, which was surveyed during 1989-90 and published in the year 1995. GPS locations were also extensively recorded during the fieldtrip to understand and delineate different land use units and consequently changes in land use land cover pattern during last 20 years. This comparative has made out some interesting revelation, as described below.

It has been observed that agriculture is being practiced in the low-lying areas or in other words valleys which are also the drainage channels

within the study area. Field survey indicated that most of these agricultural plots are mono-cropped with limited irrigation facility. While comparing with the topographic sheets survey about 20 years back, it was revealed that there is some reclamation of these low lying areas which has been transformed mostly to settlements and in some cases industry also. However, the most significant changes that have occurred are in case of barren lands, clearly marked on the topographic sheet. The barren land plots have been mostly reclaimed and those are now residential settlements. Some of the barren lands are still covered with thick weeds. Another significant change is the total disappearance of Sal Forest, in and around the study area. Although, the land areas occupied by Sal Forest are prominently marked on the SOI topographic sheet 73 J/01, but presently there is hardly any trace of Sal forest in the entire area. The Sal forest areas have either been transformed into different factories or settlements. This may be attributed to growth in population either by birth or due to migration from villages in search of job in the industrial belt. Such a situation is completely unwarranted and may lead to formation of 'Heat Islands' or 'Critically Polluted Area'. However, APNRL management has made an extensive green belt around the factory, which is definitely praise worthy.

CHAPTER 6.0
EXISTING SET UP OF APNRL PLANTCOVER

CHAPTER 6.0: EXISTING SET UP OF APNRL PLANT

6.1 Details of the APNRL Power Plant

It has already been described that APNRL Power Plant has two Thermal Power Units – each having 270 MW production capacities.

M/s. Bharat Heavy Electrical Limited was the Engineering, Procurement and Construction (EPC) Contractor responsible for Boiler-Turbine-Generator package for setting up this power plant for both the units. All other Balance of Plant (BoP) systems and civil works were executed through multiple BoP Package Contractors. M/s Development Consultants Pvt. Ltd., Kolkata was the consultant for looking after the progress during the project development and execution stage. APNRL signed Fuel Supply Agreement for Unit-1 and Unit-2 with Central Coalfields Limited for the supply of Coal on Tapering Linkage basis. APNRL has signed Water Supply Agreement for the Power plant consumptive water with Government of Jharkhand for the supply of 40 cusec of water from downstream of Chandil Dam from Subarnarekha River. APNRL has signed long term Power Purchase Agreement (PPA) directly with Jharkhand State Electricity Board (JSEB), West Bengal State Electricity Distribution Company Ltd (WBSEDCL) through Power Trading Company (PTC) and Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO) through PTC.

6.2 Coal as source of energy in APNRL Power Plant

Coal for this Thermal Power Plant is being supplied from Bharat Coking Coal Limited (BCCL) and Central Coalfields Limited (CCL) of the area. Annual coal consumption for the Power Plant varies. The annual coal consumption for the year 2017-18 and 2018-19 are 1962341 MT and 1997209 MT respectively. A detail month-wise report entitled 'Fly Ash Generation & Utilization Report' on coal consumption, fly ash generation etc. for the first seven months of the current financial year of 2019-20 (i.e. April to October, 2019) is attached herewith as Annexure–1. As per this report, on an average monthly 184,604 tons of coal have been

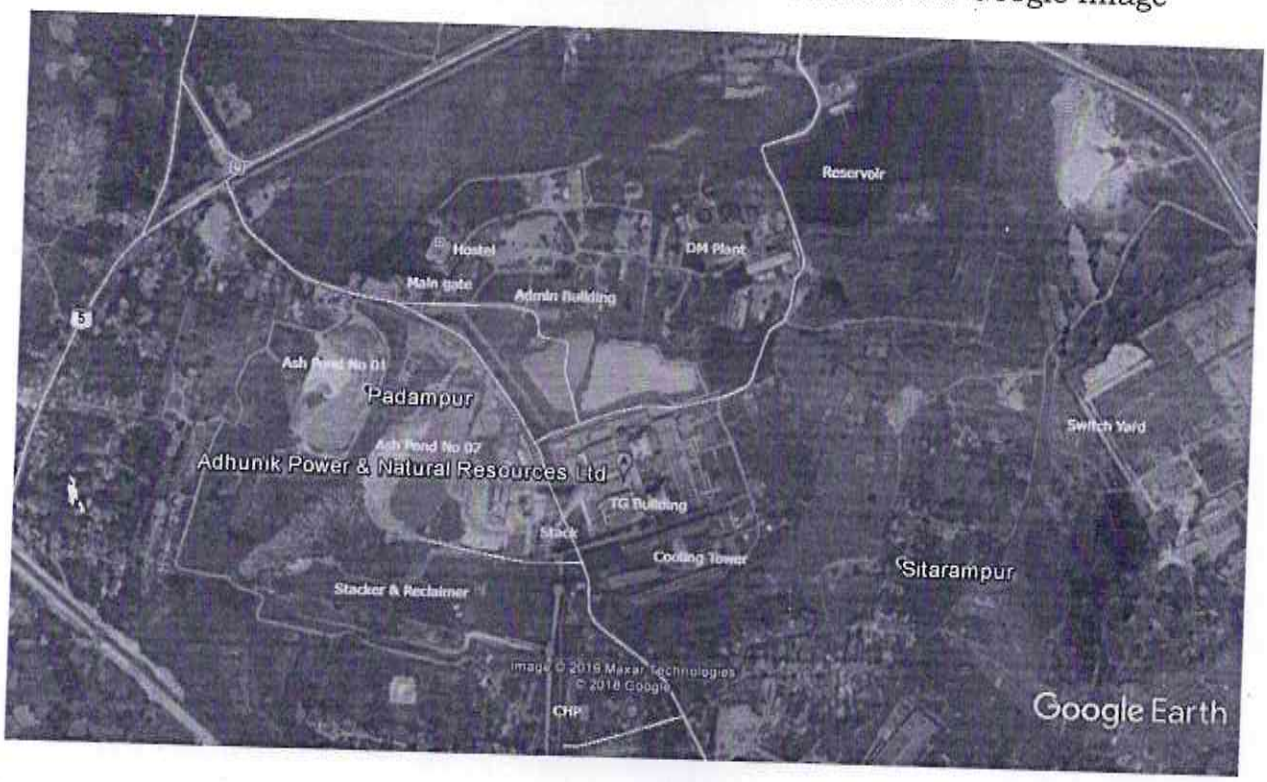
consumed in this power plant during first seven months of this financial year. Coal is brought in the plant mostly by Railways.

As per Plant operational design total generation from the plant is 64,80,000 KW/Day/Unit while Station Generation is 1,29,60,000 KW/Day. Net generation from the station is 1,10,16,000 KW/Day. Plant Load Factor (PLF) is 85%. The plant has been designed as a 'Zero Discharge' Plant and thereby question of discharge of effluent from the plant does not arise.

6.3 Ash Generation due to Thermal Power Plant

Ash content of the coal varies from 35 to 42%. Test Report of the coal used in the APNRL Plant from CSIR-National Metallurgical Laboratory is attached with this report as Annexure–2. As per this report, the ash content of coal tested was 35.83%, while GCV was 4105.3 Kcal/g. However, on an average GCV of coal used in this plant is 3250 Kcal/kg. It has been estimated that on an average, total amount of annual ash generation from this plant 13,30,846 tons per year. Out of this, about 15% is bottom ash. On an average, annual amount of bottom ash generation is 199,626 tons per year. Average annual fly generation from the plant is about 11,31,219 tons per year. However, the average monthly fly ash generation in the plant during first seven months of this financial year of 2019-20 (i.e. April to October, 2019) is 80,241.73 tons per month (Annexure – 1 : report entitled 'Fly Ash Generation & Utilization Report').

Plate – 2 : The APNRL Power Plant as viewed from the Google Image



6.4 Ash Disposal Facilities

As per the design for commissioning of the plant, that there are two number 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 truck, chute or conveyor at the site and disposed of by constructing a dry embankment (dyke). In wet disposal, the fly ash is transported as slurry through pipe and disposed of in impoundment called "ash pond". In the APNRL Power Plant, it was initially designed that 'Fly Ash' will be disposed of in wet system in the 'Ash Ponds'.

It was envisaged at the time of designing of operation of the power plant that the fly ash from the boiler would be collected in economizer hoppers, air heater hoppers, ESP hoppers and then would be conveyed through dense phase pneumatic conveying system to silo. It was envisaged to dispose the fly ash to ash disposal ponds i.e. following wet

system of disposal. For disposing fly ash/bottom ash in slurry form, the ash from silo would be mixed with water in ratio varying from 1 part ash and 4 to 20 parts of water. The slurry would then be pumped up to the ash ponds which are located nearby distance from the power plant.

It was designed that ash would be disposed in two numbers of Ash Ponds. Ash Pond No. 1 is having an aerial span of 256 m X 231 m with a depth of 11 meters. Ash pond no. 1 has a storage capacity of 7 lakh metric tons. Ash Pond No. 2 has a spatial dimension of 294 meters X 117 meters with a depth of 8 meters. Ash Pond 2 has a storage capacity of 4 lakh metric tons of fly ash. The locations of these two Ash Ponds have been shown on the Google Image.

There are various ways of ash handling and disposal depending upon the type of ash generated and constituents. The properties of ash are a function of several variables such as coal source, degree of pulverization, design of boiler unit, loading and firing conditions, handling and storage methods. Thus, it is not surprising that a higher degree of variation can occur in ash, not only between power plants but within a single power plant also over a period of time.

Further, the wet system of disposal in most power plants causes discharge of particulate ash directly into the nearby surface water system. The long storage of ash in ponds under wet condition and humid climate can cause leaching of toxic metals from ash and contaminate the underlying soil and ultimately the groundwater system. So, designing of Ash Pond is extremely important.

6.5 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 the suggestions of M/s Water Solutions, both the ash ponds were

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/m^3. 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. Two piezometers have been constructed at two prominent spots within the plant. These two 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.

6.6 Fly Ash Utilization

From the year 2017-18, APNRL has decided to make a change in its policy and decided to utilize the entire amount of 'Fly Ash' generated through its operation. A detail account of month- wise "Fly Ash' Generation and its utilization during the years 2017-18 and 2018-19 can be found in the report entitled "Action Plan for Fly Ash Utilization (2019-20 & 2020-21) & Flay Ash utilization (2017-19) and is enclosed as 'Annexure-3'.

It has been observed that during the year 2017-18, a total amount of 1,962,341.04 Metric Tons of coal was utilized for power generation in this APNRL Power Plant with an average monthly coal consumption of 163,528.42 Metric Tons. For this, a total amount 749,897.51 Metric Tons of 'Fly Ash' was generated with a monthly average of 62,491.46 Metric Tons of 'Fly Ash' generation. 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 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. However, Fly Ash Utilization is 100% 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'. However, a total

quantum of 132,078 Metric Tons of 'Bottom Ash' was generated over the year with an average monthly generation of 11,006.5 Metric Tons. This ash was disposed of in the designated 'Ash Pond', as already described.

In the current year of 2019-20, 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. 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 (Annexure-3). 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.

CHAPTER 7.0
RESULTS & DISCUSSION OF IMPACT STUDY

CHAPTER 7.0: RESULTS & DISCUSSION OF IMPACT STUDY

7.1 Locations of the sampling points

Because groundwater is hidden from view beneath the land surface, it can only be directly observed through monitoring wells. That procedure has been followed in this study wherein water samples were collected and analyzed from the same seven wells from where the water samples were collected by M/s Water Solutions about ten years back. In cases, where the sampling sources have been defunct now, water sampling has been made from a nearby one with more or less same type of water source. The locations from where the water samples were collected during field trip are Kendudih, Ramjiwanpur, Rajgora, Srirampur, Bada Hariharpur, Chota Hariharpur and Bikanipur. The exact locations of collections of water samples are:

Sl. No.	Name of Location	Latitude	Longitude
1.	Kendudih	22.813 N	86.046 E
2.	Ramjivanpur	22.807 N	86.053 E
3.	Rajgora	22.812 N	86.04 E
4.	Ramjivanpur	22.807 N	86.053 E
5.	Chota Hariharpur	22.828 N	86.053 E
6.	Bada Hariharpur	22.831 N	86.059 E
7.	Bikanipur	22.834 N	86.051 E

This method gives an opportunity of making comparison between the water qualities in the area about ten years back before this thermal power plant was set up. Thus, the previous records of water analysis results actually served as 'Reference Data'. It needs to be kept in mind that these observations are limited to the specific points of location of the monitoring wells and may not be taken as the generalized picture. However, in all cases of groundwater studies, this is the only method, which has been followed on a routine basis.

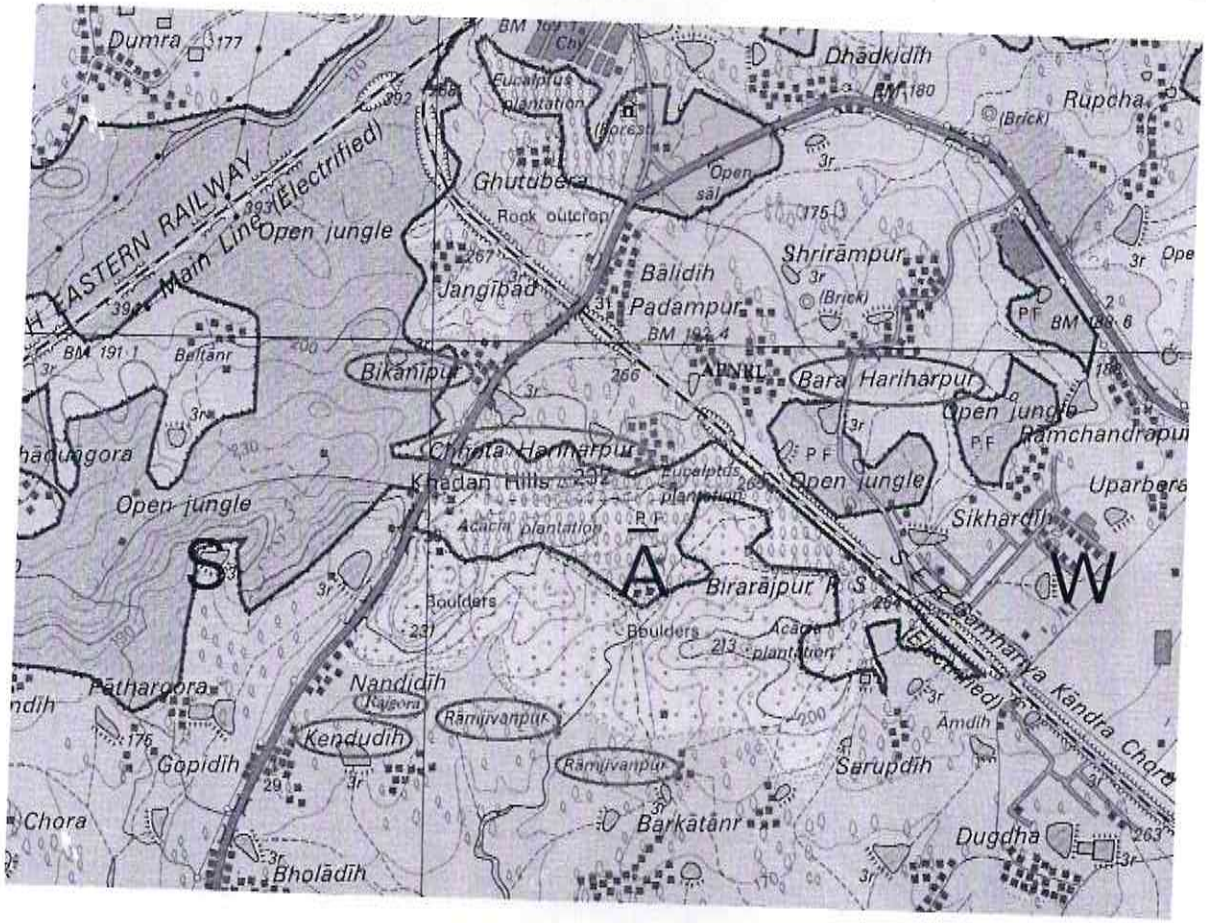


Plate – 2b: Location of the Sampling Points on SOI topographic sheet 73 J/01; Location of APNRL

7.2 Change in Water Table / Piezometric Surface due to the APNRL Plant

In the present case, the entire requirement of water for running the thermal power units i.e. 17.5 cusec are being drawn from the downstream of Chandil Dam on Subarnarekha River at an aerial distance of about 17 kilometers North from the APNRL Thermal Power Plant. Thus, there is no question of impact on the water table of the area due to operations of these thermal power units. Hence, the study of water level fluctuation in the study area is of no use so far as the impact study is considered. In case, there is any adverse change in water table of the area over this period of ten years that is definitely not due to operation of these thermal power units and that is not at all related to this Thermal Power Plant.

7.3 Hydro-chemical Studies

Quality of water is of permanent importance in any impact study on groundwater. In the present case, since there is no extraction of groundwater for this particular industrial activity, hence any impact regarding declining of water table/ piezometric surface due to this is ruled out. Hence, the only impact (if any) that can be envisaged is on the water quality. The physical, chemical and biological characteristics of the aquifer are of major importance in understanding the possible impact due to this industry during last ten years or so. The water quality of the aquifer will also determine whether the water is suitable for domestic, industrial or agricultural use.

Since the effluent form the Thermal Power Plant or the leachates from the fly ash dumping pond etc. do not contain any biological material, so possibility of any kind of biological contamination of the aquifer due to the operation of this plant has been ruled out. However, biological estimation and experimentation with water samples collected from the field has also been carried out to understand the overall impact.

When water infiltrates into the ground, its quality is modified by a number of processes. The quality of water in the zone of saturation reflects that of the water, which has percolated into the water table and subsequent reactions between water and rock material occur.

In the present case, it has already been described that the deeper aquifer within fractured rocks occur in a semi-confined to confined condition. Thus, the possibility of leachates reaching the deeper aquifer is not possible. Hence, the water sample analysis collected from the deeper aquifer through bore wells may be avoided for carrying out this study. However, to make the study comprehensive, water samples from few bore wells were also collected.

It has already been described that groundwater samples have been collected from the same sources or near that source from where water samples were collected and analyzed by M/s Water Solutions about ten

years back. This has given an excellent opportunity to compare and thereby study the impact due to setting up of this thermal power plant. Incidentally, all the sources from where the water samples were collected about ten years back were of mixed kind wherein both dug wells and bore wells. However, M/s Water Solutions had made the water level study as also the water sample collections from the dug wells only.

Polythene bottles of 1 liter capacity have been used for collection of water samples. Before water sample is taken, the bucket using which the water is being taken out from the dug wells are immersed within the water and thereby washed with the water present in the dug wells number of times so as to avoid any contamination from the bucket itself. In case of bore wells, before a water sample is taken, the well is pumped for some times so that the sample represent the groundwater from which the well is fed. All bottles have been rinsed with water to be sampled before collecting the sample for analysis. Preservatives were added to sampled water immediately to avoid any deviation in water quality. Well location, time and date of collection of individual sample have been noted down immediately on the bottles. The sample bottles have been sealed well before sending them to the laboratory for analysis.

A small introduction regarding various parameters, as measured, is given below:

7.3.1 pH :

The PH is a measure of hydrogen ion activity of water and is an indication of chemical equilibrium. This is usually controlled by the carbon dioxide – bicarbonate – carbonate system of the water and gives rise to different values in accordance with solubility of carbon dioxide changing with temperature and pressure. pH of water was determined by means of an electrometer and glass and different electrodes. The water samples from different sampling points, as described below, within the study area found to show the pH values between 6.89 to 7.25.

7.3.2 Total Dissolved Solids (TDS) :

The concentration of total dissolved solids (TDS) in groundwater has been determined directly by weighing the solid residue obtained by evaporating a measured volume of filtered sample to dryness. Groundwater has been classified according to its TDS content as follows (after Hem, 1970):

Fresh	< 1000 ppm
Brackish	1000 ppm to 3000 ppm
Moderately Saline	3000 to 10,000 ppm
Very saline	10,000 to 35,000 ppm
Brine	> 35,000 ppm

In the present samples, TDS values ranges from 294 to 456 and therefore may be termed as fresh.

7.3.3 Calcium and Magnesium

Calcium is widely distributed in the common minerals of rocks and is considered to be principal cations in groundwater. The feldspars, pyroxenes and ambhiboles and less common minerals such as apatite wollastonite present in igneous and metamorphic rocks are the common sources of calcium. The normal concentration of calcium in groundwater ranges from 10 to 100 ppm. It may be noted from the given analytical results obtained that calcium contents in groundwater in this study area ranges from 48 to 81 mg/ L. Such concentrations have no effects on health. Further, the concentration of calcium has not increased over a period of last ten years indicating that there is no appreciable impact due to setting up of this Thermal Power Plant.

Magnesium in groundwater is normally derived from ferromagnesian minerals like olivine, pyroxene, amphiboles, dark coloured mica among igneous rocks etc. unless there is any separate source. In metamorphic rocks, magnesium occurs in the structure of chlorite, montmorillonite and serpentine etc. The reaction involving solution of magnesium is

controlled by the amount of CO_2 in groundwater in dissolved state. In the present study, magnesium of groundwater vary from 9 to 20 mg/ L. Further, the concentrations of magnesium has remained almost the same over a period of last ten years indicating that there is no appreciable impact due to setting up of this Thermal Power Plant.

