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Power

Ref: APL/MEL/EMD/EC/MoEFCC/287/05/24
Date- 24.05.2024.

To,
Additional Principal Chief Conservator of Forest (APCCF)
Ministry of Environment, Forest and Climate Change
Integrated Regional Office, Bhopal
Kendriya Paryavaran Bhavan,
Link Road No- 3, E-5, Ravi Shankar Nagar
Bhopal - 462 016 (M.P)

Sub: Six Monthly Compliance Status report of Environment Clearances for Phase I & II by Mahan Energen Ltd. at Village Bandhaura, District Singrauli, Madhya Pradesh.

Ref: 1. Environmental clearance letter no. **J-13011/56/2006-IA.II (T)** Dated- 20.04.2007 & Its subsequent amendment vide letter dated 10.02.2009, 23.08.2013 and 08.04.2016 & EC transfer dated 15.09.2022
2. Environment Clearance F. No. **J-13011/56/2006-IA.II (T)**, EC Identification No. EC23A004MP195224 dated 02.08.2023.

Dear Sir,
With reference to above subject, please find enclosed herewith Six-Monthly Environment Clearances (EC) compliance status report **(Phase I & II)** along with Environmental monitoring reports as Ambient Air Quality, Water Quality, Noise level & Soil quality, CAAQM data, Met. data, Greenbelt development, Fly ash & CSR Report etc. for the period of **October'2023 to March'2024** in soft (**e-mail**).

This is for your kind information & record please.

Thanking You,
Yours faithfully,
for **Mahan Energen Ltd.**

(Santosh Kumar Singh)
Head AESG

Encl: as above

CC:

Member Secretary
Central Pollution Control Board
Parivesh Bhavan, East Arjun Nagar
Kendriya Paryavaran Bhawan
New Delhi- 110 032.

Member Secretary,
Madhya Pradesh Pollution Control Board
Paryavaran Parisar, E-5, Arera Colony,
Bhopal, MP

The Regional Officer
Madhya Pradesh Pollution Control Board
Waidhan, Navgarh, Singrauli, MP-486887

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Gujarat, India
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SIX MONTHLY COMPLIANCE REPORT
OF
ENVIRONMENT CLEARANCE (EC's)

For

2800 (Phase I 2x600 and Phase II 2x800) MW

Thermal Power Plant

At

Village Bandhaura, Tehsil Mada
District Singrauli, Madhya Pradesh

Submitted to:

Integrated Regional Office, Bhopal
Ministry of Environment, Forest & Climate Change
Central Pollution Control Board, New Delhi &
Madhya Pradesh Pollution Control Board, Bhopal

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Power

Submitted By:

Environment Management Department
Mahan Energen Limited
Bandhaura Village, Mada Tehsil, Singrauli
District, Madhya Pradesh-486 886

Period: October'2023 to March'2024

CONTENTS

Introduction

Mahan Energen Limited is wholly owned subsidiary of **Adani Power Limited** is Coal based Thermal Power Plant situated at Village Bandhaura, Khairahi, Karsualal and Nagwa in Singrauli District of Madhya Pradesh. The Plant has total capacity of **2800 MW (Phase I 2x600 MW – Operational** and **Phase II 2x800 MW – Under Construction).**

Adani Power Limited has implemented the Approved Resolution Plan and acquired 100% of paid-up share capital and management control of EPMPL on **16.03.2022. "Mahan Energen Limited"** is wholly owned subsidiary of Adani Power Limited and incorporated under Companies (Incorporation) Rules, 2014 date 25.03.2022.

The Environmental Clearance for **Phase I** was granted by MoEFCC vide No. J-13011/56/2006-IA. II(T) dated 20.04.2007 and its subsequent amendment vide letter dated 10.02.2009, 23.08.2013, 08.04.2016 and 16.07.2023 and transferred EC from Essar Power MP Limited **to Mahan Energen Limited** was granted on 15.09.2022.

Consent to Establish (CTE) and Consent to Operate (CTO) for Phase I already obtained from MPPCB and both Units are operational.

Status of the Expansion Project (2x800 MW)

Environmental Clearance (EC): EC is granted for Expansion of Bandhaura Thermal Power Plant of capacity **2x800 MW vide F. No. J-13011/56/2006-IA.II (T), EC Identification No. EC23A004MP195224 on dated: 02.08.2023** from MoEFCC, New Delhi

Consent to Establish (CTE): Consent to Establish granted vide CTE no. 58920 dated 27.09.2023 from Madhya Pradesh Pollution Control Board valid up to dated 31.08.2028.

Field work/site development and TPP Construction work of Thermal Power Plant is started, and financial closure achieved.

COMPLIANCE STATUS ON ENVIRONMENTAL CLEARANCE
1200 (2×600) MW Phase I Coal Based Thermal Power Plant

Vide letter No. J-13011/56/2006-IA.II (T) dated 20.04.2007 and
its subsequent amendment dated 10.02.2009: 23.08.2013, 08.04.2016.
and EC transferred from Essar Power to Mahan Energen Ltd. on 15.09.2022,
Amendment in EC dated 16.07.2023.

A	Specific Condition	Compliance Status
(i)	The total land requirement shall not exceed 700 ha for all activities/ facilities of the power project put together.	Complied. Power Project/plant have been developed within 700 Ha.
(ii)	Forestry clearance for diversion of 70 ha forest land involved in the project shall be obtained before starting construction on the forest land.	Compiled. The forest area is optimised to 34.98 ha now. Stage-1 FC has been obtained from MoEFCC vide letter no.6-MPC 043/2008-BHO/822 dated. 02.04.2009 and final diversion of land does not proceed. **No construction activities have been taken place in the forest land and No Forest land is involved.**
(iii)	R&R in sufficient detail shall be finalized before award of the project and a copy of the detailed R&R shall be submitted to MoEF within three months of the issue of this letter or before the award of the project whichever is earlier.	Complied. As previous, R&R Benefits are being provided as per Madhya Pradesh R&R policy 2002 and in line with agreement executed on 18.10.2008 between Collector, Singrauli and EPMPL. Copy of the agreement with MP Govt. has been forwarded to MoEFCC vide our letter no. EPMPL/ MoEFCC/ 07.07.2010. Adani Power Limited has implemented the Approved Resolution Plan and acquired 100% of paid-up share capital and management control of EPMPL on 16.03.2022. "Mahan Energen Limited" is wholly owned subsidiary of Adani Power Limited.
(iv)	The PAFs/ PAPs losing their homesteads, or a major portion of the land shall not be ousted from the land till they are settled at the alternate sites.	Complied R&R implementation as per the agreement dated; 05.09.2007 has been done. All payments as per the demand received from the state government & local administration have been made, plots allotted to all the homesteads. Supporting documents already submitted with EC compliance report.
(v)	Ash and sulphur content in the coal to be used in the project shall not exceed 35% and 0.5% respectively.	Complied. Ash and Sulphur content in the coal is being maintained below 35% & 0.5% respectively. MEL Power Plant is based on Pit head TPP and all parameters are being achieved as per notification.

(vi)	Two bi-flue stacks of 275m height each shall be provided with continuous online monitoring equipment. Exit velocity of at least 25m/sec shall be maintained	Complied One bi-flue stack of 275 M height has been installed. Also, CEMS (Continuous emission monitoring system) has been provided for both units. Exit velocity is maintained > 25m/s. Stack emission monitoring Report is enclosed as **Annexure-I.**
(vii)	High efficiency electrostatic precipitators (ESPs) with efficiency not less than 99.9% shall be installed to ensure that particulate emission does not exceed 100 mg/Nm3.	Complied ESP (9 Fields) with efficiency of 99.9% installed in both the units to meet permissible norm for particulate emissions less than 50 mg/Nm3. Stack Emission Monitoring Report has been provided as **Annexure – I.**
(viii)	Space provision shall be made for Flue Gas De-sulphurisation (FGD) unit, if required at a later stage.	Complied Space for FGD has been provided in the adjacent to chimney. As per MoEFCC Notification dated 5th Sep 2022, Mahan TPP is falling under Category "C" Non- retiring TPPs and the timelines for compliance of SO2 emission is up to December'2026.
(ix)	Low NOx burners shall be provided.	Complied Low NOx burners have already been provided in each boiler.
(x)	Adequate dust extraction system such as bag filters and water spray system in dusty areas such as coal and ash handling areas, transfer areas and other vulnerable areas shall be provided.	Compiled Dust extraction systems over fly ash silo, coal bunkers and conveyor junction points have been installed. Dry fog diffusion systems have already been provided in coal crusher house and conveyor transfer points. Water sprinkling system & Mobile Fog Cannon has been provided in coal yard area.
(xi)	Fly ash shall be collected in dry form and ash generated shall be used in a phased manner as per provisions of the notification on Fly Ash Utilization issued by the Ministry in September, 1999 and its amendments. By the end of 9th year full fly ash utilization should be ensured. Unutilized ash shall be disposed of in the ash pond in the form of High Concentration Slurry.	Complied. MoUs/Agreements have been signed with Cement Industries as M/s Prism Johnson Limited Cement and M/s Birla Corporation India Limited (BCIL) to lift the fly ash generated from the power plant. We have also signed a MOU with "Ashtech (India) Private Ltd." for lifting the Ash being generated from the Power Plant. Only unutilized Ash is being sent to Ash dyke / pond. Ash generation and utilization report is enclosed as **Annexure- IV.**
(xii)	Ash pond shall be lined with HDPE geo-synthetic membrane to avoid leaching. Adequate safety measures shall be implanted to protect the ash pond bund from getting breached.	Complied HDPE lining has been provided in the ash pond. The ash pond operates with HCSD system. Adequate safety measures such as proper

		bund slope, toe drain around the dyke, etc., have been taken to protect the bund.
(xiii)	A conservation plan for Schedule-1 animals reported in the study area of the project shall be prepared in consultation with an expert organization like Wildlife Institute of India at Dehradun and duly approved by State Wildlife Department of Madhya Pradesh. A copy of the same shall be submitted to the ministry and Regional Office at Bhopal within six months of the date of issue of this letter. The plan so prepared shall be implemented effectively. Necessary allocation of funds for the same shall be made and will be included as project cost.	Complied Ecological Assessment and Flora & Fauna Wildlife Conservation & Management Plan has been prepared by M/s. Good Earth Enviro Care in Association with Department of Environment Management, Indian Institute of Social Welfare & Business Management, Kolkata and report is submitted to PCCF – WL, Bhopal vide **letter no. APL/MEL/Env/ PCCF/ 407/23 dated; 03.04.2023.** The plan will be implemented with due approval of CWLW. Acknowledged copy is enclosed as **Annexure VI.**
(xiv)	Rain water harvesting shall be practiced. A detailed scheme for rainwater harvesting to recharge the ground water aquifer shall be prepared in consultation with Central Ground Water Authority/ State Ground Water Board and a copy of the same shall be submitted within 3 months to the Ministry.	Complied Rainwater Harvesting study carried out and report is submitted to Regional Director, Central Ground Water Board, Bhopal & Member Secretary, Central Ground Water Authority, New Delhi. **vide letter no. APL/MEL/ENV/ CGWA/404/23 dated; 03.04.2023.** Rainwater harvesting within the plant premises has been constructed/ implemented to harvest the rainwater. Acknowledged copy submitted in previous compliance. Pond deepening work is being carried out in Five-Six ponds in villages falling under the area. More than 400 farmers availed benefits from pond deepening for irrigation in their agricultural land.
(xv)	The treated effluents conforming to the prescribed standards only shall be discharged in the Bhalea nallah.	Complied. Effluent is being treated suitably and analysis results are well within the stipulated MPPCB/CPCB standard by the process of neutralizing and treated water being used for gardening. We are maintaining zero discharge of treated effluent. Effluent analysis results are provided **as Annexure–I.**
(xvi)	Regular monitoring of ground water in and around the ash pond area shall be carried out, records maintained, and periodic reports shall be furnished to the Regional Office of the Ministry.	Complied Regular monitoring of ground water is being carried out in and around the ash pond area. Record is maintained and enclosed as **Annexure – I.**
(xvii)	A 100 m wide green belt shall be developed all around the plant area and 20 m wide green belt	Being Complied The greenbelt of Plant premises is reorganized due to the ongoing construction activities of

	shall be developed all around the ash pond and township covering a total area of 100 ha.	Phase-II (2x800 MW) and the plantations are being carried to develop green belt as per the phase II plant layout.
(xviii)	First aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.	Complied.
(xix)	Leq of Noise Level should be limited to 75 dBA and regular maintenance of equipment to be undertaken. For people working in high noise areas, personal protection devices should be provided.	Complied. Leq of noise level at project boundary is being monitored and observed less than 75 dB(A). People working in high noise area are provided with PPEs like ear- muff and ear plug. Monitoring report is enclosed as **Annexure–I.**
(xx)	Regular monitoring of the ambient air quality shall be carried out in and around the power plant and records maintained. 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.	Complied. Online CAAQ monitoring system for Ambient air quality is already established. Ambient Air Quality Monitoring is also being carried out by third party consultant. Monitoring reports is enclosed as **Annexure-I.** Records of the same are being maintained and report is being sent to the Regional Office of the MoEFCC, CPCB & MPPCB. Online ambient air quality system also connected with MPPCB & CPCB portal.
(xxi)	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, informing that the project has been accorded environmental clearance and copies of clearance letters 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://www.envfor.nic.in.	Complied.
(xxii)	A separate environment monitoring cell (EMC) with suitable qualified staff should be set up for implementation of the stipulated environmental safeguards.	Complied. We have established separate environmental monitoring cell with well qualified staff to carry out regular surveillance for implementation of stipulated environmental safeguards.
(xxiii)	A half yearly report on the status of implantation of the stipulated conditions and environmental safeguards should be submitted to this Ministry, its Regional Office at Bhopal, CPCB and SPCB	Complied. Six monthly compliance reports are being submitted regularly. Last compliance report for the period of April' 2023 to September'2023 submitted vide letter no. APL/Mahan/EMD/EC/MoEFCC /245/ 11/23 dated 27.11.2023.

(xxiv)	Regional Office of the Ministry of Environment & Forests located at Bhopal will monitor the implementation of the stipulated conditions. A complete set of documents including 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.	Complied. All necessary information forwarded to the MoEFCC Regional Office, Bhopal on regular basis.
(xxv)	Separate funds should be allocated for implementation of environmental protection measures along with item-wise break-up. This cost should be included as part of the project cost. The funds earmarked for the environment protection measures should not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.	Complied. Separate Budget has been allocated for the Environmental Protection Measures by Mahan Energen Limited.
(xxvi)	Full cooperation should be extended to the scientists/ officers from the Ministry/ Regional Office of the Ministry at Bhopal/ the CPCB/ the SPCB who would be monitoring the compliance of environmental status.	Full co-operation & support is being extended to all the Govt visiting officials always.
	EC Amendment vide letter no. J-13011/56/2006 -IA. II (T) dated: 23.08.2013	
(xxvii)	The project proponent shall upload the status of compliance of the conditions stipulated in the environmental clearance issued vide this Ministry's letter of even no. dated 20.04.2007. in its website and updated periodically and also simultaneously send the same by e-mail to the Regional Office of the Ministry of Environment and Forests.	Complied. EC compliance report of Mahan Energen Limited is being uploaded on Adani Power website and soft copy is being sent to Regional Office of MoEFCC, CPCB and MPPCB.
(xxviii)	Criteria pollutants levels including NOx, RSPM (PM-10 & PM-2.5) SO2, NOx (from stack & ambient air) shall be regularly monitored and results displayed in your website and also at the main gate of the power plant.	Complied. Criteria pollutants levels including NOx, RSPM (PM-10 & PM-2.5) SO2, NOx (from stack & ambient air) being regularly monitored, and results are displayed at the main gate of the Power Plant & same being submitted to concern authorities. Monthly Env. Monitoring is being done by third party also and report is being sent to pollution control board on monthly basis. Environmental monitoring report is enclosed as **Annexure-I.**
(xxix)	Avenue plantation along the route (both sides of the road) of imported coal transportation from railway siding at Mahadiya /Singrauli Railway Siding to Rajmilan-Bandhoura- Power Plant site, over a distance of 63 kms shall be raised by the project	Complied. Domestic Coal is being used for the operation of Power Plant and Coal is procured through Forward e-auction from the nearby Coal mines of SECL/NCL.

	proponent at its own cost. The status of implementation shall be submitted to the Regional Office of the Ministry.	Currently transportation of the coal is not being done through **Mahadiya Coal siding**.
(xxx)	It shall be ensured that only mechanized covered trucks are used for imported coal transportation.	Complied. The transportation by road is done through mechanically covered trucks to the extent possible, else through tarpaulin covered trucks so as to prevent coal dust dispersion in the atmosphere.
(xxxi)	A long term study of radioactivity and heavy metals contents on coal to be used shall be carried out through a reputed institute once the power plant becomes operational. Thereafter mechanism for all in-built continuous monitoring for radio activity and heavy metals in coal and fly ash (including bottom ash) shall be put in place.	Complied. Domestic Coal are being used for power generation for Mahan TPP. Periodical coal and ash analysis are being carried out through a reputed institute. M/s Bhabha Atomic Research Centre (BARC), Department of Atomic Energy, Govt. of India for Radioactivity and heavy metal contents and reports is being submitted periodically with Six monthly EC compliance report to Ministry, CPCB and MPPCB. For provision of In-built mechanism continuous monitoring for radio activity and heavy metals in coal and fly ash (including bottom ash), the technology and monitoring instrument is not available with the suppliers in the country and is not feasible to monitor in this mechanism. Analysis Report of Radioactivity in Coal Sample is enclosed as **Annexure-II.** **MoEFCC has already amended in Environmental Clearance (EC) in CONDITION NO. (xxxi) vide F. No. J-13011/56/2006-IA-II(T) dated; 16th July' 2023.**
(xxxii)	The recommendation of the Central Electricity Authority issued vide it's letter no. 159/100ITP&I/CEA/2011, dated 01.02.2013, on the feasibility of transportation of coal from Mahadiya Railway Siding to Mahan TPP site shall be implemented.	Currently transportation of the Coal is not being done through Mahadiya Railway siding. Coal is procured through e-auction from the nearby Coal mines of Northern Coal Field and APMDCL-Suliyari Coal mine.
(xxxiii)	The project proponent shall maintain a log book of imported coal and Bill of Imports for coal to establish that the coal used for the power project are additional coal coming to the country. These documents shall be submitted to the Regional Office of the Ministry from time to time.	MEL is not using imported Coal for Power plant. We are mostly procuring the Coal through Forward e-auction from the nearby coal mines as NCL & SECL.
	EC Amendment vide letter no. J-13011/56/2006 -IA.II (T) dated 08.04.2016	
(xxxiv)	The Sulphur and ash contents of domestic coal shall not exceed 0.5% and 35 % respectively. The	Complied.

	coal shall be sourced through e-auction only in case of emergency and non-viability of imported coal. In case of variation of quality at any point of time, fresh reference shall be made to the Ministry for suitable amendments to the environmental clearance. However, for the imported coal, the ash and sulphur contents will be as specified in the earlier order.	Mahan Energen Limited currently procuring coal through domestic sources only. Ash and Sulphur and ash content in the coal is being maintained below 35% & 0.5% respectively and also being complied as per notification of **Pit head based TPP.** Ash content in Coal report is enclosed as **Annexure III.**
(xxxv)	The road transportation shall be restricted to the route as approved earlier vide amendment dated 23.08.2013.	Complied. Road transportation is being done as per the local administration instruction/approved route only and with mechanically covered truck and with instruction of Local Administration. Transportation of Coal through Conveyor Belt is under progress and Stage-I in Principle approval granted by IRO, MoEFCC, Bhopal vide letter FP/MP/Others/405152/2022 dated: 04.02.2024 for Coal conveyor belt area & project work will be completed by Dec 2026.
(xxxvi)	The transportation by road shall be through mechanically covered trucks to the extent feasible, else through tarpaulin covered trucks so as to prevent coal dust dispersion in the atmosphere.	Complied & followed. Transporting of the coal is being done through trucks covered with tarpaulin with proper sealing arrangement as per the MoEFCC and local authority direction.
(xxxvii)	Harnessing solar power within the premises of the plant particularly at available roof tops shall be carried out and status of implementation including actual generation of solar power shall be submitted along with half yearly monitoring report.	Being Complied. 100 Nos. Solar Power streetlights have been installed within the plant premises. We have already installed Solar Power Panels in Township.
(xxxviii)	Monitoring of surface water quantity and quality shall also be regularly conducted, and records maintained. The monitored data shall be submitted to the Ministry regularly. Further, monitoring points shall be located between the plant and drainage in the direction of flow of ground water and records maintained. Monitoring for heavy metals in ground water shall also be undertaken and results/findings submitted along with half yearly monitoring report.	Complied. Regular monitoring of surface water quality is being carried out on regular basis. Record are maintained & also report are sent to the Regional Office of the Ministry, CPCB & MPPCB on regular basis. Analysis Report of Surface Water Quality is enclosed as **Annexure-I.**
(xxxix)	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	Complied. There is no disturbance caused to any water body including natural drainage system in the area due to operation of the plant.
(xl)	CSR schemes identified based on need-based assessment shall be implemented in	Complied & being followed.

	consultation with the village Panchayat and the District Administration starting from the development of project itself. As part of CSR prior identification of local employable youth and eventual employment in the project after imparting relevant training shall be also undertaken. Company shall provide separate budget for community development activities and income generating programs.	CSR activities/programs are totally based on the need of the community having special focus on livelihood generation, health and education. Separate budget is allocated for CSR programs. For livelihood restoration of displaced people monthly sustenance allowance (Bhatta) is being given to PAPs. Local youths are also engaged under different contractors working inside the plant to provide them relevant training, exposure & livelihood. CSR report is enclosed as **Annexure-V.**
(xli)	For proper and periodic monitoring of CSR activities, a CSR committee or a Social Audit committee or a suitable credible external agency shall be appointed. CSR activities shall also be evaluated by an independent external agency. This evaluation shall be both concurrent and final.	Being Complied & compliance assured on regular basis. CSR activities are implemented in consultation and collaboration with nearby community & Panchayats leader as well as District Administration. Regular community meetings are organised in all the villages to understand the issues of community. Social development activities have been carried out for Need Based under the CSR activities by **Adani Foundation**.
(xlii)	An Environmental Cell comprising of at least one expert in environmental science/ engineering, ecology, occupational health and social science, shall be created preferably at the project site itself and shall be headed by an officer of appropriate superiority and qualification. It shall be ensured that the Head of the Cell shall directly report to the Head of the Plant who would be accountable for implementation of environmental regulations and social impact improvement/mitigation measures.	Complied We have established separate environmental monitoring cell with well qualified staff to carry out regular surveillance for implementation of stipulated environmental safeguards.
EC Transferred from Essar to Mahan Energen Limited on dated 15th September 2022		
1.	2X600 MW Mahan Super Thermal Power Project at Tehsil Mada, District- Singrauli (Madhya Pradesh)- Transfer of environmental clearance from M/s Essar Power (M.P.) Ltd. to M/s Mahan Energen Limited-reg. This has reference to your online proposal no. IA/MP/THE/269676/2022 dated 26th April 2022 regarding transfer of the Environmental clearance (EC) for the above said project from M/s Essar Power (M.P.) Ltd to M/s **Mahan Energen Limited**.	Noted.
2.	The ministry had earlier issued EC for 4x200 MW Mahan super thermal power project at tehsil Mada, District- Singrauli (Madhya Pradesh) in	Noted.

	favour of M/s Essar Power (M.P.) Limited vide letter dated 20th April 2007, the said EC was further amended vide letter 10th Feb 2009, 23rd August'2013 and 18th April'2016 for reducing the power generation capacity to 3 x 600 MW, changing the fuel source and extending the validity of EC.	
3.	As per details submitted by the PP the M/s Essar Power (M.P.) Limited (earlier owner) could achieve the capacity of 2 x 600 = 1200 MW only within the validity period of EC i.e.,19.04.2017 against the EC generated (reduced the capacity 3x 600 MW) by the Ministry to the aforesaid plant. Accordingly, CTO was obtained from SPCB vide letter dated 30.08.2016 from commissioned capacity i.e. 2 x 600 MW.	Noted.
4.	M/s Mahan Energen Limited has informed that the unit of M/s Essar power M P Limited was admitted into the corporate Insolvency Resolution process (CIRP) vide order dated 29.09.2020 passed by National Company Law Tribunal New Delhi and M/s Adani Power Ltd has acquired 100% paid share capital and Management control of M/s Essar power (M.P.) Ltd, and thus necessitating transfer of al requisite approvals in the name of M/s Mahan Energen Limited.	Noted & agreed.
5.	M/s Mahan Energen Limited has submitted and affidavit to abide by the terms and conditions stipulated in the environmental clearance 20th April 2007 and its subsequent amendments dated 10th February 2009, 23rd August 2013 and 08th April 2016 issued in the name of M/s Mahan Energen Limited.	Noted and being complied. Environment clearance 20th April 2007 and its subsequent amendments dated 10th February 2009, 23rd August 2013 and 08th April 2016.
6.	As per the relevant provision of the EIA Notification 2006, the environmental clearance granted by the ministry vide letter No. J-13011/56/2006-IA-II(T) dated 20th April 2007 and its subsequent amendments dated 10th February, 2009, 23rd August, 2013 and 8th April, 2016 to the project 4 x200 MW (3X600 MW reduced capacity) MW Mahan Super Thermal Power Project at Tehsil- Mada, Village-Bandhaura, Nagwa, Karsualal and Khairahi, District- Singrauli, Madhya Pradesh is hereby transferred from M/s Essar power (M.P) Limited to M/s Mahan Energen Limited, with the condition that the aforesaid power plant will be	Noted & agreed.

	operated on the power generation capacity 2 x600 MW Further expansion shall be taken up only after prior Environmental Clearance under the vision of the EIA Notification, 2006, as amended. The other terms and condition as mentioned in the initial Environmental Clearance and its further amendments shall remaining unchanged.	
7.	This issued with approval of the competent authority.	Noted.

Compliance Status of Environmental Clearance

1600 MW (2×800 MW) Expansion of Bandhaura Thermal Power Plant

Environment Clearance F. No. J-13011/56/2006-IA. II(T)
EC Identification No. EC23A004MP195224 dated 02.08.2023.

Sl. No.	Specific Conditions	Compliance Status
(i)	As already committed by the project proponent, Zero Liquid Discharge shall be ensured, and no waste/treated water shall be discharged outside the premises.	Noted & agreed, Compliance assured during operation phase. Plant design is based on Zero Liquid Discharge (ZLD). Generated wastewater will be treated in ETP & STP, and treated water will be recycled/reused with in the plant premises.
(ii)	Peripheral Green belt (Three row plantation) with Miyawaki plantation technique of 15 m thickness along the plant boundary shall be developed with more than 90% survival rate of the plant species. It would be ensured that total 33% area of total project cover area is under green cover focusing on Ash Dyke area.	Being Complied. The greenbelt of Plant premises is reorganized due to the ongoing construction activities of Phase-II (2x800 MW) and the plantations are being carried continuously. Our efforts are being made to develop more greenery in and around plant premises.
(iii)	Make a plan for pollution control with the consultation of State Pollution Control Board and submit implementation report with compliance report.	Noted & compliance assured. MEL has already submitted details of pollution control system (Air & Water CM) & along with EIA & EMP report same will be implemented during construction and operation.
(iv)	No Coal shall be transported through the villages and no coal shall be transported through road beyond 2026 and no extension shall be granted in this regard.	Compliance assured. The Transportation of Coal will be done through Conveyor Belt. Forest Clearance/approval obtained from MoEFCC. Stage-I in Principle approval granted by IRO, MoEFCC, Bhopal vide letter FP/MP/ Others/405152/2022 dated: 04.02.2024 for Coal conveyor belt area & project work will be completed by December 2026.
(v)	Extensive green cover within 2 km range of the plant boundary shall be developed. An action plan in this regard to be prepared in consultation with CPCB/expert institution and submitted before Regional Office of the Ministry within 3 months.	Being followed. The study is already conducted by the Reputed Government institute, Indian Institute of Social Welfare and Business Management (IISWBM, Kolkata) Environment Management Department. The study report is enclosed as **Annexure – XI.**
(vi)	24x7 online monitoring system for ambient air quality shall be established with its connectivity with SPCB and CPCB server. Stack monitoring shall be done through 24X7 online monitoring system. The emission Standards for Municipal Solid Waste based Thermal Power Plants as per	Compliance assured during operation phase. MEL has already installed 4 no. of CAAQMS for existing operational plant. Online Continuous Emission Monitoring System (CEMS) in both units will be installed

	Municipal Solid Waste Rules, 2016 dated 8.4.2016 (S.O. 1357 (E)) shall be complied (Refer Part C of Schedule II of Municipal Solid Waste Rules, 2016 dated 8.4.2016 (S.O. 1357 (E)).	and data transmission to CPCB and MPPCB portal before commissioning of Plant.
(vii)	Adequate dust extraction system such as cyclones/bag filters and water spray system in dusty areas such as waste delivery points, transfer areas and other vulnerable dusty areas shall be provided along with an environment friendly sludge disposal system. Water Sprinkling on roads shall be done in every 6 hours in winter season and 3 hours in summer season of roads within 1 km range approaching the plant. A logbook shall be maintained for the activity and be in six-monthly compliance report.	Compliance assured during construction. Adequate dust extraction system will be installed to control the fugitive emission.
(viii)	LED display of air quality (Continuous Online monitoring) shall be installed on the roadside (within 1 km range) and nearby hotspots viz. residential colony, Schools Hospitals; maintenance of devices shall be done on regular basis.	Complied LED display board at the main gate of Plant is already installed and operational.
(ix)	Everyday cleaning of road/Paved roads within 1 km range of plant site shall be ensured throughout the year through vacuum-based vehicle.	Being Complied For Regular cleaning of roads, road sweeping machine has been deployed, water sprinkling system also has been installed for dust suppression.
(x)	Environment Audit of plant shall be done annually, and report shall be submitted to Regional Office of the Ministry.	Compliance assured during plant operation.
(xi)	Project proponent shall explore the use of treated sewage water from the Sewage Treatment Plant of Municipality / local bodies/ similar organization located within 50km radius of the proposed power project to minimize the water drawl from surface water bodies.	Noted As on date there is no STP located within 50 Km radius of plant, feasibility and availability shall be explored.
(xii)	A detailed action plan regarding leachate handling shall be prepared and implemented in consultation with SPCB and the same shall be submitted to the Regional Office of the Ministry. Zero liquid discharge shall be adopted. Leachate shall be treated and reused. No treated leachate shall be discharged in any circumstances. Characteristics of Leachate and the treated leachate shall be monitored once in quarter and records shall be maintained.	Noted and compliance assured during plant operation.
(xiii)	Oil and grease recovered from the treatment plant should be disposed only through authorized recyclers.	Compliance assured during operation phase. Used Oil and grease will be collected and stored properly in designated cover shed and

		will be disposed off only through authorized recyclers.
(xiv)	Harnessing solar power within the premises of the plant particularly at available roof tops shall be carried out and status of implementation including actual generation of solar power shall be submitted along with half yearly monitoring report.	Being Complied 100 Nos. Solar Power Streetlights already has been installed within the plant premises. Further, Feasibility for harnessing Solar Power will be explored.
(xv)	Fly ash handling shall be done strictly as per extent rules/regulations of the Ministry/CPCB issued from time to time including Ministry's Notification No. S.O.548I(E) dated 31st December 2021.	Noted and Compliance assured during operation phase.
(xvi)	Monitoring of surface water quality and Ground Water quality shall also be regularly conducted, and records maintained. The monitored data shall be submitted to the Ministry regularly. Further, monitoring points shall be located between the plant and drainage in the direction of flow of ground water and records maintained. Monitoring for heavy metals in ground water shall also be undertaken and results/findings submitted along with half yearly monitoring report.	Being complied.
(xvii)	A well-designed rainwater harvesting system shall be put in place within six months, which shall comprise of rainwater collection from the built up and open area in the plant premises and detailed record kept of the quantity of water harvested every year and its use.	Being Complied Rainwater harvesting within the plant premises has been constructed/ implemented to harvest the rainwater. 10 no. storm water recharge pit has been developed. Pond deepening work are being carried out in 5-6 ponds in villages falling under the area. More than 400 farmers availed benefits from pond deepening for irrigation in their agricultural land.
(xviii)	Watershed development plan shall be prepared and implemented focusing on micro watershed development within 10 km radius of the project. Action taken report in this regard be submitted before regional office of the Ministry in 6 monthly compliance report.	Being Followed. The study is already conducted by the reputed Government Institute, Indian Institute of Social Welfare and Business Management (IISWBM, Kolkata)–Environment Management Department. The study report is enclosed as **Annexure XII.**
(xix)	A detailed ecological monitoring and survey covering forestry, fisheries, wildlife, and its habitat shall be done once in two years to assess the impacts of project on the local environment and ecology. Monitoring report shall be uploaded on the Parivesh Portal and a copy of the same be submitted to the regional office of MoEF&CC.	Applicable study for TPP will be carried with reported institute.

(xx)	For the DG sets, emission limits and the stack height shall be in conformity with the extant regulations and the CPCB guidelines. Acoustic enclosure shall be provided to DG set for controlling the noise pollution.	Compliance assured during construction period.
(xxi)	An Environmental Cell headed by the Environment Manger with postgraduate qualification in environmental science /environmental engineering, shall be created. It shall be ensured that the Head of the Cell shall directly report to the Head of the Plant who would be accountable for implementation of environmental regulations and social impact improvement/mitigation measures.	Complied We have already established separate environmental monitoring cell with well qualified Environment Manager/staff to carry out regular surveillance for implementation of stipulated environmental safeguards.
(xxii)	The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Firefighting system shall be as per the norms.	Compliance Assured.
(xxiii)	The energy sources for lighting purposes shall preferably be LED based.	Being complied. MEL has already installed LED based lights.
(xxiv)	Public grievance redressal system shall be established under supervision of project head. The functioning of the system shall be reviewed every month.	Being complied.
(xxv)	Epidemiological Study among population within 5 km radius of project cover area shall be carried out on regular interval (Once in two year) through independent agency. Necessary measures shall be taken as per findings of study in consultation with district administration. Action taken report shall be submitted to the Regional Office of the Ministry.	Compliance assured, once in a two years.
(xxvi)	The Project Proponent shall submit the time-bound action plan to the concerned regional office of the Ministry within 6 months from the date of issuance of Environmental Clearance for undertaking the CER activities, committed during public consultation by the project proponent and as discussed by the EAC, in terms of the provisions of the MoEF&CC Office Memorandum No.22-65/2017-IA.III dated 30 September 2020. The action plan shall be implemented within three years of commencement of the project.	Compliance assured. The time- bound action plan for CER activities is already submitted to Ministry, same is enclosed as **Annexure – VIII.**
(xxvii)	Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	Compliance assured as per the Factories Act.

(xxviii)	A multi-specialty Hospital of 100 beds shall be established and maintained to cater the need of population living within 10 km.	Compliance assured. MEL is already considered to provide multi-specialty hospital along with construction stage.
Miscellaneous		
(xxix)	Consent to Establish/Operate for the project shall be obtained from the State Pollution Control Board as required under the Air (Prevention and Control of Pollution) Act, 1981 and the Water (Prevention and Control of Pollution) Act, 1974.	Complied Consent to Establish (CTE) has already been obtained from MPPCB vide **CTE no. 58920 dated 27.09.2023 valid up to 31.08.2028.** Copy of same is enclosed as **Annexure-VII.** Consent to Operate (CTO) will be obtained before commissioning of the Plant.
(xxx)	All necessary clearance from the concerned Authority, as may be applicable should be obtained prior to commencement of project or activity.	Noted & already obtained.
B. I.	**Standard EC Conditions for Thermal Power Plants:** **Statutory Compliance**	
(i)	Emission Standards for Thermal Power Plants as per Ministry's Notification S.O. 3305(E) dated 7.12.2015, G.S.R.593 (E) dated 28.6.2018 and as amended from time to time shall be complied.	Compliance assured during operation of Plant.
(ii)	Part C of Schedule II of Municipal Solid Wastes Rules, 2016 dated 08.04.2016 as amended from time to time shall be complied for power plants based on Municipal Solid Waste.	Not Applicable. The Plant is Coal based Thermal Power Plant.
(iii)	MoEF&CC Notification G.S.R 02(E) dated 2.1.2014 as amended time to time regarding use of raw or blended or beneficiated/washed coal with ash content not exceeding 34% shall be complied with, as applicable.	Compliance assured during operation of Plant
(iv)	MoEF&CC Notifications on Fly Ash Utilization S.O. 763(E) dated 14.09.1999, S.O. 979(E) dated 27.08.2003, S.O. 2804(E) dated 3.11.2009, S.O. 254(E) dated 25.01.2016 as amended from time to time shall be complied.	Compliance assured. Fly ash will be utilized as per the MoEFCC notification and its amendments.
(v)	Thermal Power Plants other than the power plants located on coast and using sea water for cooling purposes, shall achieve specific water consumption of 2.5 m3/MWh and Zero effluent discharge.	Compliance assured during Plant operation. Specific Water consumption will be within the standard norms and plant designed is based on Zero Liquid Discharge (ZLD).
(vi)	The recommendation from Standing Committee of NBWL under the Wildlife (Protection) Act, 1972 should be obtained, if applicable.	Not Applicable for MEL TPP.
(vii)	No Objection Certificate from Ministry of Civil Aviation be obtained for installation of requisite	Not Applicable as Chimney height is less than 150 meters.

	chimney height and its siting criteria for height clearance.	The proposed Stack height is 120 meters**,** therefore NOC not required for installation of Stacks as per AAI and MoD rules.
(viii)	Groundwater shall not be drawn during construction of the project. In case, groundwater is drawn during construction, necessary permission be obtained from CGWA.	Compliance assured. No ground water is proposed. Surface water will be used for construction as well as in plant operation. We have allocated 36 MCM river water (Rihand Dam) from Water Recourse Department, Bhopal Madhya Pradesh.
II	**Ash Content / mode of transportation of Coal:**	
(i)	EC is given on the basis of assumption of_% of ash content and_km distance of transportation in rail/road/conveyor/any other mode. Any increase of % ash content by more than 1 percent, and/ or any change in transportation mode or increase in the transport distance (except for rail) require application for modifications of EC conditions after conducting the 'incremental impact assessment' and proposal for mitigation measures.	Compliance assured once during operation phase.
III	**Air quality monitoring and Management:**	
(i)	Flue Gas Desulphurization System shall be installed based on Lime/ Ammonia dosing to capture Sulphur in the flue gases to meet the SO2 emissions standard of 100 mg/Nm3.	Compliance assured. FGD will be installed during the construction of Thermal Power Plant.
(ii)	Selective Catalytic Reduction (SCR) system or the Selective Non-Catalytic Reduction (SNCR) system or Low NOX Burners with Over Fire Air (OFA) system shall be installed. To achieve NOX emission standard of 100 mg/Nm3.	Compliance assured. Low NOx burner will be installed during the construction of Thermal Power Plant.
(iii)	High efficiency Electrostatic Precipitators (ESPs) shall be installed in each unit to ensure that particulate matter (PM) emission to meet the stipulated standards of 30 mg/Nm3.	Compliance assured. High efficiency Electrostatic Precipitators (ESPs) will be installed during construction of Thermal Power Plant.
(iv)	Stacks of prescribed height m shall be provided with continuous online monitoring instruments for SOX, NOx, and Particulate Matter as per extant rules.	Compliance assured. Stack height of 120m will be provided with continuous emission monitoring system (CEMS) as per guidelines of CPCB/MoEFCC.
(v)	Exit velocity of flue gases shall not be less than 20-25 m/ s. Mercury emissions from stack shall also be monitored periodically.	Compliance assured & will be maintained during plant operation.
(vi)	Continuous Ambient Air Quality monitoring system shall be set up to monitor common/criteria pollutants from the flue gases such as PM10, PM2.5, SO2, NOX within the plant area at least at one location. The monitoring of other locations (at least three locations outside	MEL has already installed & operational4 no. of CAAQMS for existing operational plant.

	the plant area covering upwind and downwind directions at an angle of 120° each) shall be carried out manually.	
(vii)	Adequate dust extraction/suppression system shall be installed in coal handling, ash handling areas and material transfer points to control fugitive emission.	Compliance assured. Adequate dust extraction/suppression system will be installed during construction of plant.
(viii)	Appropriate Air Pollution Control measures (DEs/DSs) be provided at all the dust generating sources including sufficient water sprinkling arrangements at various locations viz., roads, excavation sites, crusher plants, transfer points, loading and unloading areas, etc.	Compliance assured. Adequate Air Pollution Control measures will be provided during construction of plant.
IV	**Noise Pollution and its control measures:**	
(i)	The Ambient Noise levels shall meet the standards prescribed as per the Noise Pollution (Regulation and Control) Rules, 2000.	Compliance assured.
(ii)	Persons exposed to high noise generating equipment shall use Personal Protective Equipment (PPE) like earplugs/earmuffs, etc.	Compliance assured. Suitable PPEs will be provided, and persons will be urged to use suitable PPEs like earplugs/earmuffs, etc. while working near high noise generating equipments.
(iii)	Periodical medical examination on hearing loss shall be carried out for all the \workers and maintain audiometric record and for treatment of any hearing loss including rotating to non-noisy/less noisy areas.	Noted and being complied.
V.	**Human Health Environment:**	
(i)	Bi-annual Health check-up of all the workers is to be conducted. The study shall take into account of chronic exposure to noise which may lead to adverse effects like increase in heart rate and blood pressure, hypertension and peripheral vasoconstriction and thus increased peripheral vascular resistance. Similarly, the study shall also assess the health impacts due to air polluting agents.	Agreed and being complied.
(ii)	Baseline health status within study area shall be assessed and report be prepared. Mitigation measures should be taken to address the endemic diseases.	Being Complied. The study is already conducted by the reputed Government Institute, Indian Institute of Social Welfare and Business Management (IISWBM, Kolkata)–Environment Management Department. The draft study report is received, final report is awaited.
(iii)	Impact of operation of power plant on agricultural crops, large water bodies (as applicable) once in two years by engaging an institute of repute. The study shall also include	Compliance assured during Plant operation.

	impact due to heavy metals associated with emission from power plant.	
(iv)	Sewage Treatment Plant shall be provided for domestic wastewater.	Noted and Compliance assured. STP will be established during construction of plant.
Vi	**Water quality monitoring and Management:**	
(i)	Induced/Natural draft closed cycle wet cooling system including cooling towers shall be set up with minimum Cycles of Concentration (COC) of 5.0 or above for power plants using fresh water to achieve specific water consumption of 2.5 m3/MW hr. (Or) Induced/Natural draft open cycle cooling system shall be set up with minimum Cycles of Concentration (COC) of 1.5 or above for power plants using sea water.	Noted and Compliance assured once the Plant is operational.
(ii)	In case of the water withdrawal from river, a minimum flow 15% of the average flow of 120 consecutive leanest days should be maintained for environmental flow whichever is higher, to be released during the lean season after water withdrawal for proposed power plant.	Noted and Compliance assured once the Plant is operational.
(iii)	Records pertaining to measurements of daily water withdrawal and river flows (obtained from Irrigation Department/Water Resources Department) immediately upstream and downstream of withdrawal site shall be maintained.	Noted and Compliance assured during operation of Plant.
(iv)	Rainwater harvesting in and around the plant area be taken up to reduce drawl of fresh water. If possible, recharge of groundwater to be undertaken to improve the ground water table in the area.	Being Complied Rainwater harvesting within the plant premises has been constructed/ implemented to harvest the rainwater. 10 no. storm water recharge pit has been developed. Pond deepening work are being carried out in 5-6 ponds in villages falling under the area. More than 400 farmers availed benefits from pond deepening for irrigation in their agricultural land.
(v)	Regular (at least once in six months) monitoring of groundwater quality in and around the ash pond area including presence of heavy metals (Hg, Cr, As, Pb, etc.) shall be carried out as per CPCB guidelines. Surface water quality monitoring shall be undertaken for major surface water bodies as per the EMP. The data obtained should be compared with the baseline data so as to ensure that the groundwater and surface water quality is not adversely impacted due to the project & its activities.	Being Complied Ground water and Surface water quality monitoring is being carried out by NABL accredited consultant, report is attached as **Annexure I**

(vi)	The treated effluents emanating from the different processes such as DM plant, boiler blow down, ash pond/dyke, sewage, etc. conforming to the prescribed standards shall be re- circulated and reused. Sludge/ rejects will be disposed in accordance with the Hazardous Waste Management Rules.	Compliance assured once the Plant is operational. Treated water will be used in CHP/AHP Ash handling system and development of greenbelt.
(vii)	Hot water dispensed from the condenser should be adequately cooled to ensure the temperature of the released surface water is not more than 5 degrees Celsius above the temperature of the intake water.	Noted & Agreed. Compliance assured during operation of plant.
(viii)	Based on the commitment made by the Project Proponent, Sewage Treatment Plants within the radius of 50 km from proposed project, the treated sewage of .....KLD from STP .... (name) shall be used as an alternative to the fresh water source to minimize the freshwater drawl from surface water bodies.	Noted As on date there is no STP located within 50 Km radius of plant, feasibility and availability shall be explored.
(ix)	Wastewater generation of .... KLD from various sources (viz. cooling tower blowdown, boiler blow down, wastewater from ash handling, etc.) shall be treated to meet the standards of pH: 6.5-8.5; Total Suspended Solids: 100 mg/l; Oil & Grease: 20 mg/1; Copper: 1 mg/l; Iron:1 mg/1; Free Chlorine: 0.5; Zinc: 1.0 mg/1; Total Chromium: 0.2 mg/1; Phosphate: 5.0 mg/1;	Noted & Compliance assured during operation of plant. ETP will be installed to treat the wastewater and meet the standards norms.
(x)	Sewage generation of .....KLD will be treated by setting up Sewage Treatment plant to maintain the treated sewage characteristics of pH: 6.5-9.0; Bio- Chemical Oxygen Demand (BOD): 30 mg/1; Total Suspended Solids: 100 mg/1; Fecal Coliforms (Most Probable Number) :< 1000 per 100 ml.	Noted & Compliance assured during operation of plant. STP will be installed to treat the domestic wastewater and meet the standards norms.
VII		**Risk Mitigation and Disaster Management:**
(i)	Adequate safety measures and environmental safeguards shall be provided in the plant area to control spontaneous fires in coal yard, especially during *dry* and humid season.	Compliance assured. Onsite emergency plan will be provided in the plant.
(ii)	Storage facilities for auxiliary liquid fuel such as LOO and HFO/LSHS shall be made as per the extant rules in the plant area in accordance with the directives of Petroleum & Explosives Safety Organization (PESO). Sulphur Content in the liquid fuel should not exceed 0.5%.	Compliance assured. Storage facilities for auxiliary liquid fuel such as LOO and HFO/LSHS will be provided.
(iii)	Ergonomic working conditions with First Aid and sanitation arrangements shall be made for the	Being complied & followed all required action.

	drivers and other contract workers during construction phase.	
(iv)	Safety management plan based on Risk Assessment shall be prepared to limit the risk exposure to the workers within the plant boundary.	Being complied
(v)	Regular mock drills for on-site emergency management plan and Integrated Emergency Response System shall be developed for all kind of possible disaster situations.	Being complied.
VIII	**Green belt and Biodiversity conservation:**	
(i)	Green belt shall be developed in an area of 33% of the total project with indigenous native tree species in accordance with CPCB guidelines. The green belt shall inter-alia cover an entire periphery of the plant.	Being Complied. The greenbelt of Plant premises is reorganized due to the ongoing construction activities of Phase-II (2x800 MW) and the plantations are being carried. Our efforts are being made to develop more greenery in and around plant premises.
(ii)	In-situ/ex-situ Conservation Plan for the conservation of flora and fauna should be prepared and implemented.	Conservation Plan for the conservation of flora and fauna is already prepared and submitted along with EIA-EMP report.
(iii)	Suitable screens shall be placed across the intake channel to prevent entrainment of life forms including eggs, larvae, juvenile fish, etc., during extraction of seawater.	Water will be drawn from existing intake well & water pipeline from Rihand Reservoir.
IX	**Waste Management:**	
(i)	Solid waste management should be planned in accordance with extant Solid Waste Management Rules, 2016.	Compliance assured. Solid waste management will be done as per the Solid Waste Management Rules, 2016
(ii)	Toxicity Characteristic Leachate Procedure (TCLP) test shall be conducted for any substance, potential of leaching heavy metals into the surrounding areas as well as into the groundwater.	Compliance assured during plant operation.
(iii)	Ash pond shall be lined with impervious liner as per the soil conditions. Adequate dam/ dyke safety measures shall also be implemented to protect the ash dyke from getting breached.	Compliance assured. Ash Pond will be developed as per guidelines of CPCB/MoEFCC during the construction.
(iv)	Fly ash shall be collected in dry form and ash generated shall be used in phased manner as per provisions of the Notification on Fly Ash Utilization issued by the Ministry and amendment thereto. By the end of 4th year, 100% fly ash utilization should be ensured. Unutilized ash shall be disposed off in the ash pond in the form of High Concentration Slurry. Mercury and other heavy metals (As, Hg, Cr, Pb, etc.) will be monitored in the bottom ash as also	Compliance assured. Fly Ash will be utilized as per the MoEFCC Ash notification and its amendments.

	in the effluents emanating from the existing ash pond. Fly ash utilization details shall be submitted to concerned Regional Office along with the six- monthly compliance reports and utilization data shall be published on company's website.	
(v)	Unutilized ash shall be disposed off in the Ash Pond in the form of High Concentration Slurry/Medium Concentration Slurry/Lean Concentration Slurry method. Ash water recycling system shall be set up to recover supernatant water.	Noted & Compliance assured during plant operation. High Concentration Slurry Disposal System (HCSD) will be installed.
(vi)	In case of waste-to-energy plant, major problems related with environment are fire smog in MSW dump site, foul smell and impacts to the surrounding populations. Therefore, the following measures are required to be taken up: A. Water hydrants at all the dumpsites of MSW area to be provided so that the fire and smog could be controlled. B. Sprayer like microbial consortia may be provided for arresting the foul smell emanating from MSW area.	**Not Applicable.** The Plant is Coal based Thermal Power Plant.
x.	**Monitoring Compliances:**	
(i)	Environmental Audit of the project be taken up by the third party for preparation of Environmental Statement as per Form-V & Conditions stipulated in the EC and report be submitted to the Ministry.	Noted, Compliance assured once the Plant is operational with Govt reputed institute.
(ii)	Resettlement & Rehabilitation Plan as per the extant rules of Govt. of India and respective State Govt. shall be followed, if applicable.	Not Applicable R&R is not required as land for expansion project is already in possession with Mahan Energen Limited.
(iii)	Energy Conservation Plan to be implemented as envisaged in the EIA / EMP report. Renewable Energy Purchase Obligation as set by MoP/State Government shall be met either by establishing renewable energy power plant (such as solar, wind, etc.) or by purchasing Renewable Energy Certificates.	Noted and Being Complied 100 Nos. Solar Power Streetlights already has been installed within the plant premises. Further, Feasibility for harnessing Solar Power will be explored. Adani group already establish more than 10,000 MW renewable energy power plant (such as solar, wind & hybrid etc.)
(iv)	Monitoring of Carbon Emissions from the existing power plant as well as for the proposed power project shall be carried out annually from a reputed institute and report be submitted to the Ministry's Regional Office.	Being Complied. The study is already conducted by the reputed Government Institute, Indian Institute of Social Welfare and Business Management (IISWBM, Kolkata Environment Management Department. The study report is awaited from the institute.

(v)	Energy and Water Audit shall be conducted at least once in two years and recommendations arising out of the Report should be followed. A report in this regard shall be submitted to Ministry's Regional Office.	Compliance assured during the Plant operation.
(vi)	Environment Cell (EC) shall be constituted by taking members from different divisions, headed by a qualified person on the subject, who shall be reporting directly to the Head of the Project.	Complied We have established separate environmental monitoring cell with well qualified staff to carry out regular surveillance for implementation of stipulated environmental safeguards.
(vii)	The project proponent shall (Post-EC Monitoring): a. Send a copy of environmental clearance letter to the heads of Local Bodies, Panchayat, Municipal bodies, and relevant offices of the Government. b. Upload the clearance letter on the web site of the company as a part of information to the general public. c. Inform the public through advertisement within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at Website of the Ministry of Environment, Forest and Climate Change (MoEF&CC) at http://parviesh.nic.in. d. Upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same periodically. e. Monitor the criteria pollutants level namely, PM (PMI0& PM2.5 incase of ambient MQ), SO2, NOx (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects and display the same at a convenient location for disclosure to the public and put on the website of the company; f. Submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MoEF&CC, the	**Complied** a. Copy of environmental clearance letter **submitted to** Dist. Development Officer, Block Development Officer, Panchayats, Zilla Parishad and relevant offices of the Government. Copy of same is enclosed as **Annexure X.** b. Environment clearance letter **uploaded** on the web site of the company. https://www.adanipower.com/Downloads c. Information through advertisement has been published in two local newspapers **(Dainik Bhaskar & Times of India)** in Hindi & English. Copy of same is enclosed as **Annexure IX.** d. Status of compliance of the stipulated environment clearance conditions, including results of monitored data will be submit half yearly and upload the same on company website. e. Monitoring of the pollutants level PM (PM10& PM2.5), SO2, NOx is being displayed at the main gate of the plant. f. Six monthly status of the compliance report of the stipulated environmental conditions including results of monitored data is being submitted to the Regional Office of MoEFCC,

	respective Zonal Office of CPCB and the SPCB. g. submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company. h. Inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project and the date of commencement of the land development work.	the respective Zonal Office of CPCB and the SPCB. g. Environmental statement for each financial year in Form-V will be submitted to State Pollution Control Board during operation phase. h. The date of **financial closure is 20.06.2023**.
XI.	**Corporate Environmental Responsibility (CER) activities:**	
(i)	CER activities will be carried out as per OM No. 22-65/2017-IA.III dated 30.09.2020 or as proposed by the PP in reference to Public Hearing or as earmarked in the EIA/EMP report along with the detailed scheduled of implementation.	Noted and being complied. The time- bound action plan for CER activities is already submitted to Ministry and same is under implementation, copy is enclosed as **Annexure – VIII.**
C.	**General Condition:**	
(i)	The EC granted to the project is strictly under the provisions of the EIA Notification 2006 and its amendments. It does not tantamount/ construe to approvals/ consent/ permissions, etc. required to be obtained under any other Acts/ Rules/ Subordinate legislations, etc., as may be applicable to the project.	Noted & agreed.
(ii)	The project proponent shall prepare a site-specific conservation plan and wildlife management plan in case of the presence of Schedule-1 species in the study area, as applicable to the project, and submit to Chief Wildlife Warden for approval. The recommendations shall be implemented in consultation with the State Forest/Wildlife Department in a time bound manner.	Complied Ecological Assessment and Flora & Fauna Wildlife Conservation & Management Plan has been prepared by M/s. Good Earth Enviro Care in Association with Department of Environment Management, Indian Institute of Social Welfare & Business Management, Kolkata and report is submitted to PCCF – WL, Bhopal vide letter no APL/MEL/Env/ PCCF/407/23 dated; 03.04.2023. The plan will be implemented with due approval of CWLW. Acknowledgement is enclosed as **Annexure VI.**
(iii)	No further expansion or modifications in the plant, other than mentioned in the EIA Notification, 2006 and its amendments, shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change. In case of deviations or alterations in the project proposal from those submitted to this Ministry	Noted and agreed.

	for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	
(iv)	The energy source for lighting purpose shall be preferably LED based, or advance having preference in energy conservation and environment betterment.	Being complied. MEL has already installed LED based lights.
(v)	The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board (SPCB) and it shall be ensured that at least one station each is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated.	Complied MEL has already installed 4 no. of CAAQMS in consultation with State Pollution Control Board (SPCB).
(vi)	The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (daytime) and 70 dBA (nighttime).	Noted & Compliance assured. Necessary noise control measures like acoustic hoods, silencers, enclosures etc. will be provided at all sources of noise generation.
(vii)	The Company shall harvest rainwater from the roof tops of the buildings and storm water drains to recharge the ground water and to utilize the same for process requirements.	Being Complied Rainwater harvesting within the plant premises has been constructed/ implemented to harvest the rainwater. 10 no. storm water recharge pit has been developed. Pond deepening work are being carried out in 5-6 ponds in villages falling under the area. More than 400 farmers availed benefits from pond deepening for irrigation in their agricultural land.
(viii)	Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.	Being Complied Training is being imparted to all employees on safety and health aspects on regular basis.
(ix)	The company shall also comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management, and risk	Noted and Compliance assured.

	mitigation measures relating to the project shall be implemented.	
(x)	The company shall undertake all relevant measures for improving the socio- economic conditions of the surrounding area. CER activities shall be undertaken by involving local villages and administration and shall be implemented.	Noted and being complied. The time- bound action plan for CER activities is already submitted to Ministry and same is under implementation, copy is enclosed as **Annexure – VIII.**
(xi)	The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment.	Noted and Compliance assured.
(xii)	A separate Environmental Management Cell (having qualified person with Environmental Science/Environmental Engineering/ specialization in the project area) equipped with full-fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.	Complied We have established separate environmental monitoring cell with well qualified staff to carry out regular surveillance for implementation of stipulated environmental safeguards.
(xiii)	The company shall earmark sufficient funds towards capital cost and recurring cost per annum to implement the conditions stipulated by the Ministry of Environment, Forest and Climate Change as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/ pollution control measures shall not be diverted for any other purpose.	Separate budget has been already allocated for Environmental protection measures.
(xiv)	A copy of the clearance letter shall be sent by the project proponent to concerned Panchayat, Zilla Parishad/Municipal Corporation, Urban local Body and the local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal.	Complied. Copy of environmental clearance letter submitted to IRO, MoEFCC, RO, MPPCB, Dist. Development Officer, Singrauli, Block Development Officer, Singaruli, Panchayats and Zilla Parishad. Copy of same is enclosed as **Annexure X.**
(xv)	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF&CC, the respective Zonal Office of CPCB and SPCB. A copy of Environmental Clearance and six-monthly compliance status report shall be posted on the website of the company.	Being Complied. Six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data is being submitted to the respective Regional Office of MoEFCC, Zonal Office of CPCB and SPCB. Copy of Environmental Clearance is already uploaded, and six-monthly compliance status report will be uploaded on website of the company. https://www.adanipower.com/Downloads

(xvi)	The environmental statement for each financial year ending 31st March in Form-V as is mandated shall be submitted 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 MoEF&CC by e-mail.	Compliance assured during operation phase. Will be submitted in operation phase, every year before 30th September.
(xvii)	The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry and at https:/ /parivesh.nic.in/. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.	Complied. Copy of environmental clearance letter **submitted to** IRO, MoEFCC, RO, MPPCB, Dist. Development Officer, Singrauli, Block Development Officer, Singaruli, Panchayats and Zilla Parishad. Copy of same is enclosed as **Annexure X.** Environment clearance letter already **uploaded** on the web site of the company https://www.adanipower.com/Downloads Information through advertisement has been published in two local newspapers in Hindi & English. **Copy of News Paper cutting is enclosed as Annexure- IX.**
(xviii)	The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.	Complied Financial closure and final approval of the project achieved.
(xix)	This Environmental clearance is granted subject to outcome of Hon'ble Supreme Court of India, Hon'ble High Court, Hon'ble NGT and any other Court of Law, if any, as may be applicable to this project.	Noted.