7.3.4 Bicarbonate and Carbonate

Bicarbonate and Carbonate usually the primary anions in groundwater are derived from CO_2 released by organic decomposition in soil. These are derived also from atmospheric CO_2 as acid rain and from solution of carbonate rocks. These ions impart exclusively the alkaline character of the groundwater and are largely controlled by the pH value of the water. The carbonate concentration of natural water is commonly less than ppm. It is found from chemical analyses that carbonate concentration in the water samples is almost similar to ten years back when the water samples from the same sources were analyzed.

7.3.5 Chloride

Chloride concentration in groundwater may be attributed to the presence of soluble chlorides from rocks, evaporates, saline intrusion, connate and juvenile water or contamination by industrial effluent or by leachates or by domestic sewage. Usually the concentration of chloride in groundwater is less than 30 ppm but in case of arid regions, this concentration may be 1000 ppm or more which is common. The chloride content in the water samples ranges from 60 to 86mg/L which is almost similar to ten years back when the water samples from the same sources were analyzed.

7.3.6 Sulphates

The sulphate is formed by oxidation of sulphide minerals like pyrite, sphalerite etc. In natural water, the sulphate concentration does not exceed 100 ppm. The sulphate concentration in the water samples ranges from 12 to 28 mg/L which is almost similar to ten years back when the water samples from the same sources were analyzed.

7.3.7 Total Hardness (TH)

The hardness of water is mostly due the presence of Ca^{2+} and Mg^{2+}. The total hardness is expressed as ppm of $CaCO_3$.

$$TH = 2.497\ Ca + 4.115\ Mg$$

where all the constituents are expressed in ppm. The calculated TH values for all the samples are same as before indicating there is hardly any impact of the construction APNRL Thermal Power Station at Padampur.

The range of Hardness as recommended by the USGS is given below:

Class	Range of Hardness	Remarks
Soft	0 – 55	
Slightly Hard	56 – 100	Require little or no softening
Moderately Hard	101 – 200	
Very Hard	➢ 200	Require Softening

The water samples collected from the study area thus indicate that the groundwater here is very hard in nature.

7.4 Assessment of Impact on Ground Water

In order to ascertain the impact of Fly Ash and other Ash Disposal in the Ash Pond as also any contamination due to leachates from the ash pond or during transport, groundwater samples four in number from near surface aquifer and three in number from deeper aquifer totaling seven number of water samples were collected from the field. As already indicated, the water samples have been collected either from the same sources from where the water samples were collected ten years back or very near to the previous sampling point from the same aquifer as before so that previous water quality measurements be used as reference for this time. The water samples were analyzed in the laboratory employing standard techniques. The chemical parameters determined are Copper, Manganese, Aluminum, Boron , Sulphate, Nitrate, Fluoride, Phenolic

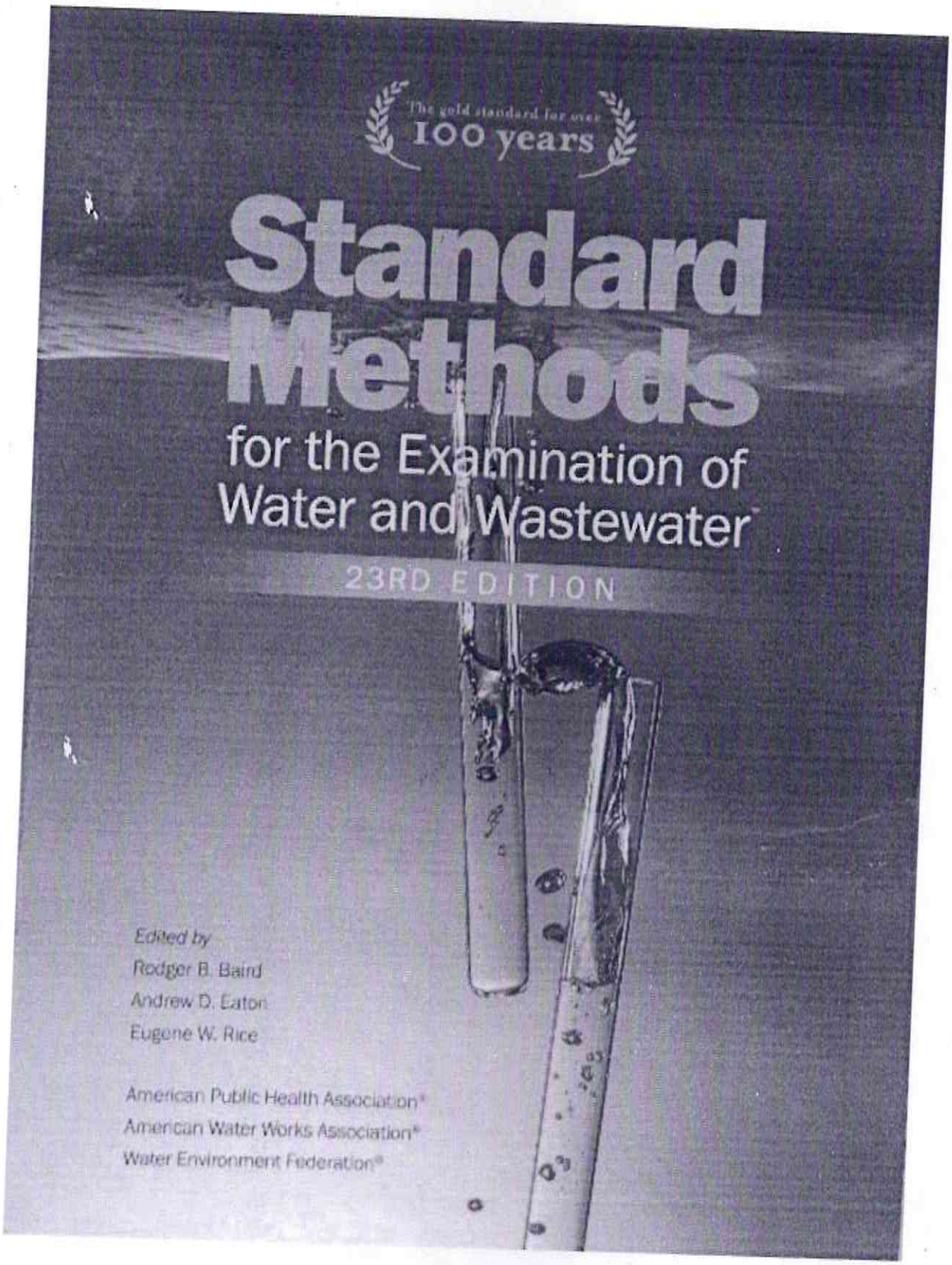
Compounds, Mercury, Cadmium, Selenium, Arsenic, Cyanide, Lead, Chromium, anionic detergents, radioactive materials, Zinc. The Physical parameters include: Colour, Odour, Taste, Turbidity, P_H, and Total Dissolved Solid. The results obtained through the physical and chemical analysis are indicated below in a tabular format.

CODE	Location of sampling	Sampling Date
GW_1	Kendudih	08.12.2019
GW_2	Ramjivanpur	
GW_3	Rajgora	
GW_4	Ramjivanpur	
GW_5	Chota Hariharpur	
GW_6	Bada Hariharpur	
GW_7	Bikanipur	

Sl. No.	Parameters	Unit	Concentrations (Code : GW_1 to GW_7)						
			GW_1	GW_2	GW_3	GW_4	GW_5	GW_6	GW_7
1	Colour	Hazen unit	<5	<5	<5	<5	<5	<5	<5
2	Odour		Unobj.	Unobj.	Unobj.	Unobj.	Unobj.	Unobj.	Unobj.
3	Taste		Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	<1	<1	<1	<1	<1	<1	<1
5	Ph		6.93	7.12	6.89	7.06	6.86	7.25	6.89
6	Free Residual Chlorine (mg/L)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
7	Anionic Detergents	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8	Total Dissolved Solids	mg/L	315	375	456	304	294	395	316
9	Phenol (as C_6H_5OH)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
10	Total Hardness (as $CaCO_3$)	mg/L	156	224	282	174	186	266	214
11	Total Alkalinity (as $CaCO_3$)	mg/L	178	192	236	170	182	242	190
12	Chloride (as Cl)	mg/L	65	78	86	72	60	74	67
13	Sulphate (as SO_4)	mg/L	24	22	28	13	12	23	18
14	Cyanide (as CN)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
15	Nitrate (as NO_3)	mg/L	2.8	3.5	4.2	3.2	4.2	3.9	3.2
16	Fluoride (as F)	mg/L	0.42	0.48	0.33	0.41	0.32	0.46	0.33
17	Calcium (as Ca)	mg/L	48	62	79	44	53	81	58
18	Magnesium (as Mg)	mg/L	9	17	20	16	13	16	17

19	Boron (as B)	mg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
20	Chromium (as Cr)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Copper (as Cu)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
22	Manganese (as Mn)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
23	Zinc (as Zn)	mg/L	0.32	0.37	0.33	0.29	0.31	0.41	0.31
24	Cadmium (as Cd)	mg/L	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
25	Iron (as Fe)	mg/L	0.46	0.38	0.62	0.37	0.41	0.56	0.44
26	Lead (as Pb)	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
27	Aluminium (as Al)	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
28	Arsenic (as As)	ppb	<2	<2	<2	<2	<2	<2	<2
29	Mercury (as Hg)	ppb	<1	<1	<1	<1	<1	<1	<1
30	Selenium (as Se)	ppb	<2	<2	<2	<2	<2	<2	<2

LEGEND:
Unobj : Unobjectionable
Test Method followed : Standard Methods for the Examination of Water and Waste Water - APHA 23rd Edition
The Results refer to the sample tested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CHAPTER 8.0
ENVIRONMENTAL RISK ASSESSMENT

CHAPTER 8.0 : ENVIRONMENTAL RISK ASSESSMENT

8.1 Environmental Risk Assessment

Environmental Risk Assessment of the Adityapur area in general and the APNRL Thermal Power Plant in particular have to take several factors into consideration:

8.1.1 Geological Situation

The geological set up of the area has already been described before in the report. The geological set up of the area does not favour storage of prolific reservoir of renewable groundwater resources. But any risk out of this is ruled out since in this power plant no groundwater is being extracted and thereby no exploitation of groundwater has been envisaged during the study. On the other hand, the thin veneer of weathered material formed from a bed rock of principally mica schist offer limited storage of groundwater through direct recharge from the rainwater. This has been corroborated by the local people during the field study. The local people has reported that during peak summer season, in most of the dug wells, water gets either dried up or muddy water started coming pointing to the fact that there is dearth of water. But, once the monsoon starts, water again starts coming into these dug wells indicating the unconfined nature of the upper aquifer.

The more promising groundwater reservoir is the area is provided by the fractured bed rock occurring beneath the veneer of weathered mantle. The interconnected fracture system provides the necessary porosity for holding groundwater in semi-confined to confined condition. However, since this aquifer is in a state of semi-confined to confined state, possibility of contamination of the groundwater through leachates is minimal. Obviously, in both cases, over withdrawal and/or rapid withdrawal of groundwater will pose severe risks for sustained groundwater availability in the area.

8.1.2 Geomorphological Situation

The area is gently rolling country with a low but definite slope towards the main Kharkai river. Therefore, surface water from abundant rainfall during monsoon months finds rapid drainage in the river and as a result stagnant water pools are few and far between. This is definitely an environmental constraint from groundwater recharge point of view which can only be overcome if suitable rainwater storage / recharge tanks reservoir are created in a judicious manner. At the same time, such a situation also help in restricting the leachates to reach the groundwater, if proper cautions can be taken so that leachates under no circumstances get chance to mix with any storage / recharge tanks.

8.1.3 Meteorological Situation

The area receives moderate rainfall of around 1100 mm per annum. But the major part of rainfall is in the 4 month monsoon period, as can be evidenced from the month-wise rainfall data. Evaporation rate is also very high during rest of the year due to very bright sunshine. Therefore, inherent environmental risks are associated with extant meteorological situation in the area. For better utilization of the high rainfall rainwater harvesting structures are essential with the clear understanding that large shallow water bodies thus created will entail substantial loss of water due to evaporation.

8.1.4 Geo-hydrological Situation

It has been reported in several literatures that the aquifers delineated through resistivity survey pointed out that they are not continuous in horizontal disposition. The thicknesses of individual aquifer(s) are also extremely variable. Pump tests carried out in several areas has also pointed to restricted yield of groundwater. Therefore, considerable environmental risk is associated with any plan for any large scale groundwater withdrawal in the area. Judicious choice of well locations and staggered operation of the pumping operation with sufficient time allowed for recuperation of the water table will be the key issues to avoid environmental risks of development of groundwater in the area.

8.1.5 Concentration of Industries

The Adityapur area houses a large number of industries within a small area. Many of the industries require a large amount of water for their operation and most of them, particularly those within the Adityapur Industrial Estate, require a large amount of water for their operation and most of them meet the water requirements from groundwater reservoir. It has been estimated by several authors more than 68% of the available replenishable groundwater is being pumped out to meet the industrial and domestic demands (CGWS, 2006). Minor Irrigation through groundwater is almost non-existent in the area. It seems that the remaining 25% of the groundwater may have already been developed during this period of 14 years. There is therefore an urgent requirement for regulating groundwater development in the area through appropriate administrative machinery involving all the stakeholders. Environmental risk associated with absence of such machinery is enormous and calls for an urgent response. However, the APNRL Power Plant does not contribute any stress on the groundwater reserve. On the other hand, a number of rainwater harvesting system has been installed by APNRL. Hence, it is a groundwater positive industry

9.0 CONCLUDING REMARKS

9.0 CONCLUDING REMARKS

Adhunik Power and Natural Resources Limited (APNRL) had set up a coal based thermal power plant at Padampur and adjoining villages under Block Gamharia, Sraiekela-Kharswan, Jharkhand. The first two units, each having installed production capacity of 270 MW were commissioned in the beginning of the year 2013. Thus, these two units are in operation for last eight years or so. The plant was designed as a 'Zero Discharge' Plant and thereby question of discharge of effluent from the plant does not arise.

On an average, annually around 2.8 million metric tons of coal is being used in this thermal power plant with an average ash production of 1.09 million metric tons, of which 85% is fly ash and rest 15% is bottom ash. As per the design for commissioning of the plant, that there are two number of Ash Silos, each with capacity of 2200 MT. It was designed that ash would be disposed in two numbers of Ash Ponds. Ash Pond No. 1 is having an aerial span of 256 m X 231 m with a depth of 11 meters and with a storage capacity of 7 lakh metric tons. Ash Pond No. 2 has a spatial dimension of 294 meters X 117 meters with a depth of 8 meters, having a capacity of 4 lakh metric tons. To stop the possibility of leakage of leachates from the ash pond, both the ash ponds were constructed with HDPE Lining to ensure impermeability. Thus, the possibility of groundwater contamination from the leachates was taken care of at the time of construction of the thermal power itself and was prevented appropriately. All the ash produced now is being used for different purposes.

Before the commissioning of this thermal power plant, APNRL Authority made a detail survey on groundwater status, chemical composition of groundwater, level of water table etc. by M/s Water Solutions of New Delhi, an esteemed organization. Now after running of the plant for last eight years, APNRL Authority wants to know whether there is any kind of groundwater contamination due to disposal and dumping of fly ash and other ash from the thermal power plant within the ash ponds and so on.

This study was entrusted to M/s Envirotech East Private Limited, Kolkata and accordingly this study was carried out.

The entire water demand for running the thermal power units i.e. 17.5 cusec are being drawn from the downstream of Chandil Dam on Subarnarekha River. There is no extraction of water from the groundwater. Thus, there is no question of impact on the water table of the area due to operations of these thermal power units.

Extensive field survey was undertaken in the surrounding area of APNRL Plant within a radius of 5 kilometers which was considered as the study area for this study. Water samples were collected from the same locations, from where M/s Water Solutions collected the samples about ten years back in the year 2010. Thus, the hydro-chemical data as produced by M/s Water Solutions were used as reference data during this study.

Some of the physical properties of the water samples were carried out in the field itself at the time of collection of water samples. Rest of the chemical components of the water samples were carried out at the laboratory of M/s Envirotech East Private Limited at Kolkata following the standard techniques. The results obtained through these analysis are summarized below.

The pH values of the water samples thus analyzed vary within the range of 6.89 to 7.25, which indicate that the water of the area is slightly acidic to slightly alkaline. The normal concentration of Ca^{+2} in groundwater ranges from 10 to 100 ppm. Such concentrations have no effect on health and it has been suggested that as much as 1000 ppm may be harmless. Calcium concentrations of the water samples range from 48 to 81 mg/ L, which is within the permissible limit.

The Mg^{+2} content of the collected samples shows a variation range of 9 to

20 mg/ L. Fluoride contents of water samples vary from 0.33 to 0.48 mg/ L. Heavy metal study includes analysis of Lead, Mercury, Chromium, Cadmium, Nickel, Zinc, Copper and Selenium. Out of these heavy metals, only Zinc has been reported from these sites.

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 due to Fly Ash and Other Ash disposal by M/s APNRL.

Since the current 7 nos. of wells are also the same wells as before so status report for both this report reflect that there is no effect of ash pond in groundwater quality in terms of leachability effect. This also corroborated the statement which M/s Adhunik Power has made that the so called ash ponds one used intermittently at plant. Further, more than 80% of the accumulated ash has already been disposed off. Thus the ash pond is now almost a vacant plot of land. It also confirms the fact that APNRL since starting of their power plant has not done any damage to the groundwater quality in terms of their ash pond which functioned temporarily to collect ash from coal burning.

10.0 DISCLOSURE FOR EXPERTS

10.0 DISCLOSURE FOR EXPERTS

Experts Worked for the Project

No.	Name	Designation	Specialization	Remarks
1.	A. K. Banerjee	Director, EEPL	1. Water pollution & Water Chemistry 2. Soil Science 3. Solid & Hazardous Waste Management	Accredited (Cat.-A) Expert for Water Pollution/Soil Science/Solid & Hazardous Waste Management of QCI-NABET, GoI
2.	Dr. R Kumar	Technical advisor	1. Environment Impact assessment (EIA) 2. Environment monitoring and assessment 3. Ecology & Biodiversity	1. Long senior managerial experience in many corporate & MNc's in the area of Environment Health & Safety. 2. Published valuable papers on EHS in National & International Journals
3.	Dr. Somenath Bhattacharya	Expert & Adviser	1. Geology & Hydro-geology 2. Wetland Management 3. Environment Impact Assessment (EIA)	1. Currently Adviser for Environment in the Ministry of Environment, Forest & Climate Change 2. Accredited Expert (Cat.-A) for Geology & Hydro-geology of QCI-NABET, GoI

ANNEXURE

Annexure I
Ash generation and Utilization FY 2019-2020

Adhunik Power & Natural Resource Limited

FLY ASH GENERATION & UTILIZATION REPORT (2019-20)

	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	Bottom 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	38213.11	10810.89
2	MAY	160104	44.57	71353.54	71353.54	100.0%	6273.66	18383.01	35993.84	10703.03
3	JUNE	200528	44.37	88976.30	88976.30	100.0%	5031.01	13583.88	57014.97	13346.45
4	JULY	187029	45.69	85444.50	85444.50	100.0%	6772.04	21930.11	43925.67	12816.67
5	AUGUST	220525	40.65	89640.11	89640.11	100.0%	4503.59	22585.10	49105.40	13446.02
6	SEPTEMBER	196408	44.00	86415.82	86415.82	100.0%	5703.61	31611.60	36138.24	12962.37
7	OCTOBER	160081	42.35	67789.23	67789.23	100.0%	6464.07	27481.76	23675.01	10168.38

Annexure II
Coal Analysis Test

CSIR-NML

NO. NML/ANC/F-13

TEST REPORT

CSIR-National Metallurgical Laboratory

(Council of Scientific & Industrial Research)

JAMSHEDPUR-831007

T-2097

Test Report No. :

Job Requisition Reference :	5255	Page No. : 01
Sample Receiving Date:	11.09.2018	BDM Ref (for external)
Test Report Issue Date:	17.09.2018	5255/MER/110918
Sample Description :		Name & Address of the Customer
Coal Sample		Adhunik Power And Natural Resources Ltd.

1. Analytical Results:

Sr. No	Sample name	Radicals	Result	Unit	Method of Analysis
1	Adhunik Power And Natural Resources Ltd.	Moisture	8.82	%	IS 1350(Part I) 1984,Reaffirmed 2013
		Ash	35.83	%	IS 1350(Part I) 1984,Reaffirmed 2013
		VM	21.57	%	IS 1350(Part I) 1984,Reaffirmed 2013
		Fixed Carbon	33.78	%	IS 1350(Part I) 1984,Reaffirmed 2013
		GCV	4105.3	Cal/g	ASTM D5865:2013
		C	50.95	%	ASTM-D5373-16
		H	3.29	%	ASTM-D5373-16
		N	1.23	%	ASTM-D5373-16
		S	0.48	%	ASTM-D4239-17

2. Additional Information; if any:-

The test results pertains to the samples submitted by you. For copies of report kindly clause No. 5.10.6 of our quality manual

Signature of analyst and date

Signature of authorised Personnel with date and seal

Annexure III

Format for Ash Utilization Action Plan

1. Name of the Unit : **Adhunik Power & Natural Resources Ltd**
2. Power Generation Capacity : **2 x 270 MWH**
3. Fly ash generation and utilization in previous two years(2017-18 and 2018-19): **Attached**
4. Fly ash Utilization Action Plan(Quarter wise* 2020-21: **As below**

S.N	Description	Unit	Q1	Q2	Q3	Q4	Total Fly Ash utilization in FY 2020-21
A	Ash Generation (Fly Ash + Bed Ash)	MT	332712	332712	332712	332712	1330846
B	Ash Utilization	MT	332712	332712	332712	332712	1330846
i)	Brick Manufacturing	MT	70701	70701	70701	70701	282805
ii)	Ready Mix concrete/Cement Manufacturing	MT	212104	212104	212104	212104	848414
iii)	Low Lying area filling/Area Development	MT	0	0	0	0	0
iv)	Road construction	MT	49907	49907	49907	49907	199627
v)	Filling of abandoned stone quarry	MT	0	0	0	0	0
vi)	Mines void filling	MT	0	0	0	0	0
vii)	Agriculture Utilization	MT	0	0	0	0	0
viii)	If any other area(specify),/Pond embankment	MT	0	0	0	0	0
	Total Ash Utilization	MT	332712	332712	332712	332712	1330846
C	Ash Utilisation percentage	%	100	100	100	100	100

Name of the Authorized Person: **Kamlesh Kumar**

Signature :

E mail ID : kamleshkrjha@adhunikgroup.co.in

Phone No : 07763818994

Note:

TPPs having fly ash utilization less than 85% will be given two years time period and TPPs having utilization more than 85% will be given one year time period to achieve 100% fly ash utilization.

MINISTRY OF POWER
CENTRAL ELECTRICITY AUTHORITY
THERMAL CIVIL DESIGN DIVISION

Monthly Abstract of Ash Generation and Utilization
(For the Period from 1st April,2017 - 31st March ,2018)

Name of Power Utility:Adhunik Power & Natural Resources Ltd — **Name of Thermal Power Plant:Adhunik Power & Natural Resources Ltd**

Installed Capacity (Total): 540 MWH

PERIOD OF REPORT-1st April,2017 to 31st March ,2018

In Mitric Tonne

	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	In construction of Highways & Road including Flyovers	Part replacement of Cement in Concrete	In Hydro power sector in RCC Dam Construction	In Ash Dyke Raising/Ash pond filling*	In Reclamation of Low Lying Area	In Mine Filling	In Agricultur /Waste Land Development	Others
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1	APRIL	183061.00	34.62	63375.72	49581	86.9%	1462.81	1224.03				36377.50	10517.04			
2	MAY	244926.00	34.19	83740.20	66521	88.3%	1079.74	1825.23				46590.91	17025.04			
3	JUNE	218500.00	37.54	82024.90	73575	99.7%	1025.25	3958.42				49651.39	18940.43			
4	JULY	213458.60	36.17	77207.98	69390	99.9%	752.26	4189.43				22027.22	42421.52			
5	AUGUST	208561.71	38.33	79941.70	71947	100.0%	719.06	2841.22				17405.33	50981.49			
6	SEPTEMBER	159670.00	40.73	65033.59	58530	100.0%	1208.87	708.60				2273.00	54339.48			
7	OCTOBER	115508.88	42.83	49470.14	49470	100.0%	1617.35	3869.82				5807.31	38175.66			
8	NOVEMBER	110705.00	36.97	40925.42	40925	100.0%	2961.58	7564.60	200.39			5039.84	25159.04			
9	DECEMBER	127491.85	36.45	46468.23	46468	100.0%	3343.15	2236.13				5973.58	34915.12			
10	JANUARY	131284.00	45.46	59679.08	59679	100.0%	1902.67	5471.03				5554.08	46751.11			
11	FEBRUARY	118526.00	43.48	51535.10	51535	100.0%	2342.23	9749.31		836.11		4495.10	34112.12			
12	MARCH	130648.00	38.65	50495.45	50495	100.0%	4150.11	14179.73				5937.08	26228.53			

MINISTRY OF POWER
CENTRAL ELECTRICITY AUTHORITY
THERMAL CIVIL DESIGN DIVISION

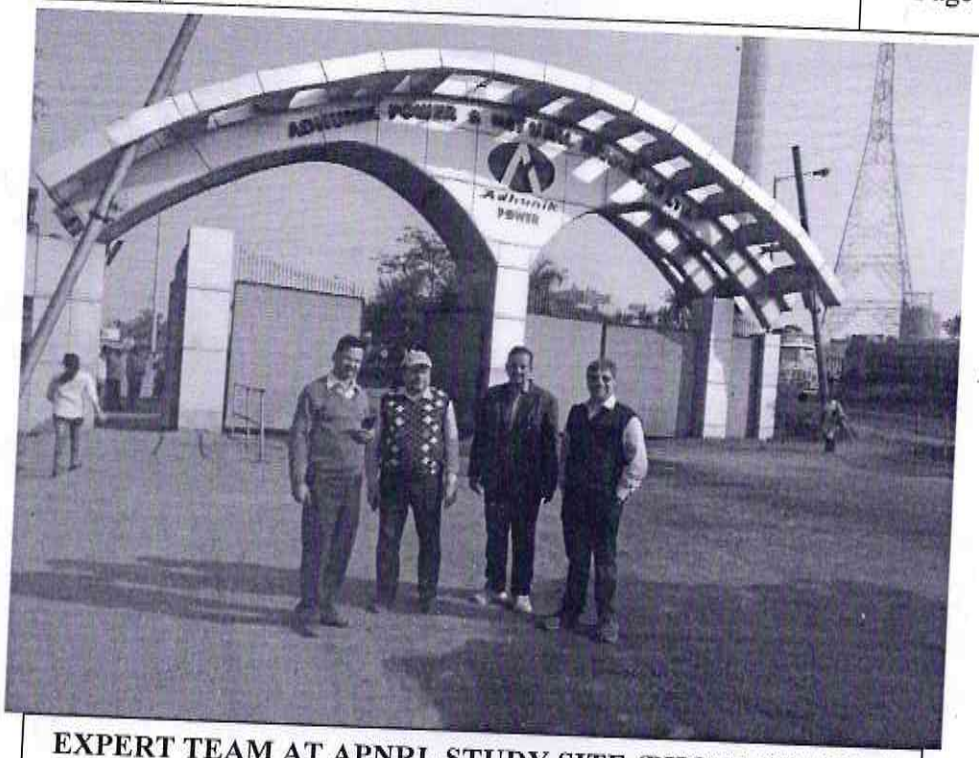
Monthly Abstract of Ash Generation and Utilization
(For the Period from 1st April,2018 - 31st March ,2019)

Name of Power Utility:Adhunik Power & Natural Resources Ltd
Installed Capacity (Total): 540 MWH
Name of Thermal Power Plant:Adhunik Power & Natural Resources Ltd
PERIOD OF REPORT-1st April,2018 to 31st March ,2019

In Mitric Tonne

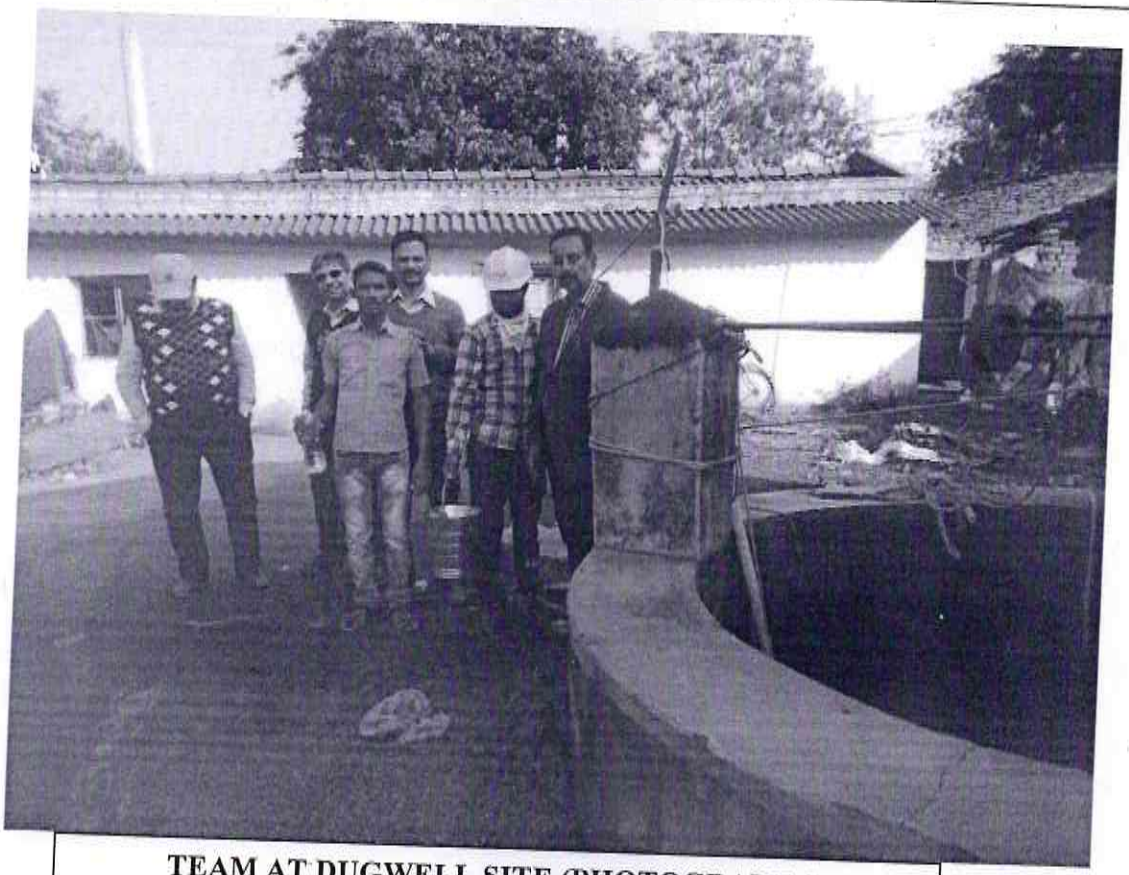
	Ash Generation and Utilization						Mode of Ash Utilization and Utilization In Each Mode									
Sl. No.	Months	Coal Consumed	Ash Contents of Coal (%)	Fly Ash Generation	Fly Ash Utilization	%age Utilization	In Making of Fly Ash Based bricks /Blocks /Tiles etc	In manufacturing of Portland Pozzolana Cement	In construction of Highways & Road including Flyovers	Part replacement of Cement In Concrete	In Hydro power sector In RCC Dam Construction	In Ash Dyke Raising	In Reclamation of Low Lying Area	In Mine Filling	In Agricultur /Waste Land Development	Others(Bottom Ash disposed in Ash Pond)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1	APRIL	127130.01	38.85	41983	41983	100.0%	2305	1289				2009	36380			7409
2	MAY	251304.54	41.64	88950	88950	100.0%	1935	1084				35366	50565			15697
3	JUNE	199618.60	47.31	80271	80271	100.0%	2155	15696				27223	35196			14165
4	JULY	237372.92	47.25	95344	95344	100.0%	2560	15732				16353	60700			16825
5	AUGUST	136659.33	47.47	55140	55140	100.0%	4274	16748					34117			9731
6	SEPTEMBER	150450.15	43.79	55997	55997	100.0%	2566	16484					36947			9882
7	OCTOBER	174298.55	42.36	62761	62761	100.0%	3721	14737					44304			11076
8	NOVEMBER	187794.14	42.33	67564	67564	100.0%	3491	10428					53645			11923
9	DECEMBER	143684.00	45.11	55096	55096	100.0%	6365	10956					37775			9723
10	JANUARY	87490.00	43.14	32081	32081	100.0%	4225	11003		1334			15519			5661
11	FEBRUARY	123042.00	47.74	49930	49930	100.0%	6159	17539		1323			24909			8811
12	MARCH	178365.00	41.77	63324	63324	100.0%	5455	16703		2243			38924			11175

PHOTOGRAPH

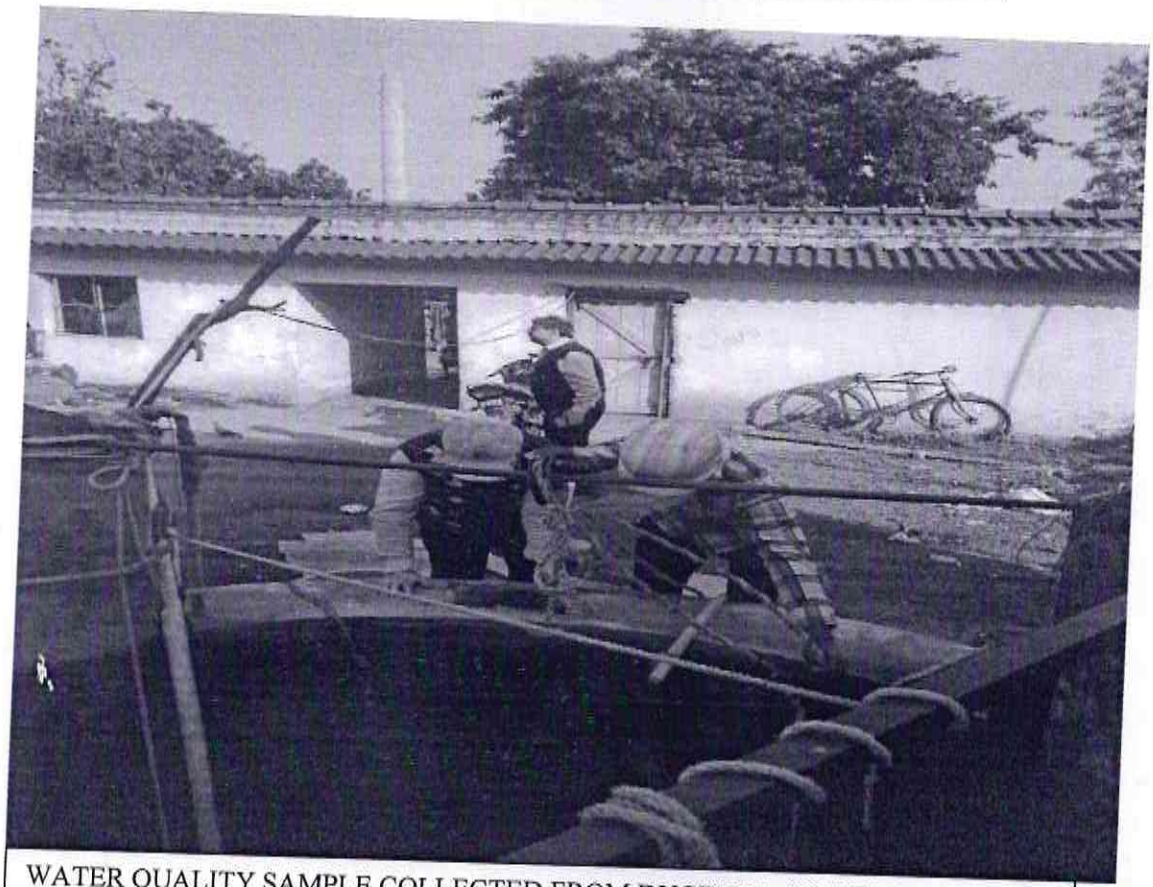


EXPERT TEAM AT APNRL STUDY SITE (PHOTOGRAPH-1)

BOREWELL LOCATED AT VILLAGE USED FOR MEASURING WATER LEVEL FLUCTUATION **(PHOTOGRAPH-2)**



TEAM AT DUGWELL SITE (PHOTOGRAPH-3)



WATER QUALITY SAMPLE COLLECTED FROM DUGWELL (PHOTOGRAPH-4)

DUGWELL USED FOR TAKING DRINKING WATER (PHOTOGRAPH-5)

DUGWELL USED FOR TAKING DRINKING WATER (PHOTOGRAPH-6)

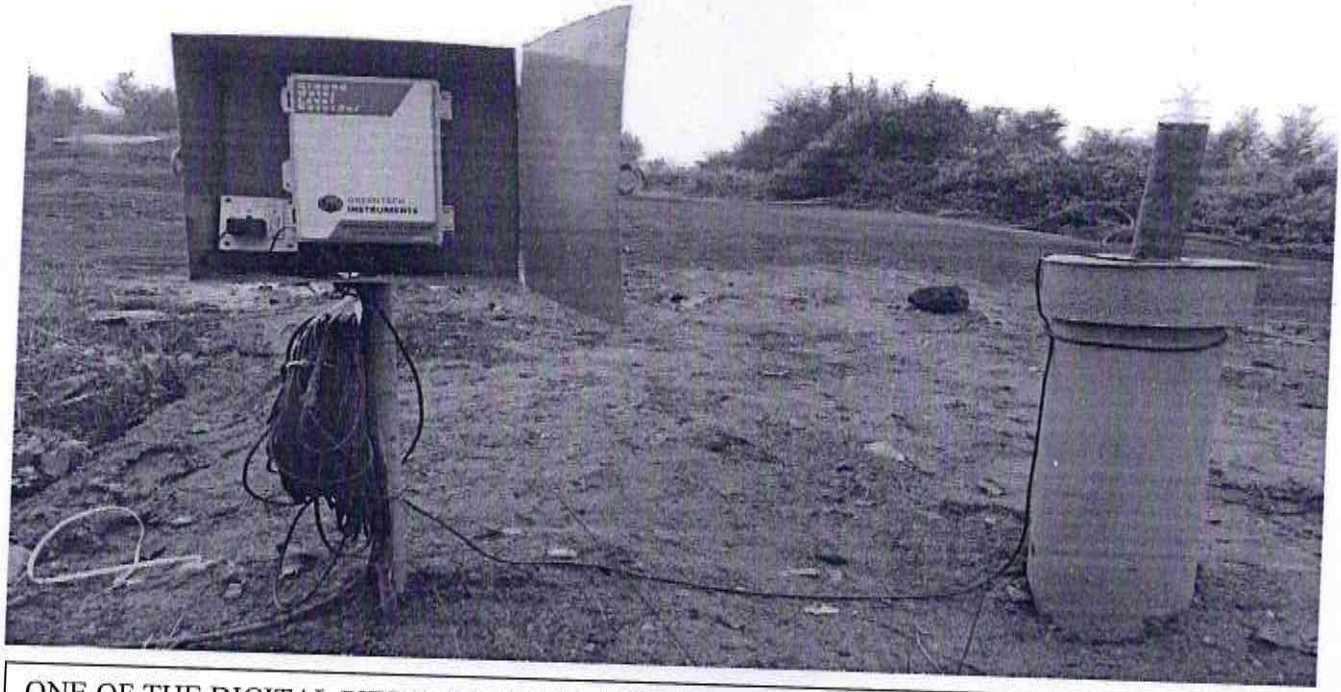
HDPE LINING BEING MADE AT ASH POND NO. – 1 (PHOTOGRAPH – 7)

ASH POND NO. – 1 AFTER PUTTING UP THE HDPE LINING (PHOTOGRAPH – 8)

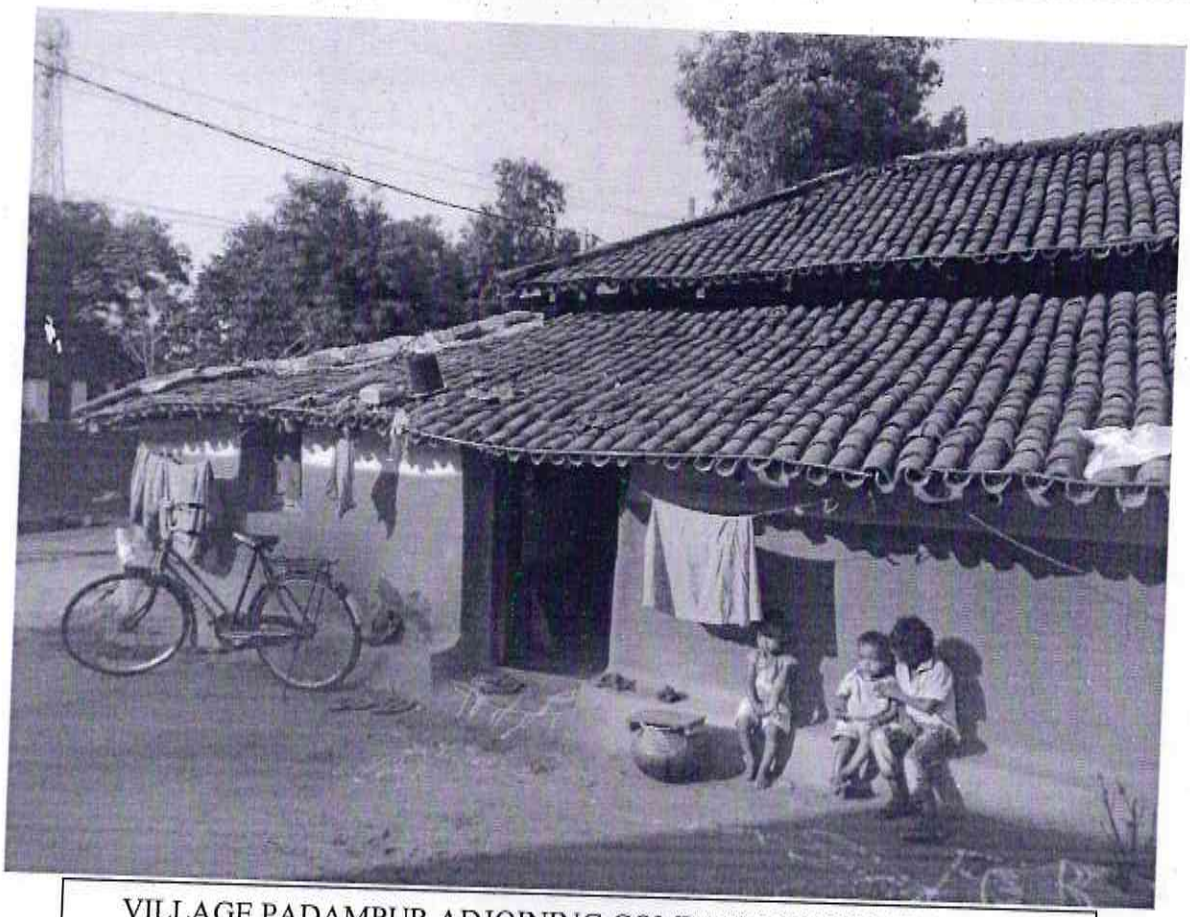
ASH POND NO. – 2 AFTER PUTTING UP THE HDPE LINING (PHOTOGRAPH – 9)