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Annexure-I

Mahan Energen Limited

Summary of Environmental Monitoring Report

Period from October'2023 to March'2024

Ambient Air Quality Monitoring Results													
Location		Near Admin Building				Near Gate No. 2				Near Gate No. 3			
Month & Year	Date	PM-10	PM-2.5	SO2	NO2	PM-10	PM-2.5	SO2	NO2	PM-10	PM-2.5	SO2	NO2
		Unit-µg/Nm3				Unit-µg/Nm3				Unit-µg/Nm3			
	Permissible Limit	100	60	80	80	100	60	80	80	100	60	80	80
October-23	03.10.2023	61.82	42.47	9.14	17.35	68.47	36.92	14.57	22.98	55.36	31.68	7.23	17.36
	06.10.2023	56.74	40.56	10.96	21.43	69.25	40.25	13.92	24.41	51.31	34.22	9.33	19.43
	09.10.2023	66.23	39.85	12.86	23.98	70.63	39.65	10.36	19.62	49.47	36.12	11.86	16.64
	12.10.2023	62.98	37.64	8.35	16.32	62.13	43.72	15.02	23.68	52.13	31.28	8.37	21.36
	16.10.2023	58.52	41.76	13.87	18.5	69.35	41.36	13.62	20.2	56.98	33.34	9.14	20.46
	20.10.2023	63.14	34.42	11.56	20.39	71.05	39.79	9.39	21.83	53.72	30.50	12.64	18.33
	23.10.2023	69.24	36.34	14.32	21.55	63.54	36.24	15.62	18.31	57.25	35.44	10.27	16.18
	27.10.2023	64.53	39.63	10.45	23.12	68.14	42.97	14.87	22.74	48.63	29.93	12.4	20.45
	30.10.2023	54.23	37.52	15.93	19.67	61.23	40.45	11.69	21.65	54.82	32.67	10.91	18.77
	Avg. Value	**61.94**	**38.91**	**11.94**	**20.26**	**67.09**	**40.15**	**13.23**	**21.71**	**53.30**	**32.80**	**10.23**	**18.78**
November-23	03.11.2023	65.78	39.67	11,09	21.65	75.62	34.57	13.03	24.32	62.96	33.69	8.96	21.44
	06.11.2023	69.73	44.92	13.76	19.94	70.82	42.76	14.65	21.74	64.18	36.42	10.34	17.57
	10.11.2023	71.43	41.33	10.65	22.47	78.63	45.36	12.83	25.87	69.12	31.17	12.43	19.88
	18.11.2023	76.98	37.75	12.78	19.55	79.03	42.18	12.91	24,12	59.88	35.74	9.3	22.63
	20.11.2023	74.78	46.98	14.01	20.66	68.16	44.71	11.33	19.54	67.09	29.18	11.24	21.71
	24.11.2023	69.71	40.23	12.98	23.14	73.87	37.92	14.07	23.07	60.15	32.94	13.27	19.27
	27.11.2023	73.54	38.65	10.77	22.33	69.09	39.99	16.88	26.72	59.34	37.75	12.77	18.29
	29.11.2023	70.83	42.42	15.23	19.08	76.29	46.13	12.14	21.63	61.83	31.87	14.25	23.02
	Avg. Value	**71.6**	**41.5**	**12.9**	**21.1**	**73.9**	**41.7**	**13.5**	**23.3**	**63.1**	**33.6**	**11.6**	**20.5**
December-23	01.12.2023	77.45	35.76	10.54	22.17	68.09	31.76	15.87	24.23	57.97	36.61	11.78	19.15
	04.12.2023	71.61	32.3	12.64	24.76	67.86	35.76	14.31	26.96	53.97	32.23	12.76	21.97
	08.12.2023	68.24	37.88	9.15	23.78	72.65	40.85	16.97	25.32	62.6	30.87	9.67	22.43
	11.12.2023	72.31	34.65	12.43	21.93	66.91	37.76	13.12	28.77	68.23	34.88	14.62	18.12
	15.12.2023	67.58	39.75	13.24	24.98	67.43	35.33	12.93	23.21	59.44	37.45	12.76	23.26
	18.12.2023	72.38	40.42	11.53	19.76	73.8	31.76	13.76	25.15	61.51	35.23	11.54	19.24
	22.12.2023	81.54	42.41	9.89	20.54	67.82	34.77	11.98	23.91	58.59	37.55	13.15	24.65
	25.12.2023	76.87	38.66	14.65	18.35	72.45	36.98	13.23	25.43	66.43	32.12	8.57	21.15
	29.12.2023	74.66	41.21	16.43	23.48	66.97	40.65	14.75	22.63	68.94	35.75	13.06	19.33
	Avg. Value	**73.63**	**38.12**	**12.28**	**22.19**	**69.33**	**36.18**	**14.10**	**25.07**	**61.97**	**34.74**	**11.99**	**21.03**

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Annexure-I

January -24	02.01.2024	76.45	38.52	14.76	22.87	67.93	44.82	11.76	25.32	63.95	35.29	12.06	23.64
	05.01.2024	74.98	37.97	16.77	20.15	64.27	41.66	13.85	22.64	66.68	37.42	14.34	21.57
	08.01.2024	68.32	42.45	13.12	23.91	68.88	38.72	16.13	26.07	61.52	34.37	13.93	23.38
	12.01.2024	69.54	41.54	14.79	24.33	65.34	38.98	13.94	23.72	58.87	38.84	12.30	20.62
	16.01.2024	71.65	43.76	12.98	25.87	71.62	42.64	14.63	20.54	66.79	33.28	14.34	22.78
	19.01.2024	73.34	40.53	16.72	22.54	69.72	44.86	15.27	24.77	62.15	36.04	15.57	23.57
	22.01.2024	69.85	39.31	15.23	25.65	67.67	39.19	17.18	21.68	58.24	36.76	14.89	24.29
	26.01.2024	73.83	42.47	14.56	21.66	75.59	43.23	13.74	26.33	62.73	32.81	13.15	22.45
	29.01.2024	75.23	43.42	15.51	22.67	72.23	41.23	14.45	23.31	61.53	34.44	12.45	24.45
	Avg. Value	**72.58**	**41.11**	**14.94**	**23.29**	**69.25**	**41.70**	**14.55**	**23.82**	**62.50**	**35.47**	**13.67**	**22.97**
February-24	02.02.2024	75.98	36.72	15.76	24.64	68.15	46.98	12.67	24.67	64.88	36.66	14.37	19.54
	05.02.2024	71.33	38.16	14.81	19.23	70.63	43.74	14.89	22.23	67.23	34.67	12.32	23.21
	09.02.2024	73.42	40.21	10.67	21.65	66.48	39.71	15.79	26.76	62.78	34.37	16.75	20.66
	12.02.2024	76.89	38.67	16.32	22.89	71.73	43.67	12.64	24.34	71.56	37.89	13.35	22.54
	16.02.2024	68.01	36.98	14.82	23.74	73.86	42.64	14.45	22.98	63.78	41.28	14.76	24.27
	19.02.2024	67.98	39.23	13.45	25.08	75.78	42.67	16.93	23.67	59.98	39.87	13.65	19.63
	23.02.2024	73.71	37.28	14.72	26.65	71.93	40.39	16.94	22.44	58.87	43.77	12.87	24.44
	26.02.2024	79.36	41.44	13.28	23.76	73.04	42.78	14.67	25.65	64.65	45.76	10.65	22.18
	28.02.2024	73.09	44.78	15.63	20.54	76.81	40.69	13.43	19.98	60.76	42.38	14.76	25.63
	Avg. Value	**73.3**	**39.3**	**14.4**	**23.1**	**72.0**	**42.6**	**14.7**	**23.6**	**63.8**	**39.6**	**13.7**	**22.5**
March-24	02.03.2024	63.67	39.87	13.06	22.36	76.53	35.16	12.08	25.54	78.48	38.67	12.08	22.34
	04.03.2024	65.23	35.42	11.76	24.54	71.32	41.53	13.77	22.76	80.87	43.74	14.04	18.42
	08.03.2024	68.56	37.78	15.98	20.43	77.84	46.12	10.96	24.34	76.54	42.17	11.14	23.06
	11.03.2024	61.78	34.76	12.32	21.84	78.54	40.17	14.46	23.83	81.39	38.54	14.76	22.34
	15.03.2024	66.98	40.64	11.43	22.87	69.18	45.17	12.87	20.09	77.54	45.34	13.84	24.02
	18.03.2024	64.54	39.94	14.76	20.32	74.42	36.75	13.98	22.87	79.44	41.25	15.34	21.78
	22.03.2024	70.43	36.87	13.09	19.67	68.17	38.86	15.94	25.78	75.23	38.72	11.54	20.46
	26.03.2024	64.85	42.65	12.87	23.85	76.84	39.96	14.64	24.89	78.55	39.18	16.84	19.46
	29.03.2024	67.23	35.98	13.56	24.78	79.65	45.65	15.32	26.06	76.37	43.32	14.42	24.32
	Avg. Value	**65.9**	**38.2**	**13.2**	**22.3**	**74.7**	**41.0**	**13.8**	**24.0**	**78.3**	**41.2**	**13.8**	**21.8**

Annexure-I

Mahan Energen Limited

Stack Emission Monitoring Results (October' 2023 to March' 2024)									
Location		**Unit-1**				**Unit-2**			
Month	**Date of Sampling**	**PM**	**SO2**	**NOx**	**Mercury (Hg)**	**PM**	**SO2**	**NOx**	**Mercury (Hg)**
		Unit-mg/Nm^3				**Unit-mg/Nm^3**			
	Permissible Limit	**50****	**200****	**450****	**0.03****	**50**	**200****	**450****	**0.03****
October' 23	05.10.2023	40.68	823.00	289.00	BQL (LOQ-0.005)	43.07	911.00	274.00	BQL (LOQ-0.005)
November' 23	25.11.2023	37.63	721.40	262.00	BLQ(LOQ-0,005)	45.25	891.00	283.00	BLQ(LOQ-0,005)
December' 23	21.12.2023	41.54	788.72	243.00	BLQ(LOQ-0,005)	44.05	824.00	276.14	BLQ(LOQ-0,005)
January' 24	19.01.2024	41.28	768.65	244.20	BLQ(LOQ-0,005)	44.04	813.45	277.30	BLQ(LOQ-0,005)
February' 24	19.02.2024	40.58	792.06	267.23	BLQ(LOQ-0,005)	43.88	834.21	283.45	BLQ(LOQ-0,005)
March' 24	22.03.2024	37.63	721.40	262.00	BLQ(LOQ-0,005)	45.25	891.00	283.00	BLQ(LOQ-0,005)

** As per MoEF & CC notification dated 05th Sep 2022, MEL is a Category "C" TPP and timelines for compliance of SO2 emission is up to 31st December 2026.

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Annexure-I

Mahan Energen Limited

Ambient Noise Monitoring Results														
October'2023 to March'2024														
Location			Admin			Gate No.1			Gate No. 2			Gate No. 3		
Month	Date	Duration	Leq	Max	Min	Leq	Max	Min	Leq	Max	Min	Leq	Max	Min
October-23	06.10.2023	Day	63.6	68.6	51.2	60.28	65.1	54.4	66.91	71.8	52.8	58.61	76.6	50.1
		Night	53.1	63.1	45.8	55.17	58.6	44.1	60.77	66.9	47.5	53.19	64.7	45.0
November-23	07.11.2023	Day	64.70	69.4	50.3	63.84	66.4	55.7	67.8	73.4	54.1	60.2	78.3	51.3
		Night	56.12	64.1	42.8	53.12	60.1	44.1	63.4	67.2	48.1	55.76	66.9	44.3
December-23	15.12.2023	Day	65.9	49.3	62.6	67.6	45.3	61.2	74.0	44.7	68.1	69.2	43.9	61.1
		Night	61.5	41.3	55.4	59.8	43.5	54.7	65.4	44.7	61.1	65.4	40.6	59.7
January-24	02.01.2024	Day	57.6	64.5	45.2	60.9	68.2	46.2	66.34	70.6	48.4	52.47	58.9	41.3
		Night	54.2	60.4	40.3	53.7	60.4	42.5	59.82	62.3	42.1	48.51	53.8	39.3
February-24	05.02.2024	Day	56.4	66.3	43.8	69.3	66.2	42.9	60.6	67.2	45.7	49.4	57.8	40.7
		Night	49.5	61.2	45.7	48.9	58.1	40.3	57.2	59.8	41.6	47.2	52.6	38.9
March-24	11.03.2024	Day	57.6	65.8	44.3	68.7	67.4	43.5	61.3	66.8	46.5	50.1	58.6	41.8
		Night	50.3	60.9	46.4	49.7	57.6	41.2	56.3	60.3	42.5	46.5	53.4	39.7

Mahan Energen Limited

Annexure-I

STP Treated Water Test Results

(October' 2023 to March' 2024)

Location of Sewage Treatment Plant (STP)						
Month	Date	Parameters				
		pH	TSS (mg/L)	BOD (mg/L)	COD (mg/L)	Oil & Grease (mg/L)
October' 23	18.10.2023	7.78	62	20.07	68.44	0.71
November' 23	09.11.2023	6.34	65	13.47	70.31	1.0
December' 23	02.12.2023	6.87	59	14.32	68.44	1.07
January' 24	11.01.2024	7.19	66	12.65	73.07	0.97
February' 24	19.02.2024	7.34	48	13.43	78.06	0.76
March' 24	04.03.2024	7.85	47	14.12	76.73	0.81

ETP Treated Water Test Results

(October' 2023 to March' 2024)

Location of Effluent Treatment Plant (ETP)						
Month	Date	Parameters				
		pH	TSS (mg/L)	BOD (mg/L)	COD (mg/L)	Oil & Grease (mg/L)
October' 23	18.10.2023	7.22	56	18	60.37	0.48
November' 23	09.11.2023	6.63	58	12	63	0.53
December' 23	02.12.2023	6.09	53	16.98	57.54	0.76
January' 24	11.01.2024	6.69	44	15.98	86.06	0.76
February' 24	19.02.2024	7.67	39	14.88	81.21	0.45
March' 24	04.03.2024	7.62	40	13.97	82.35	0.49

Annexure-I

Mahan Energen Limited

Ground Water Monitoring Results
(October' 2023 to March' 2024)

Month			November' 2023			February' 2024		
Sampling Date			09.11.2023			21.02.2024		
S. No.	Parameters	Unit	Bandhaura Village	Railla Village	Karsuaraja Village	Bandhaura Village	Railla Village	Karsuaraja Village
1	pH @ 25 °C	-	7.16	7.44	7.23	7.59	7.92	7.76
2	Turbidity	NTU	*BLQ(**LOQ-1.0)	*BLQ(**LOQ-1.0)	*BLQ(**LOQ-1.0)	*BLQ(**LOQ-1.0)	*BLQ(**LOQ-1.0)	*BLQ(**LOQ-1.0)
3	Total Dissolved Solids @ 180 ^{0}C	mg/L	494.00	491.00	482.00	376.00	213.00	472.00
4	Total Hardness as $CaCO_3$	mg/L	264.00	271.36	218.50	258.00	268.65	212.20
5	Alkalinity as $CaCO_3$	mg/L	315.50	316.28	294.00	287.09	306.38	283.00
6	Calcium as Ca	mg/L	68.50	68.70	52.13	63.20	58.17	45.12
7	Magnesium (Mg)	mg/L	23.59	24.29	21.49	25.73	25.72	23.13
8	Sulphate	mg/L	71.50	64.26	28.52	67.92	60.16	51.75
9	Nitrate	mg/L	12.60	14.56	14.32	9.22	14.03	13.87
10	Iron	mg/L	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	0.01	0.01	*BLQ(**LOQ-0.01)
11	Fluoride	mg/L	0.24	0.29	0.24	0.22	0.20	0.18
12	Sulphide	mg/L	*BLQ(**LOQ-0.02)	*BLQ(**LOQ-0.02)	*BLQ(**LOQ-0.02)	*BLQ(**LOQ-0.02)	*BLQ(**LOQ-0.02)	*BLQ(**LOQ-0.02)
13	Zinc (Zn)	mg/L	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)
14	Chloride	mg/L	86.60	89.00	86.83	72.67	81.00	77.23
15	Residual Chlorine	mg/L	*BLQ(**LOQ-0.15)	*BLQ(**LOQ-0.15)	*BLQ(**LOQ-0.15)	*BLQ(**LOQ-0.15)	*BLQ(**LOQ-0.15)	*BLQ(**LOQ-0.15)
16	Colour	Hazen	*BLQ(**LOQ-1.0)	*BLQ(**LOQ-1.0)	*BLQ(**LOQ-1.0)	*BLQ(**LOQ-1.0)	*BLQ(**LOQ-1.0)	*BLQ(**LOQ-1.0)
17	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
18	Mineral Oil	mg/L	*BLQ(**LOQ-0.1)	*BLQ(**LOQ-0.1)	*BLQ(**LOQ-0.1)	*BLQ(**LOQ-0.1)	*BLQ(**LOQ-0.1)	*BLQ(**LOQ-0.1)
19	Ammonia	mg/L	*BLQ(**LOQ-0.3)	*BLQ(**LOQ-0.3)	*BLQ(**LOQ-0.3)	*BLQ(**LOQ-0.3)	*BLQ(**LOQ-0.3)	*BLQ(**LOQ-0.3)
20	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
21	Chloramines as Cl2	mg/L	*BLQ(**LOQ-0.1)	*BLQ(**LOQ-0.1)	*BLQ(**LOQ-0.1)	*BLQ(**LOQ-0.1)	*BLQ(**LOQ-0.1)	*BLQ(**LOQ-0.1)
22	Cyanide	mg/L	*BLQ(**LOQ-0.02)	*BLQ(**LOQ-0.02)	*BLQ(**LOQ-0.02)	*BLQ(**LOQ-0.02)	*BLQ(**LOQ-0.02)	*BLQ(**LOQ-0.02)
23	Aluminum (Al)	mg/L	*BLQ(**LOQ-0.02)	*BLQ(**LOQ-0.02)	*BLQ(**LOQ-0.02)	*BLQ(**LOQ-0.02)	*BLQ(**LOQ-0.02)	*BLQ(**LOQ-0.02)
24	Arsenic (As)	mg/L	*BLQ(**LOQ-0.005)	*BLQ(**LOQ-0.005)	*BLQ(**LOQ-0.005)	*BLQ(**LOQ-0.005)	*BLQ(**LOQ-0.005)	*BLQ(**LOQ-0.005)
25	Barium as Ba	mg/L	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)

Annexure-I

26	Boron (B)	mg/L	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)
27	Cadmium (Cd)	mg/L	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)
28	Copper (Cu)	mg/L	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)
29	Lead (Pb)	mg/L	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)
30	Manganese (Mn)	mg/L	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)
31	Mercury (Hg)	mg/L	*BLQ(**LOQ-0.0005)	*BLQ(**LOQ-0.0005)	*BLQ(**LOQ-0.0005)	*BLQ(**LOQ-0.0005)	*BLQ(**LOQ-0.0005)	*BLQ(**LOQ-0.0005)
32	Selenium (Se)	mg/L	*BLQ(**LOQ-0.001)	*BLQ(**LOQ-0.001)	*BLQ(**LOQ-0.001)	*BLQ(**LOQ-0.001)	*BLQ(**LOQ-0.001)	*BLQ(**LOQ-0.001)
33	Molybdenum as Mo	mg/L	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)
34	Total Chromium Cr	mg/L	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)
35	Nickel as (Ni)	mg/L	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)
36	Silver (Ag)	mg/L	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)
37	Anionic Detergent	mg/L	*BLQ(**LOQ-0.05)	*BLQ(**LOQ-0.05)	*BLQ(**LOQ-0.05)	*BLQ(**LOQ-0.05)	*BLQ(**LOQ-0.05)	*BLQ(**LOQ-0.05)
38.1	Naphthalene	µg/L	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)
38.2	1-Methylnapthalene	µg/L	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)
38.3	2-Methylnapthalene	µg/L	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)
38.4	Acenaphthylene	µg/L	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)
38.5	Acenaphthene	µg/L	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)
38.6	Fluorene	µg/L	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)
38.7	Phenanthrene	µg/L	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)
38.8	Anthracene	µg/L	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)
38.9	Fluoranthene	µg/L	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)
38.10	Pyrene	µg/L	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)
38.11	Benzo(a) anthracene	µg/L	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)
38.12	Chrysene	µg/L	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)
38.13	Benzo (b) fluoranthene	µg/L	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)
38.14	Benzo(K) fluoranthene	µg/L	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)
38.15	Benzo(a)pyrene	µg/L	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)
38.16	Dibenzo(a,h)anthracene	µg/L	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)

Annexure-I

38.17	Benzo (g,h,i)perylene	µg/L	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)
38.18	Indenol(1,2,3-cd)pyrene	µg/L	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)	*BLQ(**LOQ-0.00005)
39.1	E.Coli (MPN/100 ml)	MPN/100ml	Absent	Absent	Absent	Absent	Absent	Absent
39.2	Total Coliform	MPN/100ml	Absent	Absent	Absent	Absent	Absent	Absent

Annexure-I

Mahan Energen Limited

Surface Water Quality Monitoring Results

(October-2023 to March-2024)

Month			November- 2023		February- 2024
Date of Sampling			09.11.2023		16.02.2024
S. NO.	Parameters	Unit	Nr. Gate No. 1	Nr. Gate No. 3	Rampa Mayar River
1	pH @ 25 °C	-	7.54	7.12	7.16
2	Turbidity	NTU	*BLQ(**LOQ-1.0)	*BLQ(**LOQ-1.0)	3.0
3	Total Dissolved Solids @ 180 ^{0}C	mg/L	248.00	144.00	510.0
4	Total Hardness as $CaCO_3$	mg/L	189.00	98.00	145.02
5	Alkalinity as $CaCO_3$	mg/L	156.12	71.42	240.23
6	Calcium as Ca	mg/L	59.00	9.21	20.13
7	Magnesium (Mg)	mg/L	10.16	18.23	23.03
8	Sulphate	mg/L	38.00	8.56	29.45
9	Nitrate	mg/L	16.78	*BLQ(**LOQ-0.01)	6.95
10	Iron	mg/L	0.02	0.026	0.19
11	Fluoride	mg/L	0.29	0.18	0.31
12	Sulphide	mg/L	*BLQ(**LOQ-0.02)	*BLQ(**LOQ-0.02)	*BLQ(**LOQ-0.02)
13	Zinc (Zn)	mg/L	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	0.27
14	Chloride	mg/L	62.0	17.65	98.26
15	Residual Chlorine	mg/L	*BLQ(**LOQ-0.15)	*BLQ(**LOQ-0.15)	*BLQ(**LOQ-0.15)
16	Colour	Hazen	*BLQ(**LOQ-0.1)	*BLQ(**LOQ-0.1)	*BLQ(**LOQ-5.0)
17	Odour	-	Unojectionable	Unojectionable	Agreeble
18	Mineral Oil	mg/L	*BLQ(**LOQ-0.1)	*BLQ(**LOQ-0.1)	*BLQ(**LOQ-0.1)
19	Ammonia	mg/L	*BLQ(**LOQ-0.3)	*BLQ(**LOQ-0.3)	*BLQ(**LOQ-0.3)
20	Taste	-	Unojectionable	Unojectionable	Agreeble
21	Chloramines as Cl2	mg/L	*BLQ(**LOQ-0.1)	*BLQ(**LOQ-0.1)	*BLQ(**LOQ-0.1)
22	Cyanide	mg/L	*BLQ(**LOQ-0.02)	*BLQ(**LOQ-0.02)	*BLQ(**LOQ-0.02)
23	Aluminum (Al)	mg/L	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.03)
24	Arsenic (As)	mg/L	*BLQ(**LOQ-0.005)	*BLQ(**LOQ-0.005)	*BLQ(**LOQ-0.005)
25	Barium as Ba	mg/L	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)
26	Boron (B)	mg/L	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.02)
27	Cadmium (Cd)	mg/L	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.02)
28	Copper (Cu)	mg/L	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.02)
29	Lead (Pb)	mg/L	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.05)
30	Manganese (Mn)	mg/L	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.05)
31	Mercury (Hg)	mg/L	*BLQ(**LOQ-0.0005)	*BLQ(**LOQ-0.0005)	*BLQ(**LOQ-0.001)
32	Selenium (Se)	mg/L	*BLQ(**LOQ-0.001)	*BLQ(**LOQ-0.001)	*BLQ(**LOQ-0.05)
33	Molybdenum as Mo	mg/L	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)
34	Total Chromium Cr	mg/L	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)
35	Nickel as (Ni)	mg/L	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)
36	Silver (Ag)	mg/L	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)	*BLQ(**LOQ-0.002)
37	Anionic Detergent	mg/L	*BLQ(**LOQ-0.05)	*BLQ(**LOQ-0.05)	*BLQ(**LOQ-0.05)
38	E.Coli (MPN/100 ml)	MPN/100ml	Absent	Absent	Absent
39	Total Coliform	MPN/100ml	Absent	Absent	Absent

Summary Sheet of Ambient Air Quality

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Approvals & Certifications

SUMMARY SHEET OF AMBIENT AIR QUALITY MONITORING – November – 2023

Name & Address of the Party: M/s Mahan Energen Limited
Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli,
Madhya Pradesh - 486886

Reporting Date: 07/12/2023

S. No.	Date of Sampling	Near Admin Buliding				Near Gate No. – 2				Near Gate No. – 3			
		Parameters & Results				Parameters & Results				Parameters & Results			
		PM10 ($\mu g/m^3$)	PM2.5 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	PM10 ($\mu g/m^3$)	PM2.5 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	PM10 ($\mu g/m^3$)	PM2.5 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)
1.	03/11/2023 To 04/11/2023	65.78	39.67	11.09	21.65	75.62	34.57	13.03	24.32	62.96	33.69	8.96	21.44
2.	06/11/2023 To 07/11/2023	69.73	44.92	13.76	19.94	70.82	42.76	14.65	21.74	64.18	36.42	10.34	17.57
3.	10/11/2023 To 11/11/2023	71.43	41.33	10.65	22.47	78.63	45.36	12.83	25.87	69.12	31.17	12.43	19.88
4.	18/11/2023 To 19/11/2023	76.98	37.75	12.78	19.55	79.03	42.18	12.91	24,12	59.88	35.74	9.30	22.63
5.	20/11/2023 To 21/11/2023	74.78	46.98	14.01	20.66	68.16	44.71	11.33	19.54	67.09	29.18	11.24	21.71
6.	24/11/2023 To 25/11/2023	69.71	40.23	12.98	23.14	73.87	37.92	14.07	23.07	60.15	32.94	13.27	19.27
7.	27/11/2023 To 28/11/2023	73.54	38.65	10.77	22.33	69.09	39.99	16.88	26.72	59.34	37.75	12.77	18.29
8.	29/11/2023 To 30/11/2023	70.83	42.42	15.23	19.08	76.29	46.13	12.14	21.63	61.83	31.87	14.25	23.02
9.	Maximum	76.98	46.98	15.23	23.14	79.03	46.13	16.88	26.72	69.12	37.75	14.25	23.02
10.	Minimum	65.78	37.75	10.65	19.08	68.16	34.57	11.33	19.54	59.34	29.18	8.96	17.57
11.	Average	71.60	41.49	12.87	21.10	73.94	41.70	13.48	23.27	63.07	33.60	11.57	20.48
12.	Limits As Per CPCB	100	60	80	80	100	60	80	80	100	60	80	80

Note:- CPCB: Central Pollution Control Board.

VARDAN ENVIROLAB (Authorised Signatory) Dr. Shiv Prakash Singh

Vardan Envirolab ®

Approvals & Certifications

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SUMMARY SHEET OF QUARTERLY AMBIENT AIR QUALITY MONITORING – November – 2023

Name & Address of the Party: M/s Mahan Energen Limited
Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli,
Madhya Pradesh - 486886

Reporting Date: 07/12/2023

S. No.	Date of Sampling	Locations	Parameters & Results								
			CO (mg/m³)	NH_3 (µg/m³)	Pb (µg/m³)	C_6H_6 (µg/m³)	B(a)P (ng/m³)	O_3 (µg/m³)	As (ng/m³)	Ni (ng/m³)	Hg (ng/m³)
1.	03/11/2023 To 04/11/2023	Near Admin Buliding	0.53	BLQ(LOQ-20.0)	BLQ(LOQ-0.1)	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ-2.0)	BLQ(LOQ-0.1)	BLQ(LOQ-5.0)	BLQ(LOQ-1.0)
2.	10/11/2023 To 11/11/2023	Near Gate No. – 2	0.57	28.76	BLQ(LOQ-0.1)	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	13.09	BLQ(LOQ-0.1)	BLQ(LOQ-5.0)	BLQ(LOQ-1.0)
3.	27/11/2023 To 28/11/2023	Near Gate No. – 3	0.66	BLQ(LOQ-20.0)	BLQ(LOQ-0.1)	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ-2.0)	BLQ(LOQ-0.1)	BLQ(LOQ-5.0)	BLQ(LOQ-1.0)
4.	Limits As Per CPCB		4	400	1	5	1	180	6	20	-

Note:- CPCB: Central Pollution Control Board.

VARDAN ENVIROLAB
Authorised Signatory

Vardan Envirolab ®

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Approvals & Certifications

SUMMARY SHEET OF AMBIENT AIR QUALITY MONITORING – December - 2023

Name & Address of the Party: M/s Mahan Energen Limited
Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli,
Madhya Pradesh - 486886

Reporting Date: 06/01/2024

S. No.	Date of Sampling	Near Admin Buliding				Near Gate No. – 2				Near Gate No. – 3			
		Parameters & Results				Parameters & Results				Parameters & Results			
		PM10 ($\mu g/m^3$)	PM2.5 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	PM10 ($\mu g/m^3$)	PM2.5 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	PM10 ($\mu g/m^3$)	PM2.5 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)
1.	01/12/2023 To 02/12/2023	77.45	35.76	10.54	22.17	68.09	31.76	15.87	24.23	57.97	36.61	11.78	19.15
2.	04/12/2023 To 05/12/2023	71.61	32.32	12.64	24.76	67.86	35.76	14.31	26.96	53.97	32.23	12.76	21.97
3.	08/12/2023 To 09/12/2023	68.24	37.88	9.15	23.78	72.65	40.85	16.97	25.32	62.62	30.87	9.67	22.43
4.	11/12/2023 To 12/12/2023	72.31	34.65	12.43	21.93	66.91	37.76	13.12	28.77	68.23	34.88	14.62	18.12
5.	15/12/2023 To 16/12/2023	67.58	39.75	13.24	24.98	67.43	35.33	12.93	23.21	59.44	37.45	12.76	23.26
6.	18/12/2023 To 19/12/2023	72.38	40.42	11.53	19.76	73.76	31.76	13.76	25.15	61.51	35.23	11.54	19.24
7.	22/12/2023 To 23/12/2023	81.54	42.41	9.89	20.54	67.82	34.77	11.98	23.91	58.59	37.55	13.15	24.65
8.	25/12/2023 To 26/12/2023	76.87	38.66	14.65	18.35	72.45	36.98	13.23	25.43	66.43	32.12	8.57	21.15
9.	29/12/2023 To 30/12/2023	74.66	41.21	16.43	23.48	66.97	40.65	14.75	22.63	68.94	35.75	13.06	19.33
10.	Maximum	81.54	42.41	16.43	24.98	73.76	40.85	16.97	28.77	68.94	37.55	14.62	24.65
11.	Minimum	67.58	32.32	9.15	18.35	66.91	31.76	11.98	22.63	53.97	30.87	8.57	18.12
12.	Average	73.63	38.12	12.28	22.19	69.33	36.18	14.10	25.07	61.97	34.74	11.99	21.03
13.	Limits As Per CPCB	100	60	80	80	100	60	80	80	100	60	80	80

Note:- CPCB: Central Pollution Control Board.

(Approved By)

VARDAN ENVIROLAB * Dr Shiv Prakash Singh Authorised Signatory

Vardan Envirolab ®

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Approvals & Certifications

SUMMARY SHEET OF AMBIENT AIR QUALITY MONITORING – January - 2024

Name & Address of the Party: M/s Mahan Energen Limited
Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli,
Madhya Pradesh - 486886

Reporting Date: 05/02/2024

S. No.	Date of Sampling	Near Admin Buliding				Near Gate No. – 2				Near Gate No. – 3			
		Parameters & Results				Parameters & Results				Parameters & Results			
		PM10 ($\mu g/m^3$)	PM2.5 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	PM10 ($\mu g/m^3$)	PM2.5 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	PM10 ($\mu g/m^3$)	PM2.5 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)
1.	02/01/2024 To 03/01/2024	76.45	38.52	14.76	22.87	67.93	44.82	11.76	25.32	63.95	35.29	12.06	23.64
2.	05/01/2023 To 06/01/2024	74.98	37.97	16.77	20.15	64.27	41.66	13.85	22.64	66.68	37.42	14.34	21.57
3.	08/01/2024 To 09/01/2024	68.32	42.45	13.12	23.91	68.88	38.72	16.13	26.07	61.52	34.37	13.93	23.38
4.	12/01/2024 To 13/01/2024	69.54	41.54	14.79	24.33	65.34	38.98	13.94	23.72	58.87	38.84	12.03	20.62
5.	16/01/2024 To 17/01/2024	71.65	43.76	12.98	25.87	71.62	42.64	14.63	20.54	66.79	33.28	14.34	22.78
6.	19/01/2024 To 20/01/2024	73.34	40.53	16.72	22.54	69.72	44.86	15.27	24.77	62.15	36.04	15.57	23.57
7.	22/01/2024 To 23/01/2024	69.85	39.31	15.23	25.65	67.67	39.19	17.18	21.68	58.24	36.76	14.89	24.29
8.	26/01/2024 To 27/01/2024	73.83	42.47	14.56	21.66	75.59	43.23	13.74	26.33	62.73	32.81	13.15	22.45
9.	29/01/2024 To 30/01/2024	75.23	43.42	15.51	22.67	72.23	41.23	14.45	23.31	61.53	34.44	12.45	24.45
10.	Maximum	76.45	43.76	16.77	25.87	75.59	44.86	17.18	26.33	66.79	38.84	15.57	24.45
11.	Minimum	68.32	37.97	12.98	20.15	64.27	38.72	11.76	20.54	58.24	32.81	12.06	20.62
12.	Average	72.58	41.11	14.94	23.29	69.25	41.70	14.55	23.82	62.50	35.47	13.67	22.97
13.	Limits As Per CPCB	100	60	80	80	100	60	80	80	100	60	80	80

Note:- CPCB: Central Pollution Control Board.

(Approved By)

VARDAN ENVIROLAB Dr. Shalini Bhandari

Vardan Envirolab ®

Approvals & Certifications
Laboratory: Plot No. 82A, Sector -5, IMT Manesar, Gurugram - 122051, Haryana
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SUMMARY SHEET OF AMBIENT AIR QUALITY MONITORING– February – 2024

Name & Address of the Party: M/s Mahan Energen Limited
Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli,
Madhya Pradesh - 486886

Reporting Date: 05/03/2024

S. No.	Date of Sampling	Near Admin Buliding				Near Gate No. – 2				Near Gate No. – 3			
		Parameters & Results				Parameters & Results				Parameters & Results			
		PM10 (µg/m³)	PM2.5 (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)	PM10 (µg/m³)	PM2.5 (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)	PM10 (µg/m³)	PM2.5 (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
1	02/02/2024 To 03/02/2024	75.98	36.72	15.76	24.64	68.15	46.98	12.67	24.67	64.88	36.66	14.37	19.54
2	05/02/2023 To 06/02/2023	71.33	38.16	14.81	19.23	70.63	43.74	14.89	22.23	67.23	34.67	12.32	23.21
3	09/02/2024 To 10/02/2024	73.42	40.21	10.67	21.65	66.48	39.71	15.79	26.76	62.78	34.37	16.75	20.66
4	12/02/2024 To 13/02/2024	76.89	38.67	16.32	22.89	71.73	43.67	12.64	24.34	71.56	37.89	13.35	22.54
5	16/02/2024 To 17/02/2024	68.01	36.98	14.82	23.74	73.86	42.64	14.45	22.98	63.78	41.28	14.76	24.27
6	19/02/2024 To 20/02/2024	67.98	39.23	13.45	25.08	75.78	42.67	16.93	23.67	59.98	39.87	13.65	19.63
7	23/02/2024 To 24/02/2024	73.71	37.28	14.72	26.65	71.93	40.39	16.94	22.44	58.87	43.77	12.87	24.44
8	26/02/2024 To 27/02/2024	79.36	41.44	13.28	23.76	73.04	42.78	14.67	25.65	64.65	45.76	10.65	22.18
9	28/02/2024 To 29/02/2024	73.09	44.78	15.63	20.54	76.81	40.69	13.43	19.98	60.76	42.38	14.76	25.63
10	Minimum	67.98	36.72	10.67	19.23	66.48	39.71	12.64	19.98	58.87	34.37	10.65	19.54
11	Maximum	79.36	44.78	16.32	26.65	76.81	46.98	16.94	26.76	71.56	45.76	16.75	25.63
12	Average	73.31	39.27	14.38	23.13	72.05	42.59	14.71	23.64	63.83	39.63	13.72	22.46
13	Limits As Per CPCB	100	60	80	80	100	60	80	80	100	60	80	80

Note:- CPCB: Central Pollution Control Board.

VARDAN ENVIROLAB
(Authorised Signatory)

Vardan Envirolab

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Approvals & Certifications

SUMMARY SHEET OF QUARTERLY AMBIENT AIR QUALITY MONITORING – February – 2024

Name & Address of the Party: M/s Mahan Energen Limited
Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli,
Madhya Pradesh - 486886

Reporting Date: 05/03/2023

S. No.	Date of Sampling	Locations	Parameters & Results								
			CO (mg/m^3)	NH_3 ($\mu g/m^3$)	Pb ($\mu g/m^3$)	C_6H_6 ($\mu g/m^3$)	B(a)P (ng/m^3)	O_3 ($\mu g/m^3$)	As (ng/m^3)	Ni (ng/m^3)	Hg (ng/m^3)
1.	28/02/2024 To 29/02/2024	Near Admin Buliding	0.62	21.67	BLQ(LOQ-0.1)	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ-2.0)	BLQ(LOQ-0.1)	BLQ(LOQ-5.0)	BLQ(LOQ-1.0)
2.	28/02/2024 To 29/02/2024	Near Gate No. – 2	0.59	17.13	BLQ(LOQ-0.1)	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ-2.0)	BLQ(LOQ-0.1)	BLQ(LOQ-5.0)	BLQ(LOQ-1.0)
3.	28/02/2024 To 29/02/2024	Near Gate No. – 3	0.54	12.64	BLQ(LOQ-0.1)	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ-2.0)	BLQ(LOQ-0.1)	BLQ(LOQ-5.0)	BLQ(LOQ-1.0)
4.	Limits As Per CPCB		4	400	1	5	1	180	6	20	-

Note:- CPCB: Central Pollution Control Board.

VARDAN ENVIROLAB * Dr Shiv Prakash Approved Signatory 05/03/2024

Vardan Envirolab ®

SUMMARY SHEET OF AMBIENT AIR QUALITY MONITORING : MARCH 2024

Name & Address of the Party: M/s Mahan Energen Limited
Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singranli,
Madhya Pradesh - 486886

Reporting Date: 05/04/2024

S. No.	Date of Sampling	Near Admin Buliding				Near Gate No. – 2				Near Gate No. – 3			
		Parameters & Results				Parameters & Results				Parameters & Results			
		PM10 (µg/m³)	PM2.5 (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)	PM10 (µg/m³)	PM2.5 (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)	PM10 (µg/m³)	PM2.5 (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
1.	02/03/2024 To 03/03/2024	63.67	39.87	13.06	22.36	76.53	35.16	12.08	25.54	78.48	38.67	12.08	22.34
2.	04/03/2024 To 05/03/2024	65.23	35.42	11.76	24.54	71.32	41.53	13.77	22.76	80.87	43.74	14.04	18.42
3.	08/03/2024 To 09/03/2024	68.56	37.78	15.98	20.43	77.84	46.12	10.96	24.34	76.54	42.17	11.14	23.06
4.	11/03/2024 To 12/03/2024	61.78	34.76	12.32	21.84	78.54	40.17	14.46	23.83	81.39	38.54	14.76	22.34
5.	15/03/2024 To 16/03/2024	66.98	40.64	11.43	22.87	69.18	45.17	12.87	20.09	77.54	45.34	13.84	24.02
6.	18/03/2024 To 19/03/2024	64.54	39.94	14.76	20.32	74.42	36.75	13.98	22.87	79.44	41.25	15.34	21.78
7.	22/03/2024 To 23/03/2024	70.43	36.87	13.09	19.67	68.17	38.86	15.94	25.78	75.23	38.72	11.54	20.46
8.	26/03/2024 To 27/03/2024	64.85	42.65	12.87	23.85	76.84	39.96	14.64	24.89	78.55	39.18	16.84	19.46
9.	29/03/2024 To 30/03/2024	67.23	35.98	13.56	24.78	79.65	45.65	15.32	26.06	76.37	43.32	14.42	24.32
10.	Maximum	70.43	42.65	15.98	24.78	79.65	46.12	15.94	26.06	81.39	45.34	16.84	24.32
11.	Minimum	61.78	34.76	11.43	19.67	68.17	35.16	10.96	20.09	75.23	38.54	11.14	18.42
12.	Average	65.92	38.21	13.20	22.30	74.72	41.04	13.78	24.02	78.27	41.21	13.78	21.80
13.	Limits As Per NAAQS	100	60	80	80	100	60	80	80	100	60	80	80

Note:- NAAQS : National Ambient Air Quality Standards.

(Approved by)
VARDAN ENVIROLAB
Authorised Signatory
02/04/2024

Vardan Envirolab

Approvals & Certifications
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www.vardan.co.in

Test Reports of Stack Emission Monitoring

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

Test Report

Sample Number:	VEL/S/01	Report No.:	VEL/AP/2310100066
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh - 486886	Format No.:	7.8 F-03
		Party Reference No.:	5703009832 Date : 14/06/2023
		Reporting Date:	14/10/2023
		Period of Analysis:	10/10/2023 - 14/10/2023
		Receipt Date:	10/10/2023
		Page No.:	1 of 1

Sample Description: STACK EMISSION MONITORING

General Information

Sampling Location	:	Boiler Unit -01
Sample Collected By	:	VEL Representative (Mr. Amit Pandey)
Sampling Instrument Used	:	Stack Monitoring Kit
Instrument Code	:	VEL/INS/ENV/SMK/04
Instrument Calibration Status	:	Calibrated
Date of Monitoring	:	05/10/2023
Meteorological Condition During Monitoring	:	Clear Sky
Stack Attached To	:	Boiler Unit -01
Stack Diameter (m)	:	6.9
Stack Height (m)	:	275
Plant Load (MWh)	:	311
Make of Stack	:	MS
Sampling Duration (Minutes)	:	41.66
Ambient Temperature - Ta (°C)	:	36.0
Temperature of Stack Gases - Ts (°C)	:	119.0
Velocity of Stack Gases (m/sec.)	:	24.71
Flow Rate of PM (LPM)	:	30.0
Flow Rate of Gas (LPM)	:	2.0
Sampling Condition	:	Isokinetic
Sampling & Analysis Protocol	:	CPCB Guidelines & IS: 11255
Parameter Required	:	As Per Work Order

S. No.	Parameters	Test Method	Results	Units	Limits As Per CPCB
1.	Particulate Matter (as PM)	IS: 11255 (P-1)	40.68	mg/Nm^3	50
2.	Sulphur Dioxide (as SO_2)	IS: 11255 (P-2)	823.00	mg/Nm^3	200
3.	Oxides of Nitrogen (as NO_X)	IS: 11255 (P-7)	289.00	mg/Nm^3	450
4.	Mercury (as Hg)	VEL/ENV/STP/144, Issue No.- 01, Issue Date : 01/11/2021	BLQ(LOQ-0.005)	mg/Nm^3	0.03

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

End of Report

VARDAN ENVIROLAB (Reviewed By)

VARDAN ENVIROLAB Dr. Deepika Mehta (Authorized Signatory) Authorized Signatory

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VEL/E-03/1/TR/PN661.81

Test Report

Sample Number:	VEL/S/02	Report No.:	VEL/AP/2310100067
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh - 486886	Format No.:	7.8 F-03
		Party Reference No.:	5703009832 Date : 14/06/2023
		Reporting Date:	14/10/2023
		Period of Analysis:	10/10/2023 - 14/10/2023
		Receipt Date:	10/10/2023
		Page No.:	1 of 1

Sample Description: STACK EMISSION MONITORING

General Information		
Sampling Location	:	Boiler Unit -02
Sample Collected By	:	VEL Representative (Mr. Amit Pandey)
Sampling Instrument Used	:	Stack Monitoring Kit
Instrument Code	:	VEL/INS/ENV/SMK/04
Instrument Calibration Status	:	Calibrated
Date of Monitoring	:	05/10/2023
Meteorological Condition During Monitoring	:	Clear Sky
Stack Attached To	:	Boiler Unit -02
Stack Diameter (m)	:	6.9
Stack Height (m)	:	275
Plant Load (MWh)	:	563
Make of Stack	:	MS
Sampling Duration (Minutes)	:	100.0
Ambient Temperature - Ta (°C)	:	39.0
Temperature of Stack Gases - Ts (°C)	:	130.0
Velocity of Stack Gases (m/sec.)	:	27.32
Flow Rate of PM (LPM)	:	10.0
Flow Rate of Gas (LPM)	:	2.0
Sampling Condition	:	Isokinetic
Sampling & Analysis Protocol	:	CPCB Guidelines & IS: 11255
Parameter Required	:	As Per Work Order

S. No.	Parameters	Test Method	Results	Units	Limits As Per CPCB
1.	Particulate Matter (as PM)	IS: 11255 (P-1)	43.07	mg/Nm^3	50
2.	Sulphur Dioxide (as SO_2)	IS: 11255 (P-2)	911.00	mg/Nm^3	200
3.	Oxides of Nitrogen (as NO_X)	IS: 11255 (P-7)	274.00	mg/Nm^3	450
4.	Mercury (as Hg)	VEL/ENV/STP/144, Issue No.- 01, Issue Date : 01/11/2021	BLQ(LOQ-0.005)	mg/Nm^3	0.03

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

End of Report

(Reviewed By) (Authorized Signatory)

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VEL/E-03/I/TR/P.N66191

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

Test Report

Sample Number:	VEL/S/01	Report No.:	VEL/AP/2311300019
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh - 486886	Format No.:	7.8 F-03
		Party Reference No.:	5703009832 Date : 14/06/2023
		Reporting Date:	04/12/2023
		Period of Analysis:	30/11/2023 - 04/12/2023
		Receipt Date:	30/11/2023
		Page No.:	1 of 1
Sample Description:	STACK EMISSION MONITORING		

General Information

Sampling Location	:	Boiler Unit -01
Sample Collected By	:	VEL Representative (Mr. Amit Pandey)
Sampling Instrument Used	:	Stack Monitoring Kit
Instrument Code	:	VEL/INS/ENV/SMK/04
Instrument Calibration Status	:	Calibrated
Date of Monitoring	:	25/11/2023
Meteorological Condition During Monitoring	:	Clear Sky
Stack Attached To	:	Boiler Unit -01
Stack Diameter (m)	:	6.9
Stack Height (m)	:	275
Plant Load (MWh)	:	600
Make of Stack	:	MS
Sampling Duration (Minutes)	:	36.45
Ambient Temperature - Ta (°C)	:	31.0
Temperature of Stack Gases - Ts (°C)	:	131.0
Velocity of Stack Gases (m/sec.)	:	28.46
Flow Rate of PM (LPM)	:	28.0
Flow Rate of Gas (LPM)	:	2.0
Sampling Condition	:	Isokinetic
Sampling & Analysis Protocol	:	CPCB Guidelines & IS: 11255
Parameter Required	:	As Per Work Order

S. No.	Parameters	Test Method	Results	Units	Limits As Per CPCB
1.	Particulate Matter (as PM)	IS: 11255 (P-1)	37.63	mg/Nm^3	50
2.	Sulphur Dioxide (as SO_2)	IS: 11255 (P-2)	721.14	mg/Nm^3	200
3.	Oxides of Nitrogen (as NO_X)	IS: 11255 (P-7)	262.00	mg/Nm^3	450
4.	Mercury (as Hg)	VEL/ENV/STP/144, Issue No.- 01, Issue Date : 01/11/2021	BLQ(LOQ-0.005)	mg/Nm^3	0.03

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

End of Report

VARDAN ENVIROLAB * Amitabh Kumar Dhiman * Technical Manager

(Reviewed By)

(Authorized Signatory)

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Vardan EnviroLab

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

Test Report

Sample Number:	VEL/S/02	Report No.:	VEL/AP/2311300020
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh - 486886	Format No.:	7.8 F-03
		Party Reference No.:	5703009832 Date : 14/06/2023
		Reporting Date:	04/12/2023
		Period of Analysis:	30/11/2023 - 04/12/2023
		Receipt Date:	30/11/2023
		Page No.:	1 of 1
Sample Description:	STACK EMISSION MONITORING		

General Information

Sampling Location	:	Boiler Unit -02
Sample Collected By	:	VEL Representative (Mr. Amit Pandey)
Sampling Instrument Used	:	Stack Monitoring Kit
Instrument Code	:	VEL/INS/ENV/SMK/04
Instrument Calibration Status	:	Calibrated
Date of Monitoring	:	25/11/2023
Meteorological Condition During Monitoring	:	Clear Sky
Stack Attached To	:	Boiler Unit -02
Stack Diameter (m)	:	6.9
Stack Height (m)	:	275
Plant Load (MWh)	:	595
Make of Stack	:	MS
Sampling Duration (Minutes)	:	108.0
Ambient Temperature - Ta (°C)	:	31.0
Temperature of Stack Gases - Ts (°C)	:	129.0
Velocity of Stack Gases (m/sec.)	:	27.41
Flow Rate of PM (LPM)	:	13.0
Flow Rate of Gas (LPM)	:	2.0
Sampling Condition	:	Isokinetic
Sampling & Analysis Protocol	:	CPCB Guidelines & IS: 11255
Parameter Required	:	As Per Work Order

S. No.	Parameters	Test Method	Results	Units	Limits As Per CPCB
1.	Particulate Matter (as PM)	IS: 11255 (P-1)	45.25	mg/Nm^3	50
2.	Sulphur Dioxide (as SO_2)	IS: 11255 (P-2)	891.00	mg/Nm^3	200
3.	Oxides of Nitrogen (as NO_X)	IS: 11255 (P-7)	283.00	mg/Nm^3	450
4.	Mercury (as Hg)	VEL/ENV/STP/144, Issue No.- 01, Issue Date : 01/11/2021	BLQ(LOQ-0.005)	mg/Nm^3	0.03

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

End of Report

VARDAN ENVIROLAB Amitabh Kumar Jha

(Reviewed By)

VARDAN ENVIROLAB Authorised Signatory 04/12/2023 Singh

(Authorized Signatory)

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Vardan EnviroLab

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

Test Report

Sample Number:	VEL/AP/01	**Report No.:**	VEL/AP/2312260001
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh – 486886	**Format No.:**	7.8 F-03
		Party Reference No.:	5703009832 Date : 14/06/2023
		Reporting Date:	30/12/2023
		Period of Analysis:	26/12/2023 - 30/12/2023
		Receipt Date:	26/12/2023
		Page No.:	1 of 1
Sample Description:	STACK EMISSION MONITORING		

General Information

Sampling Location	: Boiler Unit -01
Sample Collected By	: VEL Representative (Mr. Amit Pandey)
Sampling Instrument Used	: Stack Monitoring Kit
Instrument Code	: VEL/INS/ENV/SMK/04
Instrument Calibration Status	: Calibrated
Date of Monitoring	: 21/12/2023
Meteorological Condition During Monitoring	: Clear Sky
Stack Attached To	: Boiler Unit -01
Stack Diameter (m)	: 6.9
Stack Height (m)	: 275
Plant Load (MW/h)	: 590
Make of Stack	: MS
Sampling Duration (Minutes)	: 40.31
Ambient Temperature - Ta (°C)	: 26.0
Temperature of Stack Gases - Ts (°C)	: 128.0
Velocity of Stack Gases (m/sec.)	: 25.27
Flow Rate of PM (LPM)	: 28.0
Flow Rate of Gas (LPM)	: 2.0
Sampling Condition	: Isokinetic
Sampling & Analysis Protocol	: CPCB Guidelines &IS: 11255
Parameter Required	: As Per Work Order