THE HDPE LINING BEING PUT OVER THE BOTTOM BED OF ASH POND NO. – 2 (PHOTOGRAPH – 10)

EXHAUSTED ASH POND AFTER TAKING AWAY OF ACCUMULARED ASH (PHOTOGRAPH-11)



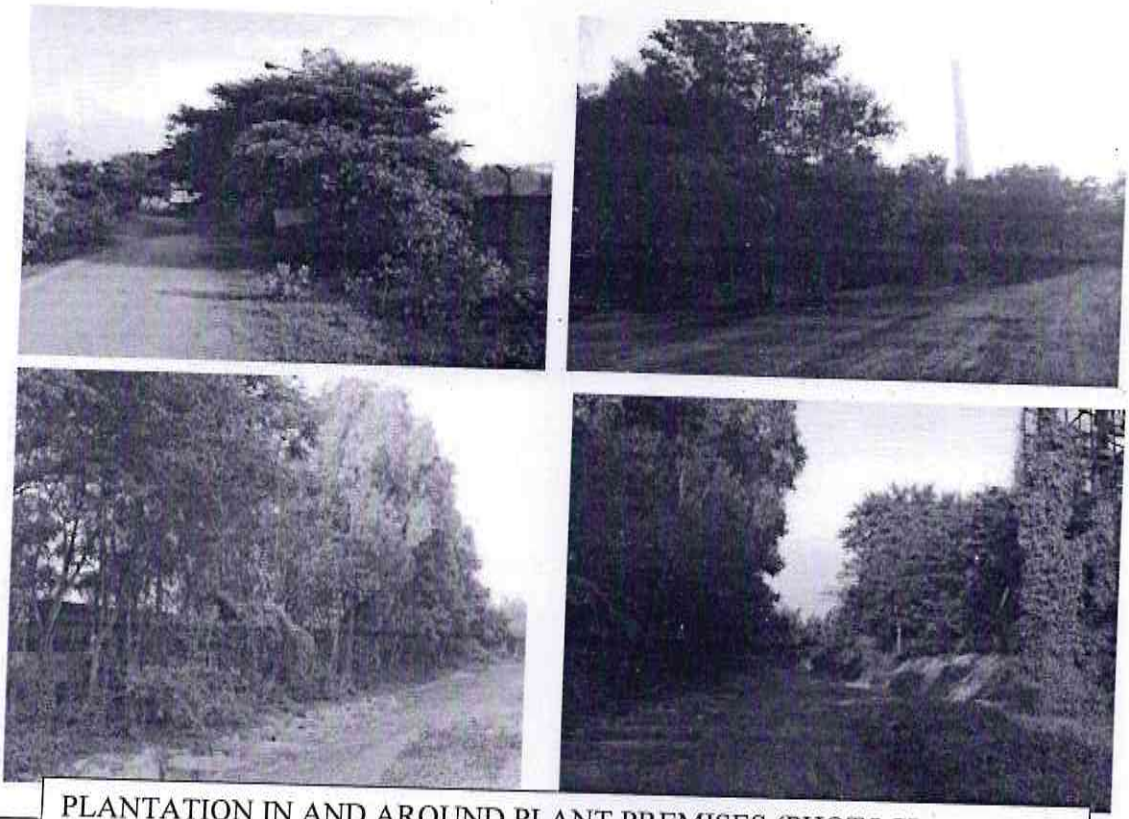
ONE OF THE DIGITAL PIEZOMETERS PLACED NEAR THE ASH POND (PHOTOGRAPH-12)



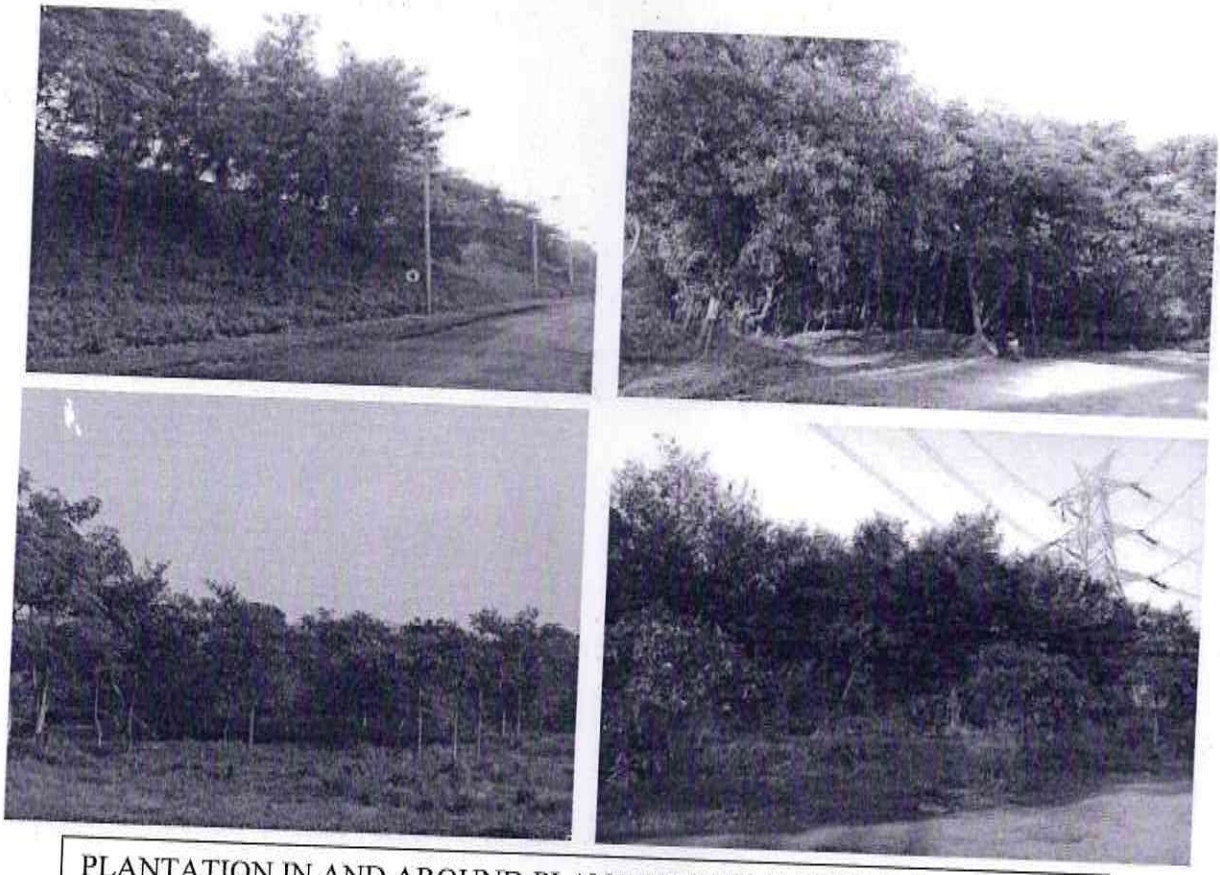
VILLAGE PADAMPUR ADJOINING COMPANY (PHOTOGRAPH-13)

STACK (PHOTOGRAPH-14)

SILO ASH BAGING READY FOR DISPOSAL (PHOTOGRAPH-15)



PLANTATION IN AND AROUND PLANT PREMISES (PHOTOGRAPH – 16)



PLANTATION IN AND AROUND PLANT PREMISES (PHOTOGRAPH – 17)

Annexure IV (1

YUGANTAR BHARATI

ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY

LAB ACCREDITED BY: National Accreditation Board for Testing & Calibration Laboratory (NABL), New Delhi
Jharkhand State Pollution Control Board (JSPCB)

Certificate No.- TC 7813

Baseline Ground Water Quality report

Issued to : - **M/s – Adhunik Power & Natural Resources Ltd.** **Vill – Padampur, Behind PGCIL substation,** **Jamshedpur-832402,Jharkhand**	**URL** (reference)	**TC78132010000019P, TC78132040000014F**
	Date of Issue	**23rd March 2020**
	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**	**14th March 2020**
Sample Quantity	**4000 ml for each Sample**	**Mode of sample Collection**	**YBAEEL sampling team**
Work allotted date	**16th March 2020**	**Sampling Location**	**Down stream of Ash pond**
Test started on	**16th March 2020**	**Sampling Source**	**Ground water (Hand pump & Bore well)**
Test completed on	**23rd March 2020**	**Meteorological cond.** (RH%, °C)	**62 % / 28°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	324	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	208	147-269	200 to 600
7.	Hardness (as $CaCO_3$)	IS 3025 (Part-21)	mg/l	172	128-308	200 to 600
8.	Nitrate (as NO_3)	APHA 4500 NO_3- B	mg/l	17.9	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	60.0	41-99	75 to 200
12.	Iron (as Fe)	APHA 3111 B	mg/l	0.25	0.13-0.90	0.3 to no relaxation
13.	Zinc (as Zn)	APHA 3111 B	mg/l	0.42	0.31-0.47	5 to 15
14.	Turbidity	IS 3025 (Part 10)	NTU	4	<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	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 0.01)	**<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	18.5	06-28	200-400
30.	Mercury (as Hg)	APHA 3112 B	mg/l	ND (MDL 0.01)	**<0.001**	-
31.	Total Coliform	APHA 9221 B	MPN/100 ml	ND (MDL 1.1)	ND	Shall not be present in any 100 ml sample
32.	E. Coli	APHA 9221 F	MPN/100 ml	ND (MDL 1.1)	--	

* provided by customer

Tested by	Checked by	Authorized Signatory	Issued by
Saima Afrin	Bajrang Kumar	Chemical Section	Umesh Das
Lab Analyst	Authorized Signatory	Yugantar Bharati Analytical & Environmental Engineering Laboratory	Technical Manager

23/3/20

Yugantar Bharati Analytical & Environmental Engineering Laboratory

TÜVRheinland ISO 9001:2015 & OHSAS 18001:2007 TÜVRheinland
Post Box no. [illegible] | Namkum Post Office | Sidroul | Ranchi - 834010 (Jharkhand)
Ph. 09835[illegible] | Tele Fax : 0651-2260787 | E-mail : ybaeel@gmail.com

YUGANTAR BHARATI

ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY

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Baseline Ground Water Quality report

Issued to : - **M/s – Adhunik Power & Natural Resources Ltd.** **Vill – Padampur, Behind PGCIL substation,** **Jamshedpur-832402,Jharkhand**	**URL** (reference)	**TC78132010000020P, TC78132040000015F,**
	Date of issue	**23rd March 2020**
	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**	**14th March 2020**
Sample Quantity	**4000 ml for each Sample**	**Mode of sample Collection**	**YBAEEL sampling team**
Work allotted date	**16th March 2020**	**Sampling Location**	**Up stream of Ash pond**
Test started on	**16th March 2020**	**Sampling Source**	**Ground water (Hand pump & Bore well)**
Test completed on	**23rd March 2020**	**Meteorological cond.** (RH%, °C)	**62 % / 28°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)	--	7.1	6.9-7.4	6.5 to 8.5
2.	Total Dissolved Solid	IS 3025 (Part-16)	mg/l	238	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	180	147-269	200 to 600
7.	Hardness (as $CaCO_3$)	IS 3025 (Part-21)	mg/l	156	128-308	200 to 600
8.	Nitrate (as NO_3)	APHA 4500 NO_3- B	mg/l	10.8	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	48	41-99	75 to 200
12.	Iron (as Fe)	APHA 3111 B	mg/l	0.21	0.13-0.90	0.3 to no relaxation
13.	Zinc (as Zn)	APHA 3111 B	mg/l	0.38	0.31-0.47	5 to 15
14.	Turbidity	IS 3025 (Part 10)	NTU	3	<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	56	42-74	250-1000
18.	Fluoride as F	APHA 4500 FC	mg/l	0.3	0.31-0.50	1-1.5
19.	Lead as Pb	APHA 3111B	mg/l	ND (MDL 0.01)	**<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	12.2	06-28	200-400
30.	Mercury (as Hg)	APHA 3112 B	mg/l	ND (MDL 0.01)	**<0.001**	-
31.	Total Coliform	APHA 9221 B	MPN/100 ml	ND (MDL 1.1)	ND	Shall not be present in any 100 ml sample
32.	E. Coli	APHA 9221 F	MPN/100 ml	ND (MDL 1.1)		

* provided by customer

Tested by	Checked by	Issued by
Saima Afrin	Bajrang Kumar	Umesh Das
Lab Analyst	Authorized Signatory	Technical Manager

Authorized Signatory
Chemical Section
Yugantar Bharati Analytical & Environmental Engineering Laboratory

An ISO 9001:2015 & OHSAS 18001:2007 Certified Laboratory
Post Box no. 32 | Namkom Post Office | Ranchi - 834010 (Jharkhand)
Ph. 09835[illegible], 9304956[illegible] | Tele Fax : 0651-2260787 | E-mail : ybaeel@gmail.com

Annexure I

Location Cordinates:	22°50'20.5"N	86°03'46.5"E
DATE	TIME	WATER LEVEL (m)
31-03-2020	01:00:00	1.78
31-03-2020	07:00:00	1.2
31-03-2020	13:00:00	1.61
31-03-2020	19:00:00	1.46
30-03-2020	01:00:00	1.47
30-03-2020	07:00:00	1.47
30-03-2020	13:00:00	1.49
30-03-2020	19:00:00	1.39
29-03-2020	01:00:00	1.44
29-03-2020	07:00:00	1.44
29-03-2020	13:00:00	1.46
29-03-2020	19:00:00	1.47
28-03-2020	01:00:00	1.46
28-03-2020	07:00:00	1.46
28-03-2020	13:00:00	1.46
28-03-2020	19:00:00	1.54
27-03-2020	01:00:00	1.5
27-03-2020	07:00:00	1.5
27-03-2020	13:00:00	1.47
27-03-2020	19:00:00	1.49
26-03-2020	01:00:00	1.47
26-03-2020	07:00:00	1.5
26-03-2020	13:00:00	1.5
26-03-2020	19:00:00	1.5
25-03-2020	01:00:00	1.56
25-03-2020	07:00:00	1.63
25-03-2020	13:00:00	1.71
25-03-2020	19:00:00	1.75
24-03-2020	01:00:00	1.7
24-03-2020	07:00:00	1.66
24-03-2020	13:00:00	1.61
24-03-2020	19:00:00	1.64
23-03-2020	01:00:00	1.64
23-03-2020	07:00:00	1.6
23-03-2020	13:00:00	1.61
23-03-2020	19:00:00	1.6
22-03-2020	01:00:00	1.57
22-03-2020	07:00:00	1.6
22-03-2020	13:00:00	1.63
22-03-2020	19:00:00	1.63
21-03-2020	01:00:00	1.59
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21-03-2020	19:00:00	1.45
20-03-2020	01:00:00	1.4
20-03-2020	07:00:00	1.39
20-03-2020	13:00:00	1.4
20-03-2020	19:00:00	1.52
19-03-2020	01:00:00	1.57
19-03-2020	07:00:00	1.61
19-03-2020	13:00:00	1.57
19-03-2020	19:00:00	1.55
18-03-2020	01:00:00	1.51

18-03-2020 07:00:00	1.55
18-03-2020 13:00:00	1.53
18-03-2020 19:00:00	1.49
17-03-2020 01:00:00	1.53
17-03-2020 07:00:00	1.49
17-03-2020 13:00:00	1.46
17-03-2020 19:00:00	1.44
16-03-2020 01:00:00	1.42
16-03-2020 07:00:00	1.43
16-03-2020 13:00:00	1.45
16-03-2020 19:00:00	1.48
15-03-2020 01:00:00	1.48
15-03-2020 07:00:00	1.43
15-03-2020 13:00:00	1.42
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29-01-2020 19:00:00	1.53
28-01-2020 01:00:00	1.53
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09-01-2020 01:00:00	1.95
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09-01-2020 13:00:00	1.77
09-01-2020 19:00:00	1.83
08-01-2020 01:00:00	1.9

08-01-2020 07:00:00	1.82
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04-01-2020 13:00:00	1.52
04-01-2020 19:00:00	1.57
03-01-2020 01:00:00	1.66
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03-01-2020 13:00:00	1.66
03-01-2020 19:00:00	1.6
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02-01-2020 13:00:00	1.63
02-01-2020 19:00:00	1.62
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27-12-2019 01:00:00	0.88
27-12-2019 07:00:00	0.96
27-12-2019 13:00:00	0.89
27-12-2019 19:00:00	0.86
26-12-2019 01:00:00	0.8
26-12-2019 07:00:00	0.78
26-12-2019 13:00:00	0.78
26-12-2019 19:00:00	0.77
25-12-2019 01:00:00	0.87

25-12-2019 07:00:00	0.85
25-12-2019 13:00:00	0.73
25-12-2019 19:00:00	0.73
24-12-2019 01:00:00	0.81
24-12-2019 07:00:00	0.82
24-12-2019 13:00:00	0.76
24-12-2019 19:00:00	0.76
23-12-2019 01:00:00	0.86
23-12-2019 07:00:00	0.92
23-12-2019 13:00:00	0.93
23-12-2019 19:00:00	0.89
22-12-2019 01:00:00	0.78
22-12-2019 07:00:00	0.79
22-12-2019 13:00:00	0.78
22-12-2019 19:00:00	0.79
21-12-2019 01:00:00	0.79
21-12-2019 07:00:00	0.79
21-12-2019 13:00:00	0.78
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20-12-2019 19:00:00	0.67
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19-12-2019 07:00:00	0.62
19-12-2019 13:00:00	0.62
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18-12-2019 13:00:00	0.72
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17-12-2019 01:00:00	0.67
17-12-2019 07:00:00	0.72
17-12-2019 13:00:00	0.71
17-12-2019 19:00:00	0.7
16-12-2019 01:00:00	0.7
16-12-2019 07:00:00	0.73
16-12-2019 13:00:00	0.7
16-12-2019 19:00:00	0.7
15-12-2019 01:00:00	0.71
15-12-2019 07:00:00	0.71
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15-12-2019 19:00:00	0.7
14-12-2019 01:00:00	0.69
14-12-2019 07:00:00	0.66
14-12-2019 13:00:00	0.66
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Location Cordinates:	22°50'21.0"N	86°03'27.5"E
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Location Cordinates:	22°50'09.4"N	86°03'48.1"E
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31-12-2019 19:00:00	0.42
30-12-2019 01:00:00	0.41
30-12-2019 07:00:00	0.4
30-12-2019 13:00:00	0.37
30-12-2019 19:00:00	0.36
29-12-2019 01:00:00	0.36
29-12-2019 07:00:00	0.33
29-12-2019 13:00:00	0.33
29-12-2019 19:00:00	0.32
28-12-2019 01:00:00	0.32
28-12-2019 07:00:00	0.33
28-12-2019 13:00:00	0.33
28-12-2019 19:00:00	0.34
27-12-2019 01:00:00	0.34
27-12-2019 07:00:00	0.34
27-12-2019 13:00:00	0.34
27-12-2019 19:00:00	0.34
26-12-2019 01:00:00	0.34
26-12-2019 07:00:00	0.33
26-12-2019 13:00:00	0.34
26-12-2019 19:00:00	0.35
25-12-2019 01:00:00	0.36

25-12-2019 07:00:00	0.37
25-12-2019 13:00:00	0.38
25-12-2019 19:00:00	0.38
24-12-2019 01:00:00	0.38
24-12-2019 07:00:00	0.37
24-12-2019 13:00:00	0.37
24-12-2019 19:00:00	0.34
23-12-2019 01:00:00	0.33
23-12-2019 07:00:00	0.29
23-12-2019 13:00:00	0.28
23-12-2019 19:00:00	0.28
22-12-2019 01:00:00	0.28
22-12-2019 07:00:00	0.28
22-12-2019 13:00:00	0.31
22-12-2019 19:00:00	0.33
21-12-2019 01:00:00	0.34
21-12-2019 07:00:00	0.3
21-12-2019 13:00:00	0.32
21-12-2019 19:00:00	0.29
20-12-2019 01:00:00	0.28
20-12-2019 07:00:00	0.28
20-12-2019 13:00:00	0.28
20-12-2019 19:00:00	0.27
19-12-2019 01:00:00	0.32
19-12-2019 07:00:00	0.32
19-12-2019 13:00:00	0.34
19-12-2019 19:00:00	0.36
18-12-2019 01:00:00	0.37
18-12-2019 07:00:00	0.37
18-12-2019 13:00:00	0.37
18-12-2019 19:00:00	0.36
17-12-2019 01:00:00	0.35
17-12-2019 07:00:00	0.34
17-12-2019 13:00:00	0.33
17-12-2019 19:00:00	0.33
16-12-2019 01:00:00	0.33
16-12-2019 07:00:00	0.34
16-12-2019 13:00:00	0.34
16-12-2019 19:00:00	0.35
15-12-2019 01:00:00	0.36
15-12-2019 07:00:00	0.36
15-12-2019 13:00:00	0.36
15-12-2019 19:00:00	0.35
14-12-2019 01:00:00	0.36
14-12-2019 07:00:00	0.36
14-12-2019 13:00:00	0.36
14-12-2019 19:00:00	0.36
13-12-2019 01:00:00	0.38
13-12-2019 07:00:00	0.4
13-12-2019 13:00:00	0.43
13-12-2019 19:00:00	0.44
12-12-2019 01:00:00	0.47
12-12-2019 07:00:00	0.44
12-12-2019 13:00:00	0.43
12-12-2019 19:00:00	0.38
11-12-2019 01:00:00	0.35

11-12-2019 07:00:00	0.34
11-12-2019 13:00:00	0.33
11-12-2019 19:00:00	0.33
10-12-2019 01:00:00	0.33
10-12-2019 07:00:00	0.33
10-12-2019 13:00:00	0.34
10-12-2019 19:00:00	0.34
09-12-2019 01:00:00	0.34
09-12-2019 07:00:00	0.34
09-12-2019 13:00:00	0.34
09-12-2019 19:00:00	0.34
08-12-2019 01:00:00	0.33
08-12-2019 07:00:00	0.32
08-12-2019 13:00:00	0.29
08-12-2019 19:00:00	0.33
07-12-2019 01:00:00	0.35
07-12-2019 07:00:00	0.37
07-12-2019 13:00:00	0.37
07-12-2019 19:00:00	0.36
06-12-2019 01:00:00	0.38
06-12-2019 07:00:00	0.37
06-12-2019 13:00:00	0.4
06-12-2019 19:00:00	0.42
05-12-2019 01:00:00	0.38
05-12-2019 07:00:00	0.37
05-12-2019 13:00:00	0.36
05-12-2019 19:00:00	0.36
04-12-2019 01:00:00	0.35
04-12-2019 07:00:00	0.35
04-12-2019 13:00:00	0.37
04-12-2019 19:00:00	0.37
03-12-2019 01:00:00	0.38
03-12-2019 07:00:00	0.39
03-12-2019 13:00:00	0.38
03-12-2019 19:00:00	0.37
02-12-2019 01:00:00	0.37
02-12-2019 07:00:00	0.37
02-12-2019 13:00:00	0.36
02-12-2019 19:00:00	0.36
01-12-2019 01:00:00	0.35
01-12-2019 07:00:00	0.34
01-12-2019 13:00:00	0.35
01-12-2019 19:00:00	0.37
30-11-2019 01:00:00	0.37
30-11-2019 07:00:00	0.37
30-11-2019 13:00:00	0.42
30-11-2019 19:00:00	0.39
29-11-2019 01:00:00	0.38
29-11-2019 07:00:00	0.37
29-11-2019 13:00:00	0.36
29-11-2019 19:00:00	0.35
28-11-2019 01:00:00	0.34
28-11-2019 07:00:00	0.35
28-11-2019 13:00:00	0.36
28-11-2019 19:00:00	0.37
27-11-2019 01:00:00	0.38

27-11-2019 07:00:00	0.39
27-11-2019 13:00:00	0.42
27-11-2019 19:00:00	0.43
26-11-2019 01:00:00	0.39
26-11-2019 07:00:00	0.37
26-11-2019 13:00:00	0.38
26-11-2019 19:00:00	0.38
25-11-2019 01:00:00	0.39
25-11-2019 07:00:00	0.41
25-11-2019 13:00:00	0.43
25-11-2019 19:00:00	0.44
24-11-2019 01:00:00	0.42
24-11-2019 07:00:00	0.46
24-11-2019 13:00:00	0.46
24-11-2019 19:00:00	0.44
23-11-2019 01:00:00	0.38
23-11-2019 07:00:00	0.37
23-11-2019 13:00:00	0.34
23-11-2019 19:00:00	0.34
22-11-2019 01:00:00	0.32
22-11-2019 07:00:00	0.34
22-11-2019 13:00:00	0.34
22-11-2019 19:00:00	0.35
21-11-2019 01:00:00	0.35
21-11-2019 07:00:00	0.37
21-11-2019 13:00:00	0.39
21-11-2019 19:00:00	0.39
20-11-2019 01:00:00	0.38
20-11-2019 07:00:00	0.38
20-11-2019 13:00:00	0.36
20-11-2019 19:00:00	0.37
19-11-2019 01:00:00	0.39
19-11-2019 07:00:00	0.43
19-11-2019 13:00:00	0.44
19-11-2019 19:00:00	0.44
18-11-2019 13:00:00	0.92
18-11-2019 19:00:00	0.1

Annexure II (4)

YUGANTAR BHARATI

ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY

LAB ACCREDITED BY: National Accreditation Board for Testing & Calibration Laboratory (NABL), New Delhi
Jharkhand State Pollution Control Board (JSPCB)

Certificate No.- TC 7813

Water Test Report	URL(Unique Lab Report) No.	TC78132010000021P, TC78132040000016F
Issued to : -	Job code – Chemical	YBAEEL/WI/L/C/Mar-20/01
M/s – Adhunik Power & Natural Resources Ltd.	Job code – Biological	YBAEEL/WA/L/M/Mar-20/02
Vill – Padampur, Behind PGCIL substation, Jamshedpur-832402,Jharkhand	Sample Code	200316-SW-E01
	Report ID	YBAEEL-200304-132814-SW01
	Date of Issue	23rd March 2020
	Type of Industries (* in case of Industrial Effluent)	Thermal Power Plant

Sample Name/Description	Surface Water	Sampling Protocol	YBAEEL/SP/01/00
Sample pkg. Condition	Sealed in plastic bottle	Sampling Date	14th March 2020
Sample Quantity	4000 ml	Mode of sample Collection	YBAEEL sampling team
Work allotted date	16th March 2020	Sampling Location	Srirampur Village
Test started on	16th March 2020	Sampling Source	Pond water
Test completed on	23rd March 2020	Meteorological cond. (RH%, °C)	62 % / 28°C

****Test Result****

Sl. No.	Tested Parameter	Method	Unit	Results	Permissible Limit (As per IS 2296 Specification)
1.	pH value	IS 3025 (Part-11)	--	7.73	6.5 to 8.5
2.	Total Dissolved Solid	IS 3025 (Part-16)	mg/l	772.0	-
3.	Temperature*	IS 3025 (Part 09)	^{0}C	26.8	-
4.	Colour	IS:3025 (Part-04)	cu	13	300
5.	Odour*	IS:3025 (Part-05)	-	Agreeable	Un-objectionable
6.	BOD	IS:3025 (Part-44)	mg/l	2.8	3
7.	COD	IS 3025 (Part-58)	mg/l	56.0	-
8.	Nitrate (as NO_3)	APHA 4500 NO_3- B	mg/l	1.22	-
9.	Arsenic (as As)	APHA 3112 B	mg/l	ND(MDL 0.01)	0.2
10.	Calcium (as Ca+)	IS 3025 (Part-40)	mg/l	52.0	-
11.	Magnesium (as Mg+)	IS 3015 (Part-46)	mg/l	44.0	30 – 100
12.	Iron (as Fe)	APHA 3111 B	mg/l	0.24	-
13.	Zinc (as Zn)	APHA 3111 B	mg/l	ND(MDL 0.1)	-
14.	Oxygen (dissolved)	IS 3025 (Part38)	mg/l	6.6	–
15.	Oil & grease	IS 3025 (Part39)	mg/l	4.2	-
16.	Phenols (C6H6OH)	IS 3025 (Part55)	mg/l	ND(MDL 0.001)	-
17.	Chloride as Cl	IS 3025 (Part 32)	mg/l	57.0	-
18.	Fluoride as F	APHA 4500 FC	mg/l	0.5	1.5
19.	Lead as Pb	APHA 3111B	mg/l	ND(MDL 0.01)	-
20.	Chromium as Cr	APHA 3111B	mg/l	ND(MDL 0.01)	-

Tested by	Checked by	Issued by
Saima Afrin	Bajrang Kumar	Umesh Das
Lab Analyst	Authorized Signatory	Technical Manager

Yugantar Bharati Analytical & Environmental Engineering Laboratory

Authorized Signatory
Chemical Section
Yugantar Bharati Analytical & Environmental Engineering Laboratory

An ISO 9001: 2015 & OHSAS 18001:2007 Certified Laboratory
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YUGANTAR BHARATI

ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY

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Jharkhand State Pollution Control Board (JSPCB)

Certificate No.- TC 7813

Water Test Report	URL(Unique Lab Report) No.	TC78132010000021P, TC78132040000016F
Issued to : - M/s – Adhunik Power & Natural Resources Ltd. Vill – Padampur, Behind PGCIL substation, Jamshedpur-832402,Jharkhand	Job code – Chemical	YBAEEL/WI/L/C/Mar-20/01
	Job code – Biological	YBAEEL/WA/L/M/Mar-20/02
	Sample Code	200316-SW-E01
	Report ID	YBAEEL-200304-132814-SW01
	Date of Issue	23rd March 2020
	Type of Industries (* in case of Industrial Effluent)	Thermal Power Plant

Sample Name/Description	Surface Water	Sampling Protocol	YBAEEL/SP/01/00
Sample pkg. Condition	Sealed in plastic bottle	Sampling Date	14th March 2020
Sample Quantity	4000 ml	Mode of sample Collection	YBAEEL sampling team
Work allotted date	16th March 2020	Sampling Location	Srirampur Village
Test started on	16th March 2020	Sampling Source	Pond water
Test completed on	23rd March 2020	Meteorological cond. (RH%, °C)	62 % / 28°C

Test Result

21.	Copper as cu	APHA 3111B	mg/l	ND (MDL 0.01)	-
22.	Conductivity	IS 3025 (Part 14)	µS/cm	944.0	-
23.	Potassium as K	APHA 3111 B	mg/l	5.2	-
24.	Sodium as Na	APHA 3111 B	mg/l	62.4	-
25.	Cadmium as Cd	APHA 3111 B	mg/l	ND (MDL 0.01)	-
26.	Sulphate as SO_4	IS 3025 (Part 24)	mg/l	160.8	-
27.	Selenium (as Se)	APHA 3111 B	mg/l	ND (MDL0.01)	-
28.	Ammonia (Free)*	IS 3025 (Part-35)	mg/l	ND(MDL0.1)	-
29.	Cyanide (as CN)*	IS 3025 (Part-27)	mg/l	ND (MDL 0.01)	-
30.	Mercury (as Hg)	APHA 3112 B	mg/l	ND (MDL 0.01)	-
31.	Total Coliform	APHA 9221 B	MPN/100 ml	120	500 MPN/100 ml
32.	E. Coli	APHA 9221 F	MPN/100 ml	23	-

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

Remarks:-According to the tested parameter, the given samples found to be under the limit of IS 2296:1992. AS per Specification, More Dissolved Oxygen is Acceptable.

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
Saima Afrin	Madhuri Sinha	Bajrang Kumar	Mukesh Kumar	Umesh Das
Lab Analyst		Authorized Signatory	Authorized Signatory	Technical Manager
		Chemical Section	Microbiological Section	

Yugantar Bharati Analytical & Environmental Engineering Laboratory

An ISO 9001: 2015 & OHSAS 18001:2007 Certified Laboratory
Post Box no. 25 | Namkum Post Office | Sidroul | Ranchi - 834010 (Jharkhand)
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Jharkhand State Pollution Control Board (JSPCB)

Certificate No.- TC 7813

Water Test Report	URL(Unique Lab Report) No.	TC78132010000022P, TC78132040000017F
Issued to : - M/s – Adhunik Power & Natural Resources Ltd. Vill – Padampur, Behind PGCIL substation, Jamshedpur-832402,Jharkhand	Job code – Chemical	YBAEEL/WI/L/C/Mar-20/01
	Job code – Biological	YBAEEL/WA/L/M/Mar-20/02
	Sample Code	200316-SW-E02
	Report ID	YBAEEL-200304-132814-SW02
	Date of Issue	23rd March 2020
	Type of Industries (* in case of Industrial Effluent)	Thermal Power Plant

Sample Name/Description	Surface Water	Sampling Protocol	YBAEEL/SP/01/00
Sample pkg. Condition	Sealed in plastic bottle	Sampling Date	14th March 2020
Sample Quantity	4000 ml	Mode of sample Collection	YBAEEL sampling team
Work allotted date	16th March 2020	Sampling Location	Padampur Village
Test started on	16th March 2020	Sampling Source	Pond water
Test completed on	23rd March 2020	Meteorological cond. (RH%, °C)	62 % / 28°C

Test Result

Sl. No.	Tested Parameter	Method	Unit	Results	Permissible Limit (As per IS 2296 Specification)
1.	pH value	IS 3025 (Part-11)	--	7.62	6.5 to 8.5
2.	Total Dissolved Solid	IS 3025 (Part-16)	mg/l	708.0	-
3.	Temperature*	IS 3025 (Part 09)	°C	26.8	-
4.	Colour	IS:3025 (Part-04)	cu	12	300
5.	Odour*	IS:3025 (Part-05)	-	Agreeable	Un-objectionable
6.	BOD	IS:3025 (Part-44)	mg/l	2.4	3
7.	COD	IS 3025 (Part-58)	mg/l	48.0	-
8.	Nitrate (as NO_3)	APHA 4500 NO_3- B	mg/l	3.4	-
9.	Arsenic (as As)	APHA 3112 B	mg/l	ND(MDL 0.01)	0.2
10.	Calcium (as Ca+)	IS 3025 (Part-40)	mg/l	35.2	-
11.	Magnesium (as Mg+)	IS 3015 (Part-46)	mg/l	22.4	-
12.	Iron (as Fe)	APHA 3111 B	mg/l	0.24	-
13.	Zinc (as Zn)	APHA 3111 B	mg/l	ND(MDL 0.1)	-
14.	Oxygen (dissolved)	IS 3025 (Part38)	mg/l	6.8	5
15.	Oil & grease	IS 3025 (Part39)	mg/l	3.6	-
16.	Phenols (C6H6OH)	IS 3025 (Part55)	mg/l	ND(MDL 0.001)	-
17.	Chloride as Cl	IS 3025 (Part 32)	mg/l	124.0	-
18.	Fluoride as F	APHA 4500 FC	mg/l	0.4	1.5
19.	Lead as Pb	APHA 3111B	mg/l	ND(MDL 0.01)	-
20.	Chromium as Cr	APHA 3111B	mg/l	ND(MDL 0.01)	-

Tested by	Checked by	Issued by
Saima Afrin	Bajrang Kumar	Umesh Das
Lab Analyst	Authorized Signatory	Technical Manager

Yugantar Bharati Analytical & Environmental Engineering Laboratory

Authorized Signatory
Chemical Section
Yugantar Bharati Analytical &
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ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY

LAB ACCREDITED BY: National Accreditation Board for Testing & Calibration Laboratory (NABL), New Delhi
Jharkhand State Pollution Control Board (JSPCB)

Certificate No - TC 7813

Water Test Report	URL(Unique Lab Report) No.	TC78132010000022P, TC78132040000017F
Issued to : - M/s – Adhunik Power & Natural Resources Ltd. Vill – Padampur, Behind PGCIL substation, Jamshedpur-832402,Jharkhand	Job code – Chemical	YBAEEL/WI/L/C/Mar-20/01
	Job code – Biological	YBAEEL/WA/L/M/Mar-20/02
	Sample Code	200316-SW-E02
	Report ID	YBAEEL-200304-132814-SW02
	Date of Issue	23rd March 2020
	Type of Industries (* in case of Industrial Effluent)	Thermal Power Plant

Sample Name/Description	Surface Water	Sampling Protocol	YBAEEL/SP/01/00
Sample pkg. Condition	Sealed in plastic bottle	Sampling Date	14th March 2020
Sample Quantity	4000 ml	Mode of sample Collection	YBAEEL sampling team
Work allotted date	16th March 2020	Sampling Location	Padampur Village
Test started on	16th March 2020	Sampling Source	Pond water
Test completed on	23rd March 2020	Meteorological cond. (RH%, °C)	62 % / 28°C

****Test Result****

21.	Copper as cu	APHA 3111B	mg/l	0.03	-
22.	Conductivity	IS 3025 (Part 14)	µS/cm	984.0	-
23.	Potassium as K	APHA 3111 B	mg/l	9.6	-
24.	Sodium as Na	APHA 3111 B	mg/l	107.8	-
25.	Cadmium as Cd	APHA 3111 B	mg/l	ND (MDL 0.01)	-
26.	Sulphate as SO_4	IS 3025 (Part 24)	mg/l	15.0	-
27.	Selenium (as Se)	APHA 3111 B	mg/l	ND (MDL0.01)	-
28.	Ammonia (Free)*	IS 3025 (Part-35)	mg/l	ND(MDL0.1)	-
29.	Cyanide (as CN)*	IS 3025 (Part-27)	mg/l	ND (MDL 0.01)	-
30.	Mercury (as Hg)	APHA 3112 B	mg/l	ND (MDL 0.01)	-
31.	Total Coliform	APHA 9221 B	MPN/100 ml	210	500 MPN/100 ml
32.	E. Coli	APHA 9221 F	MPN/100 ml	58	-

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

Remarks:-According to the tested parameter, the given samples found to be under the limit of IS 2296:1992 Class (B), As per Specification, More Dissolved oxygen is Acceptable.

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.
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- 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
Saima Afrin	Madhuri Sinha	Bairagi Kumar	Mukesh Kumar	Umesh Das
Lab Analyst		Authorized Signatory Chemical Section	Authorized Signatory Microbiological Section	Technical Manager

Yugantar Bharati Analytical & Environmental Engineering Laboratory

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Annexure VII

YUGANTAR BHARATI

ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY

LAB ACCREDITED BY: National Accreditation Board for Testing & Calibration Laboratory (NABL), New Delhi
Jharkhand State Pollution Control Board (JSPCB)

Certificate No.- TC 7813

Atmospheric Pollution Test Report				URL(Unique Lab Report) No.	TC78132020000091P
Report Release Date	23rd March 2020			Report ID	YBAEEL-200304-132814-S02
Sample Description	Boiler Stack - 02			Job code/ Ref. no.	YBAEEL/WA/L/A/Mar-20/08
Type of Industry	Thermal Power Plant			Work Order No./ Date	3030004681 / 18.02.2020
Issue to	M/s – Adhunik Power & Natural Resources Ltd. Vill – Padampur, Behind PGCIL substation, Jamshedpur-832402,Jharkhand				
Sampling Period	13thMarch, 2020			Mode of sample collection	Sampling team of YBAEEL
Sampling Protocol	IS: 11255 & CPCB Guideline (Lats/80/2013-14)				
Meteorological Cond.	W.C.– Haze & Drizzling		RH % - 72%		Temp.–22°C
Sample receipt Date	16.03.2020	Analysis Started on	16.3.2020	Analysis completed on	23.03.2020

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(duringsampling)	155 T/Hr
Stack Description (Shape & Material)	Circular / RCC	Total production Capacity	270 MW
Sampling port	Available	Height of Stack from ground level	275mtr.
Stack Identification	Stack – 02	Inner Diameter of Stack	4.2mtr.
Height of port hole from Ground level	90mtr.	Pollution Controlling Device	ESP

**Test Results **

Sl	Parameter s	Test Method	Units	Results	Limits
1.	Stack gas Temperature	IS 11255 (Part 3)2008	k	385	-
2.	Stack gas Velocity	IS 11255 (Part 3)2008	m/s	26.1	-
3.	Volumetric Flow Rate	IS 11255 (Part 3)2008	Nm^3/hr	1000733.2	-
3.	Particulate Matter (PM)	IS 11255 (Part 1)2009	mg/Nm^3	44.5	50
4.	Sulphure Dioxide (SO_2)	IS 11255 (Part 2)2009	mg/Nm^3	524.9	600
5.	Oxide of Nitrogen (as NO_x)*	IS 11255 (Part 7)2005 RA 2012	mg/Nm^3	191.7	300

Emission Rate

1.	Particulate Matter (PM)	IS 11255 (Part 1)2009	Kg/hr	44.5	-
2.	Sulphure Dioxide (SO_2)	IS 11255 (Part 2)2009	Kg/hr	525.2	-
3.	Oxide of Nitrogen (as NO_x)	IS 11255 (Part 7)2005 RA 2012	Kg/hr	191.8	-

End of Report

Remarks	Samples comply with the prescribed standard.
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 Kr. Sinha	Brij Nandan Kumar	Umesh Das
Lab Analyst	Section In-charge	Technical Manager

23/3/2020

Yugantar Bharati Analytical & Environmental Engineering Laboratory

Authorized Signatory
Atmospharic Pollution
Yugantar Bharati Analytical &
Environmental Engineering Laboratory

Annexure VIII

Adhunik Power & Natural Resource Limited

FLY ASH GENERATION & UTILIZATION REPORT (2019-20)

	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	Bottom Ash In Reclamation of Low Lying Area
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
1	OCT	160081	42.35	67789.23	67789.2	100.0%	6464.07	27481.8	23675.0	10168.38
2	NOV	114072	47.24	53889.19	53889.2	100.0%	6847.23	29704.9	8989.7	8347.33
3	DEC	178892	45.56	81496.96	81497.0	100.0%	11871.56	47089.2	9948.0	12588.20
4	JAN	178973	52.28	93561.54	93561.5	100.0%	13598.99	63882.1	2046.2	14034.23
5	FEB	165426	45.28	74902.3	74902.3	100.0%	10688.43	52591.5	387.0	11235.34
6	MAR	177107	45.18	80017.39	58915.6	74.0%	6746.99	42876.3	0.0	9292.342