S. No.	Parameters	Test Method	Results	Units	Limits As Per CPCB
1.	Particulate Matter (as PM)	IS: 11255 (P-1)	41.54	mg/Nm^3	50
2.	Sulphur Dioxide (as SO_2)	IS: 11255 (P-2)	788.72	mg/Nm^3	200
3.	Oxides of Nitrogen (as NO_X)	IS: 11255 (P-7)	243.00	mg/Nm^3	450
4.	Mercury (as Hg)	VEL/ENV/STP/144, Issue No.- 01, Issue Date : 01/11/2021	BLQ(LOQ-0.005)	mg/Nm^3	0.03

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

End of Report

Amitabh Kumar Bubey
Technical Manager
(Reviewed By)

VARDAN ENVIROLAB
Dr Shiv Prakash Singh
Authorised Signatory
(Authorized Signatory)

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

Test Report

Sample Number:	VEL/AP/02	**Report No.:**	VEL/AP/2312260002
Name & Address of the Party:	M/s Mahau Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh - 486886	**Format No.:**	7.8 F-03
		Party Reference No.:	5703009832 Date : 14/06/2023
		Reporting Date:	30/12/2023
		Period of Analysis:	26/12/2023 - 30/12/2023
		Receipt Date:	26/12/2023
		Page No.:	1 of 1
Sample Description:	STACK EMISSION MONITORING		

General Information

Sampling Location	: Boiler Unit -02
Sample Collected By	: VEL Representative (Mr. Amit Pandey)
Sampling Instrument Used	: Stack Monitoring Kit
Instrument Code	: VEL/INS/ENV/SMK/04
Instrument Calibration Status	: Calibrated
Date of Monitoring	: 21/12/2023
Meteorological Condition During Monitoring	: Clear Sky
Stack Attached To	: Boiler Unit -02
Stack Diameter (m)	: 6.9
Stack Height (m)	: 275
Plant Load (MW/h)	: 595
Make of Stack	: MS
Sampling Duration (Minutes)	: 40.0
Ambient Temperature - Ta (°C)	: 29.0
Temperature of Stack Gases - Ts (°C)	: 130.0
Velocity of Stack Gases (m/sec.)	: 26.37
Flow Rate of PM (LPM)	: 25.0
Flow Rate of Gas (LPM)	: 2.0
Sampling Coudition	: Isokinetic
Sampling & Analysis Protocol	: CPCB Guidelines &IS: 11255
Parameter Required	: As Per Work Order

S. No.	Parameters	Test Method	Results	Units	Limits As Per CPCB
1.	Particulate Matter (as PM)	IS: 11255 (P-1)	44.05	mg/Nm^3	50
2.	Sulphur Dioxide (as SO_2)	IS: 11255 (P-2)	824.00	mg/Nm^3	200
3.	Oxides of Nitrogen (as NO_X)	IS: 11255 (P-7)	276.14	mg/Nm^3	450
4.	Mercury (as Hg)	VEL/ENV/STP/144, Issue No.- 01, Issue Date : 01/11/2021	BLQ(LOQ-0.005)	mg/Nm^3	0.03

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

End of Report

VARDAN ENVIROLAB Amitabh Kumar Technical Manager
(Reviewed By)

VARDAN ENVIROLAB Dr Shiv Prakash Authorised Signatory
(Authorized Signatory)

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

Sample Number:	VEL/AP/01	**Report No.:**	VEL/AP/2401220001
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh – 486886	**Format No.:** **Party Reference No.:**	7.8 F-03 5703009832 Date : 14/06/2023
		Reporting Date:	27/01/2024
		Period of Analysis:	22/01/2024 - 27/01/2024
		Receipt Date:	22/01/2024
		Page No.:	1 of 1
Sample Description:	STACK EMISSION MONITORING		

General Information

Sampling Location	: Boiler Unit -01
Sample Collected By	: VEL Representative (Mr. Amit Pandey)
Sampling Instrument Used	: Stack Monitoring Kit
Instrument Code	: VEL/INS/ENV/SMK/04
Instrument Calibration Status	: Calibrated
Date of Monitoring	: 19/01/2024
Meteorological Condition During Monitoring	: Clear Sky
Stack Attached To	: Boiler Unit -01
Stack Diameter (m)	: 6.9
Stack Height (m)	: 275
Plant Load (MW/h)	: 599
Make of Stack	: MS
Sampling Duration (Minutes)	: 40.56
Ambient Temperature - Ta (°C)	: 25.0
Temperature of Stack Gases - Ts (°C)	: 127.0
Velocity of Stack Gases (m/sec.)	: 25.33
Flow Rate of PM (LPM)	: 30.0
Flow Rate of Gas (LPM)	: 2.0
Sampling Condition	: Isokinetic
Sampling & Analysis Protocol	: CPCB Guidelines &IS: 11255
Parameter Required	: As Per Work Order

S. No.	Parameters	Test Method	Results	Units	Limits As Per CPCB
1.	Particulate Matter (as PM)	IS: 11255 (P-1)	41.28	mg/Nm^3	50
2.	Sulphur Dioxide (as SO_2)	IS: 11255 (P-2)	768.65	mg/Nm^3	200
3.	Oxides of Nitrogen (as NO_X)	IS: 11255 (P-7)	244.23	mg/Nm^3	450
4.	Mercury (as Hg)	VEL/ENV/STP/144, Issue No.- 01, Issue Date : 01/11/2021	BLQ(LOQ-0.005)	mg/Nm^3	0.03

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

End of Report

VARDAN ENVIROLAB Amitabh Kumar Dubey Dy. Technical Manager
(Reviewed By)

VARDAN ENVIROLAB Dr Shiv Singh Authorised Signatory 27/01/2024
(Authorized Signatory)

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

Sample Number:	VEL/AP/02	**Report No.:**	VEL/AP/2401220002
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh - 486886	**Format No.:**	7.8 F-03
		Party Reference No.:	5703009832 Date : 14/06/2023
		Reporting Date:	27/01/2024
		Period of Analysis:	22/01/2024 - 27/01/2024
		Receipt Date:	22/01/2024
		Page No.:	1 of 1
Sample Description:	STACK EMISSION MONITORING		

General Information

Sampling Location	: Boiler Unit -02
Sample Collected By	: VEL Representative (Mr. Amit Pandey)
Sampling Instrument Used	: Stack Monitoring Kit
Instrument Code	: VEL/INS/ENV/SMK/04
Instrument Calibration Status	: Calibrated
Date of Monitoring	: 20/01/2024
Meteorological Condition During Monitoring	: Clear Sky
Stack Attached To	: Boiler Unit -02
Stack Diameter (m)	: 6.9
Stack Height (m)	: 275
Plant Load (MW/h)	: 599
Make of Stack	: MS
Sampling Duration (Minutes)	: 64.12
Ambient Temperature - Ta (°C)	: 27.0
Temperature of Stack Gases - Ts (°C)	: 129.0
Velocity of Stack Gases (m/sec.)	: 26.60
Flow Rate of PM (LPM)	: 28.0
Flow Rate of Gas (LPM)	: 2.0
Sampling Condition	: Isokinetic
Sampling & Analysis Protocol	: CPCB Guidelines &IS: 11255
Parameter Required	: As Per Work Order

S. No.	Parameters	Test Method	Results	Units	Limits As Per CPCB
1.	Particulate Matter (as PM)	IS: 11255 (P-1)	44.04	mg/Nm^3	50
2.	Sulphur Dioxide (as SO_2)	IS: 11255 (P-2)	813.45	mg/Nm^3	200
3.	Oxides of Nitrogen (as NO_X)	IS: 11255 (P-7)	277.30	mg/Nm^3	450
4.	Mercury (as Hg)	VEL/ENV/STP/144, Issue No.- 01, Issue Date : 01/11/2021	BLQ(LOQ-0.005)	mg/Nm^3	0.03

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

End of Report

VARDAN ENVIROLAB Technical Manager
(Reviewed By)

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Test Report

Sample Number:	VEL/AP/32	Report No.:	VEL/AP/2402230032
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh – 486886	Format No.:	7.8 F-03
		Party Reference No.:	5703009832 Date : 14/06/2023
		Reporting Date:	27/02/2024
		Period of Analysis:	23/02/2024 - 27/02/2024
		Receipt Date:	23/02/2024
		Page No.:	1 of 1
Sample Description:	STACK EMISSION MONITORING		

General Information

Sampling Location	: Boiler Unit -01
Sample Collected By	: VEL Representative (Mr. Amit Pandey)
Sampling Instrument Used	: Stack Monitoring Kit
Instrument Code	: VEL/INS/ENV/SMK/04
Instrument Calibration Status	: Calibrated
Date of Monitoring	: 19/02/2024
Meteorological Condition During Monitoring	: Clear Sky
Stack Attached To	: Boiler Unit -01
Stack Diameter (m)	: 6.9
Stack Height (m)	: 275
Plant Load (MW/h)	: 585
Make of Stack	: MS
Sampling Duration (Minutes)	: 40.56
Ambient Temperature - Ta (°C)	: 25.0
Temperature of Stack Gases - Ts (°C)	: 128.0
Velocity of Stack Gases (m/sec.)	: 25.85
Flow Rate of PM (LPM)	: 30.0
Flow Rate of Gas (LPM)	: 2.0
Sampling Condition	: Isokinetic
Sampling & Analysis Protocol	: CPCB Guidelines &IS: 11255
Parameter Required	: As Per Work Order

S. No.	Parameters	Test Method	Results	Units	Limits As Per CPCB
1.	Particulate Matter (as PM)	IS: 11255 (P-1)	40.93	mg/Nm^3	50
2.	Sulphur Dioxide (as SO_2)	IS: 11255 (P-2)	789.05	mg/Nm^3	200
3.	Oxides of Nitrogen (as NO_X)	IS: 11255 (P-7)	267.31	mg/Nm^3	450
4.	Mercury (as Hg)	VEL/ENV/STP/144, Issue No.- 01, Issue Date : 01/11/2021	BLQ(LOQ-0.005)	mg/Nm^3	0.03

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

End of Report

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(Reviewed By)

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Test Report

Sample Number:	VEL/AP/33	Report No.:	VEL/AP/2402230033
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh - 486886	Format No.:	7.8 F-03
		Party Reference No.:	5703009832 Date : 14/06/2023
		Reporting Date:	27/02/2024
		Period of Analysis:	23/02/2024 - 27/02/2024
		Receipt Date:	23/02/2024
		Page No.:	1 of 1
Sample Description:	STACK EMISSION MONITORING		

General Information	
Sampling Location	: Boiler Unit -02
Sample Collected By	: VEL Representative (Mr. Amit Pandey)
Sampling Instrument Used	: Stack Monitoring Kit
Instrument Code	: VEL/INS/ENV/SMK/04
Instrument Calibration Status	: Calibrated
Date of Monitoring	: 19/02/2024
Meteorological Condition During Monitoring	: Clear Sky
Stack Attached To	: Boiler Unit -02
Stack Diameter (m)	: 6.9
Stack Height (m)	: 275
Plant Load (MW/h)	: 590
Make of Stack	: MS
Sampling Duration (Minutes)	: 64.12
Ambient Temperature - Ta (°C)	: 27.0
Temperature of Stack Gases - Ts (°C)	: 130.0
Velocity of Stack Gases (m/sec.)	: 26.00
Flow Rate of PM (LPM)	: 28.0
Flow Rate of Gas (LPM)	: 2.0
Sampling Condition	: Isokinetic
Sampling & Analysis Protocol	: CPCB Guidelines &IS: 11255
Parameter Required	: As Per Work Order

S. No.	Parameters	Test Method	Results	Units	Limits As Per CPCB
1.	Particulate Matter (as PM)	IS: 11255 (P-1)	43.57	mg/Nm^3	50
2.	Sulphur Dioxide (as SO_2)	IS: 11255 (P-2)	845.23	mg/Nm^3	200
3.	Oxides of Nitrogen (as NO_X)	IS: 11255 (P-7)	281.50	mg/Nm^3	450
4.	Mercury (as Hg)	VEL/ENV/STP/144, Issue No.- 01, Issue Date : 01/11/2021	BLQ(LOQ-0,005)	mg/Nm^3	0.03

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

End of Report

VARDAN ENVIROLAB Pvt. Ltd. Technical Manager
(Reviewed By)

VARDAN ENVIROLAB Dr. Shiv Prakash Authorized Signatory
(Authorized Signatory)
27/02/2024

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Test Report

Sample Number:	VEL/AP/32	Report No.:	VEL/AP/2403270032
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh – 486886	Format No.:	7.8 F-03
		Party Reference No.:	5703009832 Date : 14/06/2023
		Reporting Date:	30/03/2024
		Period of Analysis:	27/03/2024 - 30/03/2024
		Receipt Date:	27/03/2024
		Page No.:	1 of 1
Sample Description:	STACK EMISSION MONITORING		

General Information

Sampling Location	: Boiler Unit - 01
Sample Collected By	: VEL Representative
Sampling Instrument Used	: Stack Monitoring Kit
Instrument Code	: VEL/INS/ENV/SMK/04
Instrument Calibration Status	: Calibrated
Date of Monitoring	: 22/03/2024
Meteorological Condition During Monitoring	: Clear Sky
Stack Attached To	: Boiler Unit - 01
Stack Diameter (m)	: 6.9
Stack Height (m)	: 275
Plant Load (MW/h)	: 590
Make of Stack	: MS
Sampling Duration (Minutes)	: 42.13
Ambient Temperature - Ta (°C)	: 28.0
Temperature of Stack Gases - Ts (°C)	: 129.0
Velocity of Stack Gases (m/sec.)	: 26.24
Flow Rate of PM (LPM)	: 30.0
Flow Rate of Gas (LPM)	: 2.0
Sampling Condition	: Isokinetic
Sampling & Analysis Protocol	: CPCB Guidelines &IS: 11255
Parameter Required	: As Per Work Order

S. No.	Parameters	Test Method	Results	Units	Limits As Per CPCB
1.	Particulate Matter (as PM)	IS: 11255 (P-1)	40.58	mg/Nm^3	50
2.	Sulphur Dioxide (as SO_2)	IS: 11255 (P-2)	792.06	mg/Nm^3	200
3.	Oxides of Nitrogen (as NO_X)	IS: 11255 (P-7)	267.23	mg/Nm^3	450
4.	Mercury (as Hg)	VEL/ENV/STP/144, Issue No.- 01, Issue Date : 01/11/2021	BLQ(LOQ-0.005)	mg/Nm^3	0.03

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

End of Report

VARDAN ENVIROLAB * Dy. Technical Manager * (Reviewed By)

VARDAN ENVIROLAB * Dr Shiv Authorised Signatory * (Authorized Signatory) 30/03/2024

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

Test Report

Sample Number:	VEL/AP/33	Report No.:	VEL/AP/2403270033
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh - 486886	Format No.:	7.8 F-03
		Party Reference No.:	5703009832 Date : 14/06/2023
		Reporting Date:	30/03/2024
		Period of Analysis:	27/03/2024 - 30/03/2024
		Receipt Date:	27/03/2024
		Page No.:	1 of 1
Sample Description:	STACK EMISSION MONITORING		

General Information

Sampling Location	: Boiler Unit - 02
Sample Collected By	: VEL Representative
Sampling Instrument Used	: Stack Monitoring Kit
Instrument Code	: VEL/INS/ENV/SMK/04
Instrument Calibration Status	: Calibrated
Date of Monitoring	: 22/03/2024
Meteorological Condition During Monitoring	: Clear Sky
Stack Attached To	: Boiler Unit - 02
Stack Diameter (m)	: 6.9
Stack Height (m)	: 275
Plant Load (MW/h)	: 595
Make of Stack	: MS
Sampling Duration (Miuutes)	: 60.24
Ambient Temperature - Ta (°C)	: 29.0
Temperature of Stack Gases - Ts (°C)	: 128.0
Velocity of Stack Gases (m/sec.)	: 26.73
Flow Rate of PM (LPM)	: 27.0
Flow Rate of Gas (LPM)	: 2.0
Sampliug Condition	: Isokinetic
Sampling & Analysis Protocol	: CPCB Guidelines &IS: 11255
Parameter Required	: As Per Work Order

S. No.	Parameters	Test Method	Results	Units	Limits As Per CPCB
1.	Particulate Matter (as PM)	IS: 11255 (P-1)	43.88	mg/Nm^3	50
2.	Sulphur Dioxide (as SO_2)	IS: 11255 (P-2)	834.21	mg/Nm^3	200
3.	Oxides of Nitrogen (as NO_X)	IS: 11255 (P-7)	283.45	mg/Nm^3	450
4.	Mercury (as Hg)	VEL/ENV/STP/144, Issue No.- 01, Issue Date : 01/11/2021	BLQ(LOQ-0.005)	mg/Nm^3	0.03

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

End of Report

VARDAN ENVIROLAB Amitabh Kumar Dy. Technical Manager
(Reviewed By)

VARDAN ENVIROLAB Dr. Shiv Singh Authorised Signatory
(Authorized Signatory)
30/03/2024

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Test Reports of Waste Water Quality

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

Test Report

Sample Number:	VEL/WW/01	**Report No.:**	VEL/PE/2310230011
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh - 486886	**Format No.:**	7.8 F-03
		Party Reference No.:	5703009832
		Callout No.:	Date : 14/06/2023
		Reporting Date:	28/10/2023
		Period of Analysis:	23/10/2023 - 28/10/2023
		Receipt Date:	23/10/2023
		Sampling Date:	18/10/2023
Sample Description:	Waste Water Sample	**Sampling Quantity:**	2 Ltrs.
Sample Location:	STP Outlet (STP Plant)	**Sampling Type:**	Grab
Sample Collected By:	VEL Representative (Mr. Amit Pandey)	**Preservation:**	Ice Box
Sampling and Analysis Protocol:	IS: 3025 & STP	**Parameter Required:**	As Per Work Order

S. No.	Parameters	Test Method	Results	Units	General Standards As Per The Environment (Protection) Rules, 1986		
					Inland Surface Water (a)	Public Sewers (b)	Land for Irrigation (c)
1.	pH (at 25°C)	IS: 3025 (P-11)	7.78	--	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
2.	Total Suspended Solids	IS: 3025 (P-17)	62	mg/L	100	600	200
3.	B.O.D. (3 Days @27°C)	IS: 3025 (P-44)	20.07	mg/L	30	350	100
4.	Chemical Oxygen Demand (C.O.D.)	IS: 3025 (P-58)	68.44	mg/L	250	--	--
5.	Oil & Grease	Clause No. 5 of IS: 3025 (P-39)	0.71	mg/L	10	20	10
6.	Faecal Coliform	IS: 1622:1981	<2	MPN/100 ml	--	--	--

Note:- GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART-A : EFFLUENTS
As Per The Environment (Protection) Rules, 1986 [SCHEDULE – VI] (See Rule 3A)

End of Report

VARDAN ENVIROLAB Amitabh Bihar Dubey Technical Manager
(Reviewed By)

VARDAN ENVIROLAB Dr Shiv Kr Singh Authorised Signatory 28/10/2023
(Authorized Signatory)

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

Test Report

Sample Number:	VEL/WW/03	**Report No.:**	VEL/PE/2310230012
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh - 486886	**Format No.:**	7.8 F-03
		Party Reference No.:	5703009832
		Callout No.:	Date : 14/06/2023
		Reporting Date:	28/10/2023
		Period of Analysis:	23/10/2023 - 28/10/2023
		Receipt Date:	23/10/2023
		Sampling Date:	18/10/2023
Sample Description:	Waste Water Sample	**Sampling Quantity:**	2 Ltrs.
Sample Location:	ETP Outlet (ETP Plant)	**Sampling Type:**	Grab
Sample Collected By:	VEL Representative (Mr. Amit Pandey)	**Preservation:**	Ice Box
Sampling and Analysis Protocol:	IS: 3025 & STP	**Parameter Required:**	As Per Work Order

S. No.	Parameters	Test Method	Results	Units	General Standards As Per The Environment (Protection) Rules, 1986		
					Inland Surface Water (a)	Public Sewers (b)	Land for Irrigation (c)
1.	pH (at 25°C)	IS: 3025 (P-11)	7.22	--	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
2.	Total Suspended Solids	IS: 3025 (P-17)	56	mg/L	100	600	200
3.	B.O.D. (3 Days @27°C)	IS: 3025 (P-44)	18	mg/L	30	350	100
4.	Chemical Oxygen Demand (C.O.D.)	IS: 3025 (P-58)	60.37	mg/L	250	--	--
5.	Oil & Grease	Clause No. 5 of IS: 3025 (P-39)	0.48	mg/L	10	20	10
6.	Total Dissolved Solids	IS: 3025 (P-16)	166	mg/L	--	--	--
7.	Chloride (as Cl)	IS: 3025(P-23)	33.06	mg/L	--	--	--

Note:- GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART-A : EFFLUENTS As Per The Environment (Protection) Rules, 1986 [SCHEDULE – VI] (See Rule 3A)

End of Report

VARDAN ENVIROLAB Amitabh Kumar Technical Manager
(Reviewed By)

VARDAN ENVIROLAB Dr Shiv Singh Authorised Signatory 28/10/23
(Authorized Signatory)

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VEL/E-03/I/TR/PN66398

Vardan EnviroLab

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

Sample Number:	VEL/PE/01	**Report No.:**	VEL/PE/2311150017
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh - 486886	**Format No.:**	7.8 F-03
		Party Reference No.:	5703009832
		Callout No.:	Date : 14/06/2023
		Reporting Date:	22/11/2023
		Period of Analysis:	15/11/2023 - 22/11/2023
		Receipt Date:	15/11/2023
		Sampling Date:	09/11/2023
Sample Description:	Waste Water Sample	**Sampling Quantity:**	2 Ltrs.
Sample Location:	STP Outlet (STP Plant)	**Sampling Type:**	Grab
Sample Collected By:	VEL Representative (Mr. Amit Pandey)	**Preservation:**	Ice Box
Sampling and Analysis Protocol:	IS: 3025 & STP	**Parameter Required:**	As Per Work Order

S. No.	Parameters	Test Method	Results	Units	General Standards As Per The Environment (Protection) Rules, 1986		
					Inland Surface Water (a)	Public Sewers (b)	Land for Irrigation (c)
1.	pH (at 25°C)	IS: 3025 (P-11)	6.34	--	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
2.	Total Suspended Solids	IS: 3025 (P-17)	65.00	mg/L	100	600	200
3.	B.O.D. (3 Days @27°C)	IS: 3025 (P-44)	13.47	mg/L	30	350	100
4.	Chemical Oxygen Demand (C.O.D.)	IS: 3025 (P-58)	70.31	mg/L	250	--	--
5.	Oil & Grease	Clause No. 5 of IS: 3025 (P-39)	1.00	mg/L	10	20	10
6.	Faecal Coliform	IS: 1622:1981	<2	MPN/100 ml	--	--	--

Note:- GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART-A : EFFLUENTS As Per The Environment (Protection) Rules, 1986 [SCHEDULE – VI] (See Rule 3A)

End of Report

VARDAN ENVIROLAB Technical Manager

(Reviewed By)

VARDAN ENVIROLAB Technical Manager Microbiology

VARDAN ENVIROLAB Authorized Signatory

(Authorized Signatory)

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Vardan EnviroLab

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

Test Report

Sample Number:	VEL/PE/03	**Report No.:**	VEL/PE/2311150019
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh - 486886	**Format No.:**	7.8 F-03
		Party Reference No.:	5703009832
		Callout No.:	Date : 14/06/2023
		Reporting Date:	22/11/2023
		Period of Analysis:	15/11/2023 - 22/11/2023
		Receipt Date:	15/11/2023
		Sampling Date:	09/11/2023
Sample Description:	Waste Water Sample	**Sampling Quantity:**	2 Ltrs.
Sample Location:	ETP Outlet (ETP Plant)	**Sampling Type:**	Grab
Sample Collected By:	VEL Representative (Mr. Amit Pandey)	**Preservation:**	Ice Box
Sampling and Analysis Protocol:	IS: 3025 & STP	**Parameter Required:**	As Per Work Order

S. No.	Parameters	Test Method	Results	Units	General Standards As Per The Environment (Protection) Rules, 1986		
					Inland Surface Water (a)	Public Sewers (b)	Land for Irrigation (c)
1.	pH (at 25°C)	IS: 3025 (P-11)	6.63	--	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
2.	Total Suspended Solids	IS: 3025 (P-17)	58.00	mg/L	100	600	200
3.	B.O.D. (3 Days @27°C)	IS: 3025 (P-44)	12.0	mg/L	30	350	100
4.	Chemical Oxygen Demand (C.O.D.)	IS: 3025 (P-58)	63.00	mg/L	250	--	--
5.	Oil & Grease	Clause No. 5 of IS: 3025 (P-39)	0.53	mg/L	10	20	10
6.	Total Dissolved Solids	IS: 3025 (P-16)	159.00	mg/L	--	--	--
7.	Chloride (as Cl)	IS: 3025(P-23)	34.02	mg/L	--	--	--

Note:- GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART-A : EFFLUENTS As Per The Environment (Protection) Rules, 1986 [SCHEDULE – VI] (See Rule 3A)

End of Report

VARDAN ENVIROLAB Dy. Technical Manager

(Reviewed By)

VARDAN ENVIROLAB Authorized Signatory

(Authorized Signatory)

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

Test Report

Sample Number:	VEL/PE/01	**Report No.:**	VEL/PE/2312050012
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh – 486886	**Format No.:**	7.8 F-03
		Party Reference No.:	5703009832 Date : 14/06/2023
		Reporting Date:	09/12/2023
		Period of Analysis:	05/12/2023 - 09/12/2023
		Receipt Date:	05/12/2023
		Sampling Date:	02/12/2023
Sample Description:	Waste Water Sample	**Sampling Quantity:**	2 Ltrs.
Sample Location:	STP Outlet (STP Plant)	**Sampling Type:**	Grab
Sample Collected By:	VEL Representative (Mr. Amit Pandey)	**Preservation:**	Ice Box
Sampling and Analysis Protocol:	IS: 3025 & STP	**Parameter Required:**	As Per Work Order

S. No.	Parameters	Test Method	Results	Units	General Standards As Per The Environment (Protection) Rules, 1986		
					Inland Surface Water (a)	Public Sewers (b)	Land for Irrigation (c)
1.	pH (at 25°C)	IS: 3025 (P-11)	6.87	--	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
2.	Total Suspended Solids	IS: 3025 (P-17)	59	mg/L	100	600	200
3.	B.O.D. (3 Days @27°C)	IS: 3025 (P-44)	14.32	mg/L	30	350	100
4.	Chemical Oxygen Demand (C.O.D.)	IS: 3025 (P-58)	68.44	mg/L	250	--	--
5.	Oil & Grease	Clause No. 5 of IS: 3025 (P-39)	1.07	mg/L	10	20	10
6.	Faecal Coliform	IS: 1622:1981	<2	MPN/100 ml	--	--	--

Note:- GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART-A : EFFLUENTS As Per The Environment (Protection) Rules, 1986 [SCHEDULE – VI] (See Rule 3A)

End of Report

VARDAN ENVIROLAB Amitabh Kumar Dubey Dy. Technical Manager
(Reviewed By)

VARDAN ENVIROLAB Dharmendra Kumar Technical Manager 09/12/2023

VARDAN ENVIROLAB Dr. Shiv Prakash Authorised Signatory 09/12/2023
(Authorized Signatory)

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

Test Report

Sample Number:	VEL/PE/03	**Report No.:**	VEL/PE/2312050014
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh - 486886	**Format No.:**	7.8 F-03
		Party Reference No.:	5703009832 Date : 14/06/2023
		Reporting Date:	09/12/2023
		Period of Analysis:	05/12/2023 - 09/12/2023
		Receipt Date:	05/12/2023
		Sampling Date:	02/12/2023
Sample Description:	Waste Water Sample	**Sampling Quantity:**	2 Ltrs.
Sample Location:	ETP Outlet (ETP Plant)	**Sampling Type:**	Grab
Sample Collected By:	VEL Representative (Mr. Amit Pandey)	**Preservation:**	Ice Box
Sampling and Analysis Protocol:	IS: 3025 & STP	**Parameter Required:**	As Per Work Order

S. No.	Parameters	Test Method	Results	Units	General Standards As Per The Environment (Protection) Rules, 1986		
					Inland Surface Water (a)	Public Sewers (b)	Land for Irrigation (c)
1.	pH (at 25°C)	IS: 3025 (P-11)	6.09	--	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
2.	Total Suspended Solids	IS: 3025 (P-17)	53	mg/L	100	600	200
3.	B.O.D. (3 Days @27°C)	IS: 3025 (P-44)	16.98	mg/L	30	350	100
4.	Chemical Oxygen Demand (C.O.D.)	IS: 3025 (P-58)	57.54	mg/L	250	--	--
5.	Oil & Grease	Clause No. 5 of IS: 3025 (P-39)	0.76	mg/L	10	20	10
6.	Total Dissolved Solids	IS: 3025 (P-16)	182.00	mg/L	--	--	--
7.	Chloride (as Cl)	IS: 3025 (P-23)	32.17	mg/L	--	--	--

Note:- GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART-A : EFFLUENTS
As Per The Environment (Protection) Rules, 1986 [SCHEDULE – VI] (See Rule 3A)

End of Report

VARDAN ENVIROLAB Pvt. Ltd. Technical Manager
(Reviewed By)

VARDAN ENVIROLAB Dr. Shiv Prakash Singh 02/12/2023 Authorised Signatory
(Authorized Signatory)

Test Report

Sample Number:	VEL/PE/01	**Report No.:**	VEL/PE/2401110001
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh – 486886	**Format No.:**	7.8 F-03
		Party Reference No.:	5703009832 Date : 14/06/2023
		Reporting Date:	19/01/2024
		Period of Analysis:	15/01/2024 - 19/01/2024
		Receipt Date:	15/01/2024
		Sampling Date:	11/01/2024
Sample Description:	Waste Water Sample	**Sampling Quantity:**	2 Ltrs.
Sample Location:	STP Outlet (STP Plant)	**Sampling Type:**	Grab
Sample Collected By:	VEL Representative (Mr. Amit Pandey)	**Preservation:**	Ice Box
Sampling and Analysis Protocol:	IS: 3025 & STP	**Parameter Required:**	As Per Work Order

S. No.	Parameters	Test Method	Results	Units	General Standards As Per The Environment (Protection) Rules, 1986		
					Inland Surface Water (a)	Public Sewers (b)	Land for Irrigation (c)
1.	pH (at 25°C)	IS: 3025 (P-11)	7.19	--	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
2.	Total Suspended Solids	IS: 3025 (P-17)	66	mg/L	100	600	200
3.	B.O.D. (3 Days @27°C)	IS: 3025 (P-44)	12.65	mg/L	30	350	100
4.	Chemical Oxygen Demand (C.O.D.)	IS: 3025 (P-58)	73.07	mg/L	250	--	--
5.	Oil & Grease	Clause No. 5 of IS: 3025 (P-39)	0.97	mg/L	10	20	10
6.	Faecal Coliform	IS: 1622:1981	<2	MPN/100 ml	--	--	--

Note:- GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART-A : EFFLUENTS
As Per The Environment (Protection) Rules, 1986 [SCHEDULE – VI] (See Rule 3A)

End of Report

VARDAN ENVIROLAB Amritesh Tiwari Technical Manager
(Reviewed By)

VARDAN ENVIROLAB Dharmendra Kumar Technical Manager-Microbiology
19/01/2024

VARDAN ENVIROLAB Dr. Technical Manager
(Authorized Signatory)
19/01/2024

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

Test Report

Sample Number:	VEL/PE/03	Report No.:	VEL/PE/2401110003
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh - 486886	Format No.:	7.8 F-03
		Party Reference No.:	5703009832 Date : 14/06/2023
		Reporting Date:	19/01/2024
		Period of Analysis:	15/01/2024 - 19/01/2024
		Receipt Date:	15/01/2024
		Sampling Date:	11/01/2024
Sample Description:	Waste Water Sample	Sampling Quantity:	2 Ltrs.
Sample Location:	ETP Outlet (ETP Plant)	Sampling Type:	Grab
Sample Collected By:	VEL Representative (Mr. Amit Pandey)	Preservation:	Ice Box
Sampling and Analysis Protocol:	IS: 3025 & STP	Parameter Required:	As Per Work Order

S. No.	Parameters	Test Method	Results	Units	General Standards As Per The Environment (Protection) Rules, 1986		
					Inland Surface Water (a)	Public Sewers (b)	Land for Irrigation (c)
1.	pH (at 25°C)	IS: 3025 (P-11)	6.69	--	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
2.	Total Suspended Solids	IS: 3025 (P-17)	44	mg/L	100	600	200
3.	B.O.D. (3 Days @27°C)	IS: 3025 (P-44)	15.98	mg/L	30	350	100
4.	Chemical Oxygen Demand (C.O.D.)	IS: 3025 (P-58)	86.06	mg/L	250	--	--
5.	Oil & Grease	Clause No. 5 of IS: 3025 (P-39)	0.76	mg/L	10	20	10
6.	Total Dissolved Solids	IS: 3025 (P-16)	197.00	mg/L	--	--	--
7.	Chloride (as Cl)	IS: 3025 (P-23)	31.14	mg/L	--	--	--

Note:- GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART-A : EFFLUENTS
As Per The Environment (Protection) Rules, 1986 [SCHEDULE – VI] (See Rule 3A)

End of Report

VARDAN ENVIROLAB Dy. Technical Manager
(Reviewed By)

VARDAN ENVIROLAB Dr. Shiv Prakash
(Authorized Signatory)
19/01/2024

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

Test Report

Sample Number:	VEL/PE/01	Report No.:	VEL/PE/2402230001
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh – 486886	Format No.:	7.8 F-03
		Party Reference No.:	5703009832 Date : 14/06/2023
		Reporting Date:	27/02/2024
		Period of Analysis:	23/02/2024 - 27/02/2024
		Receipt Date:	23/02/2024
		Sampling Date:	19/02/2024
Sample Description:	Waste Water Sample	Sampling Quantity:	2 Ltrs.+250 ml
Sample Location:	STP Outlet (STP Plant)	Sampling Type:	Grab
Sample Collected By:	VEL Representative (Mr. Amit Pandey)	Preservation:	Ice Box
Sampling and Analysis Protocol:	IS: 3025 & STP	Parameter Required:	As Per Work Order

S. No.	Parameters	Test Method	Results	Units	General Standards As Per The Environment (Protection) Rules, 1986		
					Inland Surface Water (a)	Public Sewers (b)	Land for Irrigation (c)
1.	pH (at 25°C)	IS: 3025 (P-11)	7.34	--	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
2.	Total Suspended Solids	IS: 3025 (P-17)	48	mg/L	100	600	200
3.	B.O.D. (3 Days @27°C)	IS: 3025 (P-44)	13.43	mg/L	30	350	100
4.	Chemical Oxygen Demand (C.O.D.)	IS: 3025 (P-58)	78.06	mg/L	250	--	--
5.	Oil & Grease	Clause No. 5 of IS: 3025 (P-39)	0.76	mg/L	10	20	10
6.	Faecal Coliform	IS: 1622:1981	<2	MPN/100 ml	--	--	--

Note:- GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART-A : EFFLUENTS
As Per The Environment (Protection) Rules, 1986 [SCHEDULE – VI] (See Rule 3A)

End of Report

VARDAN ENVIROLAB Technical Manager (Reviewed By)

VARDAN ENVIROLAB Authorised Signatory (Authorized Signatory) 27/02/2024

Vardan EnviroLab

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

Test Report

Sample Number:	VEL/PE/03	**Report No.:**	VEL/PE/2402230003
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh - 486886	**Format No.:**	7.8 F-03
		Party Reference No.:	5703009832 Date : 14/06/2023
		Reporting Date:	27/02/2024
		Period of Analysis:	23/02/2024 - 27/02/2024
		Receipt Date:	23/02/2024
		Sampling Date:	19/02/2024
Sample Description:	Waste Water Sample	**Sampling Quantity:**	2 Ltrs.
Sample Location:	ETP Outlet (ETP Plant)	**Sampliog Type:**	Grab
Sample Collected By:	VEL Representative (Mr. Amit Pandey)	**Preservation:**	Ice Box
Sampling and Analysis Protocol:	IS: 3025 & STP	**Parameter Required:**	As Per Work Order

S. No.	Parameters	Test Method	Results	Units	General Standards As Per The Environment (Protection) Rules, 1986		
					Inland Surface Water (a)	Public Sewers (b)	Land for Irrigation (c)
1.	pH (at 25°C)	IS: 3025 (P-11)	7.67	--	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
2.	Total Suspended Solids	IS: 3025 (P-17)	39	mg/L	100	600	200
3.	B.O.D. (3 Days @27°C)	IS: 3025 (P-44)	14.88	mg/L	30	350	100
4.	Chemical Oxygen Demand (C.O.D.)	IS: 3025 (P-58)	81.21	mg/L	250	--	--
5.	Oil & Grease	Clause No. 5 of IS: 3025 (P-39)	0.45	mg/L	10	20	10
6.	Total Dissolved Solids	IS: 3025 (P-16)	372	mg/L	--	--	--
7.	Chloride (as Cl)	IS: 3025 (P-23)	29.89	mg/L	--	--	--

Note:- GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART-A : EFFLUENTS As Per The Environmeot (Protection) Rules, 1986 [SCHEDULE – VI] (See Rule 3A)

End of Report

VARDAN ENVIROLAB * Abhishek Kumar Dubey Technical Manager *

(Reviewed By)

VARDAN ENVIROLAB * Dr. Shiv Prakash Authorised Signatory * 27/02/2024

(Authorized Signatory)

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

Test Report

Sample Number:	VEL/PE/01	Report No.:	VEL/PE/2403070001
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh – 486886	Format No.:	7.8 F-03
		Party Reference No.:	5703009832 Date : 14/06/2023
		Reporting Date:	12/03/2024
		Period of Analysis:	07/03/2024 - 12/03/2024
		Receipt Date:	07/03/2024
		Sampling Date:	04/03/2024
Sample Description:	Waste Water Sample	Sampling Quantity:	2 Ltrs.+250 ml
Sample Location:	STP Outlet (STP Plant)	Sampling Type:	Grab
Sample Collected By:	VEL Representative	Preservation:	Ice Box
Sampling and Analysis Protocol:	IS: 3025 & STP	Parameter Required:	As Per Work Order

S. No.	Parameters	Test Method	Results	Units	General Standards As Per The Environment (Protection) Rules, 1986		
					Inland Surface Water (a)	Public Sewers (b)	Land for Irrigation (c)
1.	pH (at 25°C)	IS: 3025 (P-11)	7.85	--	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
2.	Total Suspended Solids	IS: 3025 (P-17)	47	mg/L	100	600	200
3.	B.O.D. (3 Days @27°C)	IS: 3025 (P-44)	14.12	mg/L	30	350	100
4.	Chemical Oxygen Demand (C.O.D.)	IS: 3025 (P-58)	76.73	mg/L	250	--	--
5.	Oil & Grease	Clause No. 5 of IS: 3025 (P-39)	0.81	mg/L	10	20	10
6.	Faecal Coliform	IS: 1622:1981	<2	MPN/100 ml	--	--	--

Note:- GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART-A : EFFLUENTS
As Per The Environment (Protection) Rules, 1986 [SCHEDULE – VI] (See Rule 3A)

End of Report

VARDAN ENVIROLAB Technical Manager
(Reviewed By)

VARDAN ENVIROLAB Authorised Signatory
(Authorised Signatory)

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

Test Report

Sample Number:	VEL/PE/03	Report No.:	VEL/PE/2403070003
Name & Address of the Party:	M/s Mahan Energen Limited Village: Bandhora, Post: Karsualal, Tehsil: Mada, Distt.: Singrauli, Madhya Pradesh - 486886	Format No.:	7.8 F-03
		Party Reference No.:	5703009832 Date : 14/06/2023
		Reporting Date:	12/03/2024
		Period of Analysis:	07/03/2024 - 12/03/2024
		Receipt Date:	07/03/2024
		Sampling Date:	04/03/2024
Sample Description:	Waste Water Sample	Sampling Quantity:	2 Ltrs.
Sample Location:	ETP Outlet (ETP Plant)	Sampling Type:	Grab
Sample Collected By:	VEL Representative	Preservation:	Ice Box
Sampling and Analysis Protocol:	IS: 3025 & STP	Parameter Required:	As Per Work Order

S. No.	Parameters	Test Method	Results	Units	General Standards As Per The Environment (Protection) Rules, 1986		
					Inland Surface Water (a)	Public Sewers (b)	Land for Irrigation (c)
1.	pH (at 25°C)	IS: 3025 (P-11)	7.62	--	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
2.	Total Suspended Solids	IS: 3025 (P-17)	40	mg/L	100	600	200
3.	B.O.D. (3 Days @27°C)	IS: 3025 (P-44)	13.97	mg/L	30	350	100
4.	Chemical Oxygen Demand (C.O.D.)	IS: 3025 (P-58)	82.35	mg/L	250	--	--
5.	Oil & Grease	Clause No. 5 of IS: 3025 (P-39)	0.49	mg/L	10	20	10
6.	Total Dissolved Solids	IS: 3025 (P-16)	368	mg/L	--	--	--
7.	Chloride (as Cl)	IS: 3025 (P-23)	28.73	mg/L	--	--	--

Note:- GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART-A : EFFLUENTS
As Per The Environment (Protection) Rules, 1986 [SCHEDULE – VI] (See Rule 3A)

End of Report

VARDAN ENVIROLAB * Technical Manager *
(Reviewed By)

VARDAN ENVIROLAB * Authorised Signatory *
(Authorized Signatory)

भारत सरकार
परमाणु ऊर्जा विभाग
विकिरण एवं आइसोटोप प्रौद्योगिकी बोर्ड

Government of India
Department of Atomic Energy
Board of Radiation & Isotope Technology

Certificate Tracking ID / CTID : 2308293
Date of Issue / DOI : 07-Dec-2023
Certificate Serial No. / CSN : ULR-TC1170323000001156F

TC-11703

Radioanalytical Laboratory

RADIOACTIVITY TEST CERTIFICATE

Ref : BRIT/RAL/DOM/569-572/MISC/407-410/23-24

To :
M/S. MAHAN ENERGEN LIMITED
VILLAGE : BANDHURA, POST KARSUARAJA,
TEHSIL MADA, DIST. SINGRAULI, M.P. PIN 486 886

This is regarding the sample of "COAL" sent for radioactivity analysis vide your letter ref. : MEL/ENV/BRIT/105/23 dated 21.09.2023 with the following markings, as shown in italics:

NAME & ADDRESS OF THE CUSTOMER : ***MAHAN ENERGEN LIMITED, VILLAGE : BANDHURA, POST KARSUARAJA, TEHSIL MADA, DIST. SINGRAULI, M.P. PIN 486 886***

SAMPLE NAME : ***COAL SAMPLE***

DATE OF RECEIPT OF SAMPLE: 03.10.2023 **DATE OF COMPLETION OF TEST: 29.11.2023**

The samples were analysed for U-238 , Ra-226, Th-232 & K-40 radioactivity content and the values obtained are as follows:

Sr. No	SAMPLE	U-238 (Bq/Kg)	Ra-226 (Bq/Kg)	Th-232 (Bq/Kg)	K-40 (Bq/Kg)
1	COAL SAMPLE	65.1 ± 1.4	14.7 ± 1.1	25.3 ± 1.2	738 ± 14.4

Opinion: The measurement values are below the clearance level for radionuclides of natural origin in bulk solid materials, as per AERB directive 01/2010 (table-3) dated 26/11/2010.

Note: (i) The report pertains to the given sample only. (ii) The sample will be retained in this laboratory for a period of 1 months from certificate date and thereafter it will be disposed off. (iii) This report shall not be reproduced except in full, without written approval of the laboratory. (iv) The sampling is not done by this laboratory.

Checked by:
GANPAT B NAKTI
Assistant

Authorized Signatory:
AJAY NANA THAMKE
OIC, RAL

********** End of Report **********

विआप्रौबो/ बीएआरसी परिसर, सेक्टर २०, वाशी, नवी मुंबई – ४०० ७०३ (महाराष्ट्र)
BRIT/ BARC Vashi Complex, Sector 20, Navi Mumbai – 400 703 (Maharashtra)
वेबसाइट/ Website: www.britatom.gov.in; दूरभाष/ 022 2788 7002/ 7006

adani
Power

Ref: MEL/ENV/FLYASH/516/24
Date: 12.01.2024

To,
Additional Principal Chief Conservator of Forest
Ministry of Environment, Forest & Climate Change
Integrated Regional Office Western Region
Kendriya Paryavaran Bhawan, Link Road No. -3
E-5, Ravi Shankar Nagar, Bhopal- 462 016 (MP)

Sub: Advisory regarding implementation of Notification No. G.S.R. 02 (E) dated 2nd January 2014 and subsequent amendment in 21.05.2020 for supply and use of coal with ash content- regarding.

Ref: File No. L-11011/21/2014-IA, I (T), dated: 13.04.2015.

Dear Sir,
With reference to above subject matter, we are submitting herewith the compliance of said Notification.
The half yearly compliance reports of Fly Ash management for environmental safeguards stipulated in the EC and Consent are being regularly submitted to both the regional office of MoEF&CC, Bhopal as well as Madhya Pradesh Pollution Control Board (MPPCB). We are also submitting the half yearly & annual reports of Fly ash utilization & Ash content of Coal to Central Electricity Authority (CEA).

We are enclosing herewith the monthly as well as **Quarterly Average Ash Content** in the Coal for the period of **October'2023 to December'2023** as Annexure - I

Total Capacity of TPP: 1200 (2x600) MW

This is for your kind information and record please.

Thanking You,

Yours faithfully,

for **Mahan Energen Limited**

(R N Shukla)
Head- Environment & Forest
Encl.: As above

Mahan Energen Limited
Adani Corporate House
Shantigram, S G Highway
Ahmedabad 382 421
Gujarat, India
CIN : U40100GJ2005PLC147690

Tel +91 79 2656 4444
Fax +91 79 2555 7177
www.adani.com

Registered Office: Adani Corporate House, Shantigram, Vaishnodevi Circle, SG Highway, Khodiyar, 382421, Gujarat, India

MAHAN ENERGEN LIMITED

Annexure – 1

ASH PERCENTAGE IN COAL

(From October'2023 to December'2023)

Month	Coal Consumption (MT)	Ash % in Coal
October'2023	418434.25	31.95
November'2023	313584.12	35.26
December'2023	451785.88	34.51
Quarterly Average (%)	....	**33.91**

MT-Metric Tonne

- Mahan Energen Limited is based on Pit head Thermal Power Plant

adani

Power

Ref: MEL/ENV/FLYASH/586/24
Date: 15.04.2024

To,
Additional Principal Chief Conservator of Forest
Ministry of Environment, Forest & Climate Change
Integrated Regional Office Western Region
Kendriya Paryavaran Bhawan, Link Road No. -3
E-5, Ravi Shankar Nagar, Bhopal- 462 016 (MP)

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We are enclosing herewith the monthly as well as **Quarterly Average Ash Content** in the Coal for the period of **January'2024 to March '2024** as Annexure - I

Total Capacity of TPP: 1200 (2x600) MW

This is for your kind information and record please.

Thanking You,

Yours faithfully,

for **Mahan Energen Limited**

(R N Shukla)
Authorized Signatory
Encl.: As above

Mahan Energen Limited
Adani Corporate House
Shantigram, S G Highway
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Mahan Energen Limited

Annexure – 1

ASH PERCENTAGE IN COAL

(From January'2024 to March'2024)

Month	Coal Consumption (MT)	Ash % in Coal
January'2024	419552.12	34.13
February'2024	335851.00	33.02
March'2024	309571.25	34.05
Quarterly Average (%)	....	**33.73**

MT-Metric Tone

- Mahan Energen Limited is based on Pit head Thermal Power Plant

adani Power

Mahan Energen Limited

Annexure-IV

ASH GENERATION AND UTILIZATION REPORT
(October'2023 to March'2024)

Month & Year	Total Ash Generation (MT)	Fly Ah Utilized (MT)			Pond / Bottom Ash Utilized (MT)		Total Ash Utilized (MT)	Ash Utilized (%)
		Cement	For Construction purpose of proposed expansion of 2x800 MW	Total	For Construction purpose of proposed expansion of 2x800 MW	Total		
October' 2023	133674	24959	14844	39803	52101	52101	91904	68.75%
November' 2023	110562	31869	11280	43149	61667	61667	104816	94.80%
December' 2023	155889	33850	11640	45490	69249	69249	114739	73.60%
January'2024	143193	39835	14820	54655	70647	70647	125302	87.51%
February' 2024	110901	42162	7368	49530	76092	76092	125622	113.27%
March' 2024	105403	61699	240	61939	74601	74601	136540	129.54%
2023-2024	**759623**	**234374**	**60192**	**294566**	**404357**	**404357**	**698924**	**92.00 %**

Annexure V

adani
Foundation

2023-24

Annual Progress Report - Singrauli

Table of Contents

Preface

Adani Foundation's Singrauli chapter started its CSR activities for Adani Power in 2022 in 10 villages – 4 core and 6 peripheral villages. AF's journey at Singrauli can be divided into two parts: Phase I establishing AF in the area through entry point activities and Phase II – implementation of project-base interventions with community contribution.

In initial phase, **Community need based structures** were constructed of core village Nagwa – approach road repair, community Markets, Drain, pond deepening, Drainage cleaning (10 kms), renovation of Anganwadi, overhead tanks in schools for safe drinking water, Joyful learning classrooms, RO water purifier installed for drinking water facilities in schools and materials support to schools – books, bags with kits.

In FY 2023 – 24 **Under Education** sector wthe aim of bringing about a change in the quality education in the nearby rural schools, the Utthan project was started in collaboration with the Dist. Education Department, in which we started working with 21 schools in the primary section, focus on remedial education to primary students lagging in reading, writing & numeracy.

To cater health needs of the **Community Health Care Unit** started with partner Mishra Poly clinic, Waidhan, Singrauli (M.P) (2023 – 2024) to provide immediate basic health care, counseling to the patients, with referral facilities at beneficiaries' doorsteps. To provide better health facilities to the nearby rural families, a health camp was organized through a team of expert doctors.

Through Project Pad, rural women and adolescent girls were aware about menstrual hygiene and diseases like anemia. Also worked for Maternal Health and Child Health Awareness through Kilkari Project run by Anganwadi, Health dept. and Family Welfare Department.

Women Entrepreneurship chapter started in Dec. 2022 with formation of **USHA KIRAN WOMEN ENTERPRISES FEDRATION** under Sustainable Livelihood Development. Under this federation 07 SHGs are running entrepreneur activity like domestic cleaning material packaging unit at Karsualal, Droop-Batti making group at Karsualal and Organic product like Vermi-compost, compost manure, Natural pesticide & bio-meal for plant preparing work is doing at entire village, Jute Bag, Sikki Art & Craft promotion, Masala Business at Nagwa, Detergent Powder production at Karsuaraja village. Due to this total employment created for 100 families.

Under Community Engagement, total 36 sports events have been organized by AF in the last 8 months. In which Cricket tournament, football game, Volleyball, Kabaddi, Athletic has been organized. AF provided football sports kit to 42 village Teams along with this support to **sub junior national archery Tournament** team also.

Message from Business Head

Message from Business Head It gives us great pleasure to present the Annual Report of Adani Foundation – Singrauli for FY 2023-24. As a responsible corporate citizen, we always believe in creating long term values for our stakeholders with the motto of "Growth with Goodness". We are committed to building a sustainable future by driving positive changes in the areas of Education, Healthcare, Sustainable livelihood Development and Community Infrastructure Development. Over the past year, we have continued to focus on our core values of integrity, teamwork, excellence, and customer focus. Our efforts have resulted in significant progress in achieving our strategic goals and a positive on the communities we serve. We are proud to report that our initiatives have touched the lives of thousands of people directly or indirectly across the intervention area. Our education programs (Utthan & Support to R&R School, Nagwa) have provided quality education to underprivileged children, our Healthcare interventions (Regular & Specialized Medical Camp) have brought medical facility close to the communities, and our Sustainable Livelihood (AMMA, Kamdhenu, Women Entrepreneurship Programs, Annapurna, SAKSHAM) have empowered many people with skills and resource to become self-reliant. Our efforts will give them access to health, sustainable livelihoods, access to quality education which will eventually upgrade their standard of living. We would like to take this opportunity to thank our employees, partners and stakeholders for their unwavering support and commitment towards our shared vision of a better tomorrow. We remain steadfast in our commitments to creating positive impact and contributing to the sustainable development of the communities we serve. We hope you find this report informative and insightful, and we look forward to your continued support as we embark on another year of Growth with Goodness.

Mr. Pravat Sundaray, Station Head – Operations, Mahan Energen Limited, Adani Power, Bandhaura, Singrauli (M.P)

Demographic Profile

Business Unit	Adani Foundation

The Mahan Energen Limited is a 2 X 600 MW Sub-critical domestic coal-fired power plant, situated in the village of Bandhaura, Singrauli District Eastern part of Madhya Pradesh.

The 2nd Unit of 600 MW is successfully commissioned, and commercial production was commenced in October 2018. From this financial year, the work of increasing its capacity to 2 x 800 units is going on. It will start in the financial year 2026, after which the capacity of this unit will increase to 2800 MW.

Mahan Energen Limited supplies its 95% of the power in open access and rest 5% to the state of Madhya Pradesh.

The Power generated is evacuated by double circuit 400 kV Mahan-Sipat Transmission lines cover the distance of 336 KM, which has the capacity to transmit 2000 MW.

The requirement of coal for these units is met through domestic coal from various sources viz., NCL, CCL & APMDC.

A railway siding 16 km away from the plant facilitates seamless supply of coal and other raw material. Nearest Railway Siding: Gajra behra; 16 KM from plant.

Adani Foundation's outreach in 1 blocks name Waidhan. Total 10 villages of 8 Gram Panchayats; 6224 households; Population; 27503.

SL.No.	Gram Panchayat	Village	Families	Population
1	Amiliya	अमिलिया	784	3546
2	Bandhora	सेमुआ	106	464
3	Bandhora	वंधौरा	403	1727
4	Karsualal	करसुआलाल	644	2628
5	Karsuaraja	करसुआराजा	783	3220
6	Khairahi		462	1979
7	Raila	रैला	547	2883
8	Nagama	चुरवाही	160	668
9	Nagama	नगवा	1340	5442
10	Suhira	सुहिरा	1015	4946
			6244	**27503**

Block information

Block Name	No. of Town	No. of Panchayat	No. of Villages	No. of village having transport facility	Size of villages		
					0-499	500-999	000+
Waidhan	1	104	265	237	56	86	137

Population Detail of Waidhan Block -

Block	Total Population	Male Population	Female Population
Waidhan	417721	219194	198527

Socio-Demographic Details of block

Block	Population		Sex Ratio		Families	
	Male	Female	Overall	0-6 age group	BPL	APL
Waidhan	219194	98527	906	949	26768	21891

Socio-Demographic Details of block

Block	Literacy Rate %		Caste wise population %			Birth Rate	Death Rate
	Male	Female	ST %	SC%	Other %		
Waidhan	72%	38.2%	19 %	14 %	59.99 %	35 %	11 %

Core villages of the project area are rural area, so all core villages are surrounded by high rocks of stone, forest, and local rivers & water streams. Major source of livelihood is agriculture, NTFP collection, very small shops & business, of allied product of agriculture and animal husbandry (peripheral villages) Caste: Jaiswal, Shah, Saket, Sharma (OBC, SC & ST) have a total population of nearly 25 thousands with 52% of male and 48% female population.

Executive Summary

Adani Foundation's Singrauli started from June 2022 for CSR activity of Mahan Energen limited in 4 core villages which are Nagwa, Kharahi, Karsualal, Bandhura and there are 6 other villages are situated near plant Suhira, Semua, Raila, Karsuraja, Betariya, Amilia. Adani Foundation is working on the below listed sectors.