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

Annexure IX

YUGANTAR BHARATI

ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY

LAB ACCREDITED BY: National Accreditation Board for Testing & Calibration Laboratory (NABL), New Delhi
Jharkhand State Pollution Control Board (JSPCB)

Certificate No.- TC 7813

Water Test Report	URL(Unique Lab Report) No.	TC781320300000020P
Issued to : - M/s – Adhunik Power & Natural Resources Ltd. Vill – Padampur, Behind PGCIL substation, Jamshedpur-832402, Jharkhand	Job code – Chemical	YBAEEL/WI/L/C/Mar-20/05
	Sample Code	200316-WW-E03
	Report ID	YBAEEL-200304-132814-WW03
	Date of Issue	23rd March 2020
	Type of Industries (* in case of Industrial Effluent)	Thermal Power Plant

Sample Name/Description	Effluent water	Sampling Protocol	YBAEEL/SP/01/00
Sample pkg. Condition	Sealed in plastic bottle	Sampling Date	14th March 2020
Sample Quantity	4000 ml	Mode of sample Collection	YBAEEL sampling team
Work allotted date	16th March 2020	Sampling Location	Final Outlet of Ash Pond
Test started on	16th March 2020	Sampling Source	Ash Pond
Test completed on	23rd March 2020	Meteorological cond. (RH%, °C)	62 % / 28°C

Test Result

Sl. No.	Tested Parameter	Method	Unit	Results	Permissible Limit (As per IS 2490 Specification)
1.	pH value	IS 3025 (Part-11)	–	6.2	5.5-9.0
2.	Temperature*	IS 3025 (Part 09)	°C	26.8	40
3.	Total Suspended Solids	IS 3025 (Part 17)	mg/l	94.0	100
4.	Arsenic (as As)	APHA 3112 B	mg/l	ND(DL 0.01)	0.2
5.	Oil & grease	IS 3025 (Part 39)	mg/l	4.4	10
6.	Lead as Pb	APHA 3111B	mg/l	ND(DL 0.01)	0.1
7.	Chromium as Cr	APHA 3111B	mg/l	ND(DL 0.01)	0.1
8.	Mercury (as Hg)	APHA 3112 B	mg/l	ND (DL 0.01)	0.01

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

Remarks:-According to the tested parameter, the given samples found to be under the limit of IS 2490,
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
Saima Afrin	Bajrang Kumar	Umesh Das
Lab Analyst	Authorized Signatory	Authorized Signatory Technical Manager

An ISO 9001:2015 & OHSAS 18001:2007 Certified Laboratory
Post Box no. 32 | Namkum Post Office | Sidrouli, Ranchi-834010 (Jharkhand)
Ph. 09835[illegible], 9304955[illegible] | Tele Fax : 0651-2260[illegible] | E-mail : ybaeel@gmail.com

Yugantar Bharati Analytical & Environmental Engineering Laboratory

Pollution & Environment

Annexure V

YUGANTAR BHARATI

ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY

LAB ACCREDITED BY: National Accreditation Board for Testing & Calibration Laboratory (NABL), New Delhi
Jharkhand State Pollution Control Board (JSPCB)

Certificate No - TC 7815

Soil & Sludge Test Report	URL(Unique Lab Report) No.	TC78132030000021P
Issued to : - M/sADHUNIK POWER & NATURAL RESOURCES LIMITED Vill: Padampur, Behind P.G.C.I.L Substation,Jamshedpur-832105, Jharkhandg	Job code – Soil	YBAEEL/WA/L/S/Mar-20/01
	Sample Code	200316-S-E01
	Report ID	YBAEEL-200304-132814-SO01
	Date of Issue	23rd March 2020

Sample Particulars		Details of Sampling	
Sample Name/Description	Bottom Ash	Date of sampling	14.03.2020
Sample Quantity	2 kg	Sample Received Date	16.03.2020
Sample pkg. Condition	Sealed in plastic bag	Sampling Protocol	YBAEEL/SP/01/00
Test started on	16.03.2020	Sample collected by	YBAEEL sampling team
Test completed on	23.03.2020	Sample Location	Bottom ash (hopper)

Test Result

Sl. No.	Tested Parameter	Method	Unit	Results
1.	Arsenic	APHA 3114 B	ppm	0.06
2.	Mercury	APHA 3112 B	ppm	0.09
3.	Chromium	APHA 3111 B	ppm	0.55
4.	Lead	APHA 3111 B	ppm	0.94
5.	Cadmium	APHA 3111 B	ppm	0.05
6.	Copper	APHA 3111 B	ppm	0.35
7.	Nickel	APHA 3111 B	ppm	0.62
8.	Selenium	APHA 3111 B	ppm	0.01
9.	Zinc	APHA 3111 B	Ppm	1.01
10.	Unborn carbon *	IS 1350 (Part -2)	%	2.3

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

Remarks:-According to tested parameter, the results found as above.
Note : - the Parameter 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.
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- 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
(Saima Afrin)	(Bajrang Kumar)	(Umesh Das)
Lab. Analyst	Section In-Charge	Technical Manager

Yugantar Bharati Analytical & Environmental Engineering Laboratory

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

Post Box no. 32 | Namkom Post Office | Sidroul | Ranchi - 834010 (Jharkhand)
Ph. 098351-97960, 9304955304 | Tele Fax : 0651-2260787 | E-mail : ybaeel@gmail.com

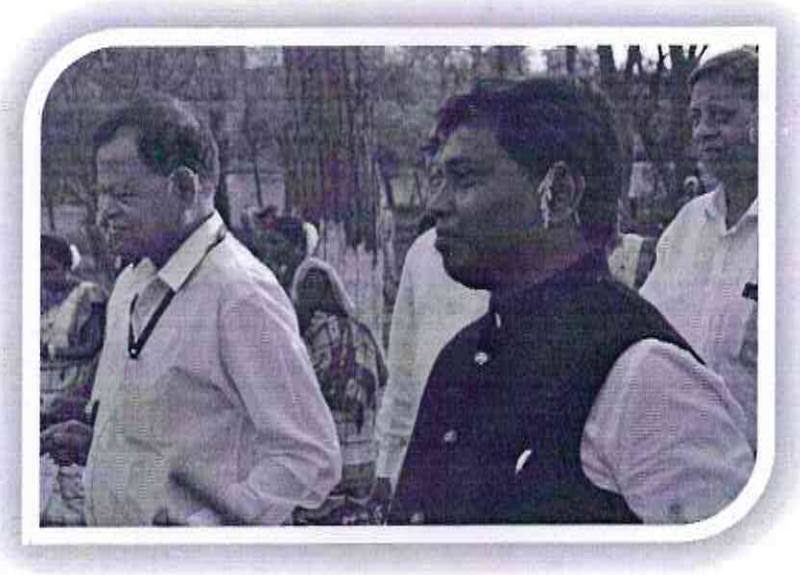
Annexure XI

Adhunik

Annual Report

2019-2020

Corporate Social Responsibility



ADHUNIK POWER AND NATURAL RESOURCES LIMITED,
PADAMPUR, KANDRA, SARAIKELA-KHARSAWAN

Adhunik Power & Natural Resource Limited (APNRL), Padampur

Corporate Social Responsibility Initiatives

(Vill. - Padampur, Block-Gamharia, District-Saraikela-Kharsawan, Jharkhand)

Annual Report: 2019-2020

The CSR Annual Report for 2019-20 is our effort since initiation. This report covers all activities of the Corporate Social Responsibilities. We are working towards a structured implementation of social responsibility at Saraikela-Kharsawan district with the guiding principle of 'sustained business excellence and inclusive growth of all stakeholders.

The objective of CSR is to improve 'Quality of Life' of the community on a sustainable basis in a pro development inclusive model of growth. We also ensure community ownership in all the initiatives and management through self-supportive community (SSC) based institutions. The employees of APNRL have always given a strong vibe of community service. Till now our focus was only on external stakeholders, but now we have decided to include internal stakeholders through volunteering. We believe volunteering is an opportune platform for developing leadership amongst our stakeholders by sensitizing them of issues faced by the communities we work with.

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, Baraharihарpur, Chotaharihарpur, 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

The objective of community healthcare is to mobilize the community and build awareness, equipping them with adequate information, skills and confidence to access health services. CSR dept. provides health services across villages. It extends primary health services to the villagers at a free of cost. It focuses on community-oriented healthcare and works towards empowering every individual with essential knowledge and skills, which would enable them to lead a healthy life.

1. **Health & Sanitation**: 24 X 7 ambulance facility has been providing to the villagers of peripheral village for better treatment. Villagers' availed ambulance facilitates during the month.

Status of Referral Patients							
S.N	Month	M	F	Children		Total No.	Village Covered
				M	F		
1	April	9	16	0	1	26	Badahariharpur, Srirampur, Dumra, Padampur ,Pindrabera, Dhatkidih,Bikanipur, ChotaHariharpur,
2	May	14	9	3	2	28	
3	June	18	8	6	1	28	
4	July	11	19	0	3	33	
5	August	11	8	7	4	30	
6	September	16	8	6	4	34	
7	October	12	10	4	2	28	
8	November	10	12	4	3	29	
9	December	10	12	5	4	31	
10	January	12	11	5	4	32	
11	February	5	9	2	2	18	
12	March	11	7	3	2	33	

2. **Medical Facilities:** Provide free medical treatment at Dispensary , APNRL, Padampur. Villagers availed the facilities during the months.

Status of Patients- Month wise

S.N	Month	M	F	Children		Total No.	Village Covered
				M	F		
1	April	20	14	4	4	42	Balidih, Badahariharpur, Srirampur, Dhatkidih, Padampur ,Pindrabera, Kandra, Gamharia
2	May	32	32	10	6	80	
3	June	46	21	13	7	87	
4	July	50	41	30	19	140	
5	August	51	37	15	7	110	
6	September	67	37	14	9	127	
7	October	41	28	17	7	93	
8	November	29	27	11	10	78	
9	December	33	25	11	03	72	
10	January	34	26	11	03	74	
11	February	33	29	17	12	91	
12	March	36	34	12	11	93	

3. **Health Check-up Camp:** An Active Case Finding Camp including General Health Check-up was organized on 6.8.2019 in the premises of Occupational Health Center of Adhunik power & Natural Resources Limited, Padampur. District TB Officer, Saraikela-Kharsawan Dr. J. Majhi was present during the camp with the team of Gamharia - Community Health Center (CHC). In the camp total 46 people villagers and employees examined. General Medicines were also distributed among the patients based on the requirement. The objective of the camp was to make the Company employees & villagers aware of preventive and curative measures of common diseases such as cold, cough Skin related, abdominal, malaria etc. andproviding specially tuberculosis treatment. Mr. Diwakar Sharma, State Coordinator- Jharkhand, Tuberculosis Call to Action,Ranchi, Dr. J. Majhi, DTO, Saraikela-Kharwan, Dr. Manoj Kumar Medical Officer, Gamharia Mr. Sujeet Kumar- Pharmacist and other officials were also participated in the camp.

Blood Donation Camp:

The transfusion of blood is an essential part of modern health care management. Adhunik Power & Natural Resources Limited, in association with Jamshedpur Blood Bank and Voluntary Blood Donor Association, Jamshedpur have organized a Blood donation camp in the Occupational Health Center-APNRL premises on 28.12.2019. During this occasion, Chief Guest Mr. Rakesh Gupta-CEO appreciated the initiative taken up by the CSR team; he congratulated the Jamshedpur Blood

Bank and Voluntary Blood Donor Association, Jamshedpur team for initiating support to such an event of social benefit. Employees of APNRL and villagers of nearby areas actively participated in blood donation camp. As a result of this noble venture, around 80 people gathered at the camp and after medical examination, 62 people have donated their blood.

The objective of the camp is **"survival of human being should not suffer due to lack of blood"** Mr. Rakesh Gupta-CEO-Plant-Operation, Mr. Rajesh Kumar Sharma- AVP, Mr. Ravindra Kumar Aggarwal, Sr. GM, Mr. Biraj Kumar-AGM, Mr. S. K. Parvez-AGM, Mr. Kamlesh Kumar, Mr. Maninder Singh, along with other company officials also participated in the camp. Mr. Bipin Giri, Mr. Sanjay Mandal, Mr. Somu Hansda, Mr. SalendraTudu, Ms. Swarsatidevi etc. took active part in organizing the camp successfully.

We are thankful to Dr. Rita Singh of Jamshedpur Blood Bank & her experienced team members, who had actively accomplished the camp successfully. Special thanks to National and Local Media for giving ample coverage of the event.

Distribution & Spray Bleaching Powder at village level: Rainy season is going on and

most of the diarrhea cases found at village levels in these seasons only. We know that main cause of diarrhea is polluted water. Every year several diarrhea cases found at village level. Based on the satiation of villages we have distributed and sprayed bleaching powder in canal, well and water logging area from 21.8.2019 to 29.8.2019 at Padampur (Mahadevpuram), Badahariharpur & Bikanipur with the support of village volunteers and villagers under the **Project of Swachchh Gram Swasth Gram** to stop mosquitos breeding to prevent various diseases caused by the dirt & mosquitos etc.

Following persons were also actively involved Shri Kali Charan Sardar, Shri Anil Sardar, Shri Kali Pada Sardar etc.

Drinking Water Supply: Drinking water was supplied to the villagers through water tanker towards meeting the need of drinking water and other water related use during social and family functions. **10 villages** from three **Gram Panchayats** were the outreach for supply of drinking water.

The **objectives** of supply of drinking water to the villagers were as follows:

i. To meet the drinking water need of villagers during function
ii. To meet the needs of water related other use(s) during water scarcity situation in villages.

EDUCATION

Children are the future of a nation. For an emerging country like India, education of underprivileged children holds the key to its progress. In fact, their education is vital, whether we are addressing health care, poverty, population control, unemployment or human rights issues.

1. **Project CYBER VILLAGE:** In order to make the village youths/students of Baraharihарpur & Rapcha and nearby areas computer literate under the Project CYBER VILLAGE, a tripartite of 1. **Adhunik Power & Natural Resource Limited (APNRL), Padampur**, 2. **Gram Panchayat** and 3. **Nav Nirman Sanstha, Jamshedpur**. The **objectives** of the **Project CYBER VILLAGE** were as under:

   - To make village youths/students of Rapcha & Dugdha Gram Panchayats computer literate for their pursuit of better career in future.
   - To make villagers aware of the importance of information revolution through internet.

2. **Bus facilities:**

   To promote higher education amongst girl students of peripheral villages have been facilitated with bus service to Jamshedpur women's college. About 40 girls' students availed the bus facilities.

   About 33 youths of peripheral village are availing transport facilities during Matric Exam 2020.

3. **Hindi essay writing competition:** The topic of Hindi essay writing completion is **Water conservation (जल-संरक्षण) - importance and solution** for class VI to VIII and **Sanitation** for class IV to V. An essay writing competition was organized on 24.6.2019 and 25.6.2019 respectively from 9:30 to 10:30 AM in 4 school premises Padampur, Srirampur, Pindrabera & Badahariharpur. All students of class IV, V, VI, VII & VIII were participated. The essay was judged on the basis of the student's vocabulary, presentation and creativity. The purpose of the competition was to encourage the students to enhance their thinking and writing skills. The essays were well written by the students.

4. **Report on Debate competition:** Skill development among the local children is the prime objective of our CSR programme. To implement this objective we had organized debate/ essay writing competitions from 3.9.2019 to 6.9.2019 in four schools namely Badahriharpur Padampur, Srirampur and Rapcha after those 3 best students are selected and awarded respective school.

Debate competition organized for class fifth and above. Panel of 3 member's team from 2-school teacher and Lady Supervisor-ICDS, Gamharia decided the winner for debate competition. Panelists were very impressed and they had very long discussion before coming to the final results.

Best 3 candidates selected in each school for prize. Prizes were awarded by School Principal in

respective School, Lady Supervisor-ICDS, Gamharia and Sr. Manager CSR, APNRL.

Mr. Sanjeet Kr. Sinha- Sr. Manager CSR, APNRL congratulated each of the participants for their participation as well as their efforts. He assured them that time to time CSR department is going to organize this kind of competition to improve the skill as well as develop their positive thinking regarding our society.

At the end of the competition school principal appreciated the CSR team for the active participation and their efforts at village level.

Vote of thanks given by School Principal.

Drawing competition: Drawing competition organized on the occasion of safety week 2020 at two levels, first one was for class 3rd to class 5th and another one was for class 6th and above. Drawing competition organized following dates in different schools

Name of the School		Date
Middle School,Padampur	-	4.3.2020
Primary School, Pindrabera-		4.3.2020
Middle School, badahariharpur-		5.3.2020
Primary School, Srirampur	-	5.3.2020
Primary School, Dhatkidih-		5.3.2020

After that 3 best students are selected in each group from respective school. Drawing competition started with the welcome note by Mr. Sanjeet Kumar Sinha- Senior Manager, CSR. During his welcome note he appreciated the students' efforts and he also congratulated them to come up as a winner at their school. After that Drawing competition started with the sharing of rules and regulation of competition by Mr. B.N.Sundaray, Sr. Manager-Safety.

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 11.3.2020 last day of safety week 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 assured them that time to time CSR department is going to organize this kind of competition at village level to improve the skill as well as develop their positive thinking regarding our society.

Vote of thanks given by Sri Sanjiv Chaudhary-AVP, Electrical.

Project Pahunch(Sustainable Education project):

Education is the basis of life which helps in the development of every citizen and also makes civilized citizen. As a part of this series, Adhunik Power & Natural Resources Limited, Padampur has been conducting additional teaching by its employees and officials on subjects like Mathematics, Science, Hindi, English in near village school of Padampur, Srirampur, Pindrabera, Badahariharpur and Dhatkidih under Project "Pahunch". Randomly evaluation is

being done by top officials of the company from time to time. It is hoped that with the efforts of this project "Pahunch", the level of education in children will developed qualitatively.

WOMEN EMPOWERMENT & LIVELIHOOD

Poverty can be reduced if the poor are organized, their capacity built to enable them to solve their problems, and capital mobilized to improve their livelihoods and enhance their living standards. APNRL CSR is promoting the concept of self-help through Women Self Help Groups (SHGs) in the villages.

Self Help Group (SHG) Meeting: - APNRL is proactively working since its inception for the benefit of local people. In order to strengthen the Women Self Help Groups (SHG) of the villages in and around its operational areas, the Company is organizing trainings to make them capable for additional source of income.

Every Month SHG meetings were organized in different peripheral village of Dugha and Rapcha Gram Panchayat and discussed regarding repayment of loan and also discussed in personal hygiene.

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.

Mahaila sammelan: A Sammelan was organized on 25.1.2020 at Badahariharpur. About 50 women participated from Badahariharpur and Chotahariharpur including Ward member Ms. LaxmiSardar, Mr. GayaduttaMahato, Gramprádhan, Ms. Pramila Mahato, Coordinator, JSLPS, Mr. Sanjeet Kumar Sinha Sr. Manager-CSR, APNRL.Mr. Sinha expressed his views and said that he is working to strengthen women's groups in taking decisions for the betterment of life. He said that the company is always ready to make women self-reliant. For this, women have to come forward. Mr. Gayadutta Mahato shared the current women scenario and about the problems faced by women in the society. He also said that a woman needs to be given equal opportunity in decision making, education, livelihood etc.

4. **National Nutritional Week 2019:** Under the social responsibilities, the CSR Department, APNRL, Padampur organized the seminar on "Nutrition and Health Education", healthy babies show, Munhajuththi and GodhBharai function at Community Hall, Padampur village on 6th Sept'2019 which covered **4 villages**. Approximately 150 women including pregnant and lactating women from 4 villages namely Padampur, Bikanipur, Dhutbera&Balidih were participated in the programme. The main objective was to raise awareness on the importance of nutrition for health which has an impact on development, productivity, economic growth and ultimately National development.

Godhbharai function organized for pregnant women: It is performed during pregnancy to pray for the good health of the mother & baby and the safe delivery. A group of women came together to bless the mom-to-be and the baby and feast on some delicious treats. The godhbharai function is generally performed during the seventh month of pregnancy or third trimester and is only attended by women.

Munhajuththi (Initiation of complementary feeding) function also organized with the objective to encourage parents to be attentive towards regular Nutrition, nutrition of infant, about 20 children taken semi solid food. It was to create awareness among mothers on post-natal care and recognize them for their sincerity towards upbringing the kid in scientific and carefulness.

Malnutrition is directly linked to human resources development, productivity and ultimately to the national growth. It is because of unbalanced diet and lack of knowledge, our area is also suffering from this problem said by president of Mahila Mandal. She explained feeding habits as follows-

- Early initiation of breastfeeding within 1

hour of birth.

- Exclusive breastfeeding for 6 months age of infants.
- Continue breastfeeding during illness.
- Introduction of nutritionally-adequate and safe complementary (semi solid) foods after 6 months together with continued breastfeeding up to 2 years of age or beyond.

Vote of thanks given by SwarsatiBaskey, Padampur

Phenyl Making by Mansa Devi Self-help Group : The members of Mansa Devi Self-help group of Srirampur engaged in making Phenyl. This has helped them in increasing corpus fund for their group.