- Sustainable Livelihood Development
- Education
- Health
- Capacity building, Training & Awareness program
- Support to sports & cultural activity.
- Community Structure Development

Key Highlights

Sustainable Livelihood Development

Vruksha Se Vikas (Plating 100 million Tree) -

1. created awareness and spread the message of saving our planet- 'Protecting our environment is the need of the hour. ' - To help nature and mother earth to get its natural beauty and components back.
2. The purpose of this drive was to educate school students about the importance of growing trees.
3. Benefits from this program to clean air across the Society near plant area & Controlled temperatures.
4. Trees help in reducing heat produced by industries. Thus, they maintain the temperature of the place. also provide a clean environment as they take in carbon dioxide and give out oxygen.

Adani SAKSHAM – Skill Development of youths

Training program by Union-RSETI

Adani foundation liaison with the Union bank's training institute named Union-RSETI (Rural Self Employment Training Institute) situated at Waidhan, Singrauli. Total 7 training batches has been completed of various trade such as Tailoring Training -02, Motor Binding & Repairing- 02, Aluminum Fabrication – 01 and Fabrication & welding batch-01 Computer Accounting and Digital Classes-01. Total 250 candidates got benefited of this training program.

Women Entrepreneurs Development

Women's Enterprise development in project area is the act of investing time and capital to help people establish, expand, or improve business. Enterprise development helps people earn a living or find a way out of poverty, and leads to long-term economic growth for themselves, their families, and their communities. Understanding the situation, Adani Foundation team has helped in identifying the villagers, empowering them, and setting up employment.

Which are mainly of the following: -

Washing Powder making-02 Batch, Masala Production -01 Jute bag making- 1 batch, Art & Craft (Sikki Art)– 01 batch. Total 49 candidates got benefited of this training program.

Training program by Adani Foundation

Adani foundation organized total 4 batches of self-employment program of Washing Powder -02, Jute Bag Production Trg- 01, Mushroom Production- 2 batches, Self-employed tailor- 2 batch, Dhoop-Batti- 1 batch. Total 150 Female candidates got benefited of this training program.

Adani Annapurna (Promotion of organic vegetable cultivation)-

The goal for Adani- Annapurna is to Conserving environment and natural resources, re-establishing ecological balance, encouraging sustainable agriculture, improving soil fertility, and putting an end to chemical pollution and toxic residues and make agriculture sustainable livelihood.

Kamdhenu Project- Dairy Development - The Dairy Development program is related to development of livestock and its allied activity. Programs enhance the breeds of animals in the project affected villages and helps in the proper management of animals by providing proper food, shelter, and protection against diseases to domestic animals. It provides employment to a large number of farmer and thereby increases their living standards. It helps in developing high yielding breeds **(Artificial Insemination, Animal Vaccination & Animal Husbandry Camp)** of animals by cross breeding. Program help to minimize the cost of domestic gas cylinder by biogas plant which will consume the huge quantity of cow-dung and produces good quality of organic slurry.

Supports & Cultural Activity-

Adani Khel Utsav-

AF supported to village youths (Male & Female) by providing sports activity material on gram panchayat level. Total 36 sports events have been organized by AF in the last 1 Years. In which cricket tournament -08, Football game – 12, Volleyball – 04, Kabaddi -03, Athletics -03 has been organized. In between also organized 02 Inter school level volleyball tournament at Coal Transport village, 01 program at Saraswati Shishu mandir Nagwa, 02 Inter village Level Cricket tournament at Coal Transport village (Khanua & Bhaliyatola). AF also support to organize National Level Sub Junior Archery tournament and provided archery set & sports kit to all the National Players of MP state.

Adani Samaroh (Cultural Activity)-

"Adani foundation believe in promoting Local Culture & develop Local Tradition among village community especially in youth & Community. In rural areas, different societies have their own culture and civilization, in which the faith and beliefs of the community are connected. Last year also Adani Foundation participated in such rural programs, Due to which a good image of Adani was created in the community.

On the occasion of various cultural days AF organized events & activity like Madhya Pradesh Foundation Day, Environment Day, Youth Day, Chairperson birthday celebration Women Day Celebration etc.

Health

- ***Hospital Facility in R & R colony-***

Adani Foundation renovates the hospital for health facility in R & R (Resettlement & Rehabilitation) colony at Nagwa village. Total OPD CASES -16647 patients got benefited from this hospital. In which Pregnancy cases- 57, Lab tested- 1313, Ambulance facility – 588 and so on.

- ***Specialized Health Camps-***

AF has been organized 50 Specialized Health Camps in the plant affected areas. Organized camp was related to Eye, Gynecological, Pediatric, orthopedic, dental health and community medicine related. Total 4839 candidates got benefited from these camps.

- ***Theme based health awareness activities-***

On the occasions of various theme-based program/day Adani foundation organized total 53 awareness program like wash day, TB Day, Cancer Day. In this total 53 program 2819 beneficiary got benefited.

- ***Sanjeevani Rural lab Test-***

The collaboration of the Adani Foundation and the government's Sanjeevani program. Their joint effort aimed to provide free complete blood tests to the villagers, but the initial lack of awareness hindered the scheme's impact. Undeterred, the Adani Foundation took it upon themselves to bridge this awareness gap and AF provided free testing for a total of 462 tests costing Rs 7 lakh.

Education

- ***R & R school support-***

For providing best education facility to R & R affected family near plant AF tie- up with Vidya Bharati's Saraswati Shishu Mandir School. At present 1205 candidates are studying in school at different levels from std. nursery to 12th. In the school there are total no. of teaching staff is 38 and supporting staff in 08.

- ***Teaching & learning material-***

AF supports to the candidate by providing books, copy, bags etc. and for physical growth of students, provided sports material like football, badminton, cricket game material to school.

Support to other Govt. Schools-

Adani foundation has been supported to other govt. schools like in Bandhaura Middle school- 245 students, Semua Primary School-55, Chirihawa tola Primary School- 70 students, Karsualal Middle school- 85 students, Potki tola primary school- 50 students, Naveen Primary school (Harijan Basti)- 50 students.

Community Infrastructure Development

Many infrastructural development works are being done by Adani Foundation in the surrounding rural areas, the main objective of which is to improve the standard of living of the villagers living at the village level.

- Refurbishment of Anganwadi Centre-
- Temple Renovation-
- Hospital Renovation-
- Drainage Repairing and Construction
- Pond Conservation and Restoration
- Road Construction of Village
- Market Complex Construction
- Refurbishment of Schools
- Skill development and Udhyamita Kendra construction
- Box Culverts construction.
- Hospital construction
- Solar light installation
- Seating Chabutra in village
- Boundary wall painting
- Worship Ghat construction.

Main section

Sustainable Livelihood Development

Objective is to promote inclusive growth and progress through livelihood security of all sections of society. At Singrauli site sustainable livelihood interventions are

5. Vriksh Se Vikas (Planting 100 million tree) Environment Protection program

In this Session we are panted Plant sapling to community which total no's 5000 which details are below: -

1. SHG Group Women- 1500 saplings (4 Core village & 4 Periphery Village)
2. School Children - 2000 Saplings (+ 2 School Kasuaraja, +2 School Nagwa & High School Suhira)
3. 20 Utthan project school - 800
4. Sarpanch of 8 village - 50 no's x 8 Village = 600 plant saplings
5. Temple / Community Hall /Marketplace & Roadside area - 100 saplings plated with support of PRI Members, & R&R Colony, Nagwa area. Institutions (Schools, GP, PHC, Temples, etc.)

1. Skill Development Trainings		
no.	**Trade**	**No. of Candidate**
1	Sewing & Tailoring Trg.	100
2	Motor Binding & repairing	60
3	Alum. Fabrication	30
4	Computer & Digital Lit.	30
5	Fabrication & welding	30
	Total	250

Adani SAKSHAM – Skill Development of youths

Adani foundation team is working on livelihood skill development Program. AF team has provided women with the skills and knowledge needed to start and run a successful business. AF team has also liaised with the Government institutions UNION Bank RSETI (Rural self-employment & Training Institute).

Total 7 training batches has been completed of various trade such as Tailoring Training -02, Motor Binding & Repairing- 02, Aluminum Fabrication – 01 and Fabrication &

welding batch-01 Computer Accounting and Digital Classes-01. Total 250 candidates got benefited of this training program.

Women Entrepreneurs Development

Home care Cleaning Material

No.	Enterprise	Beneficiary	Income
1	Washing Powder making	30	48500
2	Masala Production	22	4169
3	Jute Bag Production	24	2650
4	Sikki Art	22	4250
5	Home care Cleaning	10	60385
6	Dhup & Agarbatti	10	10916
7	Mushroom Farming	40	129127
Total		**158**	**259927**

Enterprise development helps people earn a living or find a way out of poverty, and leads to long-term economic growth for themselves, their families, and their communities.

They were strengthened with a total of 07 types of self-employment mediums, through which their income started increasing and in this financial year a total of 158 women together did business worth about Rs 2 lakh 60 thousand.

Mushroom Farming

Adani Annapurna
(Promotion of organic vegetable cultivation)-

The goal for Adani- Annapurna is to Conserving environment and natural resources, re-establishing ecological balance, encouraging sustainable agriculture, improving soil fertility, and putting an end to chemical pollution and toxic residues and make agriculture sustainable livelihood.

No.	Village	Qty
1	Nagwa	210 Quintal Vermicompost
2	Khairahi	
3	Karsualal	7000 ltr - Manure & Pesticide Production
4	Karsuaraja	
5	Bandhaura	Total Farmer 54nos
6	Malga	
7	Raila	Area cultivated. 7 acres
Total Income		**Approx. 5.64 L**

Veg. Farm Model

Vermicomposting

At the village level, Farmers were inspired to make vermicompost- 84 Units total production 210 quintals), fertilizers, and natural pesticides- 7000 liters, due to which the villagers understood the importance of organic farming. Then farmers were connected to this program who used it in vegetable farming and the villagers are also getting the benefit total 44 farmers. 54 farmers cultivated vegetables and cash crops in a total area of about 7 acres, from which they earned a profit of about Rs 5 lakh in a year 2023-24.

Kamdhenu Project- Dairy Development

This Programs enhance the breeds of animals in the project affected villages and helps in the proper management of animals by providing proper food, shelter, and protection against diseases to domestic animals. It helps in developing high yielding breeds **(Artificial Insemination, Animal Vaccination & Animal Husbandry Camp)** of animals by cross breeding.

S.No	Activity	Details		
1	**Animal Husbandry Camp**	Total Camp -13	Pashupalak No.-565	Total Animal 4510
2	**Biogas Unit**	Unit- 10	Village -6	Beneficiary - 75
3	**Fodder Farming**	1 Acre	Village -5	Beneficiary - 13
4	**Artificial Insemination**	Total Camp -13	Pashupalak No.-36	Total Animal- 5

Biogas Unit

Animal Husbandry

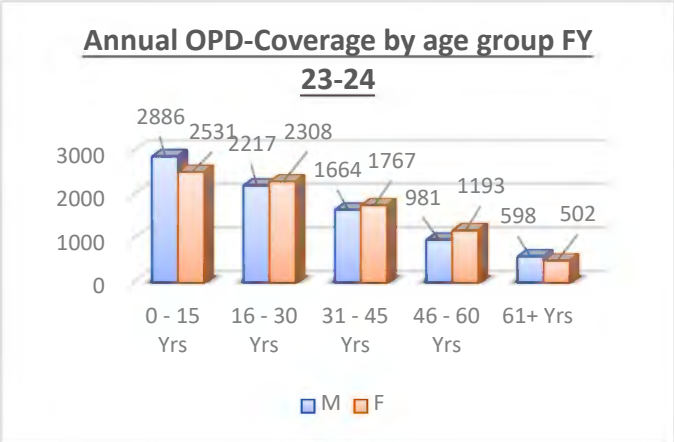
Fodder Farming

Health

Operation of R&R Hospital:

The R&R hospital, established and operated by the Adani Foundation since October 2022, continues to provide essential healthcare services to the residents of Nagwa Village's Rehabilitation and Resettlement (R&R) Colony.

Age wise No. of Direct Beneficiaries FY-23-24			
Age Group in Years	**Male**	**Female**	**Total**
0 - 15	2886	2531	5417
16 - 30	2217	2308	4525
31 - 45	1664	1767	3431
46 - 60	981	1193	2174
61+	598	502	1100
Total	**8346**	**8301**	**16647**

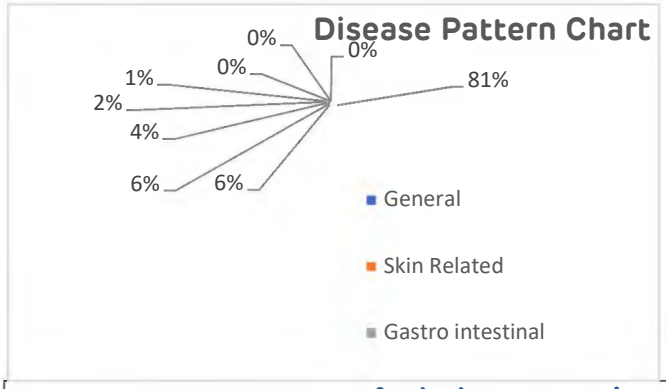


- The hospital staff, comprising qualified medical professionals and support personnel, diligently cater to the healthcare needs of the community, offering both outpatient and inpatient services.
- Services provided include primary care, emergency medical treatment, maternal and child health services, laboratory diagnostics, and pharmacy services.
- The hospital operates round the clock, ensuring accessibility and timely medical assistance to residents, thereby contributing to the overall well-being of the community.

2. Ambulance Service for Villagers:

The provision of ambulance services has played a crucial role in ensuring timely access to medical care for villagers in Nagwa and surrounding areas. The ambulance service, facilitated by the Adani Foundation, has been instrumental in transporting patients to the R&R Hospital for treatment, as well as facilitating referrals to higher-level healthcare facilities when necessary. The service operates round-the-clock, with trained drivers and equipped vehicles,

Age Goup	Male	Female
0-15 years	34.59%	30.49%
16-30 years	26.56%	27.79%
31-45 years	19.93%	21.28%
46-60 years	11.76%	4.37%
61+ years	7.17%	6.05%



Ambulance services FY 2023-24											
Month	April' 23	May' 23	June' 23	July' 23	Aug' 23	Sept.' 23	Oct' 23	Nov' 23	Dec' 23	Jan' 24	Feb' 24
Patients	51	39	54	54	80	69	68	42	39	42	50
Toral	588										

3. Specialized Health Camp:

No. of Direct Beneficiaries in Health Camp-FY-2023-24				
	Total Camp Conducted	Total Male	Total Female	Total Child
	259	**3206**	**4873**	**3217**
Grand Total OPD		**11296**		

4. Health Awareness Program:

Health Awareness Meeting FY-2023-24						
S.No.	Thematic Area Name	Meeting Topic	Participants Details			
			Child	Male	Female	Total
1.	Health	Diarrhea, Anemia, Nutrition, Malaria, TB, Maternal health	81	207	979	1267

Education

Free Education Program for R&R Family

The adani Foundation's provide Free education to all R&R family village Nagwa, children encourage underprivileged students with promising academic records to complete school and pursue higher education. Children, especially girls, being raised by single mothers and women-headed families find special mention within this framework. So far, more than 12,00 students have benefited, with this program. In certain cases, the Foundation also facilitates sponsorships for deserving students pursuing higher education.

1. Total Gender Distribution:

- Total Boys: 51.45%
- Total Girls: 48.55%
- Grand Total: 100%

Gender	SC	ST	OBC	GEN
Boys	157	137	243	119
Girls	154	99	184	113
Total	311	235	427	232
Grand Total Students Enrolled			**1205**	

Observations:

• The overall gender distribution shows a slight majority of boys enrolled in the school.

• Among different categories, the distribution of boys and girls varies, with some categories having a higher percentage of boys and others having a higher percentage of girls.

• The Scheduled Tribe (ST) category has the highest disparity in gender distribution, with a significantly higher percentage of boys compared to girls.

Utthan –

Creative methods of education

The adani Foundation promotes the use of methods such as storytelling, theater, and activity-based learning to make the learning experience more enriching for students.

Bala Painting –

The Bala Painting initiative is a part of the broader Utthan Program, which aims to enhance the educational environment and holistic development of children in schools supported by the Adani Foundation. Bala Painting involves the creative expression of children through vibrant and colorful artwork on school walls.

Site	Total School	Girls	Boys	SC	ST	OBC	General	Total
Singrauli	21	1315	1200	710	984	673	148	2515

Special Day Celebration-

A total of **15 special days** were celebrated across Utthan schools, aiming to promote cultural, educational, and social awareness among students.

Total Students Participated: 10,900

The participation of students from various Utthan schools reflects the widespread engagement and enthusiasm among the student community.

Mother Meet

The Mother Meet sessions conducted under the Utthan Program across various schools in Singrauli from November 2023 to January 2024. The Mother Meet sessions aim to engage mothers in the educational development and progress of their children.

Total Mother Meet Sessions: 21

sDuration: November 2023 to January 2024

Adani Evening Coaching Center-

Total 59 students enrolled in AECC. In 9th grade 29 and 10th grade 30 students get benefited of coaching center's

Teachers' training program

Teachers are crucial to ensuring that the education imparted at school is up to established standards. The adani Foundations training program aims to make educational activities more fulfilling for teachers, who in turn make learning a meaningful experience for children.

Community Infrastructure Development

Infrastructural Development work at R&R Colony

Renovation of Anganwadi, Bandhaura

Pond Deepening in Core Village

1.1 KM Drain Construction in R&R Colony

6 KM Approach Road Repairing in Core Village

Seating Chabutra construction at Nagwa.

Sports Activity for Youths

Supports & Cultural Activity-

Adani Khel Utsav-

AF supported to village youths (Male & Female) by providing sports activity material on gram panchayat level. Total 36 sports events have been organized by AF in the last 1 Years. In which cricket tournament -08, Football game – 12, Volleyball – 04, Kabaddi -03, Athletics -03 has been organized. In between also organized 02 Inter school level volleyball tournament at Coal Transport village, 01 program Inter Level School Volleyball Tournament at Saraswati Shishu mandir Nagwa, 02 Inter village Level Cricket tournament at Coal Transport village (Khanua & Bhaliyatola). AF also support to organize National Level Sub Junior Archery tournament and provided archery set & sports kit to all the National Players of MP state.

Adani Samaroh (Cultural Activity)-

"Adani foundation believe in promoting Local Culture & develop Local Tradition among village community especially in youth & Community. In rural areas, different societies have their own culture and civilization, in which the faith and beliefs of the community are connected. Last year also Adani Foundation participated in such rural programs, Due to which a good image of Adani was created in the community.

CASE STUDY: -

Overcoming Adversity and Rediscovering Health

Sudarshan Biar, a resident of Nagwa village, faced a challenging journey on his way to recovery. His remarkable story is a testament to the power of Dr. Vishwas Singh's resilience, determination and compassionate care at the rehabilitation hospital.

Sudarshan's battle began with the diagnosis of diabetes, a condition that requires constant vigilance. However, fate dealt him a blow when an unfortunate work-related injury turned into a debilitating wound. Sudarshan's determination took him to several hospitals, including a brief stint at Sanjay Gandhi Hospital. But the burden of financial constraints forced him to discontinue his treatment, causing his condition to rapidly deteriorate.

As his injury worsened, the function of his hand soon became endangered. In the darkest time of his life, Sudarshan reached out to Dr. Vishwas Singh, who was a ray of hope in the stormy sea of troubles. With compassion and expertise, Dr. Singh took Sudarshan under his wing and began a treatment plan that changed Sudarshan's life forever.

Dr. Singh's approach was multidimensional. He started by addressing the root cause, effectively managing Sudarshan's diabetes. Regular checkups and a strict control regimen helped stabilize his blood sugar levels. Along with this, Dr. Singh performed careful dressing and care of the wound, which ensured that the infection was controlled and gradually eliminated.

This journey was not without challenges. Despite the pain and uncertainty, Sudarshan's commitment to his recovery was unwavering. He diligently followed Dr. Singh's guidance, made lifestyle adjustments, and adhered to prescribed medications. It was a difficult process, but Sudarshan never lost sight of his goal – to regain his health and the use of his hand.

Slowly but steadily, the disease began to subside. Sudarshan's wound started healing and his diabetes came under control. His persistence paid off and he regained full use of his hand. This transformation was nothing short of a miracle, a testament to Sudarshan's resilience and Dr Singh's unwavering commitment to his patient's well-being.

Today, Sudarshan Briar stands as a symbol of hope and triumph over adversity. Her success story serves as a reminder that with the right support, determination, and access to compassionate healthcare, individuals can overcome even the toughest challenges life throws at them. Sudarshan's journey from despair to health is a shining example of the indomitable human spirit and the healing power of medical expertise and empathy. For which Sudarshan thanked the health services of Adani Foundation.

From Smoke to Sustainability: Shrimati Yadav's Biogas Journey

Shrimati Yadav, a resilient resident of a remote village nagwa in project effected area, embarked on a remarkable journey towards sustainable living, thanks to the generous support of the Adani Foundation. Her inspiring success story underscores the transformative power of financial aid and how it can change lives for the better.

Living in a region with limited access to clean cooking fuel, Shrimati Yadav faced daily challenges with traditional cooking methods that relied on firewood,cow dung and costly LPG. These methods not only consumed her valuable time but also exposed her family to indoor air pollution, jeopardizing their health and well-being. The situation was daunting, but Shrimati Yadav was determined to make a change.

Her ray of hope came in the form of the Adani Foundation, which recognized the potential for positive change in her life and community. With their financial support and expertise in sustainable technologies, Shrimati Yadav was able to realize her dream of installing a biogas plant on her family's farm.

Under the guidance of the Adani Foundation, Shrimati Yadav acquired the necessary knowledge and resources to set up the biogas digester. Organic waste from her farm, including cow dung and kitchen scraps, was efficiently processed by the biogas plant, providing her family with a consistent and clean source of cooking fuel.

The impact was immediate and transformative. Shrimati Yadav's family no longer had to endure the laborious task of collecting firewood, freeing up time for more productive activities. Moreover, their health improved as they were no longer exposed to harmful indoor smoke. The biogas plant also produced nutrient-rich slurry, which enhanced agricultural yields, further boosting the family's economic well-being.

Filled with gratitude, Shrimati Yadav expressed her heartfelt thanks to the Adani Foundation for their unwavering support and generosity. Their assistance not only changed her family's cooking style but also improved their overall quality of life. She shared her story with her community, inspiring others to embrace sustainable living practices.

Shrimati Yadav's journey from dependence on traditional cooking methods to self-reliance through biogas, with the invaluable help of the Adani Foundation, serves as a shining example of how financial assistance can create lasting change. Her gratitude and success story are a testament to the positive impact that philanthropic organizations can have on the lives of individuals and communities, even in the most remote and underserved areas.

Success Story

Sunita Rajak Story

adani
Foundation

In the quaint village of Bandhaura, 2004, I was born into a family of six, filled with love and joy. However, the absence of a son led my father down a troubled path, causing discord in our home. Despite the challenges, my resilient mother, Shrimti Parvati Rajak, sustained us by working diligently, ensuring my sister and I received an excellent upbringing.

In 2009, our lives took a turn when Essar Powder M.P. Limited arrived, prompting our family's relocate to Nand Vihar Colony Nagwa. By then, my father had remarried, leaving my mother to shoulder the responsibilities alone. Although she strived to provide for us and educate me, our household's condition remained dire.

Witnessing my mother's struggles, I longed for change. In 2023, a ray of hope emerged in the form of a sewing training center established by the Adani Foundation in Nandvihar Colony Nagwa. My sister and I seized the opportunity, completing a three-month sewing training course. Armed with newfound skills, I began my sewing venture at home, reaching out to neighboring villages.

Through perseverance and determination, my sewing shop gained popularity, transforming our lives. The Adani Foundation played a pivotal role, not only in providing training but also empowering me to be self-reliant. Today, I am proud to support my family, ensuring a comfortable life for my mother and myself.

I extend my heartfelt gratitude to the Adani Foundation, whose support brought happiness and self-sufficiency into our lives. My success story stands as a testament to the transformative power of education, determination, and the invaluable assistance provided by organizations like the Adani Foundation.

Success Story

From Despair to Hope: Sunita Saket's Inspirational Journey

In the heart of a small village nagwa , amidst the harsh realities of poverty, resides Sunita Saket, a woman of incredible strength and determination. Sunita, along with her husband Ram Ujagar Saket and their five daughters - Nirmala, Neetu, Ananya, Aarushi, and Sakshi, faced the challenges of life in a tiny two-room house. Unemployment cast a long shadow over their lives, making each day a struggle.

Amidst the dire circumstances, a glimmer of hope appeared in the form of the Adani Foundation, an organization dedicated to empowering communities. It was here that Sunita found her ray of light. The foundation offered sewing classes in the village, providing Sunita with an opportunity to learn a valuable skill.

Embracing the chance to transform her life, Sunita wholeheartedly dedicated herself to mastering the art of sewing. With newfound skills and determination, she started stitching fabrics in her humble home, turning it into a small sewing workshop. The whirr of the sewing machine became a symbol of hope, echoing the resilience of a woman who refused to succumb to despair.

Through perseverance and hard work, Sunita began to generate income for her family. The once desolate house started to brim with life, filled with the laughter and dreams of her daughters. Nirmala, Neetu, Ananya, Aarushi, and Sakshi witnessed their mother's unwavering spirit, learning valuable life lessons in the process.

Sunita's story is not just one of survival; it is a testament to the power of education and empowerment. Her journey from poverty to self-sufficiency resonates with the entire village, inspiring others to overcome their challenges. In every stitch, there is a tale of resilience, in every piece of fabric, there is a lesson of hope.

The Adani Foundation not only taught Sunita how to sew but also stitched the fabric of her dreams, weaving a success story that is bound by determination, adorned with perseverance, and embroidered with hope. Sunita Saket, once a victim of circumstance, emerged as a beacon of inspiration, illuminating the path to a brighter future for her family and her community.

1.2 Media coverage (selected news clippings, social media)


अदाणी फाउंडेशन द्वारा आयोजित निःशुल्क मेगा हेल्थ कैंप में 900 मरीजों का इलाज


अदाणी फाउंडेशन ने जैविक खेती पर दिया जोर, प्रशिक्षित महिला किसानों को बांटे किट

नवभारत न्यूज
सिंगरौली 29 मई। माड़ा तहसील अंतर्गत महान इनर्जेन लिमिटेड के पड़ोस के गांवों के 35 महिला किसानों को अदाणी फाउंडेशन द्वारा कृषि विज्ञान केंद्र वैढ़न के माध्यम से जैविक तरीके से सब्जी उत्पादन विषय पर एक दिवसीय प्रशिक्षण प्रदान किया गया।

इस प्रशिक्षण का उद्देश्य पोषण वाटिका के निर्माण के लिए खेती की तैयारी, रोपाई का तरीका, नर्सरी लगाने की विधि, फसलों में लगने वाली बीमारियों और उनके उपचार, जैविक दवा बनाना एवं उसका उपयोग करने के बारे में विस्तृत जानकारी देना है। इस सम्बन्ध में स्थानीय महिला किसानों को कृषि विज्ञान केंद्र के प्रमुख डॉ.जय सिंह एवं उनकी टीम के द्वारा विस्तारपूर्वक पावर प्वाइंट प्रेजेंटेशन के माध्यम से समझाया गया। प्रशिक्षण के उपरांत कृषि विज्ञान केंद्र द्वारा सभी महिला कृषकों को टमाटर एवं भिंडी के बीज वितरित किए गए। अदाणी फाउंडेशन ने जैविक सब्जी उत्पादन को बढ़ावा देने के लिए इस साल लगभग 100 वर्मी कंपोस्ट बेड बनाने का लक्ष्य रखा गया है। प्रशिक्षण के एक दिन उपरांत प्रशिक्षित महिलाओं के बीच निःशुल्क किट वितरित की गयी। जिसमें सब्जियों की सर्वोत्तम किस्म के बीज, जैविक दवा और वर्मी कंपोस्ट खाद थे। 50 महिला कृषकों को वितरित इस किट में करेला, बरबटी, लौकी, भिंडी, धनिया, मिर्ची, टमाटर एवं बैंगन जैसे सब्जियों के बीज के साथ ब्रह्मास्त्र, नीमास्त्र, अग्नि अस्त्र जैसे जैविक खाद व कीटनाशक और एक किलो वर्मी कंपोस्ट खाद का पैकेट दिया गया। अदाणी फाउंडेशन द्वारा ऑर्गेनिक खेती को बढ़ावा देने के लिए एक मुहिम चलाई जा रही है जिसके माध्यम से ग्रामीण इलाकों में वर्मी कंपोस्ट, ऑर्गेनिक कीटनाशक, लिक्विड फर्टिलाइजर, नीमास्त्र, जीवामृत जैसी ऑर्गेनिक पद्धति से उत्पादित सामग्री को समते खर्च में गोबर, गौमूत्र एवं हरे पत्तों के सहायता से बनाया जा रहा है। प्रशिक्षण के दौरान अदाणी फाउंडेशन के अधिकारी मनोज प्रभाकर एवं उनकी टीम ने महिला किसानों को बताया कि आज हमारे समाज में तेजी से बढ़ रही बीमारियों के लिए गलत खान पान विशेष तौर पर जिम्मेदार है।


अदाणी फाउंडेशन के सहयोग से प्रशिक्षण लेकर वाशिंग पाउडर बनाने में महिलाएं हुईं दक्ष, बनेंगी आत्मनिर्भर


पर्यावरण के प्रति जागरूक जीवन शैली अपनाने के लिए अदाणी फाउंडेशन ने शुरू की मुहिम


अदाणी फाउंडेशन द्वारा उत्थान कार्यक्रम का शुभारंभ


महिला कारीगरों को हुनरमंद बना रहा अदाणी फाउंडेशन

नगवां सामुदायिक भवन में जूट हस्तशिल्प निर्माण का दिया जा रहा प्रशिक्षण

200 महिलाएं आजीविका कार्यक्रम से जुड़ीं

adani
Foundation

200 पशुओं का निःशुल्क टीकाकरण कर दी गयी दवाइयां

अदाणी फाउंडेशन द्वारा कामधेनु कार्यक्रम के तहत पशु चिकित्सा एवं जागरूकता शिविर का आयोजन

पौधारोपण को बढ़ावा दे रहा अदाणी फॉउंडेशन, शुरू हुआ वृक्ष से विकास कार्यक्रम

अदाणी फाउंडेशन ने फाइनल टूर्नामेंट प्रतियोगिता में वितरण किया खेल सामग्री

काल चिंतन कार्यालय

वैढ़न,सिंगरौली। जनपद पंचायत बैढ़न वार्ड क्रमांक 11 सखौहां के ग्राम पंचायत सिंगाही ग्राम पड़खुरी में 7 जनवरी से फुटबॉल टूर्नामेंट प्रतियोगिता का आयोजन हुआ था जिसका फाइनल मुकाबला मकर संक्रांति के शुभ अवसर पर 14 जनवरी को खेला गया फाइनल मुकाबला कुशवाहा स्पोर्टिंग क्लब वर्सेस सिंगरौलिया के बीच खेला गया जिसमें कुशवाहा स्पोर्टिंग क्लब ने 2-0 से बढ़त बनाकर फाइनल मुकाबला में जीत हासिल करने में सफल रही इस फाइनल मुकाबला में बतौर मुख्य अतिथि के रूप में देवसर विधान सभा के विधायक राजेंद्र मेश्राम उपस्थित रहे एवं अदाणी फाउंडेशन बधौरा के कार्यक्रम प्रबंधक मनोज प्रभाकर के द्वारा खेल सामग्री प्रदान की गई विजेता एवं उपविजेता टीम को फुटबॉल जर्सी ट्रॉफी व अतिथियों को मोमेंटो फुटबॉल एवं समाज सेवियों को टी-शर्ट वितरण की गई वही अदानी फाउंडेशन श्री प्रभाकर के द्वारा क्षेत्रीय विधायक को स्मृति चिन्ह देकर सम्मानित किया व विधायक ने अदाणी फाउंडेशन के द्वारा की गई खेल सामग्री वितरण की काफी प्रशंसा किया।

अदाणी फाउंडेशन जरूरतमंद महिलाओं को बना रहा आत्मनिर्भर

सुनीता रजक और उनकी माँ

अदाणी फाउंडेशन के सहयोग से सिक्की कला ने खोली रोजगार की राह

अदाणी फाउंडेशन की मदद से मशरूम की खेती कर महिलाएं आत्मनिर्भर बनने की राह पर

Employee Volunteer Engagement

For communities, employee volunteering provides a skilled and talented volunteer pool, as employees devote personal and professional skills to community needs, Business HoDs & their family support to villagers in different program and mobilize them with their experiences and ensure them for better support by Adani.

During facilitation program of National Sports day Security Head Col. Vijay pandey

Police Awarness Program ABHIMANYU

Security Head during Adani Samaroh Prog.

Utthan Project Head – Smita Goel Mam & Mine Cluster Head family visited at MEL Singraulli Utthan School and meet with studetns and given best wishes for their bright.

Sushmita Sundaray Mam and respective HoDs family members visited at Biklang school & meet with students, encourage them and dedicate them RO water purifier for safe Drinking

Safety and Security head participated in community mobilisation about importance of Safety & Securty during safe drive awarness program

Chief Operationg Officer sh. Nanda sir visited at R&R Colony at Village nagwa, meet with villagers, Medical team & Self Help group members, ecourage & guide them for best opportunity about benefits of Income genration activity running by CSR team.

Our Beloved Chairman shr.Gautam G. Adani visited at Mahan Singraulli , encourage to entire team of MEL for best ooportunity in Adani Power & recived momento of Gautam Budhhaa

Appreciation letter from stakeholder(s)

ग्राम पंचायत क्षेत्र जमगडी जनपद पंचायत वैढन जिला सिंगरौली (म०प्र०)

प्रशंसा-पत्र

प्रमाणित किया जाता है कि श्रीमान- अदानी फाउन्डेशन पशु चिकित्सा शिविर में सराहनीय कार्य किया है ।

आपकी उल्लेखनीय सेवाओं एवं सहयोग के लिए ग्राम पंचायत क्षेत्र अत्यंत आभारी है तथा सम्मान के रूप में आपको यह प्रशंसा-पत्र प्रदान किया जाता है ।

स्थान - गौसाला जमगडी
दिनांक - 29/01/2024

सरपंच
ग्राम पंचायत क्षेत्र जमगडी

कार्यालय ग्राम पंचायत क्षेत्र कर्सुआलाल जनपद पंचायत बैढ़न
जिला-सिंगरौली (मध्यप्रदेश)

प्रशंसा पत्र

प्रमुख,

अदाणी फाउंडेशन

बन्धौरा

प्रिय सदस्यों,

हमें खुशी है कि अदाणी फाउंडेशन ने गांव में पूर्णवास स्वास्थ्य केंद्र के संचालन और स्वास्थ्य जागरूकता कार्यक्रमों के लिए महत्वपूर्ण पहल की है। आपके संपर्कसील प्रयासों के माध्यम से, गांव की आवश्यकताओं को पूरा करने में मदद मिल रही है, और स्वास्थ्य सेवाओं को सुगम और सामाजिक रूप से उपलब्ध कराया जा रहा है।

हमारा समाज सशक्तिकरण के माध्यम से आरोग्य सेवाओं तक पहुँचने में विश्वास रखता है, और आपके इस पहल के माध्यम से गांव के लोगों को इस साधन की सही दिशा में नेतृत्व मिल रहा है।

हम सभी सदस्य आपकी इस उत्कृष्ट पहल को सराहते हैं और आपके साथ इस समर्थन में साथ खड़े हैं। हमें यह आशा है कि आपका उद्यम और निष्ठा आगे भी समाज के लिए सदैव प्रेरणा का स्रोत बने रहेंगे।

धन्यवाद।

सरपंच
ग्राम पंचायत क्षेत्र 12 कर्सुआलाल
जनपद पंचायत बैढ़न
जिला-सिंगरौली (म०प्र०)

कार्यालय ग्राम पंचायत क्षेत्र नगवा जनपद पंचायत बैढ़न
जिला-सिंगरौली (मध्यप्रदेश)

प्रशंसा पत्र

प्रमुख,

अदाणी फाउंडेशन

बन्धौरा

प्रिय सदस्यों,

हमें खुशी है कि अदाणी फाउंडेशन ने गांव में पूर्णवास स्वास्थ्य केंद्र के संचालन और स्वास्थ्य जागरूकता कार्यक्रमों के लिए महत्वपूर्ण पहल की है। आपके संपर्कसील प्रयासों के माध्यम से, गांव की आवश्यकताओं को पूरा करने में मदद मिल रही है, और स्वास्थ्य सेवाओं को सुगम और सामाजिक रूप से उपलब्ध कराया जा रहा है।

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धन्यवाद।

सरपंच
ग्राम पंचायत क्षेत्र नगवा
जनपद पंचायत-बैढ़न
जिला-सिंगरौली (म.प्र.)

1.3 Beneficiaries count

S. No.	Activity Description	Direct	Indirect	Access
A.	**Education**			
1	Free education to R & R families	1203	4600	
2	Utthan Project	2515	9500	
3	Joyful Learning Bala Painting – 8 School	1600	3600	
4	RO Water Purifier for Safe Drinking -10 nos.	3200	4200	
B.	**Community Health**			
1	R & R hospital	14368	23544	
2	Health Camp	3044	10000	
3	Project Pad	1100	1900	
4	Kilkari Project	300	800	
5	Construction of Hospital- 2 no's	5000	15000	
C.	**Sustainable Livelihood Development**			
1	Women Enterprises Set-up – 7 Nos	40	150	
2	Livelihood through Skill Development – 200 no's	200	672	
3	Mushroom Production -	50	196	
4	Organic practices on agriculture- 8 Acre	25	110	
5	Livestock Management support – 10 village	65	230	
D.	**Community Infrastructure Development**			
1	Community Market Setup	12	100	
2	Anganwadi center	32	100	
3	Drainage Construction	720	2100	
4	Village Road Construction	1560	4670	
5	Water Conservation- Pond Restoration- 3 no's	3	145	

* Refer attachments:
a. Guidance on Calculation of Beneficiaries of AF CSR Projects
b. FAQ-Beneficiaries Count

Adani Foundation team

S.No.	Name	Position
1.	Mr. Manoj Prabhakar	Program Manager
2.	Mr. Rishabh Panday	Project Officer (Health, Edu.)
3.	Mr. Nikhil	Project Officer (SLD)
4.	Kamlesh Kumari	Village Coordinator
5.	Sat Kumari Jaiswal	Village Coordinator
6	Vimal Jaiswal	Village Coordinator

Site office address:

Mahan Energen Limited, Village – Bandhaura, Post –Karsualal, Tahsil – Mada, District- Singrauli
Pin- 486886

adani
Power

Ref: APL/MEL/Env/PCCF/407/23
Date: 03.04.2023

To,
The Principal Chief Conservator of Forest (Wildlife),
Pragati Bhawan, Bhopal Vikas Pradhikaran,
3rd Floor, M.P Nagar, Bhopal
Madhya Pradesh - 462011

Sub.: **Submission of Ecological Assessment and Flora Fauna Wildlife Conservation and Management Plan for Operational 1200 (2x600) MW Thermal Power Plant** with proposed Expansion of Bandhaura Ultra Super Critical Thermal Power Plant at Village Bandhaura, Tehsil Mada, District Singraulli, Madhya Pradesh by Mahan Energen Limited.

Ref.: **1. Environmental Clearance (EC) vide File no. J-13011/56/2006. IA. II(T) dated 20.04.2007 and amendments on 10.02.2009, 23.08.2013 and 08.04.2016.**
2. Certified EC compliance by MoEFCC, IRO, Bhopal vide File no. 4(0)1/2022(Env.) I/10563/2022 (2) dated; 02.09.2022.

Dear Sir,

With reference to above mentioned subject, the Ministry of Environment, Forest & Climate Change (MoEFCC) has granted Environmental Clearance vide letter no **J-13011/56/2006-IA.II** (T) dated: 20.04.2007 and its subsequent amendments dated 10.02.2009. 23.08.2013, 08.04.2016. Subsequently transfer of EC to **Mahan Energen Limited (MEL) on 15.09.2022**.

In compliance of the **Specific Condition no: xiii of EC**; "A conservation Plan for Schedule -I animals reported in the study area of the project shall be prepared in consultation with an expert organization and duly approved by state wildlife department of Madhya Pradesh". during the plant site visit by **MoEF&CC, Integrated Regional Officer, Bhopal** for certification of EC Compliance status vide letter / File no. 4(0)1/2022(Env.) I/10563/2022 (2) dated; 02.09.2022.

MEL has also proposed to undertake expansion of the existing plant of Bandhaura Ultra Super Critical Thermal Power Plant by adding 1600 (2x800) MW to existing 1200 (2x600) MW **within the existing plant boundary / areas** at Village Bandhura, Tehsil Mada, District Singraulli, Madhya Pradesh.

Mahan Energen Ltd
(Formerly Essar Power MP Ltd)
Adani Corporate House
Shantigram, S G Highway
Ahmedabad 382 421
Gujarat, India
CIN: U40100DL2005PLC201961

Tel +91 79 2555 4444
Fax +91 79 2555 7177
www.adanipower.com

Registered Office: Lower Ground Floor, Hotel Conclave Boutique, A-20, Kailash Colony, New Delhi 110 048, Delhi, India

adani
Power

We are submitting herewith the Ecological Assessment and Flora & Fauna Wildlife Conservation & Management Plan, which is prepared by M/s Good Earth Enviro Care in Association with Department of Environment Management, Indian Institute of Social Welfare & Business Management, Kolkata (Kolkata University & NABET Members).

The Wildlife Conservation Plan prepared by consultant is hereby submitted for your kind Pursual.

Solicit your suggestion and recommendation.

Thanking You,

Your's faithfully

for **Mahan Energen Limited**

(Authorized Signatory)
Head – Environment & Forest

Encl: Ecological assessment and flora fauna & Wildlife Conservation and Management Plan for Mahan Energen Limited

CC:
1. **Integrated Regional Office,** Ministry of Environment, Forest & Climate Change, Kendriya Paryavaran Bhavan, Link Road No. 3, Ravi Shankar Nagar, Bhopal (M.P) – 462016
2. **The District Forest Officer,** Majan Road, Waidhan, Singrauli, Madhya Pradesh – 486889.
3. **The Regional Officer,** Madhya Pradesh Pollution Control Board, Regional Office, Waidhan, Singrauli, M.P. -

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Consent Order

M.P. Pollution Control Board
E-5, Arera Colony
Paryavaran Parisar, Bhopal - 16 MP
Tele : 0755-2466191, Fax-0755-2463742

RED-LARGE	CTE-Expansion	CONSENT NO: ***	PCB ID: 148721

Outward No:118889,27/09/2023 **Consent No:CTE-58920**

To,

The Occupier,
M/s. Mahan Energen Limited,
(Formerly Known As Essar Power MP Ltd.),
Vill: Bandhaura, Teh. Mada,
Dist : Singrauli (MP) - 486886

Subject: Grant of Consent to Establish for expansion under section 25 of the Water (Prevention & Control of Pollution) Act,1974 & under section 21 of the Air (Prevention & Control of Pollution) Act,1981

Ref: Your Application Receipt No. 1298104 Dt. 21/08/2023 and last communication received on Dt.12/09/2023

Without prejudice to the powers of this Board under section 25 of the Water (Prevention & Control of Pollution) Act,1974 under section 21 of the Air (Prevention & Control of Pollution) Act,1981 and without reducing your responsibilities under the said Acts in any way, this is to inform you that this Board grants Consent to Establish up to **31/08/2028** for expansion of Thermal power plant at Vill: Bandhaura, Teh. Mada, Dist : Singrauli (MP) - 486886

SUBJECT TO THE FOLLOWING CONDITIONS :-

a. Location: Vill: Bandhaura, Teh. Mada, Dist : Singrauli (MP) - 486886

b. The capital investment: Rs. 12,439.43 Crs

c. Product & Production Capacity:

Product	CTE Qty / year	CCA Qty / year	CTE Qty / year after expansion
Generation of Electricity (Coal Based Power Generation Plant)	1200 MWH (2x 600 MWH)	1200 MWH (2x 600 MWH)	2800 MWH (2 X 600 MWH, 2 X 800 MWH)

The consent (for operation) as required shall be granted to your industry after fulfillment of all the conditions mentioned above. For this purpose you shall have to make an application to this Board in the prescribed proforma at least two months before the expected date of commissioning of your industry. The applicant shall not operate the unit without obtaining consent for operation from the Board and shall not bring in to use any out let for the discharge of effluent and gaseous emission.

Enclosures:-

* ***Conditions under Water Act***
* ***Conditions under Air Act***
* ***General conditions***

By the order of Chairman, MPPCB

CHANDRA MOHAN THAKUR
Member Secretary

(Organic Authentication on AADHAR from UIDAI Server)
TPAV # 3P2O7XRPUJ

CONDITIONS PERTAINING TO WATER (PREVENTION & CONTROL OF POLLUTION) ACT 1974 :-

Water Quality Monitoring and Management

1. The daily quantity of trade effluent of the unit shall not exceed **4751.0 KL/day**, and the daily quantity of sewage of the unit shall not exceed **17.0 KL/day**

2. Trade Effluent Treatment:-

The applicant shall provide comprehensive effluent treatment system as per the proposal submitted to the Board and maintain the same properly to achieve following standards-

pH	Between	5.5 – 9.0	TDS	Not exceed	2100 mg/l.
Suspended Solids	Not exceed	100 mg/l.	Chlorides	Not exceed	1000 mg/l.
BOD_3 Days 27 °C	Not exceed	30 mg/l.			
COD	Not exceed	250 mg/l.			
Oil and grease	Not exceed	10 mg/l.			

For other parameters general standards of discharge as notified under EP Act 1986 and standards notified by MPPCB from time to time shall be applicable.

3. Sewage Treatment :-

The applicant shall provide comprehensive sewage treatment system as per the proposal submitted to the Board and maintain the same properly to achieve following standards-

pH	Between	6.5 – 9.0
Suspended Solids	Not exceed	100 mg/l.
BOD_3 Days 27 °C	Not exceed	30 mg/l.
COD	Not exceed	250 mg/l.
Oil and grease	Not exceed	10 mg/l.
fecal coliform	Not exceed	1000 MPN/100 ml

4. The effluent shall be treated up to prescribed Standards and reused in the process, for cooling, ash handling and for green belt devolvement/gardening etc within premises. Hence **zero discharge condition** shall be practiced. In no case treated effluent shall be discharged outside of industry/unit premises.

5. Water meter preferably electromagnetic/ultrasonic type with digital flow recording facilities shall be installed separately for category wise consumption of water for Industrial cooling/boiler feed, mine spray, process & domestic purposes and data shall be submitted online through XGN monthly patrak/statements. The industry/unit shall also monitor the treated wastewater flow and report the same online through monthly patrak/statements.

Sr	Water Code (Qty in KLD)	WC : 97740.0	WWG : 4768.0	Water Source	Remark
1	Boiler Feed	700.0	1.0	River	Reject water shall be used in Ash Handling Plant (Zero Liquid Discharge plant)
2	Boiler Feed	2184.0	264.0		-
3	Cooling Water	62376.0	0.0		-
4	Cooling Water	71720.0	0.0		-
5	D.M Water Plant	780.0	78.0		Reject water is being used in Ash Handling Plant (Zero Liquid Discharge plant)
6	Domestic Purpose	72.0	57.0		-
7	Domestic Purpose	20.0	17.0		being treated in STP and reused in green belt
8	Mnfg Process	31368.0	1344.0		-
9	Mnfg Process	23020.0	4655.0		shall be treated in ETP and reused with in plant premises

6. Any change in production capacity, process, raw material used etc. and for any enhancement of the above prior permission of the Board shall be obtained. All authorized discharges shall be consistent with terms and conditions of this consent. Facility expansions, production increases or process modifications which result new or increased discharges of pollutants must be reported by submission of a fresh consent application for prior permission of the Board.

7. All treatment/control facilities/systems installed or used by the applicant shall be regularly maintained in good working

order and operate effectively/efficiently to achieve compliance of the terms and conditions of this consent

8. The Consent does not authorize or approve the Construction of any physical structures or facilities or the undertaking of any work in any water course or within its high flood level (HFL) area.

9. The specific effluent limitations and pollution control systems applicable to the discharge permitted herein are set forth as above conditions.

10. Compilation of Monitoring data-
i. Samples and measurements taken to meet the monitoring requirements specified above shall be representative of the volume and nature of monitored discharge.
ii. Following promulgation of guidelines establishing test procedures for the analysis of pollutants, all sampling and analytical methods used to meet the monitoring requirements specified above shall conform to such guidelines unless otherwise specified sampling and analytical methods shall conform to the latest edition of the Indian Standard specifications and where it is not specified the guidelines as per standard methods for the examination of Water and Waste latest edition of the American Public Health Association, New York U.S.A. shall be used.
iii. The applicant shall take samples and measurement to meet the monthly requirements specified above and report online through XGN the same to the Board.

11. Recording of Monitoring Activities & Results-
i. The applicant shall make and maintain online records of all information resulting from monitoring activities by this Consent.
ii. The applicant shall record for each measurement of samples taken pursuant to the requirements of this Consent as follows:

(i) The date, exact place and time of sampling
(ii) The dates on which analysis were performed
(iii)Who performed the analysis?
(iv)The analytical techniques or methods used and
(v)The result of all required analysis

iii. If the applicant monitors any Pollutant more frequently as is by this Consent he shell include the results of such monitoring in the calculation and reporting of values required in the discharge monitoring reports which may be prescribed by the Board. Such increased frequency shall be indicated on the Discharge Monitoring Report Form.
iv. The applicant shall retain for a minimum of 3 years all records of monitoring activities including all records of Calibration and maintenance of instrumentation and original strip chart regarding continuous monitoring instrumentation. The period of retention shall be extended during the course of any unresolved litigation regarding the discharge of pollutants by the applicant or when requested by Central or State Board or the court.

12. Reporting of Monitoring Results:-
Monitoring Information required by this Consent shall be summarized and reported by submitting a Discharge Monitoring report on line to the Board.

13. Limitation of discharge of oil Hazardous Substance in harmful quantities:-
The applicant shall not discharge oil or other hazardous substances in quantities defined as harmful in relevant regulations into natural water course. Nothing in this Consent shall be deemed to preclude the institution of any legal action nor relive the applicant from any responsibilities, liabilities, or penalties to which the applicant is or may be subject to clauses.

14. Limitation of visible floating solids and foam:-
During the period beginning date of issuance the applicant shall not discharge floating solids or visible foam.

15. Prohibition of By pass system of treatment facilities-
The diversion or by-pass of any discharge from facilities utilized by the applicant to maintain compliance with the terms and conditions of this Consent in prohibited except :
i. where unavoidable to prevent loss of life or severe property damage, or
ii. Where excessive storm drainage or run off would damage any facilities necessary for compliance with the terms and conditions of this Consent. The applicant shall immediately notify the consent issuing authorities in writing of each such diversion or by-pass in accordance with the procedure specified above for reporting non-compliance.

16. TPP management shall submit the information online through XGN in reference to compliance of consent conditions.

Additional Water condition:- (if any) :-

17. Induced/Natural draft closed cycle wet cooling system including cooling towers shall be set up with minimum Cycles of Concentration (COC) of 5.0 or above for power plants using fresh water to achieve specific water consumption of 2.5

m²/MW hr. (Or) Induced/Natural draft open cycle cooling system shall be set up with minimum Cycles of Concentration (COC) of 1.5 or above for power plans using sea water.

18. In case of the water withdrawal from river, a minimum flow 15% of the average flow of 120 consecutive leanest days should be maintained for environmental flow whichever is higher, to be released during the lean season after water withdrawal for proposed power plant.

19. Records pertaining to measurements of daily water withdrawal and river flows (obtained from Irrigation Department/Water Resources Department) immediately upstream and downstream of withdrawal site shall be maintained.
(iv) Rainwater harvesting in and around the plant area be taken up to reduce drawl of fresh water. If possible, recharge of groundwater to be undertaken to improve the ground water table in the area.

20. Regular (at least once in six months) monitoring of groundwater quality in and around the ash pond area including presence of heavy metals (Hg, Cr, As, Pb, etc.) shall be carried out as per CPCB guidelines. Surface water quality monitoring shall be undertaken for major surface water bodies as per the EMP. The data so obtained should be compared with the baseline data so as to ensure that the groundwater and surface water quality is not adversely impacted due to the project & its activities.

21. The treated effluents emanating from the different processes such as DM plant, boiler down, ash pond/dyke, sewage, etc. conforming to the prescribed standards shall be re- circulated and reused. Sludge/ rejects will be disposed in accordance with the Hazardous Waste Management Rules.

22. Hot water dispensed from the condenser should be adequately cooled to ensure the temperature of the released surface water is not more than 5 degrees Celsius above the temperature of the intake water.

23. The industry shall make arrangements for Ash Water Recirculation System (AWRS) to ensure 100% recirculation of overflow of the ash dyke. Industry shall make arrangement for transportation of fly ash to ash pond in the form of medium slurry mode system having 38% ash and 62% water as per MoEF directives.

24. All possible efforts including rain water harvesting to recharge ground water shall be taken up for the ground water enrichment in consultation with the Central Ground Water Authority.

25. As per the MoEF & CC Notification dated 7 December 2015, the unit shall have to achieve specific water consumption upto maximum of 3.0 m3 /MWh.

26. Ash pond shall be provided with the HDPE/LDPE lining or any other suitable impermeable media such that no leachate takes place at any point of time. Arrangements shall be provided to re circulate Ash pond water and utilized in the process or other beneficial purposes in the plant.

CONDITIONS PERTAINING TO AIR (PREVENTION & CONTROL OF POLLUTION) ACT 1981 :-

Air Quality Monitoring and Management

1. The applicant shall provide comprehensive air pollution control system consisting of control equipments as per the proposal submitted to the Board with reference to generation of emission and same shall be operated & maintained continuously so as to achieve the level of pollutants to the following standards:-

Name of section	Capacity	Stack height (m)	Fuel	Control equipment to be installed	P.M, SO_X, NO_X,Hg (mg/NM^3)
Boiler	800 MW	120	Coal- 488.9 Ton/hr	E.S.P, Low Nox Burner	30, 100, 100 & 0.03 Respectively to be achieved as notified by G.S.R. 3305 (E) dated: 07/12/2015 for Thermal Power Plants and to be achieved as per the timeline specified by CPCB.
Boiler	800 MW	120	Coal- 488.9 Ton/hr	E.S.P, Low Nox Burner	
Boiler	600 MW	275	Coal- 352.4 Ton/hr	E.S.P	
Boiler	600 MW	275	Coal- 352.4 Ton/hr	E.S.P	

2. Ambient air quality at the boundary of the industry/unit premises shall be monitored and reported to the Board regularly on quarterly basis: The Ambient air quality norms are prescribed in MoEF gazette notification no. GSR/826(E), dated: 16/11/09. Some of the parameters are as follows:

a. Particulate Matter (less than 10 micron) - 100 µg/m³ (PM10 µg/m³ 24 hrs. basis)
b. Particulate Matter (less than 2.5 micron) - 60 µg/m³ (PM2.5 µg/m³ 24 hrs. basis)
c. Sulphur Dioxide [SO2] (24 hrs. Basis) - 80 µg/m³
d. Nitrogen Oxides [NOx] (24 hrs. Basis) - 80 µg/m³
e. Carbon Monoxide [CO] (8 hrs. Basis) - 2000 µg/m³

3. The industry shall take adequate measures for control of noise level generated from industrial activities within the premises less than 75 dB(A) during day time and 70 dB(A) during night time.

4. Industry/Unit shall provide with each stack port hole with safe platform of 1 meter width with support & spiral ladder/ Stepped ladder with hand rail up to monitoring platform as per specifications given in part-III emission regulation of CPCB. In no case monkey ladder shall be allowed as stack monitoring facility.