Agarbatti Making by JagritiMahilaSamiti Srirampur and PwariMahilaSamiti, Kandra: The members of Jagriti Mahila Samiti Srirampur and Pwari Mahila Samiti, Kandra engaged in Agarbatti making as their livelihood. Nav Nirman Sanstha, Jamshedpur is facilitating the group in marketing to achieve their aim.

Nil Production by JoharJaher Ayo MahilaSamiti: 15 - members of **JoharJaher Ayo MahilaSamiti** of Padampur engaged in Nil Production & selling. This has helped them in increasing corpus fund for their group. They have made this activity as their livelihood.

Training on Agarbatti Making: A training program on Agarbatti making was organized for the members of **Vina pani SHG, Chotahariharpur** under the program of **livelihood Initiative** of Adhunik's CSR. The objective of the training program is to link the SHG members with a sustainable source of income activity which they can do along with managing their household and to impart the sense of ownership.

The training was conducted on 26.2.2020 at Kandra. Around 6 SHG members participated in this training program. They learned the processes of Agarbatti making. CSR team provided guidance and handholding support to the SHG members for initial period. Post training, a session was conducted where the participant gave their feedback about the training program. According to them, they found Agarbatti making process learning and are confident to take this activity for their additional income. The participants told that the activity will enhance their family income while being at home and also they don't need to go anywhere else to work, instead they can stay back in their home and can do this activity after getting free from their daily routine work. Also they can include their

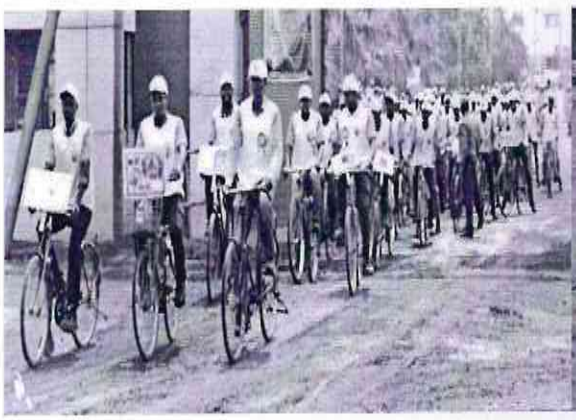
family members in this activity which will in turn help them to earn more money. Based on these facts, the participants were motivated to join this Agarbatti Making business model.

Environment

World Environment Day' 2019 "Beat Air Pollution": World Environment Day (also called as WED) has been started celebrating as an annual event on every 5th of June 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 by implementing some positive environmental actions as well as to make aware common public worldwide that everyone is responsible for saving his environment and not only somebody, government or organizations working for it.
APNRL observed the World Environment Day (WED) on 5.6.2019 at plant premises. The World Environment Day celebrated by creating awareness about importance of environment and plantation of Saplings by company officials. The programme was initiated through the plantation of tree by Plant Head inside the premises of the company. Rally was flag on by Mr. B.N Nellikwar –Plant Head and about 100 employees were moving form plant premises to Kandra Bus Stand and loudly says all the slogs which are written in placards. Security and supervisory employee take-care the cycle riding people because it was a busy road.

Objective:

- To make aware the common public about the environmental issues.
- Encourage common people from different society and communities to become an active agent in developing environmental safety measures.
- Encourage people to make their nearby surroundings safe and clean to enjoy safer, cleaner and more prosperous future.
- Let them know that community people are very essential to inhibit negative changes towards the environmental issues.
- Developing new drainage systems for conserve water recourse.



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.

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. The road needs to be repaired immediately for which the villagers had submitted the request letter to CSR dept. on 22.6.2019.

CSR team paid a visit to the site along with the villagers and found that the condition of the road is damaged severely. On 27.6.2019 the company provided the Slag with 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.

Repairing of Village Road: A meeting was held on 22.8.2019 with villagers of Bikanipur. During the meeting the villagers requested us to repair the village road from Birdhrajpur to Bikanipur near Saraikela main road. Now road repaired by internal resources of the company on 28.8.2019 and villagers are very happy for this work.

Arrangement of waste water flows over Road at Badahariharpur: 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.

A meeting with the villagers and the CSR team was held at Badahariharpur. During the meeting, the villagers said that the house's waste water flows over the village road near the Shiva temple, Badahariharpur which is in a pathetic condition. There needs to be required laying pipeline inside the road, so that the waste water passes away through the pipeline. The villagers requested to make proper arrangements by laying pipeline for waste water.

CSR team paid a visit to the site along with the villagers and found that the condition of the road is pitiable. On 23.10.2019 the company provided the Iron pipe with JCB. The Pipe line was laid and water is passing through the pipe line. Now condition of the road is well and the villagers are very happy for this work.

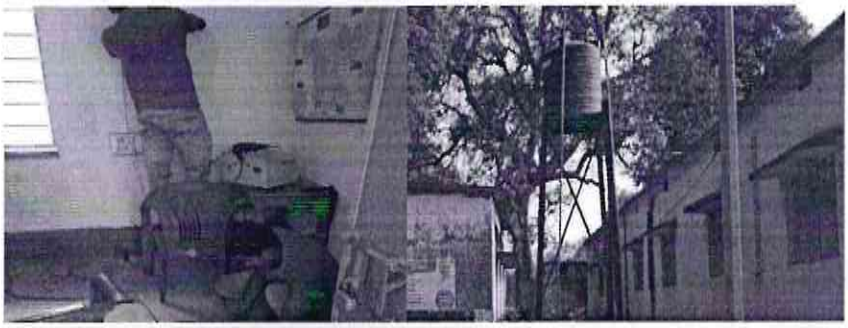
Repairing of Village Road: A meeting was held with villagers of Badahariharpur. During the meeting the villagers requested us to repair the village road, Badahariharpur. Now road repaired by internal resources of the company on 30.9.2019 and villagers are very happy for this work.

Repairing of Overhead tank:

Adhunik Power & Natural Resources Limited, Padampur is playing a vital role in improving the socio-economics conditions of local communities around which the company is operative.

On 16th of July 2019, a meeting was convened by villagers of Badahariharpur along with School teachers of Govt. Middle school, Badahariharpur 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 overhead tank which is in non-functional last few year.

The villagers told that the school children are also facing water problem. The overhead water system needs to be repaired immediately for which the school teacher had submitted the request letter to CSR dept. on 24.6.2019.



CSR team paid a visit to the site along with the school teacher & electrician, we found that the condition of the overhead pump was installed near school which is still nonfunctional due to non-availability of starter and electric wiring up to switch point, it will be required mainly a 1.5 HP starter, wiring and MCB with box to enable children and villagers to get water from overhead. On 9.7.2019 the company provided the starter, wire and MCB including labour and electrician. Now, the overhead system has been repaired and functioning, villagers and children are very happy for this work.

Sports and Culture

Adhunik Group strongly believes in promotion of Local Sports Therefore, we promote different social activities for mentioning social harmony. Every year we have given financial and material assistance to various village level sports tournament and to various committees.

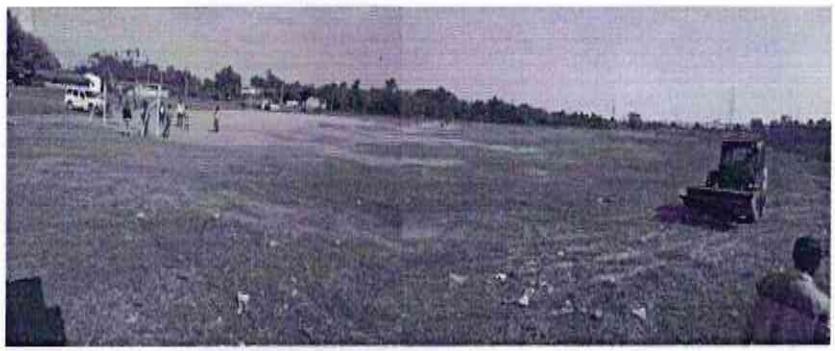
Adhunik Power is promoting traditional culture of our Jharkhand. As we all know that Seraikela has become the "Mecca" for connoisseurs of music and dance. Here lies the citadel of world famous Chhau dance. The soil of Seraikela is vibrant with the rhythm of "Chhau" which fancied the imaginations of not only Indian art lovers, but also allured and captivated art lovers across the world, due to its grace unique charm and grandeur. APNRL CSR is also providing their support for Promotion and preserves this World famous Chhau Dance in our village Chotahariharpur. Chhau Dance group of Chotahariharpur is not only famous in District level but they perform at National level also.

Sports and Culture program, Badahariharpur: Every Year Adiwasi Avan Akhara, Hariharpur-Srirampur committee organizes 4 days (26, 27, 28 & 29 of January 2020) 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.

Mr. R.K.Singh, Managing Director, Adhunik Power & Natural Resources Limited, Padampur

started kicked off the football tournament on 26.1.2020 and he said "It is great to see such enthusiasm and high level of energy of Village youths. Such events are a good break for village youths from their hectic routine work. He also encouraged the organizers Mr. RamdasTudu, Mr. Rajesh Bhagat, Mr. Ram Hansda, Mr. GobindMajhi, GorkhaHansda and participants for their laudable performance. He said "Not only will these sports activities help them develop their personalities, but also help identify their strengths in a particular sport, thus opening up newer avenues for them." Mr. Rabindra Aggarwal - Sr. GM, Mr. Sanjeet Kumar Sinha, Sr. Manager-CSR, Mr. Ranjeet Kumar Singh- Admin & Mr. Vikash Kumar-Admin were also presented.



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.

The organizers were happy and praised about the company's contribution towards successful conduction of the 4-day event and specially thanked to the plant management for the same.

Distribution of Football at Middle School, Padampur: Sports are very important for developing healthy and strong body. Sports play great role in improving and maintaining the health and fitness, improving mental skills and concentration level. Our programme is focused on supporting School Children to achieve meaningful, long term outcomes. Football is the most popular game in Jharkhand everyone loves to play it.

Football distribution function organized at Middle School, Padampur on 7.2.2020.Mr. Sanjeet Kumar Sinha, APNRL gave his valuable speech during the function. In his speech, he highlighted the importance of sports. He specifically encouraged girl's students to participate in the sports program and he provided a football on behalf of the company so that girls could play football. The Girls team received a football and very happy.

White washing, painting and cleaning work of Jahira/Sarnaasthal and

AsthanMajhyaAsthan: Sarhul festival is one of the most popular tribal festivals, celebrated across the Jharkhand every year. Sarhul festival marks the beginning of New Year. It is a ritual and traditional function of the villagers.

White washing, painting and grass cutting works completed in the **Jahira/Sarnaasthal and AsthanMajhyaAsthan** of Padampur, where the cultural program, rituals and traditional work done in the month of 7th March 2020.

Baha Bonga- Sarhul festival 9.3.2020: This year Sarhul Puja organized on **9.3.2020** at Padampur. Approx. 600 villagers including company employees from Padampur, Balidih, Bikanipur were participated in this festival and its show our traditional culture. Sarhul Puja is one of the most popular tribal festivals celebrated across the Jharkhand region; Sarhul festival marks the beginning of New Year.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.

Adhunik Power & Natural Resources Limited, Padampur is playing an important role in promoting traditional culture of local communities around which the company is operative. CSR team paid a visit to the site along with the villagers and found that the condition of the Sarnasthal and Jahirasthal pitiable. APNRL supported villagers of Padampur in Sarhul Puja by providing them finance and helped in cleaning, grass-cutting and white-washing at Sarnasthal and Jahirasthal on Feb-Mar, 2020 and also provided with financial support.

The traditional folk dance was inaugurated by Mr. R. K. Singh-MD, Adhunik Power & Natural Resources Limited, Padampur as chief guest on occasion of Sarhul Puja. He encouraged the organizers Mr. Krishan Baskey, Mr. MurlyBaskey, Mr. BangalBaskey, Mr. Indro Murmu, and participants for their laudable performance. Mr. Rakesh Gupta-CEO, Mr. Rabindra Aggarwal – Sr.GM, Mr. Sanjeet Kumar Sinha, Sr. Manager-CSR, and Mr. Vikash Kumar- Admin were also presented.

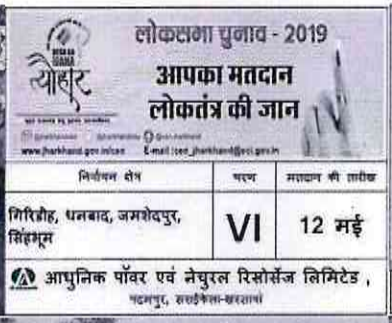
Other Initiative:

Voter's Awareness Program:

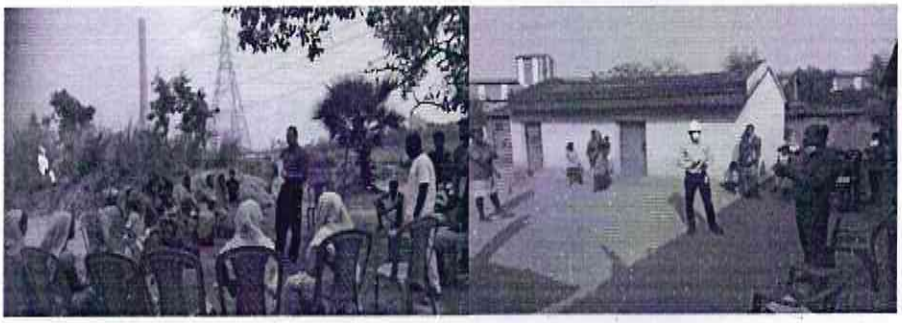
The Election Commission of India has taken initiatives for electoral literacy and voter's awareness across the country through different institute and business organizations to strengthen the democratic system of the country and making the election process more participative and meaningful to ensure enhanced voters' participation.

On 5.4.2019 CSR Team organized a voter's awareness program at Primary School Campus, Srirampur. Mr. Sanjeet Kumar Sinha motivated them to exercise their universal adult franchise in the forthcoming Lok Sabha elections to ensure the selection of right candidate. He appealed to women to have better participation ratio than their male counterparts in this election. 70 women from ShrirampurChotaHariharpur, BadaHariharpur, Virdhawajpur and Padampur villages participated in this program.

An Awareness program organized on 1.4.2019 among contract workers and employees at Campus of Adhunik Power, Padampur. About 150 workers including employees were present. They have ensured them to participate in coming election.



An awareness program organized on 20.4.2019 at the football ground, Badahariharpur in the presence of Lady Supervisor-ICSD. Following persons were also actively involved AWWs, Anil Sardar Sanjeet Kumar Sinha CSR-APNRL and villagers of Badahariharpur, Srirampur, ChotaHariharpur. Lady Supervisor-ICDS, Gamharia lauded the efforts of the Adhunik Group and appealed to the villagers to vote. Approx. 175 Women including youths from the vicinity villages like Badahariharpur, Padampur & Srirampur participated in this program.



Covid-19 Pandemic: Door to door campaign was organized by the CSR team of the company. During the campaign in peripheral villages of plant area were made aware regarding Covid- 19 and Conona Virus. They have advised to follow the habits of washing hands regularly, use of sanitizers and masks. The villagers have been elaborated to practice social distancing so that they can avoid this disease.

In amid Covid-19, we also organized a **Seminar** on 25th Jan, 2020 to SHG group members that included women of Chotahariharpur, Srirampur, Baraharihарpur and Padampur in presence of Gram Pradhan and Ward members. We provided them trainings on taking preventions from Covid-19 pandemic. Similar Seminar was conducted on 28th Jan, 2020 in Bikanipur and Baraharihарpur.

Visit of MD Sir-APNRL-6.2.2020: A joint field visit of, MD sir, APNRL, Mr. R. K. Singh Mr. S.D. Jha along with the Mr. Sanjeet Kumar Sinha – Sr. Manager-CSR; APNRL was conducted on 06.02.2020. As a part of Adhunik Power's CSR activities in imparting effective education to school going children of local school, following are the observations of our Managing Director during his visit in Padampur School.

MD sir suggested us to start a special class of English for children of class VII & VIII of Padampur School through our employees (Voluntary). He also suggested us to keep provision for cash award of Rs.1000.00 (Each) to two of the best students in the class VIII and also to provide one football to the school children. During the visit, The MD Sir made the students understand the importance of Education in context of the era and at the same time he also appreciated the effort made by School principal.

Media and Awards

News clippings of the various newspapers.

ANENUE MAIL-6.4.2019	NEWISPAT -6.4.2019	PRABHAT KHABAR-6.4.2019
Adhunik launches voter awareness campaign Mail News Service Jamshedpur, April 5: The CSR department of Adhunik Power & Natural Resources Limited, Padampur have stepped forward to spread the word about the importance of voting and the right to vote. In this connection, one-day voters' awareness campaign was organised at Primary School campus, Srirampur here on Friday. The Voters Awareness drive was especially for the women' of the vicinity villages to ensure the awareness about the right to vote among the women's of remote areas to ensure 100 percent voting in the upcoming Lok Sabha elections. The voters' awareness drive About the right to vote was successfully conducted wherein altogether 70 women' from the periphery Dhal Srirampur, Padampur, Dada Hardhanpur, Chhota Hardhanpur and Bridhrajpur villages actively participated and hosted in the campaign. The official of company Santosh Sinha motivated them to vote and cast their vote righteously. He also taught women' that how their single vote could make difference how the voting essentially help to establish a strong democracy of the country.	महिलाओं और ठेका मजदूरों को मिली मतदान संबंधी जानकारी	आधुनिक पावर ने महिलाओं व ठेका मजदूरों को किया मतदान के लिए जागरूक जमशेदपुर. मतदाता जागरूकता अभियान के तहत आधुनिक पावर एंड नेचुरल रिसोर्सेज लिमिटेड, पदमपुर में शुक्रवार को एक दिवसीय मतदाता जागरूकता अभियान चलाया गया. इस दौरान महिलाओं और ठेका मजदूरों को मतदान के लिए जागरूक किया गया. श्रीरामपुर ग्राम के प्राइमरी स्कूल के प्रांगण में आयोजित जागरूकता कार्यक्रम में लगभग 70 महिलाओं ने भाग लिया. इस दौरान कंपनी के सीएसआर विभाग के अधिकारी संतोष सिन्हा ने बताया कि कैसे उनका एक वोट भी देश की तरक्की में भागीदार हो सकता है. कार्यक्रम में श्रीरामपुर, छोटा हरिहरपुर, बड़ा हरिहरपुर, बृद्धराजपुर और पदमपुर के ग्रामीण शामिल थे. प्रभात खबर Sat, 06 / https://e

CHAMKTA AINA-6.4.2019	HINDUSTAN-6.4.2019	UDITVANI-6.4.2019
		

महिलाओं और ठेका मजदूरों को मिली मतदान संबंधी ज

आधुनिक पावर ने चलाया जागरुकता अभियान

जमशेदपुर • मतदाता जागरुकता अभियान के तहत आधुनिक पावर एंड नेचुरल रिसोर्सेज लिमिटेड, पदमपुर में शुक्रवार को मतदाता जागरुकता अभियान चलाया गया। श्रीरामपुर ग्राम के प्राइमरी स्कूल के प्रांगण में आयोजित कार्यक्रम में आसपास के गांव की लगभग 70 महिलाओं ने भाग लेकर मतदान संबंधी जानकारी हासिल की।

आधुनिक पावर ने चलाया मतदाता जागरूकता अभियान

• महिलाओं और ठेका मजदूरों को दी गयी मतदान संबंधी जानकारी

आधुनिक पावर में 62 ने किया रक्तदान किया

प्रभात खबर

Prabhat Khabar-29.12.2019

आधुनिक पावर में रक्तदान

Hindustan – 29.12.2019

'गांवों की प्रगति में ही है विकास'

जमशेदपुर। आधुनिक पावर एंड नेचुरल रिसोर्सेज लिमिटेड पदमपुर में रविवार को गणतंत्र दिवस मनाया गया। इस अवसर पर मुख्य अतिथि प्रबंध निदेशक राघवेन्द्र कुमार सिंह ने पदमपुर प्लांट स्थल पर कर्मचारियों और बड़ी संख्या में ग्रामीणों के बीच राष्ट्रीय ध्वज फहराया। राष्ट्रगान के बाद कंपनी के सुरक्षा गार्डों द्वारा परेड का प्रदर्शन किया गया। सिंह ने कहा कि गांव का विकास ही देश का वास्तविक विकास है।

Adhunik committed to development of villages in vicinity of company: MD

Mail News Service

Jamshedpur, Jan 27: The Adhunik Power & Natural Resources Limited (APNRL), Padampur celebrated India's 71st Republic Day in a patriotic way at its plant premises here on Sunday, January 26.

Chief Guest on the occasion, Raghvendra Kumar Singh, Managing Director, APNRL hoisted the national flag in presence of employees and villagers at the Padampur Plant site.

Flag hoisting followed by national anthem and spectacular parade which was performed by company security guards. Chief Guest Raghvendra Kumar Singh emphasized on the development of the villages of company vicinity as well as other villages of India.

"We all are here for the growth of the company but we cannot ignore the growth of villages too, so company is fully geared up to help villages and villagers. We are also expecting same support from the villagers too," said Singh in his address.

He added that, however company is getting good support from local villagers but company is looking for more supports from them.

On the other hand, Adhunik Power & Natural Resources Limited also felicitated the students of the nearby villages, students of the various villages and employees who excelled in their respective fields.

The celebrations ended with cultural function by the villagers, students and their family members. Later on Rakesh Gupta, CEO of the company thanked the gathering for a joyful republic day celebration. The Republic day celebration concluded with the colourful cultural programme which was performed by village school students but center of the attraction was Chhau dance performance which was performed by artist of vicinity village.

ANENUE MAIL-27.1.2020

Award 2020 for call to action for a TB- free Jharkhand: Adhunik Power & Natural Resources Limited has been recognized with memento by the Principal Secretary, Govt. of Jharkhand Mr. Rajeev Arun Akka, during the State Level

Consultative meeting on Work Place Policy on TB and comorbidities and release of impact report: call to action for a TB- free Jharkhand on 6th January 2020 for contribution towards sensitization and awareness of the top management and the supervisors under 'Employer Led Modal on TB'. The company is supporting villagers through internal resources as required for higher treatment in health check-up and further counseling. Adhunik Power has taken initiative towards this direction to fight against TB under its Corporate Social Responsibility initiatives. Approximately 100 persons had participated from various districts of Jharkhand including Dr. Nidi Madan Kulkarni-IAS, Principal Secretary-Health, Govt. Of Jharkhand, Mr. Shailesh Chaurasia, MD-NHM, Dr. Rakesh Dayal State TB Officer, Ms. Smrity Kumar Project Director, REACH, Mr. Diwaker Sharma- State Cordinator, REACH and others industries representatives.

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Annexum XII

DETAILS OF LOCAL EMPLOYEMENT TILL 31.03.2020

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

Annexure XIII

YUGANTAR BHARATI

ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY

LAB ACCREDITED BY: National Accreditation Board for Testing & Calibration Laboratory (NABL), New Delhi
Jharkhand State Pollution Control Board (JSPCB)

Certificate No.- TC 7813

Water Test Report	URL(Unique Lab Report) No.	TC781320300000018P
Issued to : - M/s – Adhunik Power & Natural Resources Ltd. Vill – Padampur, Behind PGCIL substation, Jamshedpur-832402, Jharkhand	Job code – Chemical	YBAEEL/WI/L/C/Mar-20/03
	Sample Code	200316-WW-E01
	Report ID	YBAEEL-200304-132814-WW01
	Date of Issue	23rd March 2020
	Type of Industries (* in case of Industrial Effluent)	Thermal Power Plant

Sample Name/Description	Effluent water	Sampling Protocol	YBAEEL/SP/01/00
Sample pkg. Condition	Sealed in plastic bottle	Sampling Date	14th March 2020
Sample Quantity	4000 ml	Mode of sample Collection	YBAEEL sampling team
Work allotted date	16th March 2020	Sampling Location	Final outlet of ETP
Test started on	16th March 2020	Sampling Source	Effluent Treatment Plant
Test completed on	23rd March 2020	Meteorological cond. (RH%, °C)	62 % / 28°C

Test Result

Sl. No.	Tested Parameter	Method	Unit	Results	Permissible Limit (As per IS 2490 Specification)
1.	pH value	IS 3025 (Part-11)	--	7.42	5.5-9.0
2.	Temperature*	IS 3025 (Part-09)	°C	26.6	40
3.	Total Suspended Solids	IS 3025 (Part-17)	mg/l	78.0	100
4.	Chloride (as CL^-)	IS 3025 (Part-32)	mg/l	15.0	1000
5.	Sulphate (as SO_4^{2-})	IS 3025 (Part-24)	mg/l	11.5	1000
6.	Oil & grease	IS 3025 (Part-39)	mg/l	5.6	10
7.	BOD	IS 3025 (Part-44)	mg/l	12.2	30
8.	COD	IS 3025 (Part-58)	mg/l	72.8	250
9.	Phosphate (as PO_4^{3-})*	IS 3025 (Part-31)	mg/l	0.03	-
10.	Copper (as cu)	APHA 3111 B	mg/l	0.02	3
11.	Iron (asfe)	APHA 3111 B	mg/l	0.32	--
12.	Zinc (as Zn)	APHA 3111 B	mg/l	ND (MDL 0.1)	5

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

Remarks:-According to the tested parameter, the given samples found to be under the limit of IS 2490,

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
Saima Afrin	B Kumar	23/3/20
Saima Afrin	Bajrang Kumar	Umesh Das
Lab Analyst	Authorized Signatory	Authorized Signatory Technical Manager

For Yugantar Bharati Analytical & Environmental Engineering Laboratory (Jharkhand) Pollution & Environment

An ISO 9001:2015 & OHSAS 18001:2007 Certified Laboratory
Post Box 80, 32 | Namkum Post Office | Sidrouli, Ranchi-834 010 (Jharkhand)
Ph. 098351-97080, 9304955304 | Tele Fax : 0651-2260787 | E-mail : ybaeel@gmail.com

Annexure XIV

Sewage Treatment Plant

Annexure XV

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)

पीस 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, मैं 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 नक्शों 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.T. K. Thiagarajan Dy. Chief Controller of Explosives Ranchi उप मुख्य विस्फोटक नियंत्रक, राँची Dy. Chief Controller of Explosives, Ranchi

यदि अनुज्ञप्ति परिसर इसमें उपाबद्ध विवरण और शर्तों के अनुरूप नहीं पाए जाते हैं 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.

Annexure XX(9)

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/10835
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-16770:2008(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 ***

Annexure XVI (1)

YUGANTAR BHARATI

ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY

LAB ACCREDITED BY: National Accreditation Board for Testing & Calibration Laboratory (NABL), New Delhi
Jharkhand State Pollution Control Board (JSPCB)

Certificate No.- TC 7813

Atmospheric Pollution Test Report			URL(Unique Lab Report) No.	TC78132020000088F
Report Release Date	23rd March 2020		Report ID	YBAEEL-200304-132814-N01
Sample Description	Ambient Noise		Job code/ Ref. no.	YBAEEL/WA/L/A/Mar-20/08
Type of Industry	Thermal Power Plant		Work Order No./ Date	3030004681 / 18.02.2020
Issue to	M/s – Adhunik Power & Natural Resources Ltd. Vill – Padampur, Behind PGCIL substation, Jamshedpur-832402,Jharkhand			
Sampling Period	12th to 13th March, 2020		Mode of sample collection	YBAEEL sampling team
Sampling Protocol	IS:9876:1981, (RA 2007),CPCB method (S.O.50(E) dated 11.01.2010			
Meteorological Cond.	Temp.– 22° C	RH % - 75		W.C. - Drizzling & haze
Sample receipt Date	16.03.2020	Analysis Started on	16.03.2020	Analysis completed on 23.03.2020

**Test Results **

Sl.NO.	Locations	Parameters	Units	Day Time	Night Time
1.	Main Gate Area	Leq	dB(A)	68.1	51.8
2.	Occupational Health Centre	Leq	dB(A)	47.4	36.5
3.	Sati Steel (CHP Area)	Leq	dB(A)	56.5	50.5
4.	Pindrabera Gate	Leq	dB(A)	52.6	41.5

End of Report

Sl.No	Category of area	Day (dB(A) Leq)	Night (dB(A) Leq)
1.	Industrial Area	75	70
2.	Commercial Area	65	55
3.	Residential Area	55	45
4.	Silence Zone	50	40

- 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 Prescribe Standards.
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 Kr. Sinha	Brij Nandan Kumar	Umesh Das
Lab Analyst	Section In-Charge	Technical Manager

Yugantar Bharati Analytical & Environmental Engineering Laboratory

Authorized Signatory
Atmospharic Pollution
Yugantar Bharati Analytical &
Environmental Engineering Laboratory

Post Box no. 32 | Namkom Post Office | Sidroul | Ranchi - 834010 (Jharkhand)
Ph. 098351-97960, 9304955304 | Tele Fax : 0651-2260787 | E-mail : ybaeel@gmail.com

YUGANTAR BHARATI

ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY

LAB ACCREDITED BY: National Accreditation Board for Testing & Calibration Laboratory (NABL), New Delhi
Jharkhand State Pollution Control Board (JSPCB)

Certificate No.- TC 7813

Atmospheric Pollution Test Report				URL(Unique Lab Report) No.	TC78132020000089F
Report Release Date	23rd March 2020			Report ID	YBAEEL-200304-132814-N02
Sample Description	Ambient Noise – Work Zone			Job code/ Ref. no.	YBAEEL/WA/L/A/Mar-20/08
Type of Industry	Thermal Power Plant			Work Order No./ Date	3030004681 / 18.02.2020
Issue to	M/s – Adhunik Power & Natural Resources Ltd. Vill – Padampur, Behind PGCIL substation, Jamshedpur-832402,Jharkhand				
Sampling Period	13th to 14th March, 2020			Mode of sample collection	YBAEEL sampling team
Sampling Protocol	IS:9876:1981, (RA 2007),CPCB method (S.O.50(E) dated 11.01.2010				
Meteorological Cond.	Temp. -28° C		RH % - 62		W.C.–Partially Cloudy
Sample receipt Date	16.03.2020	Analysis Started on	16.03.2020	Analysis completed on	23.03.2020

**Test Results **

Sl.NO.	Locations	Parameters	Units	Day Time	Night Time	Limits
1.	Turbine Floor	Leq	dB(A)	81.3	83.1	85 dB
2.	Admin Building	Leq	dB(A)	56.1	48.5	
3.	C H P Area	Leq	dB(A)	78.6	62.3	
4.	Compressor House	Leq	dB(A)	84.3	82.3	
5.	Switch Yard	Leq	dB(A)	55.4	52.5	

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	Sample Complies With Prescribe Standards.
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 Kr. Sinha	Brij Nandan Kumar	Umesh Das
Lab Analyst	Section In-Charge	Technical Manager

Yugantar Bharati Analytical & Environmental Engineering Laboratory

Authorized Signatory
Atmospheric Pollution
Yugantar Bharati Analytical &
Environmental Engineering Laboratory

Post Box no. 32 | Namkom Post Office | Sidroul | Ranchi - 834010 (Jharkhand)
Ph. 098351-97960, 9304955304 | Tele Fax : 0651-2260787 | E-mail : ybaeel@gmail.com

Annexure XVII

YUGANTAR BHARATI

ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY

LAB ACCREDITED BY: National Accreditation Board for Testing & Calibration Laboratory (NABL), New Delhi
Jharkhand State Pollution Control Board (JSPCB)

Certificate No.- TC 7813

Atmospheric Pollution Test Report			URL(Unique Lab Report) No.	TC78132020000087P
Report Release Date	23rd March 2020		Report ID	YBAEEL-200304-132814-A02
Sample Description	Ambient Air Quality – Buffer zone		Job code/ Ref. no.	YBAEEL/WA/L/A/Mar-20/08
Type of Industry	Thermal Power Plant		Work Order No./ Date	3030004681 / 18.02.2020
Issue to	M/s – Adhunik Power & Natural Resources Ltd. Vill – Padampur, Behind PGCIL substation, Jamshedpur-832402,Jharkhand			
Sampling Period	13th to 14th March, 2020		Mode of sample collection	YBAEEL sampling 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. - Partially cloudy	RH % - 62	Temp. - 28°C	W.D. - North to South
Sample receipt Date	16.03.2020	Analysis Started on	16.03.2020	Analysis completed on 23.03.2020

**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 RA 2017	µg/m³	83.0	88.1	94.0	100
Particulate matter ($PM_{2.5}$)	USEPA -40 CFR (PART 50) (50.7)	µg/m³	49.7	53.8	58.0	60
Sulphure Dioxide (SO_2)	IS:5182 (P-2) 2001 RA 2017	µg/m³	19.6	22.8	25.6	80
Nitrogen Dioxide (NO_2)	IS:5182 (P-6) 2006 RA 2017	µg/m³	48.3	49.7	53.5	80
Ammonia (NH_3)	SOP No. YBAEEL/SOP/AIR/01	µg/m³	35.6	41.1	38.3	400
Ozone (O3)*	IS:5182 (P-09) 2006 RA 2016	µg/m³	23.1	26.0	29.0	180
Carbon Monoxide (CO)*	IS:5182 (P-10) 2006 RA 2014	mg/m³	1.3	1.4	1.6	04
Lead (Pb)	IS:5182 (P-22) 2004 RA 2014	µg/m³	ND (DL 0.02)	ND (DL 0.02)	ND (DL 0.02)	01
Nickel (Ni)*	SOP No. YBAEEL/SOP/AIR/01	ng/m³	ND (DL 8.3)	ND (DL 8.3)	ND (DL 8.3)	20
Arsenic (As)*	SOP No. YBAEEL/SOP/AIR/01	ng/m³	ND (DL 1.0)	ND (DL 1.0)	ND (DL 1.0)	06
Benzene (C_6H_6)*	IS:5182 (P-11) 2006 RA 2017	µg/m³	ND (DL 0.06)	ND (DL 1.0)	ND (DL 1.0)	05
Benzo (a)pyrene (BaP)* Particulate Phase Only	IS:5182 (P-12) 2004 RA 2017	ng/m³	ND (DL 0.2)	ND (DL 0.2)	ND (DL 0.2)	01

End of Report

Remarks	Samples Comply With Prescribed Standard.
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 Kr. Sinha	Brij Nandan Kumar	Umesh Das
Lab Analyst	Section In-Charge	Technical Manager

Yugantar Bharati Analytical & Environmental Engineering Laboratory

Authorized Signatory
Atmospheric Pollution
Yugantar Bharati Analytical & Environmental Engineering Laboratory

An ISO 9001: 2008 & OHSAS 18001:2007 Certified Laboratory
Post Box no. [illegible] Main Post Office | Sidroul | Ranchi - 834010 (Jharkhand)
Ph. 098351-97960, 9304965904 | Tele Fax : 0651-2260787 | E-mail : ybaeel@gmail.com

YUGANTAR BHARATI

ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY

LAB ACCREDITED BY: National Accreditation Board for Testing & Calibration Laboratory (NABL), New Delhi
Jharkhand State Pollution Control Board (JSPCB)

Certificate No.- TC 7813

Atmospheric Pollution Test Report			URL(Unique Lab Report) No.	TC78132020000086P
Report Release Date	23rd March 2020		Report ID	YBAEEL-200304-132814-A01
Sample Description	Ambient Air Quality – Core Zone		Job code/ Ref. no.	YBAEEL/WA/L/A/Mar-20/08
Type of Industry	Thermal Power Plant		Work Order No./ Date	3030004681 / 18.02.2020
Issue to	M/s – Adhunik Power & Natural Resources Ltd. Vill – Padampur, Behind PGCIL substation, Jamshedpur-832402,Jharkhand			
Sampling Period	12th to 13th March, 2020		Mode of sample collection	YBAEEL sampling team
Sampling Protocol	IS:5182 and CPCB Air Manual Volume-1(NAAQM/36/2012-13)			
Sampling Locations	A. ADM Building	B. Switch Yard		C. CHP Area
Meteorological Cond.	W.C. – Drizzling & haze	RH % - 75	Temp. - 22	W.D. - north to south
Sample receipt Date	16.03.2020	Analysis Started on	16.03.2020	Analysis completed on 23.03.2020

**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 RA 2017	µg/m³	67.1	71.0	84.1	100
Particulate matter ($PM_{2.5}$)	USEPA 40 CFR (PART 50) (50.7)	µg/m³	41.4	45.6	49.7	60
Sulphure Dioxide (SO_2)	IS:5182 (P-2) 2001 RA 2017	µg/m³	13.7	18.1	21.8	80
Nitrogen Dioxide (NO_2)	IS:5182 (P-6) 2006 RA 2017	µg/m³	37.5	43.1	45.9	80
Ammonia (NH_3)	SOP No. YBAEEL/SOP/AIR/01	µg/m³	28.2	30.1	33.7	400
Ozone (O3)*	IS:5182 (P-09) 2006 RA 2016	µg/m³	17.0	19.1	22.3	180
Carbon Monoxide (CO)*	IS:5182 (P-10) 2006 RA 2014	mg/m³	0.9	1.2	1.4	04
Lead (Pb)	IS:5182 (P-22) 2004 RA 2014	µg/m³	ND (DL 0.02)	ND (DL 0.02)	ND (DL 0.02)	01
Nickel (Ni)*	SOP No. YBAEEL/SOP/AIR/01	ng/m³	ND (DL 8.3)	ND (DL 8.3)	ND (DL 8.3)	20
Arsenic (As)*	SOP No. YBAEEL/SOP/AIR/01	ng/m³	ND (DL 1.0)	ND (DL 1.0)	ND (DL 1.0)	06
Benzene (C_6H_6)*	IS:5182 (P-11) 2006 RA 2017	µg/m³	ND (DL 0.06)	ND (DL 1.0)	ND (DL 1.0)	05
Benzo (a) pyrene (BaP)* Particulate Phase Only	IS:5182 (P-12) 2004 RA 2017	ng/m³	ND (DL 0.2)	ND (DL 0.2)	ND (DL 0.2)	01

End of Report

Remarks	Sample Complies With Prescribe Standards.
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
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Tested by	Verified by	Issued by
Amit Kr. Sinha	Brij Nandan Kumar	Umesh Das
Lab Analyst	Section In-Charge	Technical Manager

Yugantar Bharati Analytical & Environmental Engineering Laboratory

Authorized Signatory
Atmospheric Pollution
Yugantar Bharati Analytical & Environmental Engineering Laboratory

Post Box no. 32 | Namkom Post Office | Sidroul | Ranchi - 834010 (Jharkhand)
Ph. 098351-97960, 9304955304 | Tele Fax : 0651-2260787 | E-mail : ybaeel@gmail.com

Annexure XVIII (A)

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.

Adhunik
GROUP OF INDUSTRIES

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

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

Annexure XIX

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 No APNRL/JSPCB/ES/2018-19/02 Date: 20th Sep 2019

The Member Secretary
Jharkhand Pollution Control Board
Jharkhand

Sub- Submission of Environmental Statement (Form V) for Unit II (1 x 270 MW) of M/s Adhunik Power & Natural Resources Limited, Village- Padampur, Dist- Saraikela-Kharswan,Jharkhand.

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

Dear Sir,

In line with compliance of above referred EC letter point No XIII of general condition, Please find attached herewith Environmental statement (Form V) for the financial year 2018-19.

This is for your kind information & record please.

Thanking You

Your's faithfully

Ravinder Aggarwal
(Head-Environment)

Encl: As mentioned above
CC: 1. The Regional Office(ECZ)
Ministry of Environment & Forest & Climate Change,
Bungalow No. A-2, Shyamali Colony,Ranchi-834002
2. The Regional Officer
Jharkhand Pollution Control Board
Jamshedpur

Annexure XX
9/6

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/RA/251219/02 Dated: 20.12.2019

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 – April 2019 to September 2019,-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 **April 2019 to September 2019.**

This is for your reference and record, please.

Thanking you,

For **Adhunik Power & Natural resources Limited**

(Authorized Signatory)

Encl: As Above

Copy to:

4) Central Pollution Control Board, Kolkata
5) Member Secretary, Jharkhand State Pollution Control Board, Jharkhand
6) Regional Officer, JSPCB, Jamshedpur

Received M. Yadav 27/12/19

Received 28-12-19

27/12/19

MONTHWISE EXPENDITURE INCURRED IN ENVIRONMENT MEASURES

(For the Period from 1st April,2019 - 31st March ,2020)

Ruppees in lakh

Sl No		Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Grand Total
1	**Material**													
1.1	ASH DISPOSAL	17.14	17.73	0.01	1.67	17.82	10.20	11.31	0.03	20.56	0.00	0.01	0.01	96.47
1.2	BTG	-	-	-	-	-	-	-	0.68	-	-	-	-	0.68
1.3	ENVIRONMENT DEPT	0.45	0.01	0.73	0.01	0.96	0.18	0.01	0.83	0.25	1.96	0.24	0.00	5.62
1.4	ESP	-	-	-	-	-	0.17	-	1.24	-	-	-	-	1.41
1.5	ETP	-	0.10	-	0.10	-	-	0.13	-	0.14	-	-	-	0.48
1.6	MILL REJECT HANDLING SYSTEM	-	-	2.45	0.13	-	-	-	-	-	-	-	0.16	2.74
1.7	STP	-	-	-	-	-	-	-	-	0.07	-	-	-	0.07
	Total	**17.59**	**17.84**	**3.19**	**1.90**	**18.77**	**10.55**	**11.45**	**2.77**	**21.02**	**1.96**	**0.24**	**0.17**	**107.47**
2	**Services**													
2.1	HOUSEKEEPING	7.28	14.58	10.79	11.74	11.26	10.88	11.68	11.31	11.71	12.02	11.54	12.15	136.93
2.2	ASH DISPOSAL	227.66	400.37	293.16	218.79	211.63	129.14	78.22	57.93	63.97	60.91	7.98	36.18	1,785.93
2.3	BTG	-	-	-	-	-	-	-	-	34.66	-	-	-	34.66
2.4	COAL HANDLING PLANT	3.92	3.85	3.88	4.05	3.92	3.92	4.03	3.92	4.03	4.14	3.65	4.02	47.32
2.5	ENVIRONMENT DEPT	3.72	1.66	1.76	1.48	1.52	1.46	2.47	1.12	1.53	1.05	4.34	8.48	30.60
2.6	MECHANICAL MAINTAINENCE	5.44	5.31	5.42	6.51	6.60	6.46	5.58	5.33	5.91	5.15	5.01	5.47	68.20
	Total	248.02	425.78	315.01	242.57	234.92	151.86	101.98	79.61	121.81	83.27	32.53	66.30	2,103.64
	Grand Total	**265.61**	**443.62**	**318.20**	**244.47**	**253.69**	**162.41**	**113.43**	**82.38**	**142.83**	**85.24**	**32.77**	**66.47**	**2211.11**