5. The industry/unit shall make the necessary arrangements for control of the fugitive emission from any source of emission/section/activities.

6. All other fugitive emission sources such as leakages, seepages, spillages etc shall be ensured to be plugged or sealed or made airtight to avoid the public nuisance.

7. The industry/ unit shall ensure all necessary arrangements for control of odour nuisance from the industrial activities or process within premises

8. All the internal roads shall be made pucca to control the fugitive emissions of particulate matter generated due to transportation and internal movements. Good housekeeping practices shall be adopted to avoid leakages, seepages, spillages etc.

9. Industry shall take effective steps for extensive tree plantation preferably of the local tree species within or around the industry/unit premises for general improvement of environmental conditions.

Additional Air condition:- (if any) :-

8. Flue Gas Desulphurisation System shall be installed based on Lime/Ammonia dosing to capture Sulphur in the flue gases to meet the S02 emissions standard of 100 mg/Nm^3.

9. Selective Catalytic Reduction (SCR) system or the Selective Non-Catalytic Reduction (SNCR system or le NOx Burners with Over Fire Air (OPA) system shall be installed to achieve NOx emission standard of 100 mg/Nm^3.

10. High efficiency Electrostatic Precipitators (ESPs) shall be installed in each unit to ensure that particulate matter (PM) emission to meet the stipulated standards of 30 mg/Nm^3.

11. Stacks of prescribed height 120 m shall be provided with continuous online monitoring instruments for SOX. NOx and Particulate Matter as per extant rules.

12. Exit velocity of flue gases shall not be less than 20-25 m/s. Mercury emissions from stack shall also be monitored

periodically.

13. Continuous Ambient Air Quality monitoring system shall be set up to monitor common/criteria pollutants from the flue gases such as PM10, PM2.5, S02, NOX within plant area at least at one location. The monitoring of other locations (at least three locations outside the plant area covering upwind and downwind directions at an angle of 120 each) shall be carried out manually.

14. Adequate dust extraction/suppression system shall be installed in coal handling, ash handling areas and material transfer points to control fugitive emissions.

15. Appropriate Air Pollution Control measures (DES/DSs) be provided at all the dust generating sources including sufficient water sprinkling arrangements at various locations viz., roads, excavation sites, crusher plants, transfer points, loading and unloading areas, etc.

16. The TPP shall have to abide by the timelines for the achievement of new emission norms as per the MoEF&CC notification G.S.R. 243(E) dated 31-03-21 according to the categorization of the TPP to be done by the task force, as provided in the said notification.

17. Continuous automatic monitoring system and opacity meter shall be installed for monitoring of emission level of particulate matter, oxides of sulphur and nitrogen both in the ambient air and in the stack. Permanent ambient air monitoring stations, in all the directions shall be provided.

18. Industry shall provide adequate facility for Management of fly ash as per the directions of MoEF, notified in Gazette of India.

19. Coal transportation to the plant site shall be undertaken by rail and road transportation shall be terminated immediately**.** The entire internal roads should be made pucca and good housekeeping practices shall be adopted.

20. The Industry shall install Outdoor HD Industrial grade IP (Internet Protocol) Cameras with pan-Tilt Zoom (PTZ) feature, minimum focal length 20X with night vision facility and temper proof mechanism at suitable location to display all emission sources / stacks, coal yards coal conveyors / crushers and effluent discharge point and connect the same with Environment Surveillance Centre, MP Pollution control board Bhopal, and ensure its uninterrupted connectivity for remote Surveillance.

21. In case of coal being imported, or as per the statutory applicable norms being in force, the industry shall install sulphur recovery system for control of sulphur dioxide emission.

22. The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board (SPCB) and it shall be ensured that at least one station each is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated.

Noise pollution and its control measures

1. The Ambient Noise levels shall meet the standards prescribed as per the Noise Pollution (Regulation and Control) Rules, 2000.

2. Persons exposed to high noise generating equipment shall use Personal Protective Equipment (PPE) like earplugs/ear muffs, etc.

3. Periodical medical examination on hearing loss shall be carried out for all the workers and maintain audiometric record and for treatment of any hearing loss including rotating to non- noisy/less noisy areas.

4. The industry shall take adequate measures for control of noise level generated from industrial activities within the premises less than 75 dB(A) during day time and 70 dB(A) during night time.

GENERAL CONDITIONS:

Environmental Management:-

1. Zero Liquid Discharge shall be ensured and no waste/treated water shall be discharged outside the premises.

2. Industry shall take effective steps for extensive tree plantation of the local tree species within or around the industry/unit premises for general improvement of environmental conditions. Peripheral Green belt (Three row plantation) with Miyawaki plantation technique of 15 m thickness along the plant boundary shall be developed with more than 90% survival rate of the plant species. It would be ensured that total 33% area of total project cover area is under green cover focusing on Ash Dyke area.

3. Sal Plantation shall be done in 30.2 ha land available within project cover area at southern-east side of the plant as committed by the Project Proponent. Dedicated Nursery for Sal plantation shall be developed within two years. PP shall submit progress on Sal plantation & Nursery in Six monthly compliance report to IRO, MOEF&CC.

4. Extensive green cover within 2 km range of the plant boundary shall be developed. An action plan in this regard to be prepared in consultation with CPCB / expert institution and submitted before Regional Office of the Ministry within 3 months.

5. 24X7 online monitoring system for ambient air quality shall be established with its connectivity with SPCB and CPCB server. Stack monitoring shall be done through 24X7 online monitoring system. The emission Standards for Municipal Solid Waste based Thermal Power Plants as per Municipal Solid Waste Rules, 2016 dated 8.4.2016 (S.O. 1357 (E)) shall be complied (Refer Part C of Schedule Il of Municipal Solid Waste Rules, 2016 dated 8.4.2016 (S.O. 1357 (E)).

6. Adequate dust extraction system such as cyclones/bag filters and water spray system in dusty areas such as waste delivery points, transfer areas and other vulnerable dusty areas shall be provided along with an environment friendly sludge disposal system. Water Sprinkling on roads shall be done in every 6 hours in winter season and 3 hours in summer season of roads within 1 km range approaching the plant. A logbook shall be maintained for the activity and be in six-monthly compliance report.

7. LED display of air quality (Continuous Online monitoring) shall be installed on the roadside (within 1 km range) and nearby hotspots viz. residential colony, Schools Hospitals; maintenance of devices shall be done on regular basis.

8. Everyday cleaning of road/Paved roads within 1 km range of plant site shall be ensured throughout the year through vacuum based vehicle.

9. Environment Audit of plant shall be done annually and report shall be submitted to Regional office of the Ministry.

10. Project proponent shall explore the use of treated sewage water from the Sewage Treatment Plant of Municipality/local bodies/ similar organization located within 50km radius of the proposed power project to minimize the water drawl..

Solid Waste management:

1. The non hazardous solid waste arresting in the industry/unit/unit premises sweeping, etc. be disposed off scientifically so as not to cause any nuisance/pollution. The applicant shall take necessary permission from civic authorities for disposal to dumping site. If required.

Non Hazardous Solid wastes:-

Type of waste	Quantity	Disposal
Scrap/ Plastic packing material wood, card board, gunny begs etc		Sale to authorized party/As Per CPCB. MoEF Guide lines / Others.
FLY ASH (FLY AND BOTTOM)		

2. Disposal of Collected Solid waste/sludge-

All hazardous waste/sludge shall be disposed of as per the Authorization issued under Hazardous & other waste (M&TM) Rules 2016. And/other Solids Sludges, dirt, silt or other pollutant separated from or resulting from treatment shall be disposed of in such a manner as to prevent any pollutant from such materials from entering any such water Any live fish, Shall fish or other animal collected or trapped as a result of intake water screening or treatment may be returned to eaters body habitat. Solid waste management should be planned in accordance with extant Solid Waste Management Rules, 2016.

3. Toxicity Characteristic Leachate Procedure (TCLP) test shall be conducted for any substance, potential of leaching heavy metals into the surrounding areas as well as into the groundwater.

4. In case of waste-to-energy plant, major problems related with environment are fire smog in MSW dump site, foul smell and impacts to the surrounding populations. Therefore, the following measures are required to be taken up.

   a. Water hydrant at all the dumpsites of MSW area to be provided so that the fire and smog could be controlled.
   b. Sprayer like microbial consortia may be provided for arresting the foul smell emanating from MSW area.

Fly Ash Management/Ash content/ mode of transportation of coal:

1. The Industry shall use the existing Ash pond, which shall be lined with impervious liner as per the soil conditions. Adequate dam/dyke safety measures shall also be implemented to protect the ash dyke from getting breached.

2. The industry shall comply the provisions of fly ash notification 2021 to utilize 100% fly ash generated from the plant. Hence there will not be need of new ash dyke. Thus the industry is not allowed to construct new ash pond without prior permission of the board.

3. Fly ash shall be collected in dry form and ash generated shall be used 100% as per provisions of the Notification on Fly Ash Utilization issued by the Ministry and amendment thereto.

4. The industry shall utilize the fly ash for mixing with external overburden dump of its coal mine as per fly ash notification, 2021. The pipe conveyor system from which the coal is transported from coal mine to TPP, the same system shall be used to transport fly ash to coal mine to utilize the fly ash for mixing with overburden dump of coal mine as per fly ash notification.

5. The industry management shall procure Bulkers/closed transport vehicles under its control to ensure fast and quick delivery of fly ash for ensuring free delivery of fly ash within the radius up to 300 km radius to the prospective users as per provision of Fly ash Notification.

6. The TPP Management shall ensure all the compliances regarding disposal and utilization of Fly ash from its TPP as stipulated in MoEF&CC Notifications No. S.O. 5481(E) and its amendments

7. The TPP management shall adhere to the office memorandum (OM)of MoEF&CC dated 28-08-19 and the conditions stipulated therein pertaining to the use of fly ash as mentioned in the para 7 of the OM. TPP shall have to follow the same and the guidelines of the CPCB entitled “Guidelines for disposal/utilization of Fly ash for reclamation of Low Lying Areas and in stowing of abandoned mines /Quarries” for the disposal of fly ash.

8. Industry shall provide adequate facility for Management of fly ash as per the directions of MoEF, notified in Gazette of India.

9. The industry shall submit Ash dyke safety report every year, which shall be done by institute of repute.

Monitoring of compliance:

1. Environmental Audit of the project be taken up by the third party for preparation of Environmental Statement as per Form-V & Conditions stipulated in the EC and report be submitted to the Ministry.

Other conditions :-

1. Industry shall have to comply the conditions provided by the GOI, MoEF&CC in the EC given to the industry.

2. The energy source for lighting purpose shall be preferably LED based, or advance having preference in energy conservation and environment betterment.

3. The Company shall harvest rainwater from the roof tops of the buildings and storm water drains to recharge the ground water and to utilize the same for process requirements.

4. Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and

routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.

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5. Any change in production capacity, process, raw material used etc. and for any enhancement of the above prior permission of the Board shall be obtained. All authorized discharges shall be consistent with terms and conditions of this consent. Facility expansions, production increases or process modifications which result new or increased discharges of pollutants must be reported by submission of a fresh consent application for prior permission of the Board.

6. Provision for Electric Power Failure-
The applicant shall assure to the consent issuing authority that the applicant has installed or provided for an alternative electric power source sufficient to operate all facilities utilized by the applicant to maintain compliance with the terms and conditions of the Consent.

22. The applicant shall allow the staff of Madhya Pradesh Pollution Control Board and/or their authorized representative, upon the representation of credentials:
    a. To inspect raw material stock, manufacturing processes, reactors, premises etc to perform the functions of the Board.
    b. To enter upon the applicant's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this Consent.
    c. To have access at reasonable times to any records required to be kept under the terms and conditions of this Consent.
    d. To inspect at reasonable times any monitoring equipment or monitoring method required in this Consent: or,
    e. To sample at reasonable times any discharge or pollutants.

23. This consent is transferable in nature, in case of any change in ownership / management, the new owner / partner / directors / proprietor shall immediately apply for the consent with new requisite information.

24. The issuance of this Consent does not convey any property rights in either real or personal property or any exclusive privileges, nor does it authorise any invasion of personal rights, nor any infringement of Central, State or local laws or regulations.

25. Industry shall install separate electric metering arrangement for running of pollution control devices and this arrangement shall be made in such fashion that any non functioning of pollution control devices shall immediately stop electric supply to the production and shall remain tripped till such time unless the pollution control device/devices are made functional. The record of electricity consumption for running of pollution control equipment shall be maintained and submitted to the Board every month.

26. This consent is granted in respect of Water pollution control Act 1974 or Air Pollution Control act, 1981 only and does not relate to any other Department/Agencies. License required from other Department/Agencies have to be obtained by the unit separately and have to comply separately as per there Act / Rules.

27. The applicant shall submit such information, forms and fees as required by the board not letter than 180 day prior to the date of expiration of this consent.

28. Balance consent fee, if any shall be recoverable by the Board even at a later date.

29. The industry/unit shall establish a separate environmental cell, headed by senior officer of the unit for reporting the environmental compliances equipped with fall-fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions. The industry/ Unit shall submit environmental statement for the previous year ending 31st March on or before 30th September every year to the Board.

30. Industry shall obtain membership of Emergency Response Center of the Board if needed.

31. After notice and opportunity for the hearing, this consent may be modified, suspended or revoked by the Board in whole or in part during its term for cause including, but not limited to, the following:
    (a) Violation of any terms and conditions of this Consent.
    (b) Obtaining this Consent by misrepresentation of failure to disclose fully all relevant facts.
    (c) A change in any condition that requires temporary or permanent reduction or elimination of the authorized

discharge.

32. Knowingly making any false statement for obtaining consent or compliance of consent conditions shall result in the imposition of criminal penalties as provided under the section 42(g) of the Water Act or section 38 (g) of the Air Act.

33. On violation of any of the above-mentioned conditions the consent granted will automatically be taken as canceled and necessary action will be initiated against the industry.

Consent to establish as required under the Water (Prevention & Control of Pollution) Act, 1974 and under the Air (Prevention & Control of Pollution) Act, 1981 is granted to your unit subject to fulfillment of all the conditions mentioned above. The Project Proponent shall submit an application to this Board through XGN for obtaining the Consent for Operation before two months of the commencement of fly ash filling. The applicant without valid consent (for operation) of the Board shall not bring in to use any outlet for the discharge of effluent and gaseous emission

For and on behalf of
M.P. Pollution Control Board

By the order of Chairman, MPPCB

(Organic Authentication on AADHAR from UIDAI Server)
TPAV # 3P2O7XRPUJ

CHANDRA MOHAN THAKUR
Member Secretary

Annexure VIII

PROPOSED EXPANSION OF BANDHAURA ULTRA SUPER CRITICAL THERMAL POWER PLANT BY ADDING 1600 (2X800) MW WITH EXISTING CAPACITY OF 1200 (2X600) MW AT VILLAGE BANDHAURA, TEHSIL MADA, DISTRICT SINGRAULI, MP BY MAHAN ENERGEN LTD.

Year–wise implementation Plan of focus & key areas identified and considered under CER

PROPOSED CER BUDGET PLAN

Sr. No	Key Area Identification under CER for addressing issued raised during Public Hearing	Proposed Expenditures year wise (Rs. In Crores)					Total Proposed Expenditures (Rs. In Crores)
		1st Year	2nd Year	3rd Year	4th Year	5th Year	
A	**Educational Initiatives**						
	Modernization and necessary construction of Saraswati Shishu Mandir/Higher Secondary School (Class Kg/ I to XII), Nagawa village.	0.40	0.80	0.80	-	-	**2.0**
	Distribution of drinking water filter/Drinking water coolers in schools.	0.05	0.10	0.10	-	-	**0.25**
	Basic teaching and learning infrastructure support to Govt. Schools, Supporting in creation of assembly halls, prayer halls, classrooms, computer, space for mid-day meals, playground, school boundary walls etc. for government school.	0.35	0.70	0.70	-	-	**1.75**
	Educational Vocational Guidance fair (EVGF) for career talk. Conducting Quiz competition for Students, Preparatory Coaching Classes for Navoday Entrance Examination.	0.10	0.20	0.20	-	-	**0.50**
	Community to provide awareness about education, health, hygiene, and good practices.	0.05	0.10	0.10	-	-	**0.25**
	Program for skill improvements of teaching staffs in govt. school.	0.05	0.10	0.10	-	-	**0.25**
	Sub Total	**1.0**	**2.0**	**2.0**	-	-	**5.0**

B	**Community Health Initiatives**						
	Operation of Primary Health Centre at Nagawa, R & R Colony.	0.6	0.6	0.6	0.6	0.6	**3.0**
	Rural Medical Camps through Medical Team of Primary Health Centre @ 4 Nos. of camps per month (@ 60 patients per camp), Safe Menstrual Hygiene Management Awareness, Mega Health Camp, Cataract Screening & Operation.	0.2	0.2	0.2	0.2	0.2	**1**
	Promotion of awareness of malnutrition and anemia.	0.1	0.1	0.1	0.1	0.1	**0.5**
	Promotion of Poshan Vatika at backyard of villagers & Project Suposhan.	0.1	0.1	0.1	0.1	0.1	**0.5**
	Sub Total	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**5.0**
C	**Sustainable Livelihood and Women Empowerment**						
	Skill Development Centre (SDC) to make the youth for achieving their Goals in life by becoming Skilled Professionals.	0.3	0.3	0.3	0.3	0.1	**1.3**
	Development & Support for Drip irrigation in core zone villages.	0.2	0.2	0.2	0.2	0.1	**0.9**
	Sub Total	**0.5**	**0.5**	**0.5**	**0.5**	**0.2**	**2.2**
D	**Community Rural Infrastructure Development**						
	Repairing, widening & Maintenance of Existing roads in consultation with Gram Panchayats	0.5	0.5	0.5	0.5	0.5	**2.5**
	To provide facility for potable drinking water, RO Plants and water supply system through overhead tank in villages.	0.5	0.5	0.25	0.15	0.10	**1.5**
	Creation of clean and hygienic environment by proper drainage systems, community sanitation campaign etc.	0.5	0.5	0.25	0.15	0.10	**1.5**

	Upgradation & Renovation of primary health centers. With toilet facilities etc.	0.5	0.5	0.5	0.5	0.5	**2.5**
	Provision of solar street lighting, green nurturing programs, implementation of Swachchh Bharat initiatives.	0.5	0.5	0.5	0.2	0.3	**2.0**
	Sub Total	**2.5**	**2.5**	**2.0**	**1.5**	**1.5**	**10.0**
E	**Maintenance of R & R Colony**						
	Maintenance and Repairing of R & R colony and existing Private Higher Secondary School.	1.5	1.5	1.5	0.5	0.5	**5.5**
	Maintenance of Primary Health Centre which is operational within the colony	1.5	1.5	1.5	0	0	**4.5**
	Sub Total	**3.0**	**3.0**	**3.0**	**0.5**	**0.5**	**10.0**
F	**Sports & Culture Development**						
	Promotion of sports for youths and women	0.1	0.1	0.1	0.05	0.05	**0.4**
	Cultural activities for villagers	0.1	0.1	0.1	0.05	0.05	**0.4**
	Sub Total	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	**0.8**
G	**Development of local youth & women for management & administration**						
	Team/ Leaders development at village level as coordinator for various programme and activities.	0.4	0.4	0.4	0.4	0.4	**2.0**
	Vehicles for emergency purpose for local villagers including private ambulances as per requirement	0.1	0.1	0.1	0.1	0.1	**0.5**
	Sub Total	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**2.5**
	Total (A+B+C+D+E+F+G)	**8.7**	**9.7**	**9.2**	**4.1**	**3.8**	**35.5**

स्टेट विंडो

OMG-2: शिवजी को कचोरी खरीदते दिखाया, अक्षय को नोटिस

उज्जैन | महाकाल मंदिर के पुजारियों ने फिल्म ओ माय गॉड-2 के निर्माता अक्षय कुमार को नोटिस भेजा है। उनका कहना है कि फिल्म में भगवान शिव का रूप गलत तरीके से दिखाया गया है। उन्हें बाजार में दुकान से कचोरी खरीदते दिखाया गया है। यह भगवान शिव के श्रद्धालुओं को आहत करता है। यह पहला मौका नहीं है, जब इस तरह की आपत्ति ली गई है। इसके पहले भी महाकाल के पुजारी के साथ मंदिर में शूटिंग को लेकर संत ने नाराजगी जताई थी। ओएमजी-2 फिल्म 11 अगस्त को सिनेमाघरों में रिलीज हो वाली है। सेंसर बोर्ड ने फिल्म को ए सर्टिफिकेट दिया है यानी इसे 18 साल से कम आयु के लोग नहीं देख पाएंगे। इस पर महाकाल मंदिर के पुजारियों का कहना है कि ऐसा प्रतीत होता है कि इस फिल्म में अश्लील सीन हैं।

4 महीने में 10 हजार करोड़ जीएसटी कलेक्शन

इंदौर| प्रदेश में कारोबार की रफ्तार तेज हो चली है। जीएसटी संग्रहण के आंकड़े इसकी पुष्टि कर रहे हैं। इस वित्तीय वर्ष में अब तक 10496 करोड़ रुपए का जीएसटी संग्रहण हो चुका है। वहीं इसी अवधि में पिछले साल महज 8312 करोड़ रुपए प्राप्त हुए थे। इसी को देखते हुए मप्र के लिए जीएसटी संग्रहण का टारगेट भी 32 हजार करोड़ रुपए से बढ़ाकर 34 हजार करोड़ कर दिया गया है। वाणिज्यिक कर आयुक्त लोकेश कुमार जाटव ने बताया कि इसका कारण है करदाताओं द्वारा समय पर सही रिटर्न भरना। पिछले सालों में कंस्ट्रक्शन, माइनिंग आदि सेक्टर की स्क्रूटिनी में जो अतिरिक्त टैक्स की देयता आई है उसे भी इस साल में भरा गया है।

स्कूल की छत का प्लास्टर गिरा, दो छात्र घायल

एजेंसी, सतना| जिले के मैहर में मंगलवार एक शासकीय स्कूल की छत का प्लास्टर गिरने से दो छात्र मामूली रूप से घायल हो गये। पुलिस के अनुसार मैहर थाना क्षेत्र के घुरपुरा गांव में शासकीय स्कूल की छत का प्लास्टर गिरने से पांचवी कक्षा के दो छात्र घायल हो गये, जिन्हें इलाज के लिया मैहर के सिक्ति अस्पताल ले जाया गया। घायल बच्चों का नाम सुभाष कोल और शारदा कोल बताया गया है।

बाघ के शिकार के चार आरोपी पकड़ाए

सिवनी|स्टेट टाइगर स्ट्राइक फोर्स भोपाल और टाइगर स्ट्राइक फोर्स जबलपुर की संयुक्त टीम ने बाघ के शिकार के मामले में चार आरोपियों को गिरफ्तार किया है। आरोपियों को टीम ने दक्षिण सामान्य वन मंडल बालाघाट के वन परिक्षेत्र कटंगी से गिरफ्तार किया है। उनके पास से बाघ के मुंछ के बाल, हड्डियां और नाखून जब्त किए हैं। आरोपियों से पूछताछ की जा रही। एसीसीएफ ने बताया कि आरोपियों ने बाघ का शिकार बरघाट परियोजना मंडल सिवनी के बेहरई परिक्षेत्र के जंगल से करंट लगाकर किया था। इसके बाद उसके अंग निकालकर उसको बेचने की कोशिश रहे थे। आरोपियों ने अपना जुर्म स्वीकार कर लिया है।

मंत्री ने लिखी हटाने की नोटशीट, फिर भी नहीं हटाया

हार्टिकल्चर डायरेक्टर निधि ने 300 को दिया नोटिस, कर्मचारियों ने मांगा वीआरएस

भास्कर न्यूज | गोपाल

मप्र कैडर की 2012 बैच की आईएएस अधिकारी और हार्टिकल्चर डायरेक्टर निधि निवेदिता फिर सुर्खियों में हैं। इस बार उनकी कार्यशैली विवादों में है। विभाग के ही ग्वालियर सहायक संचालक (उद्यान) का एक पत्र सामने आया है, जिसमें उन्होंने लिखा है कि डायरेक्टर ने अपनी गलतियों और अक्षमताओं को छिपाने के लिए 300 फील्ड व डायरेक्टरेट के अधिकारियों को नोटिस जारी किया है। इनके कामकाज की वजह से ही आधा दर्जन से अधिक लोग वीआरएस का आवेदन दे चुके हैं। दूसरी तरफ विभाग के राज्यमंत्री (स्वतंत्र प्रभार) भारत सिंह कुशवाहा की नोटशीट भी है कि संचालक ने बजट के उपयोग में लापरवाही बरती है। इसलिए उन्हें संचालक के पद से हटा दिया जाए। यह नोटशीट 19 अप्रैल 2023 की है, जो अब सामने आई है। डायरेक्टर निधि निवेदिता अभी भी पद पर बरकरार हैं। नोटशीट और सहायक संचालक के पत्र के संबंध में डायरेक्टर से संपर्क करने की कोशिश की गई, लेकिन पक्ष नहीं मिल पाया। निधि निवेदिता वही अधिकारी हैं, जिन पर जनवरी 2020 में भाजपा कार्यकर्ताओं पर थप्पड़ मारने के आरोप लगे थे। तब वे राजगढ़ कलेक्टर रहीं। उस समय भाजपा सीएम के समर्थन में तिरंगा यात्रा निकाल रही थी। तब उन्हें कलेक्टर पद से हटा दिया गया था। इसके बाद वे महिला बाल विकास में भी रहीं। अब हार्टिकल्चर डायरेक्टर हैं। बहरहाल, ग्वालियर सहायक संचालक का पत्र फरवरी 2023 का है जो अब सामने आया है। इसमें यह भी लिखा है कि बिना किसी ठोस कारण के 38 जिलों के अधिकारियों की एक वेतन वृद्धि रोकी जा चुकी है। मैदानी अफसर डिप्रेशन, भय और मानसिक तनाव में काम कर रहे हैं। दबाव में अधिकारियों को काम करना पड़ रहा है।

मंत्री की नोटशीट में 'बजट खर्च में डायरेक्टर की'

'समीक्षा में पाया गया कि वर्ष 2019-20 में 18.74 करोड़, 2020-21 में 6.68 करोड़ और वर्ष 2021-22 में 12.68 करोड़ की राशि अनुपयोगी रखी गई। इसी तरह उद्यानिकी विभाग को वित्तीय वर्ष 2022-23 में 658 करोड़ बजट मिला। इसमें भी केंद्रीय योजनाओं में पीएम कृषि सिंचाई योजना के तहत माइक्रो इरिगेशन में 160 करोड़ मिले, 51.68 करोड़ (32.30%) ही खर्च हुए। राष्ट्रीय उद्यानिकी मिशन में 55 करोड़ में से 27.33 करोड़ (53.32%) ही खर्च हुए। पीएम सूक्ष्म खाद्य उद्यम उन्नयन में 110 करोड़ में से 19.50 करोड़ और राष्ट्रीय कृषि विकास योजना में 35 करोड़ में से 4.55 करोड़ ही खर्च किए गए। इसी तरह राज्य की स्कीमों (कृषक प्रशिक्षण सह भ्रमण कार्यक्रम, फर पौधे रोपण योजना, फसल बीमा योजना, खाद्य प्रसंस्करण उद्योगों के विकास, उद्यानिकी फसलोत्तर प्रबंधन के तहत एकीकृत शीत शृंखलाकी अधोसंरचना विकास, व्यावसायिक उद्यानिकी फसलों के संरक्षण, मसाला क्षेत्र विस्तार आदि के साथ अन्य) में 216 करोड़ में से 172 करोड़ ही खर्च हुए। कुल मिलाकर 653 करोड़ में से खर्च 45.42% हुआ।

कार्रवाई किसी पर नहीं, सिर्फ नोटिस हुए हैं

विभाग में काम करना मेरी जवाबदारी है। लक्ष्य की पूर्ति जिला अधिकारी नहीं करेंगे तो आगे की प्रक्रिया तो अपनानी होगी। कार्रवाई किसी पर नहीं हुई है, सिर्फ नोटिस हुए हैं। वीआरएस लोग अपनी व्यक्तिगत समस्या के कारण ले रहे हैं। मंत्री की नोटशीट की बात है तो बजट का पूर्ण उपयोग किया गया है।'

- निधि निवेदिता, डायरेक्टर, हार्टिकल्चर, मप्र

'बजट खर्च नहीं हो तो इसका दोषी कौन होगा। यह लापरवाही की श्रेणी में आता है। इसीलिए नोटशीट तैयार और कारण स्पष्ट करने को कहा। जहां तक विभाग से हटाने का सवाल है तो जिम्मेदारी तो तय होना चाहिए। दो बार जहले जी बजट सरेंडर हो चुका है। अब तक वो क्यों नहीं हटाई गईं, इस पर कुछ नहीं कह सकता।'

- भारत सिंह कुशवाह, राज्यमंत्री (स्वतंत्र प्रभार), उद्यानिकी

हाईकोर्ट ने पूछा आदेश के बावजूद क्यों नहीं दिया वेतन

संवाददाता, जबलपुर। मध्य प्रदेश हाईकोर्ट ने राज्य शासन से पूछा है कि आदेश के बावजूद याचिकाकर्ता पूर्व कर्मी को वेतन का भुगतान क्यों नहीं किया गया। एक अवमानना प्रकरण में जस्टिस एमएस भट्टी की एकलपीठ ने गृह विभाग के प्रमुख सचिव अजय भल्ला डीजीपी सुधीर सक्सेना, पुलिस अधीक्षक उमरिया एसके सिन्हा, जिला महिला सशक्तिकरण अधिकारी भरत सिंह राजपूत व महिला एवं बाल विकास विभाग के सचिव इंदीवर पांडे को कारण बताओ नोटिस जारी कर जवाब मांगा है। उमरिया निवासी मनीषा श्रीवास्तव की ओर से अधिवक्ता मोहनलाल शर्मा व शिवम शर्मा ने पक्ष रखा। उन्होंने बताया कि महिला एवं बाल विकास विभाग और जिले के पुलिस कप्तान ने जन सुविधा केन्द्र में याचिकाकर्ता को 18 मार्च 2012 को टेलीकॉम ऑपरेटर के पद पर नियुक्ति दी थी। वर्ष 2015 में बिना नोटिस दिए सेवा समाप्त कर दी गई। इतना ही नहीं, याचिकाकर्ता को 23 मार्च 2012 से 14 अगस्त 2015 का वेतन भी नहीं दिया। इस मामले में हाईकोर्ट ने 28 जुलाई 2022 को वेतन भुगतान के आदेश दिए थे। एक वर्ष बाद भी हाईकोर्ट के आदेश का पालन नहीं होने पर अवमानना याचिका दायर की गई। पी-4

25 अनिवार्य प्रकरणों पर सुनवाई टली

संवाददाता, जबलपुर|प्रदेश की समस्त अधीनस्थ अदालतों में तीन माह में 25 प्रकरणों के अनिवार्य निराकरण के हाईकोर्ट प्रशासन के आदेश को चुनौती देने के मामले में हाईकोर्ट में मंगलवार को समयाभाव के कारण सुनवाई टल गई। जस्टिस शील नागू व जस्टिस अमरनाथ केसरवानी की खंडपीठ ने मामले पर 10 अगस्त को सुनवाई निर्धारित की है। ओबीसी एडवोकेट्स वेलफेयर एसोसिएशन के प्रतिनिधि व सेवानिवृत्त एडीजे राजेंद्र कुमार श्रीवास एवं एडवोकेट यूनियन फॉर डेमोक्रेसी एण्ड सोशल जस्टिस के प्रतिनिधि अधिवक्ता रमगिरीश वर्मा ने याचिकाएँ दायर की हैं।

बैतूल की डिप्टी कलेक्टर के इस्तीफे पर नियम के अनुरूप लें निर्णय

संवाददाता, जबलपुर। मध्यप्रदेश हाईकोर्ट ने बैतूल की डिप्टी कलेक्टर निशा बांगरे के इस्तीफे पर सामान्य प्रशासन विभाग के परिपत्र के आधार पर राज्य शासन को निर्णय लेने के निर्देश दिए। जस्टिस एमएस भट्टी की एकलपीठ ने शासन को इसके लिए 30 दिन की मोहलत दी है। छतरपुर के लवकुश नगर में एसडीएम के पद पर पदस्थ डिप्टी कलेक्टर बांगरे ने सरकार से संतान पालन के लिए अवकाश लिया था। इस दौरान आम्ला में अपने नवनिर्मित घर के गृहप्रवेश कार्यक्रम और सर्वधर्म शांति सम्मेलन कार्यक्रम में शामिल होने के लिए उन्होंने अनुमति माँगी थी। सामान्य प्रशासन विभाग ने उन्हें अनुमति नहीं दी जिससे नागज होकर उन्होंने 22 जून 23 को सामान्य प्रशासन विभाग को अपना इस्तीफा भेज दिया था।

हिंदुत्व, विकास और भ्रष्टाचार के मुद्दे पर सीएम और पूर्व सीएम आमने-सामने

जो राम को काल्पनिक मानते थे, वे कथाएं करा रहे : सीएम

भोपाल |मुख्यमंत्री शिवराज सिंह चौहान ने मंगलवार को कहा कि मैं गरीबों की तकलीफ दूर करता हूं तो कमलनाथ की तकलीफ बढ़ जाती है। उनकी सरकार में मप्र में 5 मेडिकल कॉलेज थे, आज संख्या 30 तक पहुंच रही है। सीएम ने कहा कि जो लोग भगवान राम को काल्पनिक मानते थे, आज वो कथाएं और हनुमान चालीसा करा रहे हैं। यह चुनावी भक्ति है। मेरे से 18 साल का हिसाब मांग रहे हैं तो सुन लें 2003 में मप्र बीमारू राज्य था। प्रति व्यक्ति आय 11 हजार रुपए थी। केवल 61 हजार किलोमीटर टूटी-फूटी सड़क थी, आज 5.11 लाख किलोमीटर शानदार सड़कें हैं। तब बच्चे लालटेन में पढ़ते थे, आज 24 घंटे बिजली मिल रही है। 18 साल में हमने मप्र बदला है।

शिवराज इतिहास के सबसे भ्रष्ट मुख्यमंत्री : कमलनाथ

भोपाल | पूर्व मुख्यमंत्री कमलनाथ ने मुख्यमंत्री के आरोपों पर पलटवार करते हुए कहा कि मैंने तो प्रदेश का सबसे बड़ा हनुमान मंदिर छिंदवाड़ा में 15 साल पहले बना दिया था। क्या तब चुनाव थे। मैंने तो इस बात की कभी पब्लिसिटी भी नहीं की। पंडित प्रदीप मिश्रा का छिंदवाड़ा आगमन प्रस्तावित है। मुझे जानकारी लगी तो मैंने कहा कि छिंदवाड़ा में आपका स्वागत करेंगे। कोई भी धर्म प्रेमी छिंदवाड़ा आए, उसका स्वागत है। नाथ ने कहा कि विश्व आदिवासी दिवस मनाने जा रहे हैं, परंतु देश के सबसे बड़े आदिवासी प्रदेश मप्र में किस तरह आदिवासियों पर अत्याचार हो रहे हैं। सिंगरौली में विधायक के बेटे ने एक आदिवासी पर गोली चलाई। आज मणिपुर में देखिए, क्या हो रहा है। इतिहास के सबसे भ्रष्ट मुख्यमंत्री शिवराज हैं।

संत रविदास मंदिर के साथ 50 हजार करोड़ के बीना रिफाइनरी विस्तार प्रोजेक्ट का भी भूमिपूजन करेंगे मोदी

भोपाल |प्रधानमंत्री नरेंद्र मोदी 12 अगस्त को सागर में संत रविदास मंदिर निर्माण के भूमिपूजन के साथ-साथ केंद्र सरकार की 50 हजार करोड़ की महत्वाकांक्षी परियोजना बीना रिफाइनरी की विस्तारीकरण परियोजना का भी भूमिपूजन करेंगे। इस रिफाइनरी को पेट्रोलियम, केमिकल एंड पेट्रोकेमिकल इन्वेस्टमेंट रीजन (पीसीपीआरआई) के रूप में विकसित किया जाना है। इसी दिन कोटा से बीना के बीच रेलमार्ग के दोहरीकरण के बाद तैयार नए रेल ट्रैक का भी लोकार्पण किया जाएगा।

15 जिलों में नहीं हुई जरूरत की बारिश

भास्कर न्यूज़ |भोपाल। प्रदेश के 15 जिलों में भजरूरत की बारिश नहीं हुई है। 6 जिले ऐसे हैं, जहां सामान्य से 20% या इससे अधिक कम बारिश हुई। मौसम केंद्र के इंचार्ज डायरेक्टर वेद प्रकाश सिंह ने बताया कि मध्य भारत में मानसून ब्रेक की स्थिति बन गई है। सीजन में ऐसा पहली बार मानसून ब्रेक हुआ है। इसकी वजह यह है कि बारिश करने वाली रेखा (मानसून ट्रफ लाइन) हिमालय की तराई के नजदीक पहुंच गई है।भोपाल जिले में अब तक 444.5 मिमी बारिश हुई है। यह सामान्य बारिश 559.1 मिमी से 20% कम है। पांच साल पहले 2018 में भी ऐसा ही हुआ था। भोपाल में पिछले 3 दिन से एक मिनी भी पानी नहीं गिरा। प्रदेश अब तक ओवरऑल 571.9 मिमी बारिश हुई है। यह सामान्य बारिश 547.2 मिमी से 6% ज्यादा है।

इन चार जिलों में सामान्य से कम बारिश

जिला	कितनी हुई	होनी थी	कितने % कम
सतना	389.2	530.8	-27%
अशोक नगर	371.8	497.5	-25%
खरगोन	317.8	419.3	-24%
भोपाल	444.5	569.1	-20%

चार जिले, जहां सबसे ज्यादा बारिश

जिला	अब तक हुई	होनी थी	कितनी ज्यादा
सिंह	631.8	346.5	+83%
निवाड़ी	650.0	408.8	+59%
नरसिंहपुर	906.0	583.3	+55%
इंदौर	700.6	494.0	+42%

आगे क्या... भारी बारिश के आसार नहीं...

इंचार्ज डायरेक्टर ने बताया कि अभी कोई सिस्टम भी नहीं है। इस अगस्त तक प्रदेश में कहीं भी भारी बारिश के आसार नहीं है। तापमान बढ़ने के कारण लोकल लेवल पर बादल बनने से कहीं-कहीं हल्की हो सकती है।

धान, सोयाबीन और दलहन को नुकसान

6-7 दिन बारिश नहीं हुई तो धान और सोयाबीन के पौधों की वृद्धि रुक जाएगी। दलहन को भी नुकसान होगा।

– डॉ. आरके जाधवसवाल, साइंटिस्ट, फल अनुसंधान केंद्र

रिश्वत लेते मेडिकल ऑफिसर गिरफ्तार

रीवा| लोकायुक्त रीवा की टीम ने एक हफ्ते के अंदर दूसरी ट्रेप कार्रवाई करते हुए मंगलवार की सुबह सीधी जिले के सामुदायिक स्वास्थ्य केंद्र चुरहट में पदस्थ मेडिकल ऑफिसर डॉ. आरके साकेत को दो हजार रुपए की रिश्वत लेते रंगे हाथ पकड़ा है। यह कार्रवाई अभिषेक सिंह पिता रमेश सिंह निवासी ग्राम दुआरा तहसील चुरहट जिला सीधी को शिकायत पर हुई है। इसलिए मांगी रिश्वत लोकायुक्त एसपी गोपाल सिंह धाकड़ ने बताया कि शिकायतकर्ता के चाचा अंकुश सिंह को दुर्घटना में आई चोट को एमएलसी केस में गंभीर लिखे जाने के एवज 4 हजार रुपए रिश्वत की मांग की गई थी। जिसमें से 1500 रुपए पूर्व में ले लिए गए।

चयनित शिक्षकों ने सिर मुंडाकर किया विरोध, महिलाओं ने कटवाई चोटी

भोपाल। वर्ष 2020 में आयोजित हुई शिक्षक पात्रता परीक्षा पास करने के बावजूद नियुक्ति नहीं मिलने से नाराज कई दिनों से हड़ताल पर बैठे चयनित अभ्यर्थियों ने सिर मुंडाकर प्रदर्शन किया। तो वहीं कुछ महिला चयनित शिक्षिकाओं ने भी अपनी चोटी कटवाकर धरने को अपना समर्थन दिया। चयनित अभ्यर्थियों ने मंगलवार को डीपीआई के सामने सिर मुड़ा कर नियुक्ति की मांग की। इससे पहले ये चयनित शिक्षक जून माह में लोक शिक्षण संचालनालय (डीपीआई) के सामने धरना-प्रदर्शन, भूख हड़ताल और आमरण अनशन कर चुके हैं। प्राथमिक शिक्षक भर्ती के चयनित शिक्षकों द्वारा अभी तक सरकार द्वारा मांगे न माने जाने के विरोध अगस्त क्रान्ति के रूप में प्रतिदिन प्रदर्शन के विभिन्न तरीकों को अपनाकर विरोध दर्ज करेंगे।यहां मौजूद दिव्यांग अभ्यर्थी राजा राम ने बताया कि वह टीकमगढ़ से भोपाल आए हैं।

परिवहन चेकपोस्टों को बंद कर लागू होगा गुजरात मॉडल

भास्कर न्यूज़ |भोपाल| प्रदेश में संचालित परिवहन चेकपोस्टों पर वाहन संचालकों को बड़ी राहत देने के परिपेक्ष्य में वाहनों के आवागमन को सुगम और सरल बनाने के लिए गुजरात राज्य की तर्ज पर चेकपोस्टों को बंद कर चेकिंग व्यवस्था का आधुनिकीकरण किया जाएगा। इस आधुनिकीकरण से जहां एक ओर वाहन मालिकों को बड़ी राहत मिलेगी वहीं दूसरी ओर वाहन चालकों को समय की बचत होगी। उक्त बदलाव की जानकारी देते हुए प्रदेश के परिवहन मंत्री गोविन्द सिंह राजपूत ने मंगलवार को मीडिया से अनौपचारिक चर्चा में बताया कि गुजरात मॉडल के लागू होने तक प्रदेश में चल रहे परिवहन चेकपोस्ट पर वाहनों के आवागमन को सुगम करने के लिए 7 अस्थाई चेकपोस्ट (प्राणपुर, खिलौआ, नहर, समरसा, करहाल, रानीगंज तिगेला, राजना) एवं इसके अतिरिक्त वर्तमान में चल रहे सभी 6 चेकिंग पाईंट आज से ही बंद किये जायेंगे। राजस्व एवं परिवहन मंत्री गोविन्द सिंह राजपूत ने बताया कि अभी देश में महाराष्ट्र, कर्नाटक, पश्चिम बंगाल, छत्तीसगढ़, तेलंगाना, आंध्रप्रदेश, बिहार, केरल आदि राज्यों में परिवहन चेकपोस्ट पर मैनुअल चेकिंग की व्यवस्था चल रही है। प्रदेश में गुजरात मॉडल लागू करने के लिये सभी परिवहन चेकपोस्टों पर आवश्यक संसाधन जैसे ब्रेथ एनालाईजर, स्पीड रडारगन, पोर्टेबल तौलकांटे, बॉडीवार्न कैमरा, पीओएस मशीन के साथ अतिरिक्त मानव संसाधन की भी आवश्यकता होगी जिसे 14 दिसम्बर तक पूर्ण कर लिया जाएगा।

ट्रक ऑपरेटर्स ने बताई अपनी समस्याएं| प्रदेश की बॉर्डर पर मौजूद परिवहन नाकों पर हो रही अवैध वसूली से ट्रक ऑपरेटर्स लगातार परेशानी में हैं। कुल 47 में से 19 इंटीग्रेटेड किए गए नाकों पर अवैध वसूली से परेशान ऑपरेटर्स अब परिवहन विभाग के खिलाफ मुखर हैं।

TIMES BUSINESS
THE TIMES OF INDIA, BHOPAL | WEDNESDAY, AUGUST 9, 2023

AI Tech May Hit Women Harder, Need To Upskill

Workers in **lower-wage jobs** — which are disproportionately held by women — are up to 14 times more likely to need to change occupations than those in highest-wage positions, and most will need increased social-emotional and **digital skills** to do so successfully

Source: McKinsey, Tortoise Media

➤ In the **US**, a projected decrease of 3.7mn and 2mn jobs due to AI in office support and customer service, respectively, leaves **women 1.5 times more likely to need to move** into new occupations

➤ By extension, in **India**, a lack of gender diversity in IT graduates — which translates to **fewer women with the required digital skills** — may cause the AI wave to hit women harder

Maruti for preferential share issue to buy Suzuki's Guj unit

Won't Use ₹46,000Cr Cash Reserves, Cites Profitability Gains

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New Delhi: Maruti Suzuki will seek shareholders' nod to buy parent Suzuki's Gujarat factory through a preferential share allotment, and not by using its cash reserves which was over Rs 46,000 crore at the end of June quarter, chairman R C Bhargava said on Tuesday. He claimed that conserving cash and earning interest on it will prove to be a better option to increase profitability, earnings per share (EPS) and dividend

The company on July 31 announced its board's intentions to take over Suzuki Motor's plant that has a book value of around Rs 12,755 crore against Rs 18,000 of investments (after depreciation). The board has approved termination of contract manufacturing agreement with Suzuki Motor Gujarat and acquiring the shares through the allotment basis. The preferential share allotment will see Suzuki's stake go up to 58.3% from 56.4%. "The board decision is subject to all legal and regulatory compliances, including minority shareholders' approval," Bhargava said.

AIMS MORE EFFICIENT FUNCTIONING

- Conserving cash and earning interest will be a better option to increase profitability, earnings per share and dividend, says Maruti Suzuki chairman R C Bhargava
- Maruti board has approved termination of contract manufacturing agreement with Suzuki Motor Gujarat and acquiring of shares through allotment basis
- Suzuki's stake will rise from 56.4% to 58.3% after preferential share allotment
- Main aim of acquisition is to align production operations under a single management for smoother and more efficient functioning, says Bhargava
- Cash reserves had helped the company tide over difficult periods,Bhargava adds

Maruti targets a production capacity of **40 lakh units annually** by 2030-31

"Profit after tax (PAT) of Maruti would be higher in the share-swap option in each year, increasing by over Rs 1,400 crore in 2030-31. The EPS would be higher in the swap option, starting from Rs 7 per share and going up to Rs 20 per share in 2030-31, and the dividend payable, with the same pay-out ratio, would be higher in the swap option. This is primarily because in the swap option, while there is a continued additional earning of interest income, the equity dilution is very low," Maruti said. The company added that its assessment is based on "hypothetical figures and assumptions" and "are not to be taken as Maruti's projections of profit".

The future PAT figures are based on an assumed 12.5% growth each year, the company said, adding that it is considering an interest rate of 7%. The minority shareholders' approval will be sought at an EGM or through postal ballot, which would also consider the views of the other shareholders.

Bhargava reiterated that the main aim of the acquisition is to align the production operations under a single management for a smoother and more efficient functioning, taking into consideration the company's future growth prospects where it envisages total production capacity of 40 lakh units annually by 2030-31.

Asked why the company is not using cash to go for the deal as it has huge reserves, Bhargava said Maruti's shareholders would want higher dividend and share price, that would come through share issuance. He said on its part, Maruti has been making investments for new plants, R&D, and engineering development. He added that cash reserves had helped the company tide over difficult periods such as the 2008 financial crisis, the pandemic, and the semiconductor shortage crisis.

Not time to press growth accelerator now: Sanyal

TIMES NEWS NETWORK

Kolkata: This is not the time to press the accelerator for higher growth, rather the focus should be on building the supply side, said **Sanjeev Sanyal**, a member of the Economic Advisory Council (EAC) to the Prime Minister.

Sanyal also said that India would surpass Germany to become the fourth-biggest economy in the world in 18-24 months. The economy will grow 6.5-7% this year, Sanyal said. He was speaking at a Bharat Chamber of Commerce event here on Tuesday.

"Currently, there is macroeconomic stability in the country. The current account deficit (CAD) is within a reasonable range and foreign exchange reserves are at $600 billion," he said. Sanyal pointed out that with weak export demand, there is no need to push domestic demand through stimulus as this might put stress on the external sector causing problems in the CAD.

The focus would have to be on keeping the supply strong as it had been during the Covid years, he said. "Past investments in infrastructure are benefiting us now. A growth of 6.5% given the world's depressing scenario is not bad. There is no need to press the growth accelerator now. We can do that when there is a clear highway. Some bumps are still there," Sanyal said.

According to him, it is not wise to sacrifice macroeconomic stability for a few higher points of growth and the need is to keep the banking system robust and strong supply side. Elaborating on India's position in the global economy, he noted that with the German economy almost stagnant, and Japan not growing fast, it is only a matter of time that the $3.8 trillion Indian economy would surpass them.

Govt now selective in levying dumping duty

Finmin Rejects 57% Of Recos In 3 Years, Most Cases Deal With Cheap Imports From China

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New Delhi: For long, India was counted to be the top user of anti-dumping duty and often came under attack at the World Trade Organization (WTO). But for the last three years, the government has been very selective in imposing the duty even after the Directorate General of Trade Remedies (DGTR) investigations have established that the goods were being "dumped" into India.

By its very definition, dumping is established when the price in the importing country is lower than the origin and causes or threatens to cause injury to the domestic industry. Between 1991 and August 2020, DGTR, a quasi-judicial body, had recommended imposition of anti-dumping duty in 1,039 cases and it was accepted into all but seven cases, resulting in a rejection rate of 0.7%, data compiled by Centre for Digital Economy Policy Research showed.

But post-Covid, just when the government launched the Atmanirbhar Bharat campaign, this seems to have taken a drastic turn, with the finance ministry rejecting a significant chunk of the recommendations. Since August 2020, DGTR's "success rate" has dropped to 43% as only 61 of its 141 recommendations have been accepted, according to data accessed by **TOI**.

As has traditionally been the case, goods from China have been the biggest target of anti-dumping action. When it comes to the cases rejected by the revenue department, in over half — 43 of the 80 rejected cases — China was a subject country. The list included carbon black, caustic soda, flat rolled products of stainless steel, viscose spun yarn and polyester yarn.

There were 23 cases — 29% share of the rejected cases — where China was the sole country whose producers were dumping goods into India, including tyre, amoxycillin, melamine and nylon tyre cord fabric, among others.

So, why is the revenue department rejecting cases concerning Chinese producers, who are shipping goods that are causing damage to Indian industry, when one of the key themes is to prevent Indian industry from cheap imports from across the border?

The official argument is that dumping duty, where the main focus is on intermediaries and raw material, pushes up the cost of the finished product and the finance ministry and Niti Aayog do not support the action across the board. Industry players, however, point out that in a large number of cases dumping will eventually wipe out domestic players.

TALE OF TWO PERIODS

Source: Centre for Digital Economy Policy Research, Industry

➤ When it comes to cases rejected by the revenue department, in over half (43 of 80 rejected cases), China was a subject country

➤ The list included carbon black, caustic soda, flat rolled products of stainless steel, viscose spun yarn and polyester yarn

HDFC Ergo to utilise claims database to estimate costs

TIMES NEWS NETWORK

Mumbai: HDFC Ergo General Insurance has made the decision to utilise its health insurance claims database to offer the general public an estimated cost for various medical procedures performed at different hospitals.

The insurer has also introduced a platform that facilitates connections with individuals who have previously undergone similar medical procedures. These services are made available through the

BACKED BY AI

company's recently launched app, named 'Here'. The medical cost estimation tool employs an AI-powered engine that draws upon health claims that HDFC Ergo has settled over the years. This enables the app to provide estimated costs for medical procedures at specific hospitals across various room categories in any city.

Anuj Tyagi, joint MD of HDFC Ergo, said, "While we have introduced several pioneering AI/ML-backed digital solutions to enhance customer experience, we also recognised the need to create an inclusive digital ecosystem that can offer customers accurate, credible, and trustworthy information around the clock." The 'Here' app also features a personal health assistant.

Carlyle buys $500mn stake in engg services co Quest

TIMES NEWS NETWORK

Mumbai: Private equity financier Carlyle will acquire a minority stake in engineering services company Quest Global, replacing Bain Capital and Advent, who will exit the company. According to sources, Carlyle would pay $500 million for little more than one-fourth of the company, valuing it at $1.8-2 billion.

Singapore-based Quest Global was set up by its present chairman Ajit Prabhu and CEO Aravind Melligeri in 1997. Its clients include giants such as Airbus, BMW, P&W, Rolls-Royce, Siemens and GE. It has a multi-disciplinary team of 17,500 engineers, across 67 delivery centres and offices, in 17 countries.

As part of this transaction, Quest Global will repurchase its company shares and Ajit Prabhu will acquire an additional stake in the firm. "Carlyle was the first early-stage private equity investor in Quest Global, and we are proud to partner again," said Amit Jain, MD of Carlyle India Advisors. Jain added that Quest Global will benefit from the growing focus on increased outsourcing and disruptive technology advancements across industries. Bain Capital, Advent and Singapore sovereign wealth fund GIC jointly bought a minority stake in Quest Global for $350 million in 2016.

Ananya Birla's fin co to buy Sachin Bansal's Chaitanya

TIMES NEWS NETWORK

Mumbai: Entrepreneur Ananya Birla's Svatantra Microfin has said it will acquire Chaitanya India Fin Credit from Sachin Bansal's Navi group for Rs 1,479 crore.

The deal is expected to be completed by the end of the year, subject to regulatory approvals. The acquisition will make Svatantra the second-largest microfinance entity in India. It will have a reach of more than 3.6 million active customers through 1,517 branches across 20 states. Its assets under management stood at Rs 12,409 crore as of March 31.

Both Svatantra and Chaitanya are new-generation NBFC-MFIs (non-banking financial company, microfinance institution) leveraging technology to create an impact and offer last-mile financial services to rural India. Chaitanya was acquired by Flipkart founder Sachin Bansal in 2019 after selling his stake to Walmart. Bansal marked his entry into financial services with the acquisition of Chaitanya Rural Intermediation Development Services for Rs 739 crore.

Svatantra was incorporated in 2012 by Ananya, daughter of Kumar Mangalam Birla. It started operations in March 2013, positioning itself as a differentiated process and technology-driven microfinance entity, which offers microcredit at affordable rates in the country. The company has over 7,000 employees and 2.2 million rural customers across 19 states with assets of Rs 7,499 crore (as on March 31).

Tata Play, Isro commercial arm launch GSAT-24 satellite

Surendra.Singh @timesgroup.com

New Delhi: Isro's commercial arm NewSpace India has collaborated with Tata Play to help the direct-to-home (DTH) service provider start beaming of television channels from commercially-dedicated GSAT-24 satellite from Monday.

The entire satellite capacity on-board GSAT-24, which was launched specifically for the leading DTH service provider last year, is leased to its committed customer Tata Play and will help it increase its carrying capacity to 900 channels and will cover the length and breadth of the country, including far-flung places like Andaman Nicobar and Lakshsdweep islands. The increased bandwidth will enable Tata Play to provide its users with an even sharper picture and sound quality, a statement said.

'A rare founder who was always there for his team'

'I RIDE, THEREFORE I AM'

- Pepperfry co-founder **Ambareesh Murty** (51) had a knack for adventure and **loved to go on bike rides**
- His last Instagram post had glimpses of his bike ride on the **Leh-Manali highway**. Its caption read: 'I ride, therefore I am'
- **Leh** was Murty's favourite city, the furniture co's other co-founder Ashish Shah said
- Prior to launching Pepperfry with Shah in 2011, Murty worked with brands like **Levi's, Britannia and eBay**

Pic: Murty's Instagram post

"Ambareesh's life was defined by his unwavering determination, insatiable curiosity. His infectious zest for life made even the ordinary thrilling in his presence... his legacy isn't just the business he crafted from scratch but the lives he transformed along the way..."
— **Pankaj Makkar** | MD, BERTELSMANN INDIA INVESTMENTS

▶ From P 1

The entire Pepperfry team is dedicated to upholding the values that Ambareesh instilled in the company and ensuring that his legacy continues to guide us into the future. As we grieve the loss of a remarkable individual, we also celebrate the legacy of Ambareesh Murty and the lasting impact he has left on our organisation and the industry as a whole," the company said in a statement.

Murty, who had a knack for adventure and loved to go on bike rides, described himself as a closet sociopath, history buff and a poker of bears on Instagram. His last post on the social media platform was, in fact, a reel featuring glimpses of his bike ride through the More Plains located on the Leh-Manali highway. Murty had fondly captioned it as "I ride, therefore I am." Leh was his favourite city, Shah mentioned in a LinkedIn post.

Pankaj Makkar, MD at Bertelsmann India Investments, which counts Pepperfry as its portfolio company, remembers Murty as a true friend and a rare kind of founder who was always there for the team. "Ambareesh's life was defined by his unwavering determination, insatiable curiosity," Makkar said.

China's trade dives in blow to recovery

China's trade plunged in July as slowing global demand clouded the outlook for exports, while domestic pressures weighed on imports in a hit to the economic recovery.

Overseas shipments dropped 14.5% in dollar terms last month from a year ago, the worst decline since February 2020 while imports contracted 12.4%, the customs administration said on Tuesday. That left a trade surplus of $81 billion . The export and import figures were worse than what economists polled by Bloomberg had expected.

The slump in imports "is a reflection of weak domestic demand", said Zhang Zhiwei, chief economist at Pinpoint Asset Management. The drop was the worst since January. "The overall consumption and investment growth probably both stayed quite weak in China." Data due Wednesday is expected to show consumer prices declined in July. BLOOMBERG

adani

Power

Ref: APL/MEL/MoEFCC/EC/0509/23
Date: 04.08.2023

To
The District Development Officer,/ Collector
Waidhan, District Singrauli,
Madhya Pradesh

Sub.: Ministry of Environment, Forest & Climate Change (MoEFCC) has granted Environmental Clearance (EC) to Bandhaura Thermal Power Plant for Proposed expansion of 1600 (2×800) MW in addition to the existing 1200 (2x600) MW at Village Bandhaura, Tahsil Mada, District Singrauli, Madhya Pradesh.

Ref.: Environment Clearance vide letter no. **J-13011/56/2006-IA.II (T)** issued on dated **02.08.2023**

Dear Sir,

With refrance to the above mentioned subject we would like to inform you that Ministry of Environment, Forest & Climate Change (MoEFCC) has granted Environmental Clearance to Bandhaura Thermal Power Plant for Proposed 1600 (2×800) MW in addition to the existing 1200 (2x600) MW within existing plant boundary at Village Bandhaura, Tahsil Mada Singrauli District, in Madhya Pradesh vide letter no. **J-13011/56/2006-IA.II (T)** issued on dated **02.08.2023** and may also be seen at the Website of MoEF&CC at https://parivesh.nic.in/.

This is for your kind information and record please.

Thanking You

Yours faithfully,
for Mahaan Energen Limited.

(R N Shukla)
Authorized Signatory

Encl.: Copy of Environmental Clearance (EC).

CC **The Block Development Officer**
Bilaunji, Waidhan – Singrauli.
Zilla Panchayat / Zilla Parishad Office
Waidhan – Singrauli.
The Village Panchayat Office (list encl.)
Waidhan – Singrauli.
NGO (Local), if any

14/8/23 आवक शाखा कलेक्टर जिला-सिंगरौली (म.प्र.)

Mahan Energen Ltd
(Formerly Essar Power MP Ltd)
Adani Corporate House
Shantigram, S G Highway
Ahmedabad 382 421
Gujarat, India
CIN: U40100DL2005PLC201961

Tel +91 79 2555 4444
Fax +91 79 2555 7177
www.adanipower.com

Registered Office: Lower Ground Floor, Hotel Conclave Boutique, A-20, Kailash Colony, New Delhi 110 048, Delhi, India

Received 11/8/23

11/8/23

adani

Power

Sub: Ministry of Environment, Forest & Climate Change (MoEFCC) has granted Environmental Clearance (EC) to Bandhaura Thermal Power Plant for Proposed expansion of 1600 (2×800) MW in addition to the existing 1200 (2x600) MW at Village Bandhaura, Tahsil Mada, District Singrauli, Madhya Pradesh.

Ref: MoEFCC Letter No. J-130011/56/2006-IA. II(T) dated 27.07.2023

RECEIPT:

Tehsil / Block: Singrauli

Sl. No.	Name of Gram Panchayat/ Mukhiya/Panchayat Samiti	Name, Sign with Seal, and date.
1	Sarpanch/Mukhiya/Sachiv Gram Panchyat- **Bandhura** Tahsil- Mada, Dist.- Singrauli	सरपंच ग्राम पंचायत बंधौरा जनपद पंचायत वैढ़न, जिला सिंगरौली
2	Sarpanch/Mukhiya/Sachiv Gram Panchyat- **Kheirahi** Tahsil- Mada, Dist.- Singrauli	सरपंच ग्राम पंचायत क्षेत्र खैराही जनपद पंचायत वैढ़न जिला–सिंगरौली (म० प्र०)
3	Sarpanch/Mukhiya/Sachiv Gram Panchyat- **Nagwa** Tahsil- Mada, Dist.- Singrauli	सरपंच ग्राम पंचायत क्षेत्र नगवा जनपद पंचायत–वैढ़न जिला–सिंगरौली (म.प्र.)
4	Sarpanch/Mukhiya/Sachiv Gram Panchyat- **Suhira** Tahsil- Mada, Dist.- Singrauli	सरपंच ग्राम पंचायत क्षेत्र सुहिरा जनपद पंचायत वैढ़न जिला–सिंगरौली (म०प्र०)
5	Sarpanch/Mukhiya/Sachiv	

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adani

Power

	Gram Panchyat- **Raila** Tahsil- Mada, Dist.- Singrauli	सरपंच ग्राम पंचायत क्षेत्र रैला जनपद पंचायत चैढ़न जिला सिंगरौली (म.प्र.)
6	Sarpanch/Mukhiya/Sachiv Gram Panchyat- **Amiliya** Tahsil- Mada, Dist.- Singrauli	सरपंच ग्राम पंचायत क्षेत्र अमिलिया जनपद पंचायत चैढ़न जिला–सिंगरौली (म० प्र०)

Mahan Energen Ltd
(Formerly Essar Power MP Ltd)
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adani

Power

Ref: APL/MEL/MoEFCC/EC/0508/23
Date: 04.08.2023

To
The Regional Officer,
Madhya Pradesh Pollution Control Board
Regional Office, Waidhan,
Singrauli, Madhya Pradesh

Sub.: Ministry of Environment, Forest & Climate Change (MoEFCC) has granted Environmental Clearance (EC) to Bandhaura Thermal Power Plant for Proposed expansion of 1600 (2×800) MW in addition to the existing 1200 (2x600) MW at Village Bandhaura, Tahsil Mada, District Singrauli, Madhya Pradesh.

Dear Sir,

With refrance to the above mentioned subject we would like to inform you that Ministry of Environment, Forest & Climate Change (MoEFCC) has granted Environmental Clearance to Bandhaura Thermal Power Plant for Proposed 1600 (2×800) MW in addition to the existing 1200 (2x600) MW within existing plant boundary at Singrauli District, in Madhya Pradesh vide letter no. J-13011/56/2006-IA.II(T) issued on dated 02.08.2023 and may also be seen at the Website of MoEF&CC at https://parivesh.nic.in/.

This is for your kind information and record please.

Thanking You

Yours faithfully,
for Mahaan Energen Limited.

(R N Shukla)
Authorized Signatory

Encl.: Copy of Environmental Clearance (EC).
CC:
Integrated Regional Office,
Ministry of Environment, Forest & Climate Change
Kendriya Paryavaran Bhavan,
Bhopal (M.P) - 462016

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Annexure XI

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PERIPHERAL GREEN BELT DEVELOPMENT PLAN FOR MAHAN THERMAL POWER PLANT

Document No: IISWBM/IRP/PGBD-APL/2024-25/01 V1.0 Dated 30/04/2024

IISWBM

April 2024

PERIPHERAL GREEN BELT DEVELOPMENT PLAN FOR MAHAN THERMAL POWER PLANT

Document No: IISWBM/IRP/PGBD-APL/2024-25/01 V1.0 Dated 30/04/2024

Submitted By

adani

Mahan Energen Limited

Vill-Bandhuara, Block-Baidhan
Singrauli (MP)

Executed By

DEPARMENT OF ENVIRONMENT MANAGEMENT
INDIAN INSTITUTE OF SOCIAL WELFARE & BUSINESS MANAGEMENT
(A Constituent Institute of University of Calcutta)
KOLKATA – 700 073

APRIL, 2024

CONTENTS

EXECUTIVE SUMMARY

Adani Power Limited (APL), a member of the Adani Group, has taken up implementation of large Thermal Power Projects at various locations in India in view of the growing needs of power requirements in the country. APL is also actively planning to implement Thermal Power Stations at various locations in India, totaling to about 20,000 MW in the coming years.

Mahan Energen Limited – MEL is a subsidiary company of Adani Power Limited (APL) which has been formed to develop 2x800 MW Ultra Super Critical Thermal Power Plant at Bandhaura, Khairahi, Karsualal and Nagwa Villages under Singrauli District, Madhya Pradesh. The Project is proposed to be developed as an expansion of the existing 2 x 600 MW units at the site and all the necessary infrastructure to cater the requirement of the enhanced capacity will be developed while also using the facilities of the existing plant.

A detailed assessment of existing green belt in and around Mahan TPP is necessary to further strengthen the green cover and develop a plan for development of peripheral green belt around Mahan TPP for effective utilization of natural resources besides creating sustainable livelihood for local people.

The prime objectives of peripheral green belt development include:

- To assess the existing status of green belt in and around Mahan TPP (core as well as buffer area).
- To identify public/common areas for developing additional green belt within the study area.
- To formulate strategies and action plan for peripheral green belt development around Mahan TPP.

The detail scope of work for the study was as follows:

1) Collection of the Primary data from the field and Secondary data and study was conducted by the team experts

2) The detailed study was undertaken for the study zone (core and buffer zone) i.e. 2 km radius from the project site of the project area and the study was carried out by Ecologist/Botanist/Environment Professional.

3) Mapping of the Land Use, Water bodies and Forest, Vegetation types within the 2 km radius area from the project site was done using GIS and

remote sensing.

4) Ecological status of the study area such as habitat type and its quality, species, diversity, rarity, fragmentation, ecological and study have provided information regarding the nature and distribution of vegetation in and around the project area.

5) Promotion of afforestation and reforestation to protect and improve the local environment.

6) Sustainable livelihoods for local communities through sustainable agriculture and alternative income-generating activities.

7) Monitoring and evaluation of project outcomes to ensure effective resource management and sustainable development.

8) Recommendation on institutional mechanism for implementation of green belt and micro watershed development plan.

The approach for development of peripheral green belt in the buffer zone of Mahan TPP includes:

- **Regulatory Guidelines:** Design and development of the green belt would align with industry-specific requirements and guidelines provided by relevant regulatory bodies, such as the Central Pollution Control Board (CPCB).

- **Site Selection**: Determination of the location and area for the proposed green belt development have been done based on project-specific factors.

- **Species Selection**: Local or native fast-growing tree species would be chosen that is suited to the region's climate and soil conditions. Preference would be given to species with economic, medicinal, or ecological value, as well as those that bear fruits. Additionally, non-edible shrub species would be preferred to support biodiversity.

- **Planting Arrangement**: Optimization of planting patterns would be done to maximize the effectiveness of the green belt in reducing pollution. Plantation of trees, shrubs, and bio-fencing in circular rows, with recommended spacing between trees and shrubs would be done to ensure adequate growth and coverage. In terms of planting arrangement, Miyawaki technique would be employed to develop greenbelt in the wasteland areas whereas Double Row plantation technique would be used for development of green cover in public land such as schools, health centers etc.

- **Plantation and Protection**: Sufficient number of trees and shrubs would be planted to achieve the desired density and coverage. Bamboo or iron tree guards would be used to protect saplings from damage.

- **Consultation with Authorities:** Consultation would be done with local forest departments or environmental agencies to identify suitable plant species and ensure compliance with regulations.

For the peripheral green belt development surrounding the Mahan TPP, a comprehensive approach has been devised, taking into account the involvement of various key stakeholders and the identification of strategic locations for development of green cover. Educational institutes, gram panchayat offices, health centers, and other government institutions have been identified within a 2km buffer zone of the Mahan TPP. Additionally, wasteland areas within this vicinity have been identified for potential transformation.

The LULC analysis revealed that tree cover comprises a significant portion of the study area, covering approximately 7.4 km^2 and accounting for 20.5% of the total area. Following this, open grasslands occupy nearly 14 km^2, constituting more than 38% of the buffer zone. Croplands span approximately 12 km^2, representing 33% of the total area. Conversely, the built-up area of settlements occupies a smaller proportion, accounting for 6.8% of the buffer zone. Additionally, water bodies and bare ground/wasteland cover minimal areas, with water bodies occupying 0.6% and bare ground/wasteland covering 0.5% of the buffer zone respectively.

The NDVI analysis revealed that out of 35.87 km^2 of the buffer area, around 27.2 km^2 is having low vegetative cover that is approximately 76 % of the entire buffer zone. Whereas nearly 7 km^2 of the buffer zone is covered by moderately dense vegetation which accounts for 19 % of the total area. According to NDVI analysis, vegetation that falls under “Very Dense/Healthy Vegetation Cover” is absent in the area. The buffer zone also consists of 5.05 km^2 of land that is devoid of vegetation cover and is nearly around 2% of the entire buffer zone. Additionally, a very small portion of the area is occupied by water bodies (0.06 km^2 or 0.17 %).

The strategies formulated for development of peripheral green belt include:

Analysis of Land Use/Land cover- The land use/land cover analysis indicates that approximately 740 hectares of the total buffer zone identified within 2 Km of Mahan TPP are characterized by tree cover, indicating a significant presence of green cover. Conversely, around approximately 20 hectares are designated as wastelands, representing areas with limited vegetation or degraded landscapes.

Assessment of Existing Green Cover- The assessment of the existing green cover in the buffer zone of Mahan TPP revealed that a significant portion of the study area is characterized by

low vegetation density, while patches of lands devoid of vegetation have also been identified interspersed within the landscape. The green belt development plan would be implemented through careful selection of plant species in targeted areas that in turn would lead to the increase in the overall green cover of the buffer zone by an estimated 20-25%.

The selection of plant species for green belt development depends on several factors including climate, elevation, and soil conditions. While selecting tree species for plantation, it is essential to consider certain desirable characteristics. The primary objectives in selecting suitable trees for a site involve ensuring adequate space both above and below ground for the tree's canopy and roots to grow, as well as considering its future maintenance needs. The aim is to plant trees that can reach full maturity with minimal need for pruning, as pruning cuts can leave trees vulnerable to decay.

The wasteland constitutes an area of approximately 21.13 Ha and it is envisioned that approximately 31695 trees will be planted within this area, contributing to the transformation of barren land into a flourishing green landscape. It is envisaged that a total of 960 trees would be strategically planted across the school premises and 240 trees would be planted withim gram panchayat offices symbolizing a concerted effort to enhance the aesthetic appeal and ecological functionality of these community infrastructure.

In the proposed development of green belts within the identified wasteland areas around Mahan TPP, the innovative Miyawaki technique is proposed for implementation. The method involves densely planting native species in multiple layers to accelerate forest growth and biodiversity. The double row technique of plantation is proposed to be implemented in schools, health centers, and other public land around Mahan TPP.

The total estimated budget for the implementation of green belt development plan is 54.52 Lakhs INR.

In conclusion, the peripheral green belt development plan for the Mahan TPP buffer zone represents a proactive and holistic approach towards environmental conservation and community development.

The recommendations for the development of green belt in the buffer zone of Mahan TPP include:

- Given the significant presence of wastelands in the buffer zone, targeted tree plantation initiatives should be undertaken to rejuvenate degraded landscapes and enhancing biodiversity.

- Adequate allocation of resources should be done for tree plantation in the public institutions to create vibrant and sustainable ecosystems that benefit local communities.

- A proper tracking mechanism should be followed to monitor the progress of green belt development plan.

- Frequent assessments should be undertaken to evaluate the impact of tree plantation efforts on increasing green cover and improving environmental sustainability in the buffer zone surrounding the Mahan TPP.

- Local residents should be encouraged to actively participate in tree plantation drives and environmental conservation efforts, fostering a sense of ownership.

- Adoption of sustainable maintenance practices should be ensured to support the long-term health and vitality of newly planted trees.

- Collaboration with relevant stakeholders including government agencies, non-profit organizations, and local communities is recommended to leverage resources and expertise in green belt development plan.

- It is recommended to conduct awareness campaigns and educational programs to promote the importance of green belt development and environmental conservation among local communities around Mahan

1.0 INTRODUCTION

1.1 BACKGROUND

The Adani Group (1988) has grown from being a trading house to a diversified business group with interests from infrastructural development to FMCGs. The Adani Group has made foray into high growth sector like Power, Infrastructure, Global Trading, Logistics and Energy.

Adani Power Limited (APL), a member of the Adani Group, has taken up implementation of large Thermal Power Projects at various locations in India in view of the growing needs of power requirements in the country. APL is also actively planning to implement Thermal Power Stations at various locations in India, totaling to about 20,000 MW in the coming years.

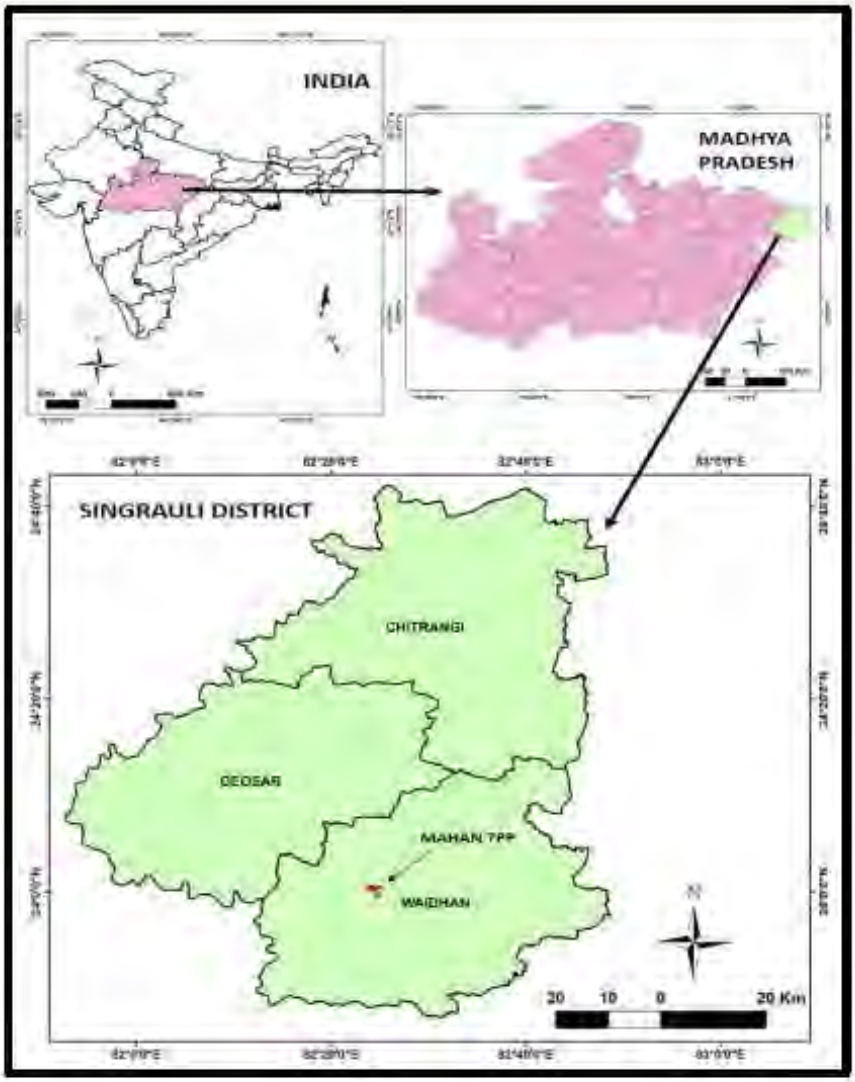
Mahan Energen Limited – MEL is a subsidiary company of Adani Power Limited (APL) which has been formed to develop 2x800 MW Ultra Super Critical Thermal Power Plant at Bandhaura, Khairahi, Karsualal and Nagwa Villages under Singrauli District, Madhya Pradesh (Figure 1.1). The Project is proposed to be developed as an expansion of the existing 2 x 600 MW units at the site and all the necessary infrastructure to cater the requirementof the enhanced capacity will be developed while also using the facilities of the existing plant.

The Project is conceptualised to be operated by utilising coal from nearbycommercial coal mines and water from the Rihand reservoir. For auxiliaries' viz.Coal Handing, Ash Handling and Plant Water System, it is proposed to utilise thelatest technology with adequate margin to ensure high availability of the Project. Land Area of about 920 Acres has been identified for the Project which includesthe existing 1200 MW plant and land area for accommodation of coal stockyard,water reservoir, roads & green belt etc.

A detailed assessment of existing green belt in and around Mahan TPP is necessary to further strengthen the green cover and develop a plan for development of peripheral green belt around Mahan TPP for effective utilization of natural resources besides creating sustainable livelihood for local people. The effective peripheral greenbelt around Mahan TPP would also help greatly to reduce the effect of Air pollution, Noise pollution, Soil erosion, act as a wind barrier, increase the water holding capacity of soil, reduce the surface water run-off, providing shelter to animals and ultimately improve the biodiversity of the area.

In accordance with its mission of being enviro-socially responsible corporate entity with thrust on sustainable development, MEL aims to focus on strengthening green belt around its Mahan TPP. To accomplish this mission, it is imperative to carry out proposed study that can facilitate in formulating a comprehensive short as well as long-term green belt development plan.

FIGURE 1.1: LOCATION OF PROPOSED USCTPP AT SINGARAULI MADHYA PRADESH



1.2 OBJECTIVES OF THE STUDY

The prime objectives of peripheral green belt development include:

- To assess the existing status of green belt in and around Mahan TPP (core as well as buffer area).
- To identify public/common areas for developing additional green belt within the study area.
- To formulate strategies and action plan for peripheral green belt development around Mahan TPP.

1.3 SCOPE OF THE STUDY

The scope of the study includes the undertaking of a reconnaissance survey. On the basis of the reconnaissance survey a framework was evolved for undertaking time bound detailed field survey within the influence zone of the project site (i.e. 2 km radius) and assessment of existing greenbelt was done. The detail scope of work for the study was as follows:

1) Collection of the Primary data from the field and Secondary data and study was conducted by the team experts

2) The detailed study was undertaken for the study zone (core and buffer zone) i.e. 2 km radius from the project site of the project area and the study was carried out by Ecologist/Botanist/Environment Professional.

3) Mapping of the Land Use, Water bodies and Forest, Vegetation types within the 2 km radius area from the project site was done using GIS and remote sensing.

4) Ecological status of the study area such as habitat type and its quality, species, diversity, rarity, fragmentation, ecological and study have provided information regarding the nature and distribution of vegetation in and around the project area.

5) Promotion of afforestation and reforestation to protect and improve the local environment.

6) Sustainable livelihoods for local communities through sustainable agriculture and alternative income-generating activities.

7) Monitoring and evaluation of project outcomes to ensure effective resource management and sustainable development.

8) Recommendation on institutional mechanism for implementation of green belt and micro watershed development plan.

The layout map of Mahan TPP has been presented in Figure 1.2 and the buffer zone map around Mahan TPP proposed for peripheral green belt development has been presented in Figure 1.3.

FIGURE 1.2: LAYOUT MAP OF MAHAN TPP

FIGURE 1.3: BUFFER ZONE (2KM RADIUS) IDENTIFIED FOR PERIPHERAL GREEN BELT DEVELOPMENT AROUND MAHAN TPP

1.4 PROJECT AT A GLANCE

General:

Project Authority (SPV)	:	Mahan Energen Ltd.
Project	:	2x800 MW Ultra Super-Critical ThermalPower Project.
Selected Location	:	Bandhaura, Nagwa, Karsualal and Khairahi village, Singrauli District, M.P.
Latitude and Longitude of the site	:	24°0'28.90"N latitude / 82°24'49.94"E longitude
Altitude	:	320 to 340 m.
Average RL	:	335 m.
Annual average rain fall	:	1132.7 mm
Nearest Major Town	:	Waidhan and Singrauli
Seismic Zone	:	Zone-III as per IS 1893
Access by Road	:	State Highway (SH14) is passing about 16km from the site.
Access by Rail	:	Singrauli Station is located at 52 km fromProject Site.
Access by Air	:	Nearest Airport is at Varanasi at a distanceof 280 km.
Access by Sea	:	Nearest Seaport is at Dhamra at a distanceof 770 km.

Preliminary Project Particulars:

Main Fuel	:	Coal from Commercial Coal Mines (GCV 3000-4200 Kcal/Kg)
Fuel Transportation	:	Through Long Belt conveyor (LBC) system.
Water	:	From the Rihand Reservoir at 36 km fromSite.
Land	:	920 Acres of land is available for the PowerProject.
Layout Features	:	2 X 800 MW Ultra Super-Critical Units

Technical Features:

Power Generating Unit sets	:	Two units of 800 MW turbine generator fed by steam from coal fired P.F. boiler operating at Ultra Super-critical range.
Cooling System	:	Closed recirculating condenser cooling system with induced draft cooling tower.
Coal Handling System	:	Coal handling facility, which comprises receipt of coal from Mines through LBC system, with on-line existing & new crushing and stacking by existing & new stacker-cum-reclaimer in the existing & new coal yard and finally feeding the bunker level conveyors.
Ash Disposal System	:	Provision will be made for disposal of fly ash in dry form to adjacent Cement Plants/ Mineback filling. Provision will be made for disposal of ash in high concentration slurry form.
Power Evacuation	:	At 400 kV level to State Transmission Unit (STU)

Environmental Aspects	:	Elaborate arrangements for Flue gas desulphurization (FGD) and Selective Catalytic Reduction (SCR) systems complying with emission norms as per latest MoEF & CC. Independent steel wet flue foreach unit, down- stream of FGD of suitable height as per MoEF & CC guidelines and an adequately designed electrostatic precipitator with more than 99.99% efficiency are envisaged. Waste water quality to be maintained as per MoEF & CC notification. Zero Plant Discharge facility shall be present since the cooling water, blow down water, waste water and ash water would be recycled back to the systemafter suitable treatment for reuse. For coal transportation from mines, pipe conveyor technology will be adopted to mitigate environmental concerns.
Rehabilitation Requirement	:	Nil

Other Facilities:

Township	:	Township with civic amenities would be developed.
Mode of Implementation	:	The Project would be implemented on EPCconcept.
Project Time Frame	:	54 months from Zero Date i.e. the date of 'Financial Closure' for Commercial Operation of Unit#3 and 60 months for Unit#4

FIGURE 1.4: VIEW OF MAHAN TPP AT SINGRAULI MADHYA PRADESH

2.0 FRAMEWORK FOR PERIPHERAL GREEN BELT DEVELOPMENT

Peripheral green belt development for industrial areas plays a pivotal role in fostering sustainable development and mitigating the adverse impacts of industrial activities on the surrounding environment. It involves the strategic planning and establishment of green cover around the periphery of project area to create a protective barrier that shields neighbouring communities and ecosystems from pollution and other detrimental effects.

One of the key benefits of peripheral green belt development is its ability to mitigate air pollution. Vegetation within the green belt acts as a natural filter, absorbing harmful pollutants such as carbon dioxide, sulfur dioxide, and particulate matter emitted by industrial activities. Through photosynthesis, trees and plants not only sequester carbon but also release oxygen, thereby improving air quality and reducing the concentration of greenhouse gases in the atmosphere. Furthermore, development of green cover serves as a noise barrier, dampening the sound waves generated by machinery, transportation, and other industrial processes.

In addition to its role in pollution abatement, the peripheral green belt contributes to soil conservation and erosion control. The roots of trees and vegetation stabilize the soil, preventing erosion caused by rainfall and runoff. By enhancing the water-holding capacity of the soil, the green belt also helps regulate surface water runoff, reducing the risk of flooding and soil degradation. On the other hand, green belt provides habitat and refuge for a diverse range of flora and fauna, promoting biodiversity and ecological resilience. By preserving natural habitats and creating corridors for wildlife movement, it supports the conservation of native species and fosters ecological connectivity within the landscape.

From a socio-economic perspective, peripheral green belt development enhances the aesthetic appeal of industrial areas, transforming them into visually pleasing landscapes that blend seamlessly with the natural surroundings. This not only elevates the standard of living for nearby residents but also boosts the desirability of the area for potential investments and tourism.

Overall, peripheral green belt development represents a holistic approach to sustainable urban planning, integrating environmental protection, public health, and economic prosperity. By investing in the creation and maintenance of green spaces around industrial zones, communities can achieve a balance between industrial development and environmental conservation, ensuring a healthier and more resilient future for generations to come.

2.1 APPROACH FOR GREEN BELT DEVELOPMENT

The approach for development of peripheral green belt for Mahan TPP follows a structured process to ensure environmental sustainability and compliance with regulatory standards. The approach for development of peripheral green belt includes:

- **Regulatory Guidelines:** Design and development of the green belt would align with industry-specific requirements and guidelines provided by relevant regulatory bodies, such as the Central Pollution Control Board (CPCB).

- **Site Selection**: Determination of the location and area for the proposed green belt development have been done based on project-specific factors.

- **Species Selection**: Local or native fast-growing tree species would be chosen that is suited to the region's climate and soil conditions. Preference would be given to species with economic, medicinal, or ecological value, as well as those that bear fruits. Additionally, non-edible shrub species would be preferred to support biodiversity.

- **Planting Arrangement**: Optimization of planting patterns would be done to maximize the effectiveness of the green belt in reducing pollution. Plantation of trees, shrubs, and bio-fencing in circular rows, with recommended spacing between trees and shrubs would be done to ensure adequate growth and coverage. In terms of planting arrangement, Miyawaki technique would be employed to develop greenbelt in the wasteland areas whereas Double Row plantation technique would be used for development of green cover in public land such as schools, health centers etc.

    - **Miyawaki Technique**: This method would involve densely planting native species in multiple layers to accelerate forest growth and biodiversity. It would focus on creating compact, diverse ecosystems within a small area, making it suitable for maximizing green cover in the wastelands.

    - **Double Row Technique:** The technique would involve planting two rows about 8 inches apart which would allow growing two rows of plants in almost the same amount of space as one row would require.

- **Plantation and Protection**: Sufficient number of trees and shrubs would be planted to achieve the desired density and coverage. Bamboo or iron tree guards would be used to protect saplings from damage.

- **Consultation with Authorities:** Consultation would be done with local forest departments or environmental agencies to identify suitable plant species and ensure compliance with regulations.

2.2 SITE SELECTION

For the peripheral green belt development surrounding the Mahan TPP, a comprehensive approach has been devised, taking into account the involvement of various key stakeholders and the identification of strategic locations for development of green cover. Educational institutes, gram panchayat offices, health centers, and other government institutions have been identified within a 2km buffer zone of the Mahan TPP. Additionally, wasteland areas within this vicinity have been identified for potential transformation. The proposed approach emphasizes the greening of essential community institutions such as schools, gram panchayat offices, health facilities etc. By focusing on the identified areas, the proposed peripheral green belt development plan would not only aim to enhance the environmental resilience of the area but would also directly benefit the well-being and quality of life of local community.

2.2.1 Land Use/Land Cover Analysis

The land use/land cover characteristics of the area within 2 km of the Mahan TPP was analyzed to assess the prevailing land pattern within the buffer zone in order to identify suitable location for development of green belt. The data has been derived from the ESA Sentinel-2 imagery at 10 m resolution downloaded for the year 2023.

The description of the different LULC classes derived from the imagery are as follows:

1. Waterbodies: Areas where water was predominantly present throughout the year; may not cover areas with sporadic or ephemeral water; contains little to no sparse vegetation, no rock outcrop nor built up features like docks; examples: rivers, ponds, lakes, oceans, flooded salt plains.

2. Tree Cover: Any significant clustering of tall (~15 feet or higher) dense vegetation, typically with a closed or dense canopy; examples: wooded vegetation, clusters of dense tall vegetation within savannas, plantations, swamp or mangroves (dense/tall vegetation with ephemeral water or canopy too thick to detect water underneath).

3. Flooded Vegetation: Areas of any type of vegetation with obvious intermixing of water throughout a majority of the year; seasonally flooded area that is a mix of grass/shrub/trees/bare ground; examples: flooded mangroves, emergent vegetation, rice paddies and other heavily irrigated and inundated agriculture.

4. Cropland: Human planted/plotted cereals, grasses, and crops not at tree height; examples: corn, wheat, soy, fallow plots of structured land.

5. Built-up Area: Human made structures; major road and rail networks; large homogenous impervious surfaces including parking structures, office buildings and residential housing; examples: houses, dense villages / towns / cities, paved roads, asphalt.

6. Bare Ground: Areas of rock or soil with very sparse to no vegetation for the entire year; large areas of sand and deserts with no to little vegetation; examples: exposed rock or soil, desert and sand dunes, dry salt flats/pans, dried lake beds, mines.

7. Open Grassland: Open areas covered in homogenous grasses with little to no taller vegetation; wild cereals and grasses with no obvious human plotting (i.e., not a plotted field); examples: natural meadows and fields with sparse to no tree cover, open savanna with few to no trees, parks/golf courses/lawns, pastures. Mix of small clusters of plants or single plants dispersed on a landscape that shows exposed soil or rock; scrub-filled clearings within dense forests that are clearly not taller than trees; examples: moderate to sparse cover of bushes, shrubs and tufts of grass, savannas with very sparse grasses, trees or other plants.

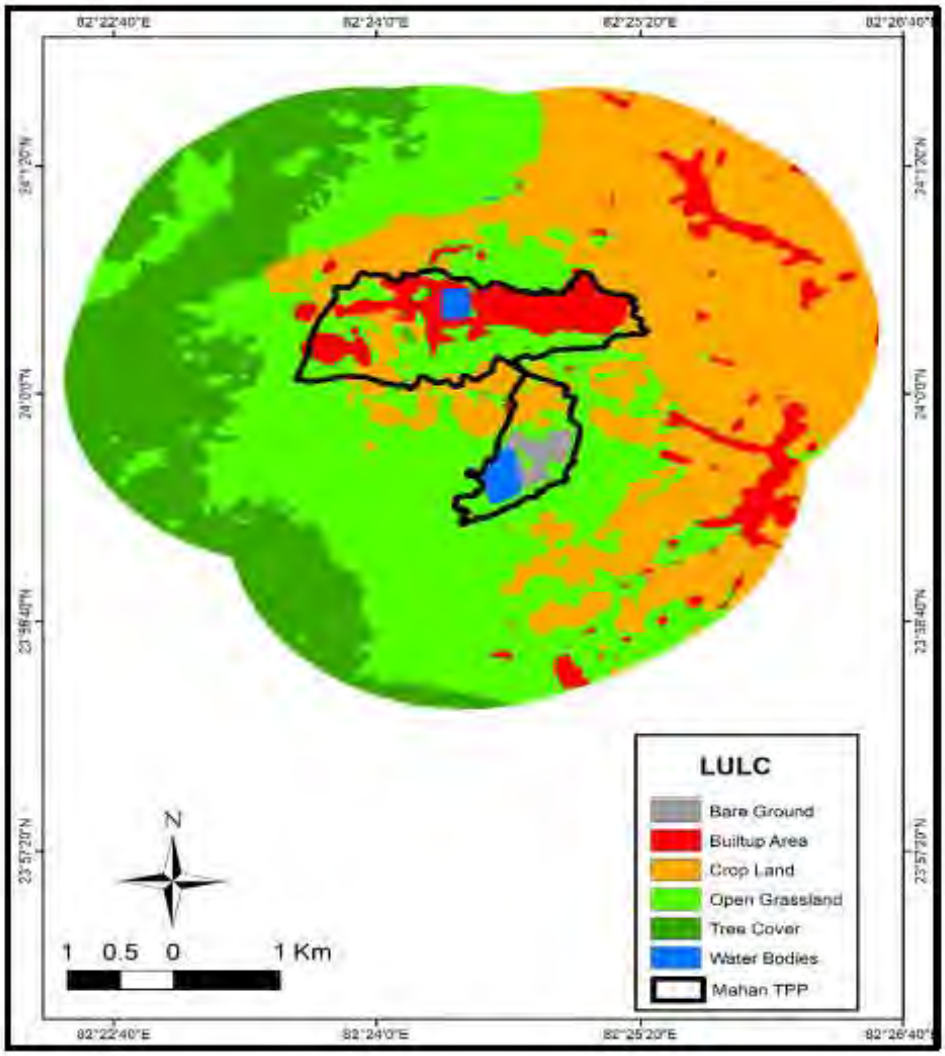
Table 2.1 and Figure 2.1 present the results of land use/land cover classification in the study area within 2 Km buffer zone of Mahan TPP. The analysis highlights that the tree cover comprises a significant portion of the study area, covering approximately 7.4 km^2 and accounting for 20.5% of the total area. Following this, open grasslands occupy nearly 14 km^2, constituting more than 38% of the buffer zone. Croplands span approximately 12 km^2, representing 33% of the total area. Conversely, the built-up area of settlements occupies a smaller proportion, accounting for 6.8% of the buffer zone. Additionally, water bodies and bare ground/wasteland cover minimal areas, with water bodies occupying 0.6% and bare ground/wasteland covering 0.5% of the buffer zone respectively. The significant presence of tree cover and the notable extent of wastelands indicate the potential for enhancement of green cover within the 2 Km buffer zone of Mahan TPP.

TABLE 2.1: AREA STATISTICS OF LANDUSE-LANDCOVER CLASSES WITHIN 2 KM BUFFER ZONE OF MAHAN TPP

LULC Classes	Pixel* Count	Area (Km^2)	Per Cent of Total Area
Water	2263	0.23	0.63
Tree Cover	73885	7.39	20.58
Crop Land	119135	11.91	33.18
Buildup Land	24291	2.43	6.77
Bare Ground/Wasteland	1960	0.20	0.55
Open Grassland	137516	13.75	38.30
Total	**359050**	**35.91**	**100**

* Spatial Resolution = 10 m.

FIGURE 2.1: LAND USE LAND COVER CHARACTERISTICS WITHIN 2KM OF MAHAN TPP



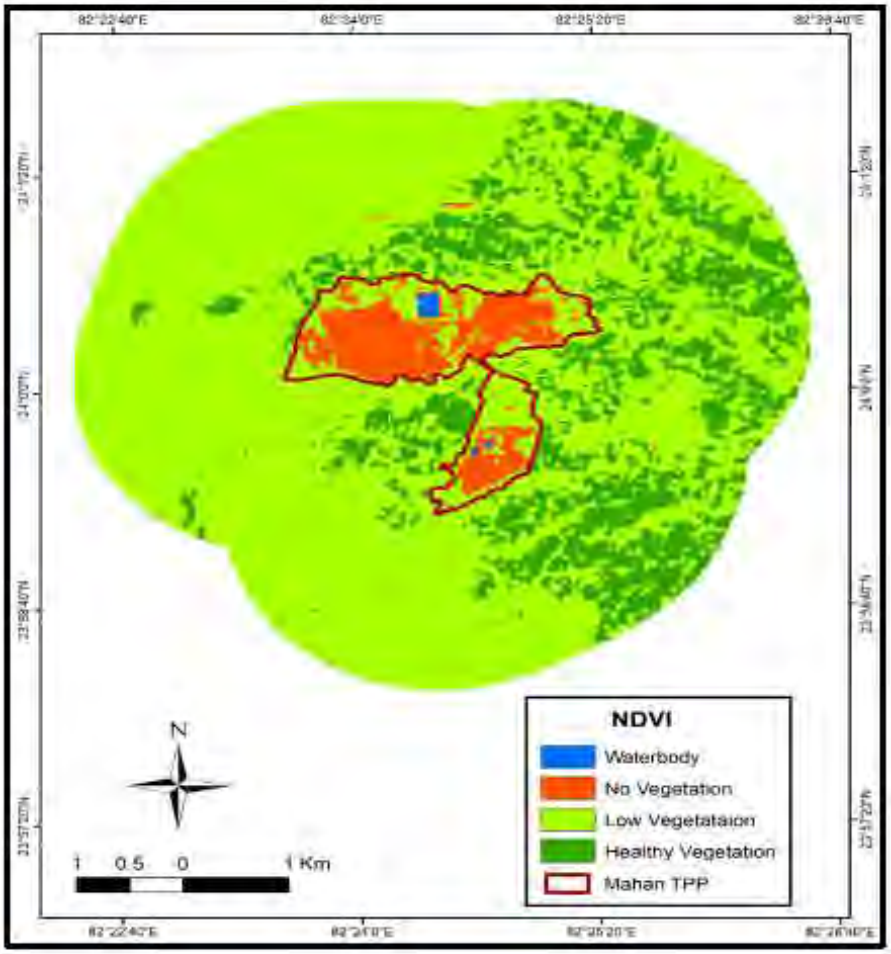
2.2.2 NDVI of Study Area

The Normalized Difference Vegetation Index (NDVI) analysis was undertaken to assess the existing status of vegetation cover around the 2 Km buffer zone of Mahan TPP. The study was conducted on GIS platform using Landsat-8 data of March 12, 2024 (Figure 2.2). The analysis revealed the status of the vegetation cover of the study area within 2 km radius of the Mahan TPP. Out of 35.87 km^2 of the buffer area, around 27.2 km^2 is having low vegetative cover that is approximately 76 % of the entire buffer zone (Table 2.2). Whereas nearly 7 km^2 of the buffer zone is covered by moderately dense vegetation which accounts for 19 % of the total area. According to NDVI analysis, vegetation that falls under "Very Dense/Healthy Vegetation Cover" is absent in the area. The buffer zone also consists of 5.05 km^2 of land that is devoid of vegetation cover and is nearly around 2% of the entire buffer zone. Additionally, a very small portion of the area is occupied by water bodies (0.06 km^2 or 0.17 %).

TABLE 2.2: NORMALIZED DIFFERENCE VEGETATION INDEX CALCULATION FOR THE STUDY AREA

Reclassification Value	NDVI		Pixel* Count	Feature	Area (sqkm)	Percentage (%)
	Minimum	Maximum				
0	-1	0	68	Waterbody	0.06	0.17
1	0	0.1	2014	No Vegetation Cover	1.81	5.05
2	0.1	0.3	30234	Low Vegetation Cover	27.21	75.86
3	0.3	0.7	7540	Healthy Vegetation Cover	6.79	18.92
Total			**39856**		**35.87**	**100**

FIGURE 2.2: NORMALIZED DIFFERENCE VEGETATION INDEX (NDVI) MAP WITHIN 2KM OF MAHAN TPP



2.2.3 Wastelands

Wasteland areas were identified within a 2-kilometer radius of Mahan TPP using GIS and subsequent field verification during February – March, 2024. The data has been derived from the ESA Sentinel-2 imagery at 10 m resolution downloaded for the year 2023. The identified waste land within buffer zone of Mahan TPP are as depicted in Figure 2.3. For the purpose, an inventory constituting the detailed locations of the wasteland areas within the buffer zone have been prepared as presented in Table 2.3. This empirical observation underscores the necessity for targeted intervention to revitalize these underutilized spaces into vibrant green zones. The strategic identification of these wasteland areas serves as a crucial foundation for the formulation of peripheral green belt development plan around Mahan TPP, providing a tangible roadmap for sustainable land use planning and ecological restoration efforts. By repurposing these wastelands, the project aims to not only enhance the aesthetic appeal of the surroundings but also to harness their potential to mitigate environmental degradation and promote biodiversity conservation.

FIGURE 2.3: LOCATION MAP OF WASTELANDS WITHIN 2 KM OF MAHAN TPP

TABLE 2.3: DETAIL OF WASTELANDS WITHIN BUFFER ZONE OF MAHAN TPP

Sl No	Name	Co-ordinates	Direction	Area (Hectors)
1	Barren land 1	23°59'34.59"N/82°22'47.97"E	South-West	4.35
2	Barren land 2	23°59'23.62"N/82°23'10.39"E	South	1.19
3	Barren land 3	23°59'30.74"N/82°23'29.55"E	South	3.79
4	Barren land 4	23°59'13.10"N/82°23'48.11"E	South	14.7
5	Barren land 5	23°58'57.92"N/ 82°24'4.78"E	South	6.31
6	Barren land 6	24° 1'38.25"N/ 82°24'35.11"E	North	5.63
7	Barren land 7	24° 1'36.61"N/ 82°24'46.75"E	North	0.37
8	Barren land 8	24° 1'25.74"N/ 82°24'25.28"E	North	4.1
9	Barren land 9	24° 1'30.65"N/ 82°24'37.72"E	North	0.90
10	Barren land 10	24°1'45.60"N/82°24'15.47"E	North	1.1
11	Barren land 11	23°58'48.13"N/82°24'26.18"E	South	16.4
12	Barren land 12	23°58'39.37"N/ 82°24'8.07"E	South	9.66
13	Barren land 13	23°58'35.37"N/82°24'15.92"E	South	8.60

2.2.4 Public Land

2.2.4.1 Schools

For the purpose of identification of educational institutions for green belt development, an inventory of schools constituting detailed information falling within the buffer zone have been prepared (as presented in Table 2.4). During on-field verification, schools located within a 2-kilometer radius of the Mahan TPP were identified as having suitable space for green belt development, as depicted in Figure 2.4. This critical assessment highlights the opportunity to leverage educational institutions as focal points for green infrastructure integration, enhancing both environmental sustainability and educational outreach. By strategically incorporating green belts within school premises, the initiative not only contributes to ecological restoration but also facilitates experiential learning opportunities for students, fostering a deeper connection with nature and environmental stewardship. The detail of schools and anganwadi centers falling within CSR zone of Mahan TPP is presented in Figure 2.1.

FIGURE 2.4: LOCATION MAP OF SCHOOLS WITHIN 2 KM OF MAHAN TPP

TABLE 2.4: DETAIL OF SCHOOLS WITHIN 2 KM OF MAHAN TPP

Block	School Name	Co-ordinate
Waidhan	(i) Shaskiya Purba Madhyamik Vidyalaya, Bhanduara	Lat- 24.013511 Long-82.411736
	(ii) Shas. Prath. Pathsala Chirihoba,Karsuaraja	Lat- 24.007499 Long-82.422681
	(iii) Shaskiya Purba Madhyamik Vidyalaya Khairahi School Kendra Karsualal	Lat-23.99854 Long-82.425211

2.2.4.2 Gram Panchayats

Following field verification, it was determined that gram panchayats located within a 2-kilometer radius of the Mahan TPP boundary possess ample space suitable for green belt development, as illustrated in Figure 2.5. The inventory providing detailed information regarding the gram panchayats falling within the project area is presented in Table 2.5. This insightful assessment underscores the potential to integrate green infrastructure within these areas, empowering grassroots communities to actively participate in environmental conservation efforts. By strategically implementing green belts within gram panchayat premises, the initiative not only enhances ecological resilience but also fosters community engagement and ownership, catalyzing sustainable development at the grassroots level. The detail of GP offices falling within CSR zone of Mahan TPP is presented in Annexure 2.1.

FIGURE 2.5: LOCATION MAP OF GRAM PANCHAYATS WITHIN 2 KM OF MAHAN TPP

TABLE 2.5: DETAIL OF GRAM PANCHAYATS WITHIN 2 KM OF MAHAN TPP

Block	Panchayat Name	Co-ordinate
Waidhan	(i) Karyalay Gram panchayat khetra -Bandhuara	Lat-24.007703 Long-82.422704
	(ii) Karya. Gram Panchayat Khairahi	Lat-23.993556 Long-82.40535
	(iii)Nagwa Panchayat	Lat-23.98137500 Long-82.41978056

2.2.4.3 Health Centers

Upon thorough field verification, it was identified that health centers situated within buffer zone of Mahan TPP offer suitable space for green belt development, as delineated in Figure 2.6. Furthermore, Table 2.6 presents the detail of health centers falling within the buffer zone. The detail of health facilities falling within the CSR zone of Mahan TPP have been presented in Annexure 2.1. This meticulous inventorization not only identifies potential sites for green infrastructure integration but also underscores the critical role of health institutions in fostering community well-being and environmental sustainability. By strategically implementing green belts within the premises of these health centers, the initiative would

not only enhance ecological resilience but also promote public health and community resilience in the buffer zone of Mahan TPP.

FIGURE 2.6: LOCATION MAP OF HEALTH CENTERS WITHIN 2 KM OF MAHAN TPP

TABLE 2.6: DISTRIBUTION OF HEALTH FACILITIES WITHIN 2 KM OF MAHAN TPP

S.No.	Name Of Health Facility	Location
1	Primary Health Center	R&R Colony, Nagwa
2	Sub Center,Nagwa	Nagwa

FIGURE 2.7: FIELD SURVEY FOR FORMULATION OF PERIPHERAL GREEN BELT DEVELOPMENT PLAN

3.0 STRATEGIES & ACTION PLAN

The strategies proposed to be adopted for peripheral greenbelt development around the Mahan TPP along with action plan for the same is presented in subsequent section.

3.1 STRATEGIES FOR PERIPHERAL GREEN BELT DEVELOPMENT

The strategies formulated for development of peripheral green belt include:

Analysis of Land Use/Land cover- A detailed analysis of the Land Use and Land Cover (LULC) pattern was conducted to comprehensively understand the existing land patterns within the study area, with a specific focus on identifying wastelands. The findings indicate that approximately 740 hectares of the total buffer zone identified within 2 Km of Mahan TPP are characterized by tree cover, indicating a significant presence of green cover. Conversely, around approximately 20 hectares are designated as wastelands, representing areas with limited vegetation or degraded landscapes. The on-site verification, presented unique opportunity to strategically develop green cover in these underutilized spaces, thereby contributing to the overall enhancement of the green cover around the buffer zone of Mahan TPP. Proactive measures would be undertaken to reclaim and revitalizie the wastelands to further strengthen the green cover around the Mahan TPP.

Assessment of Existing Green Cover- An extensive assessment of the existing green cover was undertaken utilizing Normalized Difference Vegetation Index (NDVI) analysis. This analysis revealed that a significant portion of the study area is characterized by low vegetation density, while patches of lands devoid of vegetation have also been identified interspersed within the landscape. In response to these findings, the green belt development plan would adopt a strategic approach. The plan would be implemented through careful selection of plant species in targeted areas that in turn would lead to the increase in the overall green cover of the buffer zone by an estimated 20-25%. This proactive initiative would further contribute to the enhancement of ecological resilience and biodiversity around the Mahan TPP. Through meticulous planning and execution, the green belt development plan would ensure the significant increase in the green cover within the 2 Km buffer area of Mahan TPP.

3.2 PERIPHERAL GREEN BELT DEVELOPMENT

3.2.1 Criteria for Selection of Plant Species

The selection of plant species for green belt development depends on several factors including climate, elevation, and soil conditions. While selecting tree species for plantation, it is essential to consider certain desirable characteristics. The primary objectives in selecting suitable trees for a site involve ensuring adequate space both above and below ground for the tree's canopy and roots to grow, as well as considering its future maintenance needs. The

aim is to plant trees that can reach full maturity with minimal need for pruning, as pruning cuts can leave trees vulnerable to decay. To mitigate the risk of widespread diseases and pests, it is advisable to plant a diverse range of tree species rather than relying on uniform avenues of identical trees, although there may be specific situations where such uniformity is appropriate. The following factors would be taken into account for selection of a tree species species for green belt development.

1. The species should be fast growing and providing optimum penetrability.
2. The species should be wind-firm and deep rooted.
3. The species should form a dense canopy.
4. As far as possible, the species should be indigenous and locally available.
5. Species tolerant to air pollution like SO_2 and NO_2 should be preferred.
6. The species should have large leaf area index to arrest the Particulate Matter.
7. Trees with high foliage density, leaves with larger leaf area and hairy on both the surfaces.
8. Ability to withstand conditions like inundation and drought.
9. Soil improving plants (Nitrogen fixing rapidly decomposable leaf litter).
10. Attractive appearance with good flowering and fruit bearing.
11. Bird and insect attracting tree species.
12. Sustainable green cover with minimal maintenance.

3.2.2 Site Selection

3.2.2.1 Green Belt Development Plan for Wastelands

Table 3.1 presents the detail of wasteland areas identified within the buffer zone of Mahan TPP. The wasteland considered for the proposed green belt development is depicted in Figure 3.1-3.3. Spanning a total area of approximately 21.13 Ha, this designated space presents an opportunity for environmental rehabilitation and ecosystem restoration. Through the green belt development plan, it is envisioned that approximately 31695 trees will be planted within this area, contributing to the transformation of barren land into a flourishing green landscape.

TABLE 3.1: DETAIL OF WASTELAND AREAS IDENTIFIED FOR PROPOSED GREEN BELT DEVELOPMENT WITHIN BUFFER ZONE

Sl No	Name	Co-ordinates	Direction	Total Area (Ha)	Proposed Area for plantation (Ha)	Proposed number of trees
1	Barren land 1	23°59'23.62"N/ 82°23'10.39"E	South-east section 1	1.19	0.4	600
2	Barren land 2	23°59'30.74"N/ 82°23'29.55"E	South-east section 2	4.70	1.5	2250
3	Barren land 3	23°59'13.10"N/ 82°23'48.11"E	South section 1	14.7	4.8	7200
4	Barren land 4	23°58'57.92"N/ 82°24'4.78"E	South section 3	9.1	3	4500
5	Barren land 5	23°58'48.13"N/ 82°24'26.18"E	South section 3	16.4	5.4	8100
6	Barren land 6	23°58'39.37"N/ 82°24'8.07"E	South section 4	9.66	3.2	4800
7	Barren land 7	23°58'35.37"N/ 82°24'15.92"E	South section 5	8.60	2.83	4245
Total				**64.35**	**21.13**	**31695**

FIGURE 3.1: PROPOSED WASTELAND AREA FOR GREEN BELT DEVELOPMENT WITHIN BUFFER ZONE

FIGURE 3.2: IDENTIFICATION OF WASTELAND AREAS FOR GREEN BELT DEVELOPMENT AT SELECTED LOCATIONS WITHIN BUFFER ZONE

FIGURE 3.3: IDENTIFICATION OF WASTELAND AREAS FOR GREEN BELT DEVELOPMENT AT SELECTED LOCATIONS WITHIN BUFFER ZONE

3.2.2.2 Green Belt Development Plan in Public Land

The criteria for green belt development in public land such as schools, gram panchayat offices, and health centers would emphasize the selection of tree species suitable for the rural environment. The schools considered for inclusion in the proposed green belt development initiative are delineated in Table 3.2. Covering a combined area of approximately 2 hectares, these educational institutions offer ample space for the development of green cover. It is envisaged that a total of 960 trees would be strategically planted across these school premises (0.64 Ha), fostering a green and sustainable learning environment for students. Additionally, the detail of gram panchayat offices identified for greenbelt development has been presented in Table 3.3. Out of the total area, 0.16 Ha of land has been identified for plantation. Within this designated space, approximately 240 trees are proposed for plantation, symbolizing a concerted effort to enhance the aesthetic appeal and ecological functionality of these community infrastructure. Table 3.4 provides comprehensive information on the health centers considered for inclusion in the green belt development plan. These vital healthcare facilities represent focal points for environmental enhancement efforts. It is anticipated that in the 0.08 Ha of identified land, nearly 120 plants would be strategically planted within this designated area, aiming to create a healthier and more sustainable environment for both patients and healthcare providers alike. This initiative underscores a commitment to promoting holistic well-being and integrating green infrastructure into critical community institutions within the buffer zone of Mahan TPP.

TABLE 3.2: DETAIL OF SCHOOLS IDENTIFIED FOR PROPOSED GREEN BELT DEVELOPMENT WITHIN BUFFER ZONE

Sl no	School name	Coordinates	Total Area (Ha)	Proposed Area for plantation (Ha)	Proposed number of trees
1	Shashakiya Purba Madhyamik Vidyalay Bandhuara	24°0'48.64"N/82°24'42.25"E	0.54	0.18	270
2	Shash Pratha Pathshawala Chirihawa	24°0'27.00"N/82°25'21.65"E	0.25	0.08	120
3	Govt. Higher Secondary School Karsuaraja	23°59'35.22"N/82°26'5.56"E	0.24	0.08	120

4	Saraswati Sishu Mandir Nanda Vihar, Nagwa	23°58'34.69"N/82°24'15.35"E	0.9	0.3	450
Total			**1.93**	**0.64**	**960**

TABLE 3.3: DETAIL OF GRAM PANCHAYATS IDENTIFIED FOR PROPOSED GREEN BELT DEVELOPMENT

Sl no	GP name	Coordinates	Total Area (Ha)	Proposed Area for plantation (Ha)	Proposed number of trees
1	Bandhaura GP	24°0'27.70"N/82°25'21.13"E	0.04	0.013	20
2	Khairahi GP	23°59'32.75"N/82°24'11.29"E	0.04	0.013	20
3	Nagwa GP	23°58'52.95"N/82°25'11.21"E	0.40	0.13	200
Total			**0.48**	**0.16**	**240**

TABLE 3.4: DETAIL OF HEALTH CENTERS IDENTIFIED FOR PROPOSED GREEN BELT DEVELOPMENT

Sl no	GP name	Coordinates	Area (Hector)	Proposed Area for plantation (Ha)	Proposed number of trees
1	PHC Nagwa	23°58'27.33"N/82°24'39.30"E	0.16	0.05	75
2	Health Sub Center, Suhira	24° 0'38.98"N/82°25'4.10"E	0.1	0.03	45
Total			**0.26**	**0.08**	**120**

FIGURE 3.4: IDENTIFICATION OF PUBLIC LAND FOR GREEN BELT DEVELOPMENT AT SELECTED LOCATIONS AROUND MAHAN TPP

FIGURE 3.5: IDENTIFICATION OF PUBLIC LAND FOR GREEN BELT DEVELOPMENT AT SELECTED LOCATIONS AROUND MAHAN TPP

3.3 ACTION PLAN FOR PERIPHERAL GREEN BELT DEVELOPMENT

3.3.1 Plantation Scheme

3.3.1.1 Wasteland

Table 3.5 provides a comprehensive overview of potential plant species that would be suitable for planting in wasteland around Mahan TPP, offering valuable insights into selection of plant species that can thrive in challenging environments. These species would be carefully selected based on their resilience and adaptability to harsh conditions, making them suitable for green belt development in degraded landscapes.

TABLE 3.5: DETAIL OF PLANT SPECIES SUITABLE FOR PLANTATION IN WASTELANDS AROUND MAHAN TPP

Sl No.	Local Name	Scientific Name	Family
1	Mango	*Mangifera indica*	Anacardiaceae
2	Bahera	*Terminalia bellirica*	Rubiaceae
3	Peeple	*Ficus religiosa*	Moraceae
4	Kadam	*Neolamarckia cadamba*	Rubiaceae
5	Neem	*Azadirachta indica*	Meliaceae
6	Muchukunda	*Pterospermum acerifolium*	Sterculiaceae
7	Haldu	*Adina cordifolia*	Rubiaceae
8	Arjun	*Terminalia arjuna*	Combretaceae
9	Katbadam	*Terminalia catappa*	Combretaceae
10	Chatim	*Alstonia scholaris*	Apocynaceae
11	Teak	*Tectona grandis*	Lamiaceae
12	Palas	*Butea monosperma*	Fabaceae
13	Indian gooseberry	*Phyllanthus emblica*	Phyllanthaceae
14	Indian jujube	*Ziziphus Mauritiana*	Rhamnacea
15	Jamun	*Syzygium cumini*	Myrtaceae
16	Asan	*Terminalia elliptica*	Combretaceae
17	Kanchan	*Bauhinia purpurea*	Fabaceae
18	Champa	*Michelia champaca*	Magnoliaceae
19	Tamarind	*Tamarindus indica*	Fabaceae
20	Sisoo	*Dalbergia sissoo*	Fabaceae
21	Sausage Tree/Worsboom	*Kigelia pinnata*	Bignoniaceae
22	Bel	*Aegle marmelos*	Rutaceae
23	Sal	*Shorea robusta*	Dipterocarpaceae
24	Kendu	*Diospyros melanoxylon*	Ebenaceae
25	Sidha	*Anogeissus latifolia*	Lythraceae
26	Marking nut	*Semecarpus anacardium*	Anacardiaceae
27	Khair	*Acacia catechu*	Fabaceae

3.3.1.2 Public Land

For development of green belt in public land such as schools, gram panchayats and health centers located within 2 Km radius if Mahan TPP, a focus on using fruit-bearing and flowering plants would be prioritized to enhance the aesthetic appeal and functionality of these areas. The plantation would be undertaken by following the double row technique. Table 3.6 provides a detailed overview of suitable plant species that would be planted in the first row which has been worked out based on the land availability and climatic conditions whereas table 3.7 presents the detail of plant species that are proposed to be planted in the second row. The selection of plant species would be done in a way that it provides additional benefits such as shade, food, and habitat for wildlife along with enhancement of aesthetic appeal. Through plantation of fruit-bearing and flowering plants, the green belt development plan would aim to further increase and enhance the existing green cover around Mahan TPP.

Figure 3.6 depicts the status of existing green cover within the 2 Km buffer zone of Mahan TPP.

TABLE 3.6: DETAIL OF PLANT SPECIES SUITABLE FOR PLANTATION IN 1ST ROW IN PUBLIC LAND

Sl No.	Local Name	Scientific Name	Family
1	Neem	*Azadirachta indica*	Meliaceae
2	Pipal	*Ficus religiosa*	Moraceae
3	Imli	*Tamarindus indica*	Fabaceae
4	Bargad	*Ficus benghalensis*	Moraceae
5	silk floss tree	*Chorisia Speciosa*	Malvaceae
6	Sisham	*Dalbergia sissoo*	Fabaceae
7	Mango	*Mangifera Indica*	Anacardiaceae

TABLE 3.7: DETAIL OF PLANT SPECIES SUITABLE FOR PLANTATION IN 2ND ROW IN PUBLIC LAND

Sl No.	Local Name	Scientific Name	Family
1	Bambo	*Bambusa vulgaris*	Poaceae
2	Amaltas	*Cassia fistula*	Fabaceae
3	Rosy trumpet tree or Pink pouli	*Tabebuia rosea*	Bignoniaceae
4	Arjun	*Terminalia arjuna*	Combretaceae
5	Kachnar Gulmorh	*auhinia variegata*	Caesalpiniaceae
6	Jamun	*Syzygium cumini*	Myrtaceae
7	Cape Honeysuckle	*Tecoma capensis*	Bignoniaceae

FIGURE 3.6: STATUS OF EXISTING GREEN COVER WITHIN BUFFER ZONE OF MAHAN TPP

3.3.2 Plantation Technique

3.3.2.1 Miyawaki Technique

In the proposed development of green belts within the identified wasteland areas around Mahan TPP, the innovative Miyawaki technique is proposed for implementation. The method involves densely planting native species in multiple layers to accelerate forest growth and biodiversity. By harnessing this technique, the wasteland areas can be transformed into lush green spaces teeming with diverse flora, contributing significantly to environmental restoration and ecosystem revitalization. The detail of the Miyawaki plantation technique is as follows:

Integrating the concepts of ecological successions, potential natural vegetation (PNV), cooperative processes of high-density plating in humus rich soils, Dr. Akira Miyawaki developed the ecological engineering technique popularly known as “Miyawaki method” in the early 1970s for the restoration of indigenous forests in Japan using native tree species.

This crowd foresting technique build a dense and efficient forest ecosystem as equivalent as that of a 100–150-year-old forest in a short span of 20-30 years if developed in compliance with the recommended steps. Four stages of the Miyawaki foresting technique for development of a forest successfully includes:

Initial Survey of the Locality:

The initial survey of the study area would be undertaken to develop an understanding about the soil characteristics of the site and the potential natural vegetation of the locality. According to different definitions PNV covers either the original vegetation or the subsequent vegetation established naturally in the area subsequent to any major environment al changes like soil erosion. The underlying idea is the planting native vegetation would help forest cover to get established even under no human interference in later stages of the forest development process.

Collection of Seeds:

The stage commences once the tree species for plantation have been identified. Identification of trees should be planned in such a way that the forest after establishment be a multilayered one. Hence, identified tree species are divided into four layers such as shrub, tree, sub tree and canopy layers and percentage of each tree species would be decided accordingly. Seeds of the selected vegetation are collected in large numbers from a natural forest locally or from a similar geo-climatic area and germinate them properly in a nursery bed. The seedlings would be transplanted at 2-3 leaves stage to grow in bags filled with potting mixture prepared using equal amount of soil, coir pith/wood chips, rice/wheat hull and dry cow dung. The plants would be kept under partial shade for a minimum period of 2-3 months before planting in the main field.

Preparation of the Planting Site:

The stage begins with loosening the soil by incorporating organic biomass like wood chips, coir pith, bagasse, rice or wheat hull etc. so that the soil holds more water. For this, the first step would be digging the soil up to one metre deep. Then, the soil to a depth of 50 cm would be taken out and filled with a mixture of soil (20-30 cm topsoil of the site), locally available organic biomass, and dry cow dung. Additionally, microorganisms isolated from a natural forest soil would be used to enhance the soil fertility of the new forest. This loosened fertile soil would help the samplings to grow fast with better spread of roots deep into the soil.

Plantation:

Plantation would be done densely where one square meter area accommodates at least 4 trees with different layers (1 canopy level,1 tree level, 1 sub tree level and 1 shrub level) for a multilayered forest.The site would be mulched using any organic mulch preferably rice/wheat straw to protect the soil from being eroded. As the soil is loose, saplings need to

be supported with sticks to withstand conditions like wind, heavy rain etc. The planted site would be managed with timely irrigation and weeding in the first 2-3 years. Once the trees attain a height of 2 meters or more the forest would not require any human interference to grow further.

The subsequent section meticulously outlines a comprehensive, step-by-step process for implementing the Miyawaki plantation technique, providing detailed guidance for the successful development of green cover within the identified wasteland areas around Mahan TPP.

Step 1: Soil Analysis and Soil Preparation

Understanding the texture of the soil helps to analyse the water holding capacity of the soil, the capacity of root perforation, water infiltration, and retention of nutrients by the soil. This includes assessment of soil parameters like physical texture, organic carbon, nitrogen, soil pH, potassium, phosphorus and visible evidence of micro or macro fauna in the soil. This analysis helps to design natural methods for treatment of soil. This includes use of perforation material such as wheat, groundnut shells, corn husk, rice husk which will significantly improve perforation and help the roots to grow. Water retention materials like coco peat and sugarcane stock help the soil retain water and moisture. Addition of vermicompost, cow manure helps to improve the soil nutrient conditions. Addition of cultures of bacteria and mycorrhiza can also be decided based on the assessment results. Soils that are deficient in nitrogen would benefit immensely through Arbuscular Mycorrhizal Fungi (AMF) and nitrogen fixing bacteria like Rhizobium. AMF is available commercially and can even be cultured. Nitrogen fixing bacteria can be cultured and can also be added to the soil by planting nitrogen fixing leguminous plants. Soil texture also needs to be studied. Loamy soils are the most preferred as they contain a good mix of sand, clay and organic matter and provide the ideal balance of water, nutrients as well as drainage, thereby supporting good plant growth. At the end, it is essential to add a layer of mulch. This will protect and insulate the soil, thereby preventing excessive water loss due to evaporation. Some excellent options are dried grass, dried leaves, barley stalk, wheat stalk, rice straw, and corn stalk.

For preparation of the soil for afforestation, various biomass materials can be added which includes:

- **Ingredients for the Soil-**

(i) Adding perforator materials such as wheat, groundnut shells, corn husk, rice husk will significantly improve perforation and help the roots to grow.

(ii) Water retainers should be added next to help the soil retain water and moisture. Materials such as sugarcane stalk and cocopeat are recommended.

(iii) For the soil to receive nutrition, organic fertilizers such as vermicompost, cow manure can be used.

(iv) The final step would be to add a layer of mulch as it protects and insulates the soil. It also prevents sun rays to fall directly on the soil and ensures that the water in the soil does not evaporate. Some excellent options are dried grass, dried leaves, barley stalk, wheat stalk, rice straw, and corn stalk.

• Organic fertilizers- The ground requires fertilizer to provide nutrients for plant growth. Some organic fertilizers are cowpat, goat muck and vermicompost.

• Perforating materials- These materials are helpful for plants to penetrate their roots deeper into the ground. Rice husk, wheat husk, or groundnut shells can be an excellent resource to increase perforation.

• Water retainers- A ground must have significant water retention power to develop a forest. An afforest can add coconut coir and peat moss to strengthen the soil's water retention power.

• Mulch- It is usually layered over the ground to protect it from the scorching sun. It is vital, especially for saplings, as their growth may be affected in dried soil. Afforests can use decaying leaves, dried bark, or even composts.

Step 2: Determination of Native Species and Floral Composition through Quadrat Survey

This step involves developing a database of the floral diversity through a quadrat survey in a native forest in the same agroclimatic zone as the site where the Miyawaki forest is aimed to be developed. Through this survey, the potential natural vegetation can be determined. The same also needs to be validated using secondary information such as the published flora of the region (in India, the Botanical Survey of India regularly updates the flora of different regions and the same should be referred to). The data (quantitative and qualitative), thus collected will help to develop the plant community composition that will be developed through the Miyawaki technique. The community composition should comprise of plants of all forms (trees, shrubs, herbs) in order to develop a natural forest. Species selection should be done in a manner that a mix of flowering, medicinal, timber, and fruiting species are chosen. While choosing the trees for the Miyawaki forest to be developed, emphasis should be given on selecting the 5 most dominant native trees (based on the results from the quadrat analysis). These trees will constitute around 50 percent of the floral diversity of the forest. The next abundant native species (based on the results from the quadrat analysis) will constitute 25-40 percent of the forest. The rest of the forest will be comprised of native species which have been found in the next level of abundance in the quadrat study.

The detailed step by step approach for the second step is as follows:

• Afforests must select the native plant species and identify their genus (deciduous or evergreen), height and influence on nature.

• Foresters must allocate those plants in layers, depending on all the above factors.

• 40 to 50 per cent of the total number of trees must comprise the most commonly found species in one's neighborhood. Foresters must choose at least 5 different genera that would be the significant species in that forest.

• Some moderately found native species will compose 25 to 40 per cent as supporting plants. Finally, some other minor species will constitute the rest of the forest.

• Afforests need to collect saplings of these species, which must be in a minimum height of 60 to 80 cm.

Step 3: Preparation of the Ground and Equip the Afforestation Area

The step involves meticulous preparation of the ground and equipping the afforestation area for optimal growth and development of the green belt. This crucial phase entails clearing the land of any debris or obstacles, ensuring a clean and uniform surface for planting. The soil is then carefully prepared through techniques such as loosening, aeration, and soil amendment to create a nutrient-rich substrate conducive to plant growth. Additionally, irrigation infrastructure may be installed to provide adequate water supply, essential for the establishment of young saplings. Furthermore, protective measures such as fencing or barriers may be implemented to safeguard the afforestation area from potential disturbances or encroachments. By meticulously preparing the ground and equipping the site with essential resources, it sets the stage for the successful implementation of the Miyawaki technique, facilitating robust growth and biodiversity enhancement within the green belt.

The subsequent section presents the detailed step by step approach for ground preparation and equipping the area proposed for afforestation.

• Before starting the planting process, afforests must inspect the ground to determine the possibilities and practicality of this project.

• The soil of this area must be clean from any debris and weed.

• It also must catch sunlight for at least 8-9 hours a day to start afforestation under the Miyawaki method.

• Foresters must install irrigation facilities, create 100 sq meter mounds and demark those before sowing.

Step 4: Undertaking Plantation

This is the most critical step for the successful establishment of a Miyawaki forest. The sub-steps that need to be followed are: In the plantation area, separate plantation bed area needs to be drawn out. The soil needs to be excavated for 3-4 feet. This excavated soil then needs to be mixed with the appropriate amounts of perforators, organic fertilizers and water retainers. The mixed soil should then be put back into the land. Care needs to be taken that the land does not get compressed at this stage and should be left aerated and loose. The levelled soil needs to be marked with chalk and pits (12"X12") should be dug at every 1.5-2 feet, in a triangular manner. The saplings should then be placed in these pits, taking care that saplings of the same species are not planted next to each other. After the sapling is planted, 4-5 feet bamboo sticks should be inserted in the soil, close to the sapling. This will help prevent the sapling from drooping or bending in the first few months. Finally, a 5-7-inch-thick layer of mulch should be added to the soil (a minimum of half kg of mulch per tree needs to be added). For the first time, the saplings must be watered for an hour to make sure the mulching and the soil settle down. Tree density of 3trees/m^2 is ideal.

The subsequent section presents step by step approach for undertaking plantation.

● Outline the area to plant with chalk powder.

● Within the area of planting, draw out the plantation bed area and sperate the service area.

● Excavate the soil for about 3-4 feet and keep the excavated soil on the side.

● Mix the perforators, organic fertilizers, and water retainers, without any clumps. Ensure that they are mixed in the same ratios for each mound.

● Push back the mixed soil to fill the land. Ensure that the land is not compressed or walked upon. The idea is to leave the soil aerated and loose.

● Level the soil with hand tools.

● Mark the leveled soil with chalked powder for creating pits every 1.5-2 feet, in a triangular formation.

● Dig pits that are 12 inches wide and 12 inches deep.

● Place the saplings depending on the number of varieties you have and how your grid is created. For instance, if you have 30 species of trees, then mark the grid based on 30 pits.

● Before removing the saplings from their bags, dip the bags in a bucket that is filled with 20 part water, and 1 part Jeeva Amrut, or gaumutra, or coffee mix. Ensure that all the bubbles are settled before removing the sapling bags.

● Remove the sapling from the bag, place it in the pit, and loosely cover it with soil.

● Try not to plant two similar species next to each other and don't follow any pattern while planting. Maintain a 60cm distance between each sapling.

● After planting the saplings, insert 4-5 feet of bamboo sticks into the soil, close to the plant. These support sticks will ensure the saplings don't bend or droop during the first few months.

● Add a 5–7-inch layer of mulch in the soil. Consider at least half a kilo of mulch per tree. Tie it down with jute ropes to ensure the mulch doesn't fly around during strong winds. Tie the ropes on bamboo pegs that are nailed at the forest periphery. This will ensure that the rope is pressed down on the mulch.

● For the first time, the trees must be watered for an hour to make sure the mulching and the soil settle.

Step 5: Maintenance & Monitoring

The step involves critical tasks aimed at nurturing the newly planted saplings and facilitating their healthy growth. By meticulously levelling the soil and marking out pit locations, the groundwork is laid for the systematic planting of saplings. Careful preparation of saplings, including dipping them in a water-based solution for hydration, precedes their placement in the pits. Once planted, the saplings are secured with support sticks to prevent bending or drooping. Addition of mulch serves to retain moisture and provide essential nutrients to the soil, promoting optimal growth. Finally, watering the newly planted saplings ensures that they are adequately hydrated and settle into their new environment. These meticulous steps are essential for the successful establishment of a thriving green belt using the Miyawaki technique.

FIGURE 3.7: SCHEMATIC DIAGRAM OF MIYAWAKI PLANTATION TECHNIQUE

FIGURE 3.8: IMPLEMENTATION OF MIYAWAKI PLANTTAION TECHNIQUE

3.3.2.2 Double Row Technique

Implementation of the double row technique of plantation in schools, health centers, and other public land around Mahan TPP would involve a systematic approach which includes:

1. Site Assessment: Assessment of the site conditions would be undertaken including soil type, sunlight exposure, and availability of space within the schools, gram panchayats and health centers to determine the suitability for plantation.

2. Selection of Plant Species: Appropriate plant species would be chosen that are well-suited to the local climate, soil conditions, and intended purpose of the development of green belt.

3. Marking the Rows: Measuring tools and stakes would be used to mark the location of the double rows. It would be ensured that the rows are spaced appropriately to allow for healthy growth and maintenance access.

4. Digging Furrows: Digging of furrows or trenches would be done along the marked rows to prepare the planting beds. The depth and width of the furrows should accommodate the root systems of the selected plant species.

5. Plantation: Plantation of the selected trees or shrubs in double rows would be done within the prepared furrows. Appropriate spacing between each plant would be maintained to allow for adequate growth and development.

6. Backfilling and Mulching: The furrows would have to be backfilled with soil and the soil around the base of each plant would be gently firmed to provide stability. A layer of organic mulch would be applied around the plants to conserve moisture and suppress weed growth.

7. Watering and Maintenance: The newly planted trees or shrubs would be watered thoroughly to help establish root systems. A regular watering schedule would be planned, especially during dry periods, to ensure the plants remain healthy. Monitoring would be undertaken for signs of pests, diseases, or other issues appropriate measures would be taken if required.

8. Support and Protection: Support stakes or trellises would be provided for taller plants to prevent leaning or damage from wind. Installation of protective measures would be done such as tree guards or fencing.

9. Regular Pruning and Maintenance: The plants would be pruned as necessary to promote healthy growth and maintain desired shape and size. Any dead or diseased branches would be removed.

10. Monitoring and Evaluation: Regular monitoring would be undertaken to assess the growth and health of the planted trees and shrubs. The effectiveness of the double row plantation technique in achieving the desired goals of development of green cover in schools, health centers, and other public land would be evaluated.

3.4 COST ESTIMATE

Cost of the plantation for development of green belt within 2 Km buffer zone of Mahan TPP has been calculated as per the existing labor charges (Rs.100 per day), material cost (plants, FYM, tree guard, etc.) and the total area of treatment. One row each for tree, shrub and bio-fencing has been proposed with a spacing of 3 m x 3 m for trees and 2 m x 2 m for shrubs (to take care of the mortality in the next season). The pit size has been recommended as 45 x 45 x 45 cm for trees and 30 x 30 x 30 cm for shrubs. The total estimated budget for the implementation of green belt development plan is **54.52 Lakhs INR.**

TABLE 3.8: BUDGET FOR GREEN BELT DEVELOPMENT PLAN

Sl No.	Components	Budget (Rs. in Lakhs)
1	Cost of plantation including maintenance for 5 years and establishment charges @ Rs 60,000/ha for 22.01 ha	13.21
2	Thorny brushwood production guard for 2904 saplings @ Rs 10/No.	3.3
3	Fencing	2.00
4	Bamboo tree guards @ 100 each	33.01
5	Contingency	1.00
6	Watering @ Rs. 200/day for 200 days/yr for 5 yrs (200x200x5)	2.00
	Total	54.52

4.0 CONCLUSION & RECOMMENDATIONS

The peripheral green belt development plan for the Mahan Thermal Power Plant (TPP) area encompasses a comprehensive strategy aimed at enhancing environmental sustainability and community well-being. A thorough analysis of Land Use and Land Cover (LULC) analysis was undertaken to assess the existing status of land pattern in the study area. The analysis revealed that more than 20 Ha of the study area is covered by wastelands, while over 20% iof the total area is under green cover. Recognizing the potential for improvement, the focus of the green belt development plan around Mahan TPP is directed towards converting wastelands into green cover and augmenting greenery around public institutions such as schools, gram panchayats (GPs) and health centers. This would result in the overall increase of nearly 20-25% of the total green cover in the buffer zone.

The green belt development plan for the buffer zone surrounding the Mahan TPP boundary sets forth specific targets for tree plantation across various areas. A total of 31,695 trees are proposed to be planted in wasteland areas, aiming to rejuvenate and rehabilitate degraded landscapes. In addition, public institutions such as schools, gram panchayats, and health centers are identified in the previous chapter for enhancement of green cover, with 960 trees slated for schools, 240 trees for gram panchayats, and 120 trees for health centers. This strategic allocation of tree plantation efforts would enable the overall increase in the total green cover in the buffer zone.

This quantified approach would ensure that each area receives an appropriate allocation of green infrastructure, contributing to the overall improvement of the environment and quality of life in the surrounding communities. By focusing on the revitalization of wastelands and the greening of public institutions, the green belt development plan aims to create vibrant, sustainable ecosystems around the Mahan TPP. The total estimated budget for the implementation of green belt development plan is estimated to be INR 54.52 lakhs.

In conclusion, the peripheral green belt development plan for the Mahan TPP area represents a proactive and holistic approach towards environmental conservation and community development. Through collaborative efforts and strategic interventions, the plan would enhance biodiversity, mitigate environmental degradation, and foster a greener, healthier future for generations to come.

The recommendations for the development of green belt in the buffer zone of Mahan TPP include:

- Given the significant presence of wastelands in the buffer zone, targeted tree plantation initiatives should be undertaken to rejuvenate degraded landscapes and enhancing biodiversity.

- Adequate allocation of resources should be done for tree plantation in the public institutions to create vibrant and sustainable ecosystems that benefit local communities.

- A proper tracking mechanism should be followed to monitor the progress of green belt development plan.

- Frequent assessments should be undertaken to evaluate the impact of tree plantation efforts on increasing green cover and improving environmental sustainability in the buffer zone surrounding the Mahan TPP.

- Local residents should be encouraged to actively participate in tree plantation drives and environmental conservation efforts, fostering a sense of ownership.

- Adoption of sustainable maintenance practices should be ensured to support the long-term health and vitality of newly planted trees.

- Collaboration with relevant stakeholders including government agencies, non-profit organizations, and local communities is recommended to leverage resources and expertise in green belt development plan.

- It is recommended to conduct awareness campaigns and educational programs to promote the importance of green belt development and environmental conservation among local communities around Mahan TPP.

ANNEXURE 2.1
DETAIL OF PUBLIC UTILITIES FALLING WITHIN CSR ZONE OF MAHAN TPP

TABLE 2.1 (A): DETAIL OF HEALTH FACILITIES FALLING WITHIN CSR ZONE OF MAHAN TPP

S.No.	Name Of Health Facility	Location
1	Primary Health Center	R&R Colony, Nagwa
2	Sub Center,Nagwa	Nagwa
3	Sub Center, Suhira	Suhira
4	Sub Center, Amiliya	Amiliya
5	Sub center, Chaura	Chaura

TABLE 2.1 (B): DETAIL OF ANGANWADI CENTERS FALLING WITHIN CSR ZONE OF MAHAN TPP

S.No.	Location of AWC	Total Center in Village
1	Nagwa	5
2	Karsualal	3
3	Bandhaura	2
4	Khairahi	3
5	Karsuaraja	4
6	Raila	5
7	Suhira	4
8	Amiliya	3

TABLE 2.1 (C): DETAIL OF SCHOOLS FALLING WITHIN CSR ZONE OF MAHAN TPP

S.No.	Name Of School	Location
1	Govt. Primary School Adarsh,Nagwa	Nagawa
2	Govt. Primary School Churwahi	Nagawa
3	Govt. Middle School Nagawa	Nagawa
4	Govt. Primary School Naveen Karsualal	Karsualal
5	Govt. Middle School Karsualal	Karsualal
6	Govt. Primary School Palagari	Karsualal
7	Govt. Primary School Potkitola	Karsualal
8	Govt. Middle School Bandhaura	Bandhaura
9	Govt. Primary School Chirihinwa	Bandhaura
10	Govt. Primary School Semua	Bandhaura
11	Govt. Middle School Khairahi	Khairahi
12	Govt. Primari School Ambedkar Khairahi	Khairahi
13	Govt. H.S. School Kasruaraja	Karsuaraja
14	Govt. Primary School Naveen Raila	Raila

15	Govt. Primary School Gadakhand	Suhira
16	Govt. Primary School Gudari Kholi	Suhira
17	Govt. Primary School Uttaranchal	Suhira
18	Govt. H.S. School Suhira	Suhira
19	Govt. Middle School Amiliya	Amiliya
20	Govt. Primary School Sonrail Tola	Amiliya
21	Govt. Primary School Pokharitola	Amiliya

TABLE 2.1 (D): DETAIL OF GRAM PANCHAYAT OFFICES FALLING WITHIN CSR ZONE OF MAHAN TPP

S.No.	Location of AWC	Total Center in Village
1	Nagwa	1
2	Karsualal	1
3	Bandhaura	1
4	Khairahi	1
5	Karsuaraja	1
6	Raila	1
7	Suhira	1
8	Amiliya	1

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Annexure XII

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MICRO WATERSHED DEVELOPMENT PLAN AROUND MAHAN THERMAL POWER PLANT

Document No: IISWBM/IRP/MWSD-APL/2024-25/02 V1.0 Dated 23/05/2024

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May 2024

MICRO WATERSHED DEVELOPMENT PLAN AROUND MAHAN THERMAL POWER PLANT

Document No: IISWBM/IRP/MWD-APL/2024-25/02 V1.0 Dated 23/05/2024

Submitted By

adani™

Mahan Energen Limited

Vill-Bandhuara, Block-Baidhan
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Executed By

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MAY, 2024

CONTENTS

EXECUTIVE SUMMARY

Adani Power Limited (APL), a member of the Adani Group, has taken up the implementation of large Thermal Power Projects at various locations in India in view of the growing needs of power requirements in the country. APL is also actively planning to implement Thermal Power Stations at various locations in India, totalling to about 20,000 MW in the coming years.

In accordance with its mission of being enviro-socially responsible corporate entity with thrust on sustainable development, MEL aims to focus on developing micro watershed around its Mahan TPP. To accomplish this mission, it is imperative to carry out proposed study that can facilitate in formulating a comprehensive short as well as long-term micro watershed development plan. The plan would employ a holistic approach aimed at conserving and managing natural resources within small, localized areas. It would involve the active participation of local communities and various stakeholders in the sustainable management of soil, water, and vegetation. Through practices such as soil and water conservation, afforestation and livelihood diversification, the plan seeks to reduce soil erosion, improve land productivity, enhance water availability for agriculture and domestic use, and alleviate poverty.

The objectives of the study are as follows:

- To observe the geomorphological condition of the study area including discussion on geology, and geomorphology.
- To study the meteorology of the study area
- To study the soils and drainage patterns, elevation, and LULC of the study area
- To suggest effective micro watershed development plan.

The detail scope of work for the present study is as follows:

1) The study needs to cover and collect the Primary data from the field and Secondary data. The study shall be conducted in the winter season by the team expert.

2) The detailed micro watershed assessment for the study area (core and buffer zone) i.e. 10 km radius from the project area shall be carried out by Environment professional.

3) Observing the geology, geomorphology, drainage patterns, and meteorology with the help of secondary data as well as field visits.

4) Mapping of the Land Use and water bodies within 10 km radius area from the project site using GIS and remote sensing.

5) Enhancing water availability for irrigation and domestic use through rainwater harvesting and groundwater recharge.

6) Promotion of afforestation and reforestation to protect and improve the local environment.

7) Monitoring and evaluation of project outcomes to ensure effective resource management and sustainable development.

8) Recommendation on the institutional mechanism for implementation of the Micro watershed development plan

The study area is located at Bandhaura, Nagwa, Karsualal and Khairahi villages under Singrauli District, Madhya Pradesh. Geographical Coordinates of the Mahan TPP is 24°0'28.90"N latitude /82°24'49.94"E longitude.

A watershed is a land area that channels rainfall to creeks, streams, and rivers, eventually leading to a common outlet such as a larger water body like a river, lake, or ocean. It encompasses all the land where water drains into a specific watercourse. Micro-watershed development is often implemented as part of larger watershed management programs, with a focus on improving the overall health and resilience of the entire watershed.

The plan would focus on preserving soil integrity and preventing erosion within the study area. Techniques such as contour plowing, reforestation, and terracing would help stabilize soil, minimize sediment runoff, and retain soil moisture, thus enhancing agricultural productivity and mitigating the risk of landslides and soil degradation.

The prime approaches for the development of watershed include:

- **Identification and delineation:** The first step would involve identifying and delineating micro-watersheds based on natural boundaries, such as ridgelines, streams, and terrain. This would help in understanding the specific hydrological and ecological characteristics of the area.

- **Preparation of thematic map:** The second would involve preparation of thematic map such as elevation of the area, soil types and land use/land cover. LULC maps provide critical insights into the spatial distribution of land types. Soil maps offer essential information on soil types and properties. Elevation maps depict the topography, informing decisions on water flow, erosion control measures, and infrastructure layout.

- **Watershed planning:** Once a micro-watershed is identified, and thematic map is prepared stakeholders, local communities, government agencies, and non-governmental organizations (NGOs), may collaborate to create a comprehensive development plan. This plan would consider the conservation and sustainable management of soil, water, and vegetation.

- **Soil and water conservation:** Soil erosion is a common problem in many micro-watersheds. Techniques such as contour farming, terracing, check dams, and reforestation would be implemented to reduce erosion, improve soil fertility, and increase water retention.

- **Water resource management:** Efficient water resource management is crucial for agriculture and other livelihood activities. Water harvesting structures, like ponds and percolation tanks, would be constructed to capture rainwater and replenish groundwater. This would help in ensuring a more reliable water supply for irrigation and domestic use.

- **Afforestation and reforestation:** Planting and maintaining trees and other vegetation are vital components of micro-watershed development. Trees help in stabilizing soil, preventing erosion, and improving overall ecological health.

- **Livelihood development:** Micro-watershed development programs aim to improve the socio-economic conditions of local communities. This may involve training in sustainable farming practices, promoting alternative livelihoods, and providing access to credit and markets.

- **Community participation:** Active community involvement and participation are central to the success of micro-watershed development projects. Local residents would be engaged in planning, implementing, and monitoring activities, ensuring that solutions are contextually relevant and sustainable.

- **Monitoring and evaluation:** Regular monitoring and evaluation would be done to assess the impact of micro-watershed development plan on the study area.

The reconnaissance survey was undertaken by a team led by Dr. S C Santra, Dr. K. M. Agrawal from IISWBM along with MEL Team from 8th - 9nd March, 2024. The team had a kick-off meeting at the MEL TPP on 7th March, 2024 to finalise the modalities for commencing the field study as well as collection of secondary data.

In the context of micro watershed development, understanding the geo-morphological features is paramount as the geological structure and composition of the land significantly affect water infiltration, storage, and movement within the watershed. Porous rock formations and permeable soils enhance groundwater recharge by allowing water to percolate through the subsurface efficiently, thereby increasing the availability of groundwater resources. In contrast, impermeable layers and geological faults can obstruct water flow, leading to surface runoff and potential erosion issues, which undermine water conservation efforts. Comprehensive geo-morphological assessments facilitate the identification of areas with high recharge potential and those prone to runoff or contamination, enabling the design of effective interventions such as check dams, contour bunding, and afforestation.

The geology of the district reveals the occurrence of various work formations as old as granites of the Achaean age to the Alluvium of Recent age. The other important formations outcropping in the district are the Deccan trap of cretaceous–Eocene, Gondwana's of Paleozoic to Mesozoic Sandstone, and other ranks of Vindhayans and Phyllites. Quartzites, Schist Gneisses and Granites of Archeans age.

The Singrauli region is majorly covered with alluvial soil, red sandy soil, yellow loamy Sandy soil, laterite soil, and red loam soil. The district comprises sedimentary, crystalline and metamorphic rocks, that weather into red soil. Similarly, the red colour of the laterite soil is more due to the diffusion of Iron compounds rather than due to the high proportion of Iron oxides. The alluvial soil is mostly restricted by along the banks of major rivers, whose thickness varies from few meters to 25 meters.

The three main rivers flows along with several tributaries which are the son, Gopal and Rihand. In the Southern part of the district the elevation of hills ranges varies between 142 and 743 m above MSL and it helps to developed drainage in area.

The LULC analysis in the buffer zone indicates that the tree cover comprises a significant portion of the study area, covering approximately 42% of the total area. Following this, open grasslands occupy nearly 110.28 km^2, constituting nearly 27% of the buffer zone. Croplands span approximately 106 km^2, representing nearly 26% of the total area. Conversely, the built-up area of settlements occupies a smaller proportion, accounting for 5.26% of the buffer zone. Additionally, water bodies and bare ground/wasteland cover minimal areas, with water bodies occupying 0.23% and bare ground/wasteland covering 0.06% of the buffer zone respectively.

The summer season in Singrauli is usually hot and dry. Temperatures during this period often soar, with daytime temperatures frequently exceeding 39°C. Hot, dry winds known as "loo" can sometimes blow, causing discomfort. Winter in Singrauli is relatively mild and pleasant. Daytime temperatures in winter usually range from 15°C to 25°C (59°F to 77°F), while nighttime temperatures can drop to around 5°C to 10°C (41°F to 50°F).

A number of micro watershed development schemes are practiced in India. The selection of suitable techniques for artificial recharge depends on various factors, which includes:

- Quantum of non-committed surface run-off available.
- Rainfall pattern
- Land use and vegetation
- Topography and terrain profile
- Soil type and soil depth
- Thickness of weathered / granular zones
- Hydrological and hydro-geological characteristics
- Socio-economic conditions and infrastructural facilities available
- Environmental and ecological impacts of artificial recharge scheme proposed.

The following guidelines can be followed to select a site for an artificial micro watershed development scheme:

- Adequate space for surface storage is available.
- Water level is deep enough (> 8 m) and adequate sub-surface storage is available.
- Permeable strata are available at shallow/moderate depth.
- Adequate quantity of surface water is available for recharge.

- Adequate surface drainage density is present.
- Considering the geological and hydro-geological formations of the area, the following micro watershed development schemes are recommended:
- Contour Trenches.
- Gully Plugs, Nala Bunds, Check Dams.
- Recharge Pit/Recharge Shaft.

The micro-watershed development plan can be tailored to address the specific environmental challenges and opportunities within the area that include:

1. Reforestation: Planting native tree species in the buffer zone to restore degraded forest areas and enhance vegetative cover. This would help reduce soil erosion, regulate water flow, and promote ground water recharge. The Miyawaki Plantation technique has been proposed to be implemented as a measure for reforestation.

2. Soil conservation: Implementing soil conservation measures such as contour bunding, vegetative barriers, and mulching to prevent soil erosion and improve soil moisture retention. This would contribute to enhancing the resilience of ecosystems and promoting sustainable land use practices.

3. Water management infrastructure: Constructing a variety of water management structures, such as check dams, percolation ponds, recharge wells, and deepening existing ponds, plays a crucial role in harvesting rainwater, controlling surface runoff, and facilitating groundwater recharge. These interventions are essential for mitigating the impacts of water scarcity and ensuring a reliable water supply for local communities and ecosystems.

Integration of watershed development plan into the management of the buffer zone of Mahan TPP would lead to the conservation of natural resources, promotion of ecological sustainability, and enhancement of community resilience in the surrounding area.

The estimated cost of reforestation, construction of check dams, groundwater recharge and deepening of ponds for development of micro watershed within 10 Km buffer zone of Mahan TPP has been calculated. The total estimated budget for the implementation of green belt development plan is **92.00 Lakhs INR.**

1.0 INTRODUCTION

1.1 BACKGROUND

The Adani Group (1988) has grown from being a trading house to a diversified business group with interests from infrastructural development to FMCGs. The Adani Group has made foray into high growth sector like Power, Infrastructure, Global Trading, Logistics and Energy.

Adani Power Limited (APL), a member of the Adani Group, has taken up implementation of large Thermal Power Projects at various locations in India in view of the growing needs of power requirements in the country. APL is also actively planning to implement Thermal Power Stations at various locations in India, totaling to about 20,000 MW in the coming years.

Mahan Energen Limited – MEL is a subsidiary company of Adani Power Limited (APL) which has been formed to develop 2x800 MW Ultra Super Critical Thermal Power Plant at Bandhaura, Khairahi, Karsualal and Nagwa Villages under Singrauli District, Madhya Pradesh. The Project is proposed to be developed as an expansion of the existing 2 x 600 MW units at the site and all the necessary infrastructure to cater the requirement of the enhanced capacity will be developed while also using the facilities of the existing plant.

The Project is conceptualised to be operated by utilising coal from nearby commercial coal mines and water from the Rihand reservoir. For auxiliaries' viz. Coal Handing, Ash Handling and Plant Water System, it is proposed to utilise the latest technology with adequate margin to ensure high availability of the Project. Land Area of about 920 Acres has been identified for the Project which includes the existing 1200 MW plant and land area for accommodation of coal stockyard, water reservoir, roads & green belt etc.

In accordance with its mission of being enviro-socially responsible corporate entity with thrust on sustainable development, MEL aims to focus on developing micro watershed around its Mahan TPP. To accomplish this mission, it is imperative to carry out proposed study that can facilitate in formulating a comprehensive short as well as long-term micro watershed development plan. The plan would employ a holistic approach aimed at conserving and managing natural resources within small, localized areas. It would involve the active participation of local communities and various stakeholders in the sustainable management of soil, water, and vegetation. Through practices such as soil and water conservation, afforestation and livelihood

diversification, the plan seeks to reduce soil erosion, improve land productivity, enhance water availability for agriculture and domestic use, and alleviate poverty.

1.2 OBJECTIVES OF THE STUDY

The objectives of the study are as follows:

- To observe the geomorphological condition of the study area including assessment of geology, and geomorphology.
- To study the meteorology of the study area
- To study the soil, drainage pattern, elevation, and LULC of the study area
- To suggest effective micro watershed development plan.

1.3 SCOPE OF THE STUDY

The scope of the study includes the undertaking of a reconnaissance survey. Based on the reconnaissance survey a framework would be evolved for undertaking a time-bound detailed field survey within the influence zone of the project site (i.e. 10 km radius) and assessment of micro watershed. The detail scope of work for the proposed study is as follows:

1) The study needs to cover and collect the Primary data from the field and Secondary data.
2) The detailed micro watershed assessment for the study area (core and buffer zone) i.e. 10 km radius from the project area shall be carried out by Environment professionals.
3) Observing the geology, geomorphology, drainage patterns, and meteorology with the help of secondary data as well as field visits.
4) Mapping of the Land Use and water bodies within 10 km radius of Mahan TPP using GIS and remote sensing.
5) Enhancing water availability for irrigation and domestic use through rainwater harvesting and groundwater recharge.

6) Promotion of afforestation and reforestation to protect and improve the local environment.

7) Monitoring and evaluation of project outcomes to ensure effective resource management and sustainable development.

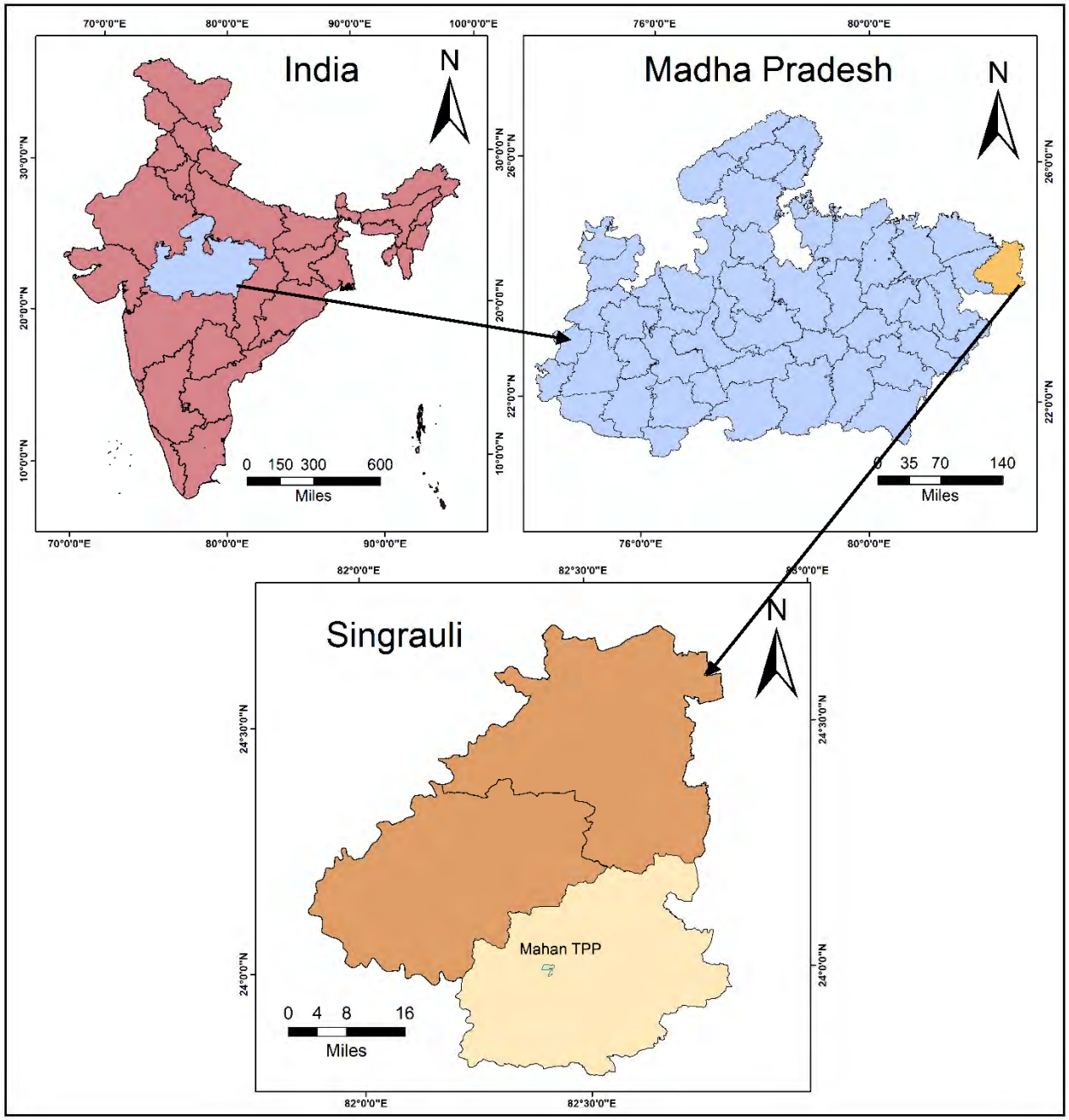
8) Recommendation on the institutional mechanism for implementation of the Micro watershed development plan

The Scope of Work would also include presentation of the study report before the Expert Appraisal Committee of MoEF&CC and subsequent preparation of replies to the clarifications asked, if any.

1.4 DETAIL OF PROJECT LOCATION

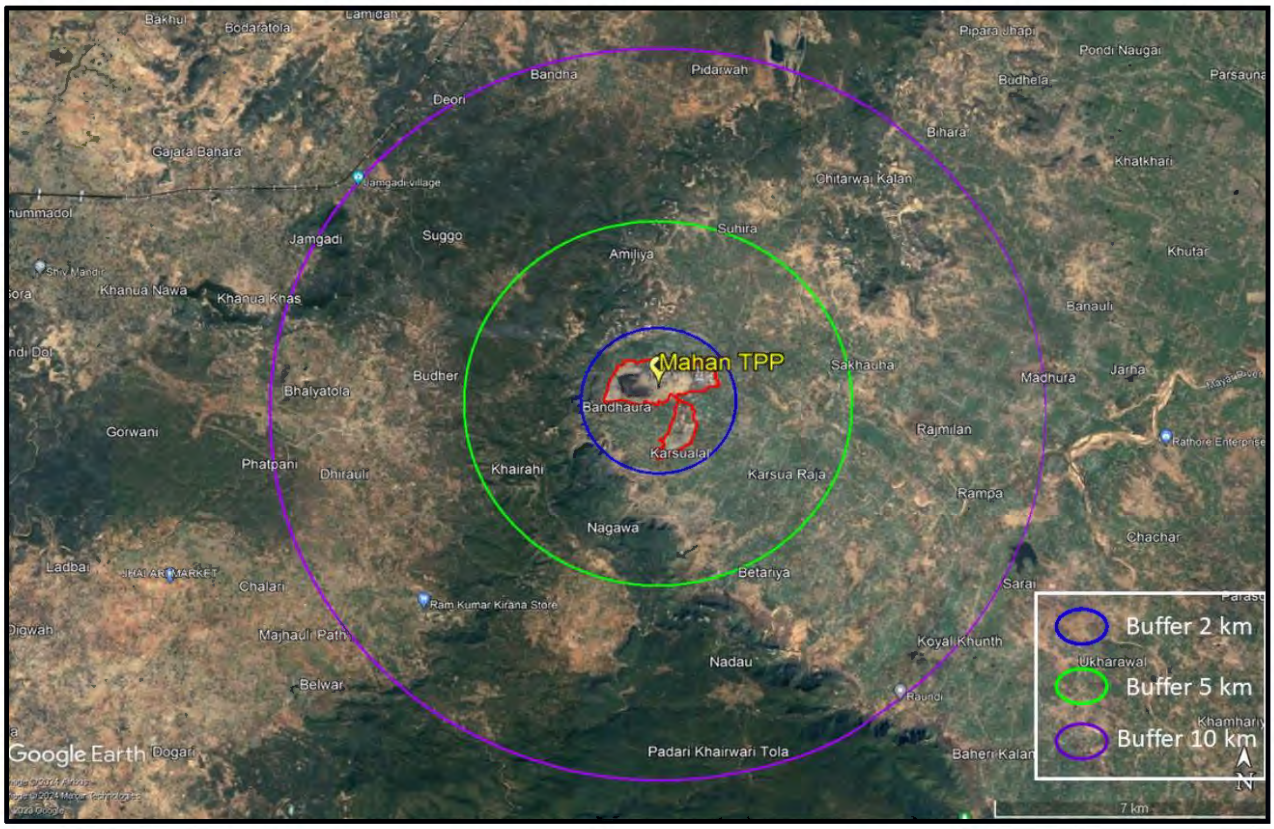
The study area is located at Bandhaura, Nagwa, Karsualal and Khairahi villages under Singrauli District, Madhya Pradesh (Figure 1.1). Geographical Coordinates of the Mahan TPP is 24°0'28.90"N latitude /82°24'49.94"E longitude.

FIGURE 1.1: LOCATION OF THE STUDY AREA OF MAHAN TPP



The buffer zone identified around Mahan TPP for development of micro watershed has been presented in Figure 1.2.

FIGURE 1.2: BUFFER ZONE FOR DEVELOPMENT OF MICRO-WATERSHED AROUND MAHAN TPP



1.5 PROJECT AT A GLANCE

General:

Project Authority (SPV)	:	Mahan Energen Ltd.
Project	:	2x800 MW Ultra Super-Critical Thermal Power Project.
Selected Location	:	Bandhaura, Nagwa, Karsualal and Khairahi village, Singrauli District, M.P.

Latitude and Longitude of the site :		24°0'28.90"N latitude / 82°24'49.94"E longitude
Altitude	:	320 to 340 m.
Average RL	:	335 m.
Annual average rain fall	:	1132.7 mm
Nearest Major Town	:	Waidhan and Singrauli
Seismic Zone	:	Zone-III as per IS 1893
Access by Road	:	State Highway (SH14) is passing about 16km from the site.
Access by Rail	:	Singrauli Station is located at 52 km fromProject Site.
Access by Air	:	Nearest Airport is at Varanasi at a distanceof 280 km.
Access by Sea	:	Nearest Seaport is at Dhamra at a distanceof 770 km.

Preliminary Project Particulars:

Main Fuel	:	Coal from Commercial Coal Mines(GCV 3000-4200 Kcal/Kg)
Fuel Transportation	:	Through Long Belt conveyor (LBC) system.
Water	:	From the Rihand Reservoir at 36 km fromSite.
Land	:	920 Acres of land is available for the PowerProject.

Layout Features	:	2 X 800 MW Ultra Super-Critical Units

Technical Features:

Power Generating Unit	:	Two units of 800 MW turbine generator sets fed by steam from coal fired P.F. boiler operating at Ultra Super-critical range.
Cooling System	:	Closed recirculating condenser cooling system with induced draft cooling tower.
Coal Handling System	:	Coal handling facility, which comprises receipt of coal from Mines through LBC system, with on-line existing & new crushing and stacking by existing & new stacker-cum-reclaimer in the existing & new coal yard and finally feeding the bunker level conveyors.
Ash Disposal System	:	Provision will be made for disposal of fly ash in dry form to adjacent Cement Plants/ Mine back filling. Provision will be made for disposal of ash in high concentration slurry form.
Power Evacuation	:	At 400 kV level to State Transmission Unit (STU)
Environmental Aspects	:	Elaborate arrangements for Flue gas desulphurization (FGD) and Selective Catalytic Reduction (SCR) systems complying with emission norms as per latest MoEF & CC. Independent steel wet flue for each unit, down- stream of FGD of suitable height as per MoEF & CC guidelines and an adequately designed electrostatic precipitator with more than 99.99% efficiency are envisaged. Waste water quality to be maintained as per MoEF & CC notification. Zero Plant Discharge facility shall be present since the cooling water, blow down water, waste water and ash water would

be recycled back to the systemafter suitable treatment for reuse. For coal transportation from mines, pipe conveyortechnology will be adopted to mitigate environmental concerns.

Rehabilitation Requirement : Nil

Other Facilities:

Township : Township with civic amenities would be developed.

Mode of Implementation : The Project would be implemented on EPCconcept.

Project Time Frame : 54 months from Zero Date i.e. the date of 'Financial Closure' for Commercial Operation of Unit#3 and 60 months for Unit#4

FIGURE 1.3: VIEW OF MAHAN TPP AT SINGRAULI MADHYA PRADESH

2.0 FRAMEWORK FOR MICRO WATERSHED DEVELOPMENT

A watershed is a land area that channels rainfall to creeks, streams, and rivers, eventually leading to a common outlet such as a larger water body like a river, lake, or ocean. It encompasses all the land where water drains into a specific watercourse. Micro-watershed development is often implemented as part of larger watershed management programs, with a focus on improving the overall health and resilience of the entire watershed. It plays a vital role in addressing environmental degradation, enhancing agricultural productivity, and improving the quality of life for rural communities while promoting sustainable resource management practices. The micro watershed development plan would involve strategic planning and establishment of rainwater harvesting structures, check dams, and pond deepening in the suitable locations within the 10 km buffer zone of the Mahan TPP.

The plan would focus on preserving soil integrity and preventing erosion within the study area. Techniques such as contour plowing, reforestation, and terracing would help stabilize soil, minimize sediment runoff, and retain soil moisture, thus enhancing agricultural productivity and mitigating the risk of landslides and soil degradation. Implementation of the plan is crucial for controlling floods, especially in areas that are prone to waterlogging and soil erosion.

In addition, the plan would contribute to socio-economic development by enhancing livelihood opportunities through employment generation in activities involved in the development of micro watershed like afforestation and soil conservation, improving agricultural productivity through sustainable water management and soil conservation measures, ensuring water security for agricultural, industrial, and domestic purposes, stimulating economic growth through infrastructure development such as water harvesting structures and access roads, providing ecosystem services essential for socio-economic activities, attracting tourism and recreational opportunities, empowering local communities through participation in decision-making processes, and promoting education and awareness about sustainable resource management practices, thus fostering inclusive and sustainable development in rural areas.

Overall, micro watershed management plan offers a holistic approach to sustainable development, integrating environmental protection, water management, biodiversity conservation, and socio-economic development. By harnessing the resilience of natural ecosystems and implementing innovative solutions, the plan would ensure a harmonious coexistence between industrial activities and the surrounding environment, paving the way for a healthier, more resilient future for all stakeholders.

2.1 APPROACHES FOR DEVELOPMENT OF MICRO WATERSHED

The prime approaches for the development of micro watershed include:

- **Identification and delineation:** The first step would involve identifying and delineating micro-watersheds based on natural boundaries, such as ridgelines, streams, and terrain. This would help in understanding the specific hydrological and ecological characteristics of the area.

- **Preparation of thematic map:** The second would involve preparation of thematic map such as elevation of the area, soil types and land use/land cover. LULC maps provide critical insights into the spatial distribution of land types. Soil maps offer essential information on soil types and properties. Elevation maps depict the topography, informing decisions on water flow, erosion control measures, and infrastructure layout.

- **Watershed planning:** Once a micro-watershed is identified, and thematic map is prepared stakeholders, local communities, government agencies, and non-governmental organizations (NGOs), may collaborate to create a comprehensive development plan. This plan would consider the conservation and sustainable management of soil, water, and vegetation.

- **Soil and water conservation:** Techniques such as contour farming, terracing, check dams, and reforestation would be implemented to reduce erosion, improve soil fertility, and increase water retention.

- **Water resource management:** Water harvesting structures, like ponds and percolation tanks, would be constructed to capture rainwater and replenish groundwater. This would help in ensuring a more reliable water supply for irrigation and domestic use.

- **Afforestation and reforestation:** Planting and maintaining trees and other vegetation are vital components of micro-watershed development. Trees help in stabilizing soil, preventing erosion, and improving overall ecological health.

- **Livelihood development:** Micro-watershed development program would aim to improve the socio-economic conditions of local communities. This may involve training in sustainable farming practices, promoting alternative livelihoods, and providing access to credit and markets.

- **Community participation:** Active community involvement and participation are central to the success of micro-watershed development projects. Local residents would be engaged in planning, implementing, and monitoring activities, ensuring that solutions are contextually relevant and sustainable.

- **Monitoring and evaluation:** Regular monitoring and evaluation would be done to assess the impact of micro-watershed development plan on the study area.

2.2 RECONNAISSANCE SURVEY

The reconnaissance survey was undertaken by a team led by Dr. S C Santra, Dr. K. M. Agrawal from IISWBM along with MEL Team from 8th - 9nd March, 2024. The team had a kick-off meeting at the MEL TPP on 7th March, 2024 to finalise the modalities for commencing the field study as well as collection of secondary data.

Initially, MEL Team appraised the objective of proposed study and the required coverage of the same as per MoEF&CC Environmental Clearance condition. MEL Team also shared the detailed information regarding the drainage pattern of the area. They also shared the key features of existing water conservation practices in the study area. During the meeting detail plan for undertaking field study was also discussed and resolved that all the required primary data need to be collected within stipulated time frame.

The survey was undertaken to primarily examine the existing stream network as well as identification of wastelands falling within the buffer zone of Mahan TPP for the formulation of micro watershed development plan.

2.3 IDENTIFICATION AND DELINEATION OF WATERSHED

The Singrauli district lies on the Son sub-basin of the Ganga basin. In the district, three main rivers flow along with several tributaries, the major rivers in the region are the Son, Gopal, and Rihand. Micro watershed in the study area have been identified based on natural boundaries of ridgelines, streams, and terrain. It involved identifying the local stream network, focusing on smaller-scale drainage patterns within a specific geographical area that enabled a comprehensive understanding of runoff patterns, and sediment transport, facilitating targeted management strategies for sustainable land use and conservation practices within the micro watershed. The sub watershed (Figure 2.1) falling in the buffer zone of Mahan TPP is under the Mayar river, which is one of the streams of the Rihand. The micro watershed (Figure 2.2.) of the study area is under the Rampa river, which is a stream of the Mayar river.

FIGURE 2.1: SUB WATERSHED OF THE STUDY ARE

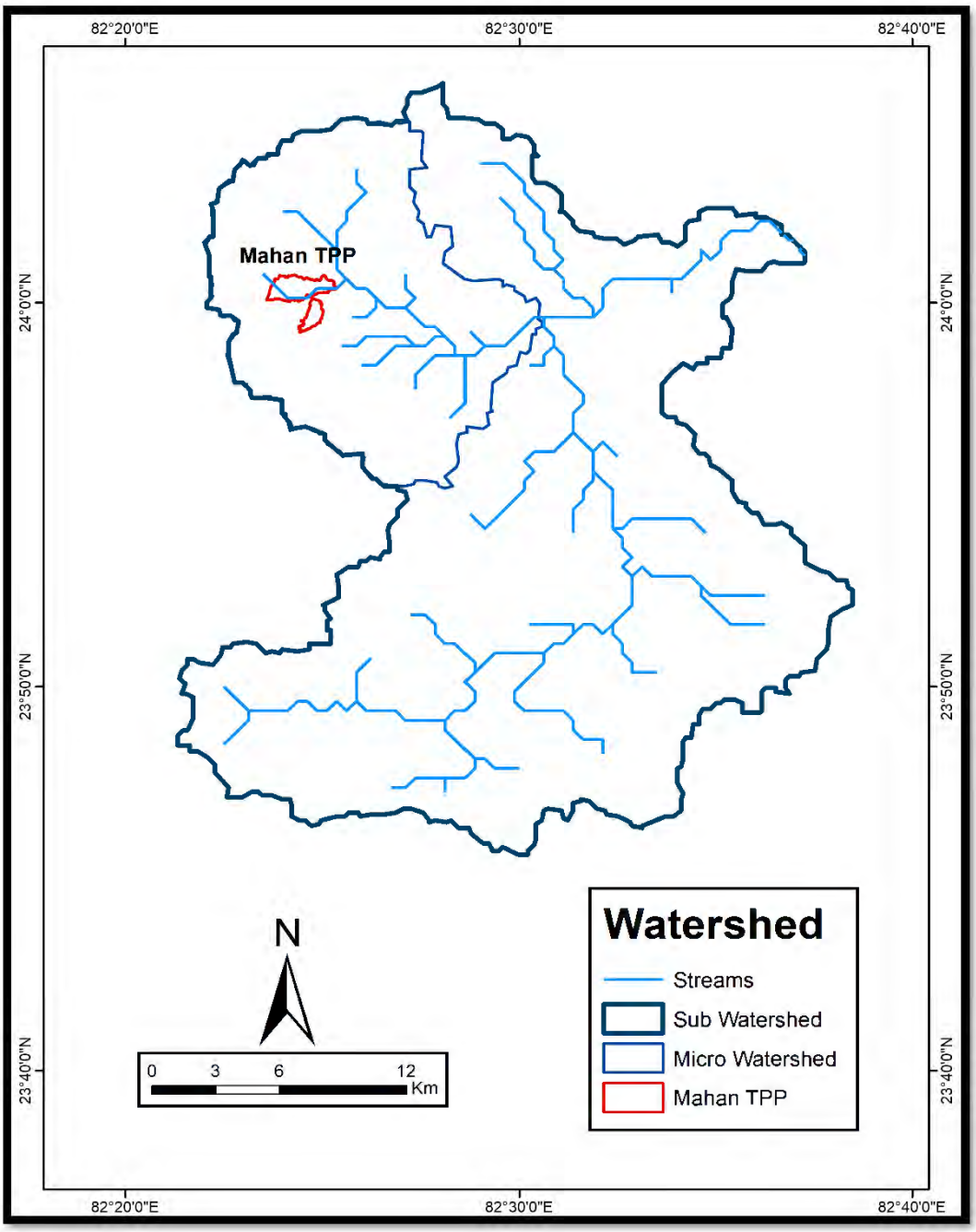


FIGURE 2.2: MICRO WATERSHED OF THE STUDY AREA

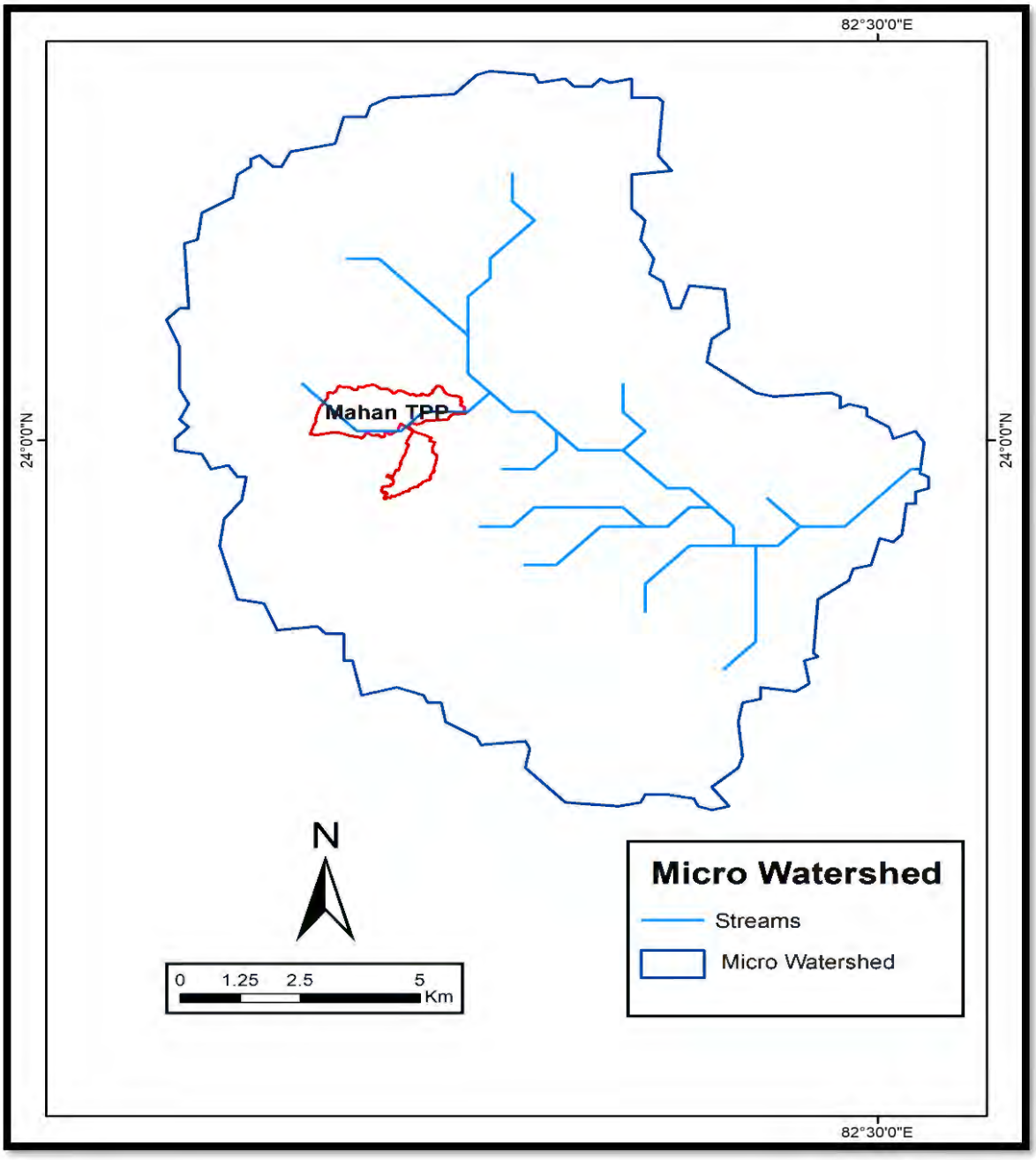


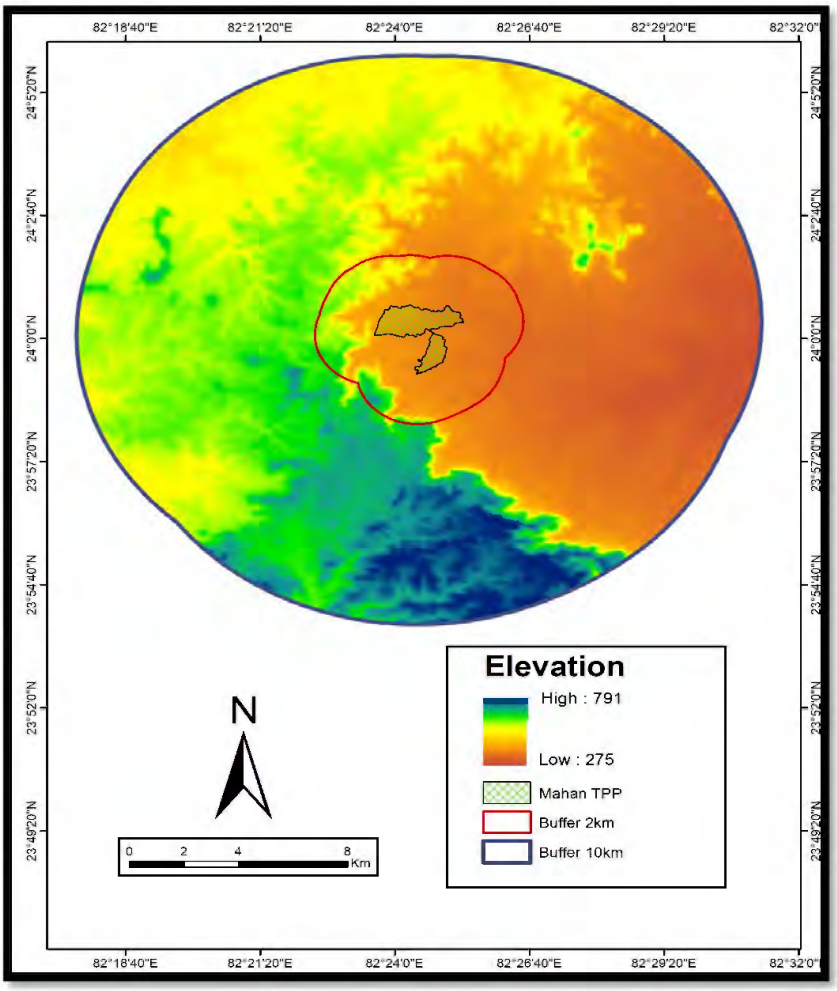
FIGURE 2.3: STREAM NETWORK WITHIN THE BUFFER ZONE OF MAHAN TPP

FIGURE 2.4: IDENTIFICATION OF WASTELAND AREAS FOR MICRO WATERSHED DEVELOPMENT AT SELECTED LOCATIONS WITHIN BUFFER ZONE

2.4 ELEVATION

Elevation plays a crucial role in micro watershed management plans as it determines the flow of water, influencing soil erosion, drainage patterns, and the distribution of vegetation. Higher elevations often serve as catchment areas for rainfall, channelling water into lower-lying areas where it can be utilized for agriculture, replenish groundwater, or domestic use. Additionally, elevation influences the suitability of land for various purposes, guiding water conservation structures planning efforts within micro watersheds to ensure sustainable development and natural resource conservation. In the 10 km buffer around the Mahan TPP where the highest elevation is 791 m in the southwestern side and the lowest elevation is 275 m in the eastern side (Figure 2.5).

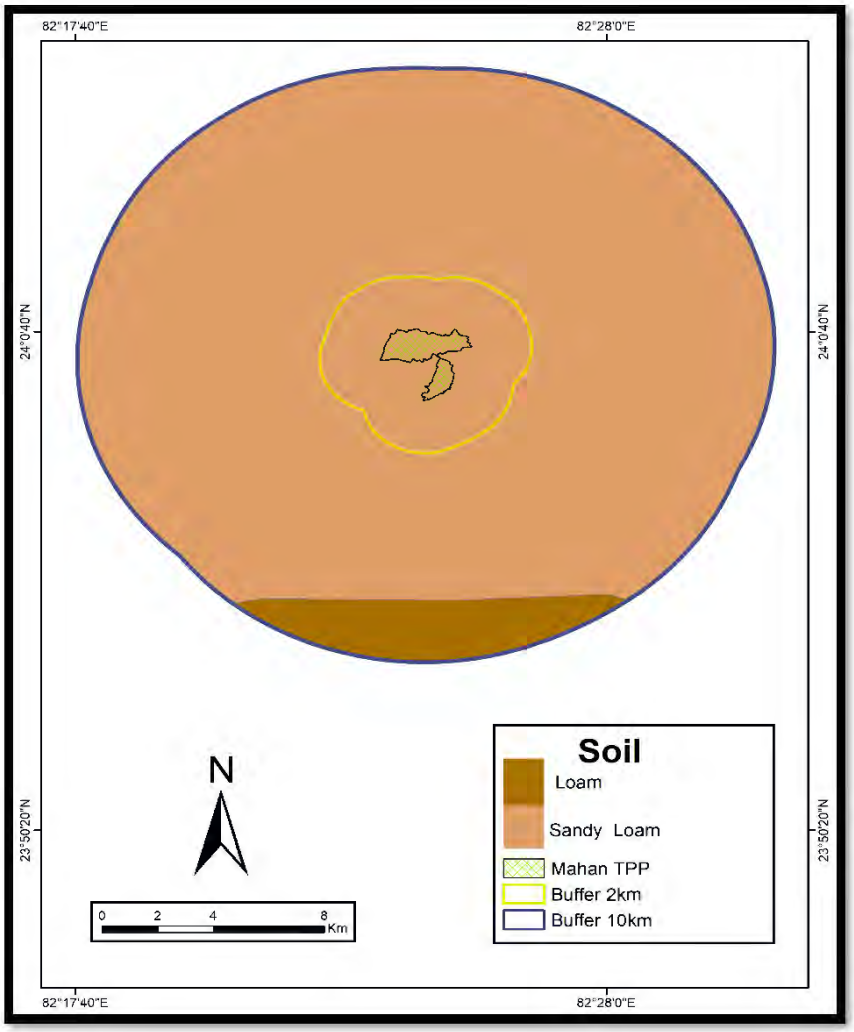
FIGURE 2.5: ELEVATION OF THE STUDY AREA



2.5 SOIL

The soil map of the study area reveals that it is predominantly composed of sandy loam and loam soils. Sandy loam soil, which constitutes more than 90% of the area, is characterized by its high permeability, allowing water to drain quickly due to its larger particle sizes and lower water retention capability. Loam soil, making up the remainder of the area, has a balanced mixture of sand, silt, and clay, offering moderate permeability that enables adequate water drainage while retaining essential moisture for plant growth. The soil map of the study area has been presented in figure 2.6.

FIGURE 2.6: SOIL OF THE STUDY AREA



2.6 LULC PATTERN

The land use/land cover characteristics of the area within 10 km of the Mahan TPP was analyzed to assess the prevailing land pattern within the buffer zone in order to identify suitable locations for development of groundwater plan. The data has been derived from the ESA Sentinel-2 imagery at 10 m resolution downloaded for the year 2023.

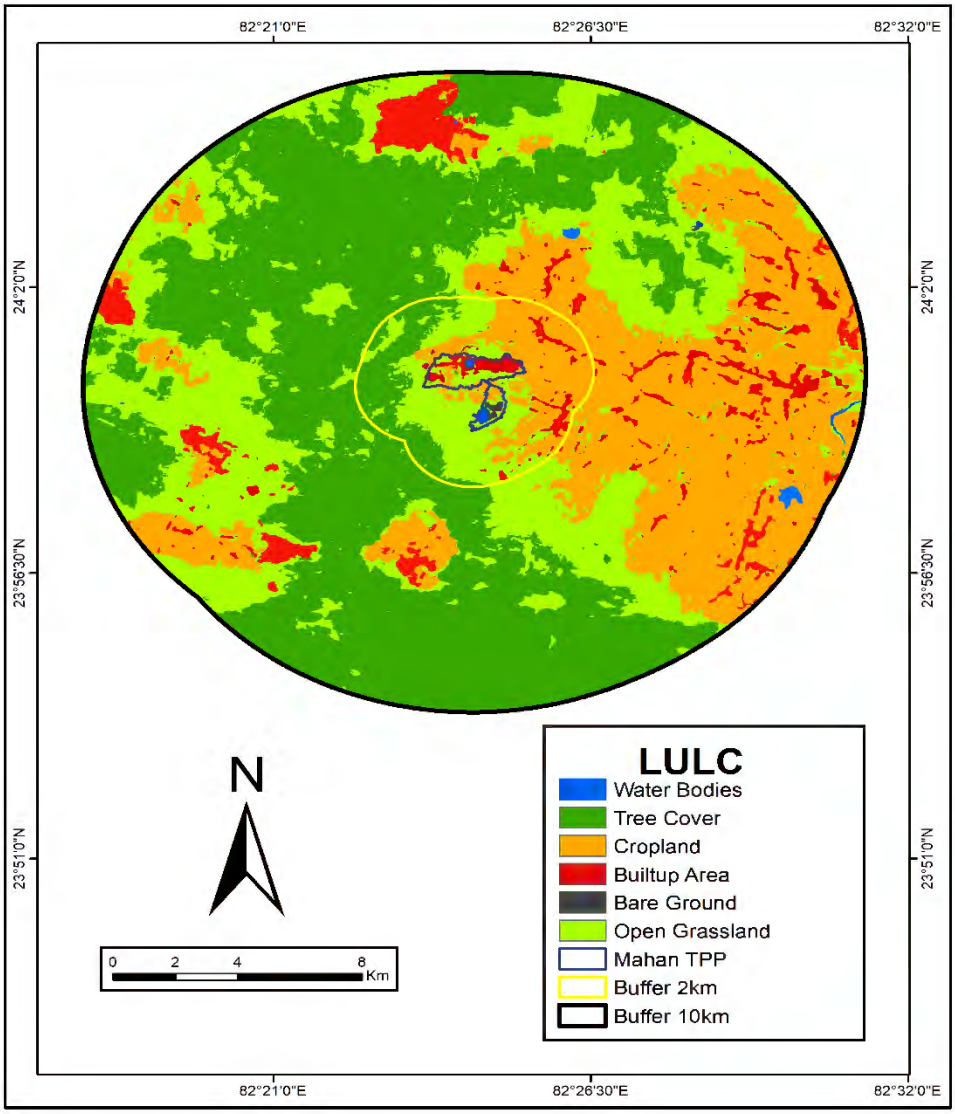
Table 2.1 and Figure 2.7 present the results of land use/land cover classification in the study area within 10 Km buffer zone of Mahan TPP. The analysis highlights that the tree cover comprises a significant portion of the study area, covering approximately 42% of the total area. Following this, open grasslands occupy nearly 110.28 km^2, constituting nearly 27% of the buffer zone. Croplands span approximately 106 km^2, representing nearly 26% of the total area. Conversely, the built-up area of settlements occupies a smaller proportion, accounting for 5.26% of the buffer zone. Additionally, water bodies and bare ground/wasteland cover minimal areas, with water bodies occupying 0.23% and bare ground/wasteland covering 0.06% of the buffer zone respectively.

TABLE 2.1: AREA STATISTICS OF LANDUSE-LANDCOVER CLASSES OF THE AREA WITHIN 10 KM FROM THE MEL TPP

LU-LC CLASSES	Pixel* Count	Area (Km^2)	Percent of Total Area
Water	9320	0.93	0.23
Tree Cover	1707057	170.71	41.67
Crop Land	1059557	105.96	25.86
Builtup Land	215332	21.53	5.26
Bare Ground	2444	0.24	0.06
Open Grassland	1102793	110.28	26.92
Total	**4096503**	**409.65**	**100**

* Spatial Resolution = 10 m.

FIGURE 2.7: LULC PATTERN OF THE STUDY AREA



3.0 GEO-MORPHOLOGICAL ASSESSMENT

"Geo" pertains to the Earth or geological features, while "morphology" refers to the study of the form and structure of objects or landscapes. Therefore, "geo-morphological assessment" involves the examination and analysis of the physical characteristics, topography, and geological features of an area. This assessment encompasses the study of landforms, soil types, rock formations, drainage patterns, and other geological elements that contribute to the overall landscape.

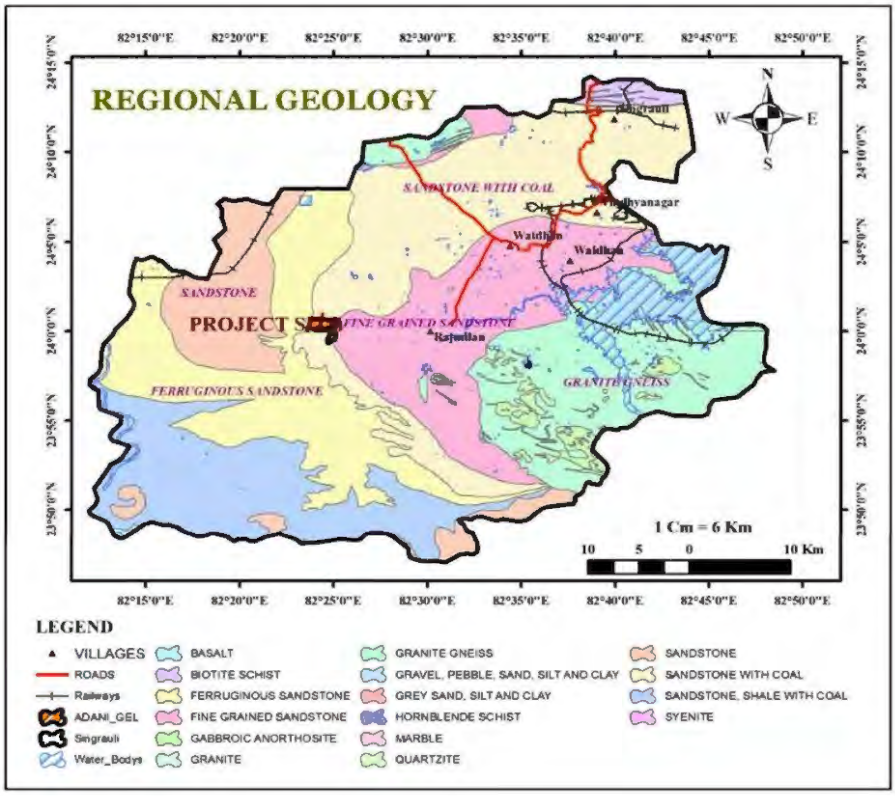
In the context of micro watershed development, understanding the geo-morphological features is paramount as the geological structure and composition of the land significantly affect water infiltration, storage, and movement within the watershed. Porous rock formations and permeable soils enhance groundwater recharge by allowing water to percolate through the subsurface efficiently, thereby increasing the availability of groundwater resources. In contrast, impermeable layers and geological faults can obstruct water flow, leading to surface runoff and potential erosion issues, which undermine water conservation efforts. Comprehensive geo-morphological assessments facilitate the identification of areas with high recharge potential and those prone to runoff or contamination, enabling the design of effective interventions such as check dams, contour bunding, and afforestation.

3.1 GEOLOGY

The analysis of geology of the Singrauli district reveals the occurrence of various rock formations as old as granites of the Achaean age to the Alluvium of Recent age. The other important formations outcropping in the district are the Deccan trap of cretaceous–Eocene, Gondwana's of Paleozoic to Mesozoic Sandstone, and other ranks of Vindhayans and Phyllites. Quartzites, Schist Gneisses and Granites of Archeans age (CGWB, 2013). The geological structure of Singrauli district is relatively stable, characterized by gentle folding and faulting. The region does not exhibit significant tectonic activity or seismicity compared to other parts of India.

Understanding the geology of the study area is crucial for assessing groundwater resources, and environmental impacts. The study area is part of Singrauli Tahsil under Singrauli District and is covered with recent alluvium, Deccan Trap, Gondwana, Vindhyan, and Archean rocks. The geological map of Singrauli district has been presented in Figure 3.1.

FIGURE 3.1: GEOLOGICAL MAP OF THE STUDY AREA



3.2 GEOMORPHOLOGY

The district as a whole constitutes a hilly terrain as most of the district is covered by kaimur hilly ranges. The district is divided into three physiographic divisions: -

(i) Kaimur hilly ranges

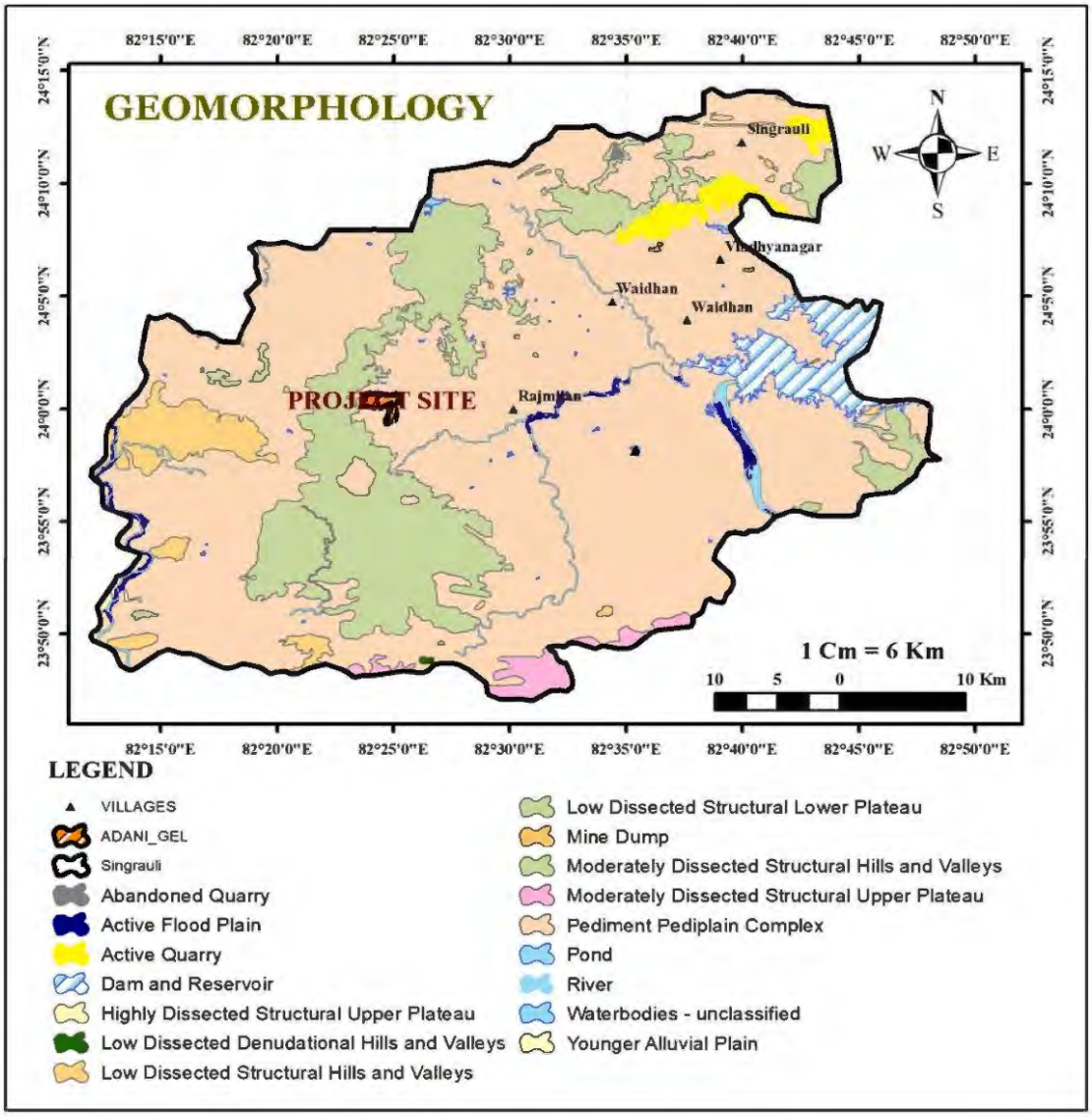
(ii) The Central part hilly ranges and

(iii) Southern hilly ranges

The district as a whole lie on the Son sub-basin of the Ganga basin. In the district, three main rivers flow along with several tributaries. The major rivers are the son, Gopal and Rihand. The Kaimur range stretched from NE and SW direction covers major part of the district. The central part of the district forms a series of hilly ranges. In the southern part of the district, the elevation of hilly ranges varies between 142 and 743 m above MSL. The general slope of the area is towards the Northeast.

The entire district is drained by the 3 major rivers ie. Son, Gopal, and Rihand along with their tributaries. The geomorphological map of Singrauli district has been presented in Figure 3.2.

FIGURE 3.2: GEOMORPHOLOGICAL MAP OF THE STUDY AREA



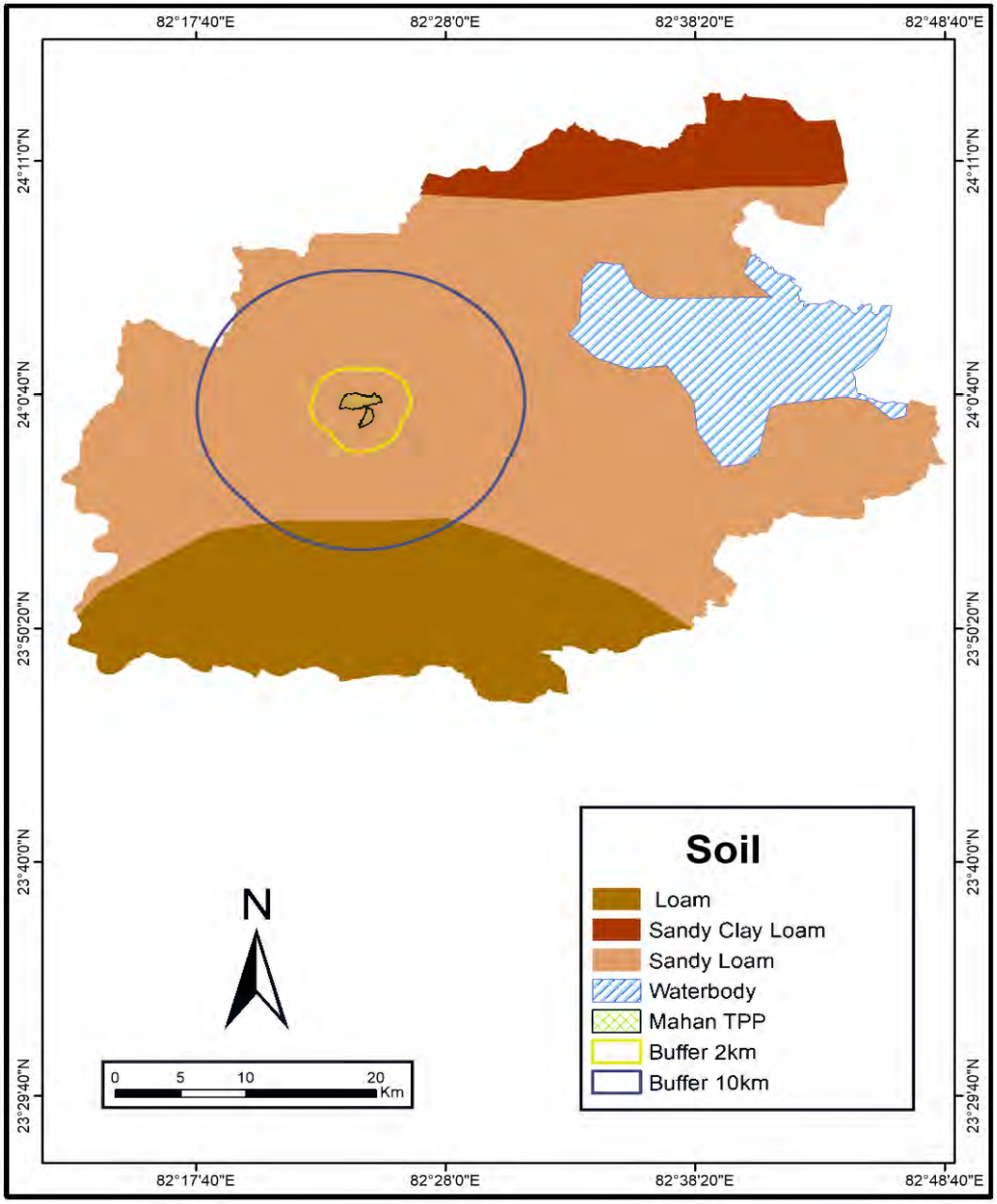
3.3 SOIL

The Singrauli region is majorly covered with alluvial soil, red sandy soil, yellow loamy Sandy soil, laterite soil, and red loam soil. The district comprises sedimentary, crystalline and metamorphic rocks, that weather into red soil. Similarly, the red colour of the laterite soil is

more due to the diffusion of Iron compounds rather than due to the high proportion of Iron oxides. The alluvial soil is mostly restricted by along the banks of major rivers, whose thickness varies from few meters to 25 meters. (CGWB, 2013)

The study area is majorly covered with Sandy Loam and Loam soil (Figure 3.3).

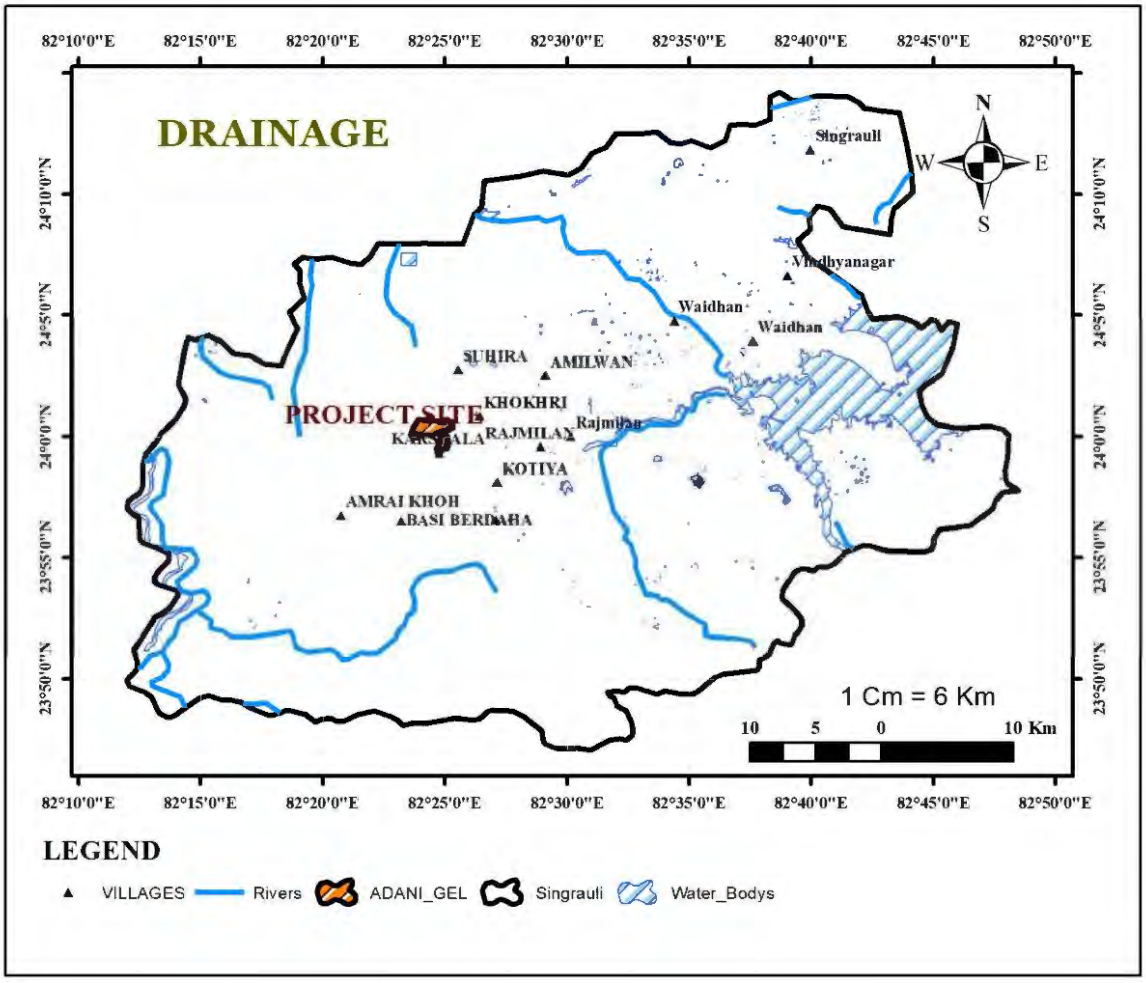
FIGURE 3.3: SOIL MAP OF THE STUDY AREA



3.4 DRAINAGE

The three main rivers flow along with several tributaries are the son, Gopal and Rihand. In the Southern part of the district. The elevation of hills varies between 142 and 722 m above MSL and it subsequently influence the drainage pattern in the area. The general slope of the area is towards Northeast. The entire district is drained by the above-mentioned 3 rivers and their tributaries in the Ganges drainage System. The pattern of drainage is dendritic in nature except the localized radial pattern in the hilly terrain (CGWB, 2022). The drainage map of the study area has been depicted in figure 3.4.

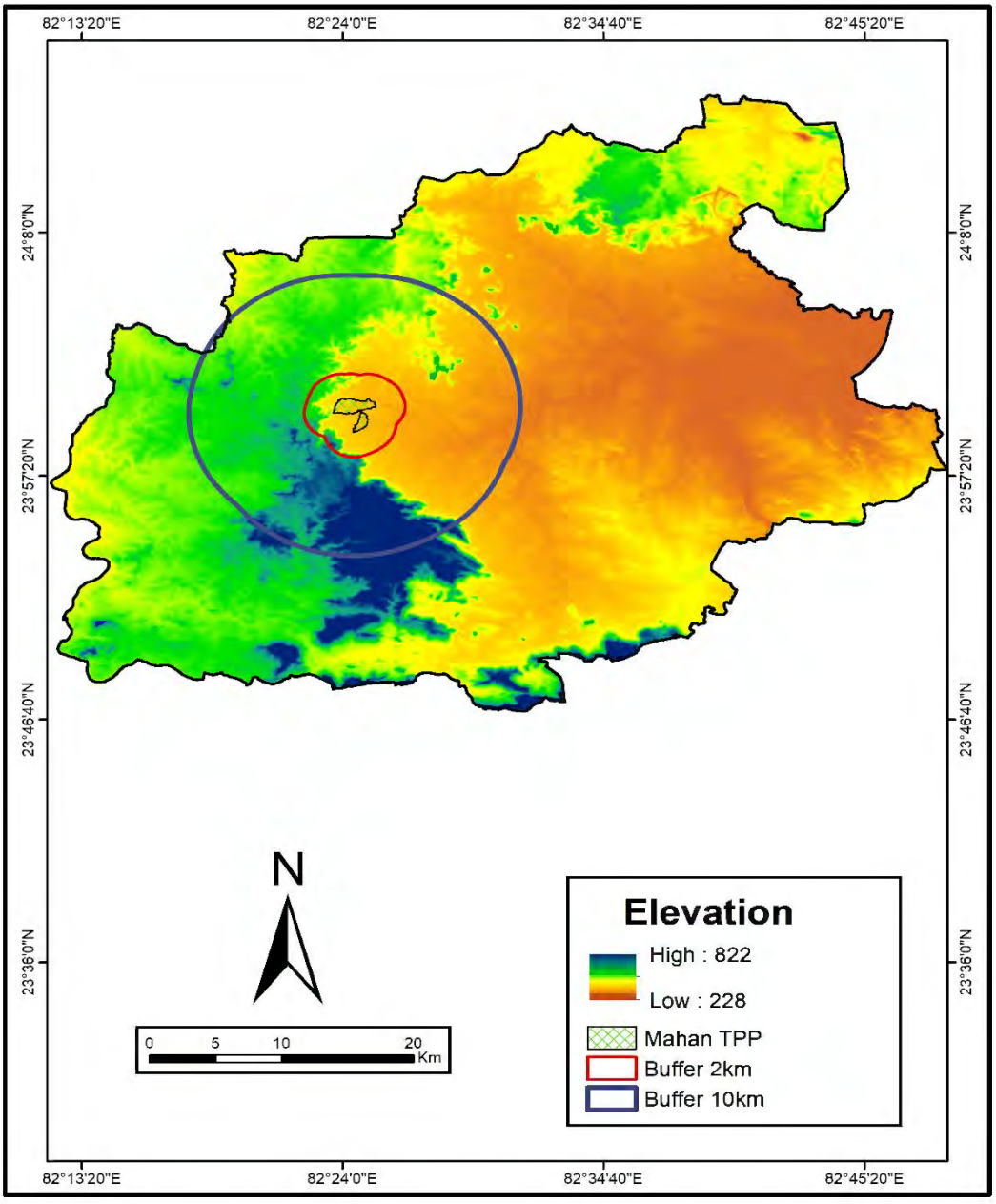
FIGURE 3.4: DRAINAGE MAP OF THE STUDY AREA



3.5 ELEVATION

The study area's Digital elevation model (DEM) was prepared using SRTM DEM data (Figure 3.4). The elevation of the study area varies from 228 m to 822 m above mean sea level and the slope is towards the northeast part of the study area.

FIGURE 3.4: ELEVATION MAP OF THE STUDY AREA



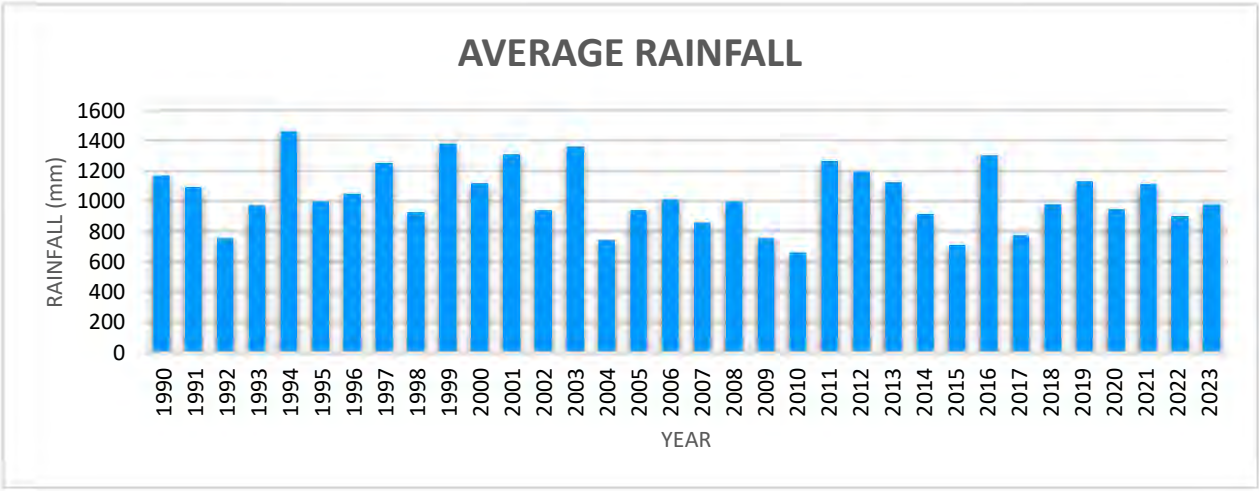
3.6 METEOROLOGY

Singrauli district experiences a subtropical climate characterized by hot summers, a monsoon season, and cool winters. The summer season in Singrauli is usually hot and dry. Temperatures during this period often soar, with daytime temperatures frequently exceeding 39°C. Hot, dry winds known as "loo" can sometimes blow, causing discomfort. Winter in Singrauli is relatively mild and pleasant. Daytime temperatures in winter usually range from 15°C to 25°C (59°F to 77°F), while nighttime temperatures can drop to around 5°C to 10°C (41°F to 50°F). Foggy conditions are common during the early morning, especially in December and January. The relative humidity varies between 29% during April and 83% during August. The average rainfall of the district is 1020 mm for the period 1990-2023. The micro meteorology and rainfall patterns of the Singrauli district are shown in table 3.1 and figure 3.4.

TABLE 3.1: MICRO METEOROLOGY OF THE OF THE SINGRAULI DISTRICT

Month	Min. Temperature		Max. Temperature		Humidity
January	10.6 °C	(51.1) °F	22.7 °C	(72.9) °F	62%
February	13.8 °C	(56.8) °F	26.9 °C	(80.4) °F	54%
March	18 °C	(64.3) °F	32.4 °C	(90.4) °F	40%
April	22.9 °C	(73.3) °F	38 °C	(100.4) °F	29%
May	26.3 °C	(79.3) °F	39.7 °C	(103.4) °F	34%
June	27.1 °C	(80.8) °F	35.9 °C	(96.7) °F	53%
July	25.1 °C	(77.2) °F	30.4 °C	(86.7) °F	81%
August	24.6 °C	(76.3) °F	29.8 °C	(85.6) °F	83%
September	23.8 °C	(74.9) °F	29.9 °C	(85.9) °F	82%
October	20.6 °C	(69) °F	29.4 °C	(84.9) °F	71%
November	16.2 °C	(61.1) °F	26.8 °C	(80.2) °F	62%
December	12.2 °C	(53.9) °F	23.4 °C	(74.1) °F	64%

FIGURE 3.4: AVERAGE ANNUAL RAINFALL OF SINGRAULI DISTRICT FROM 1990-2023



4.0 STRATEGIES & ACTION PLAN

Micro-Watershed development plays a pivotal role in conserving and restoring the ecological integrity of watersheds, which are vital for ensuring the sustainable management of water resources. This holistic approach encompasses a diverse array of strategies aimed at not only conserving but also enhancing the natural functions of watersheds.

Activities such as soil conservation, reforestation, and water management interventions are key components of watershed development efforts. Soil conservation measures, including terracing and contour plowing, help prevent soil erosion and sedimentation, thereby preserving soil fertility and improving water quality. Reforestation initiatives involve planting native tree species to restore degraded forest areas, which not only enhances biodiversity but also promotes groundwater recharge and regulates hydrological cycles. Additionally, water management interventions such as the construction of check dams and percolation ponds facilitate ground & surface water recharge, enhance infiltration, and mitigate the impacts of floods and droughts.

4.1 STRATEGIES FOR MICROWATERSHED DEVELOPMENT

4.1.1 Micro Watershed Development Scheme

A number of micro watershed development schemes are practiced in India. The selection of suitable techniques for artificial recharge depends on various factors, which includes:

- Quantum of non-committed surface run-off available.
- Rainfall pattern
- Land use and vegetation
- Topography and terrain profile
- Soil type and soil depth
- Thickness of weathered / granular zones
- Hydrological and hydro-geological characteristics
- Socio-economic conditions and infrastructural facilities available
- Environmental and ecological impacts of artificial recharge scheme proposed.

The following guidelines can be followed to select a site for an artificial micro watershed development scheme:

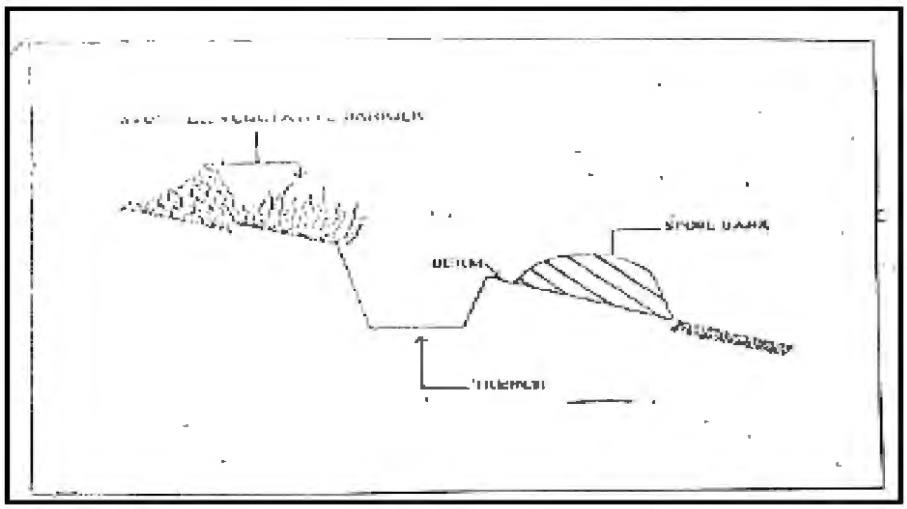
- Adequate space for surface storage is available.
- Water level is deep enough (> 8 m) and adequate sub-surface storage is available.
- Permeable strata are available at shallow/moderate depth.
- Adequate quantity of surface water is available for recharge.
- Adequate surface drainage density is present.
- Considering the geological and hydro-geological formations of the area, the following micro watershed development schemes are recommended:
- Contour Trenches.
- Gully Plugs, Nala Bunds, Check Dams.
- Recharge Pit/Recharge Shaft.

Contour Trenches

Contour trenches are rainwater harvesting structures, which can be constructed on hill slopes as well as on degraded and barren waste lands in both high- and low- rainfall areas. Cross section of a typical contour trench is shown in Figure 4.1**.** The trenches break the slope at intervals and reduce the velocity of surface runoff. The water retained in the trench will help in conserving the soil moisture and ground water recharge.

The size of the contour trench depends on the soil depth and normally 1000 to 2500 sq. cm cross sections are adopted. The size and number of trenches are worked out based on the rainfall proposed to be retained in the trenches. The trenches may be continuous or interrupted and should be constructed along the contours. Continuous trenches are used for moisture conservation in low rainfall area whereas intermittent trenches are preferred in high rainfall area. The horizontal and vertical intervals between the trenches depend on rainfall, slope and soil depth. In steeply sloping areas, the horizontal distance between the two trenches will be less compared to gently sloping areas. In areas where soil cover is thin, depth of trenching is restricted and more trenches at closer intervals need to be constructed. In general, the horizontal interval may vary from 10m in steep slopes to about 25 m in gentle slopes.

FIGURE 4.1: A TYPICAL SECTION OF CONTOUR BUNDS



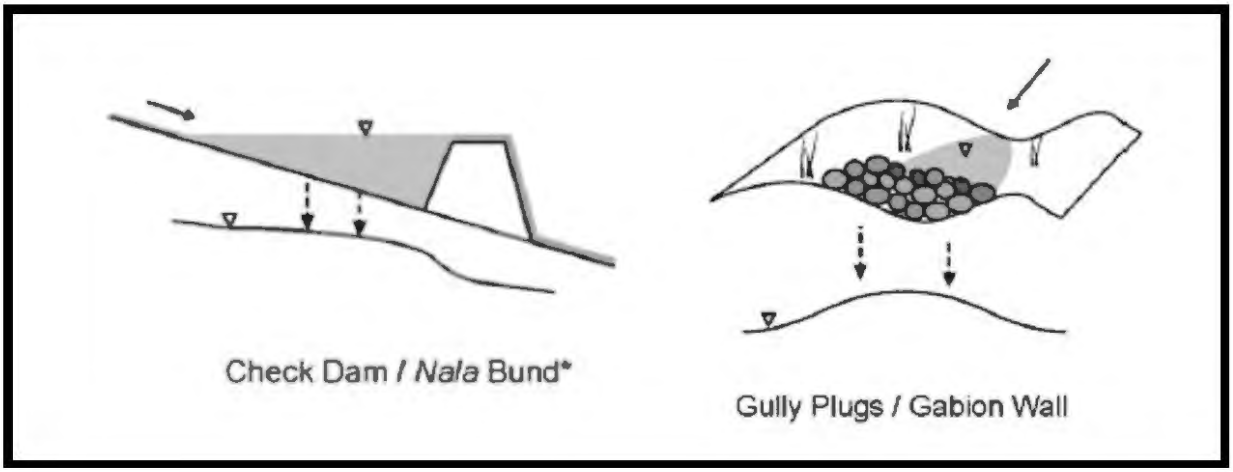
Gully Plugs, Nala Bunds and Check Dams

These structures are constructed across gullies, nalas or streams for impeding the flow of surface water in the stream channel and water is retained for a longer duration in the pervious soil or rock surface. As compared to gully plugs, which are normally constructed across 1st order streams, nala bunds and check dams are constructed across bigger streams, in areas having gentler slopes. These may be temporary structures such as brush wood dams, loose/ dry stone masonry check dams constructed with locally available material or permanent structures constructed using stones, brick and cement. Competent civil and agro-engineering techniques are to be used in the design, layout and construction of permanent check dams to ensure proper storage and adequate outflow of surplus water to avoid scours on the downstream side for long term stability of the dam. Gabion structure is also a kind of check dam constructed across small streams to conserve stream flows using locally available stones and a steel wire mesh, with practically no submergence beyond the stream course.

The site selected for check dam should have sufficient thickness of permeable soils or weathered material to facilitate recharge of stored water within a short span of time. The water stored in these structures is mostly confined to the stream course and the height is normally less than 2 m. These are designed based on stream width and excess water is allowed to flow over the wall. In order to avoid scouring from excess run off, water cushions are provided on the downstream side. To harness the maximum run off in the stream a series of such check dams can be constructed to have recharge on a regional scale.

A series of small bunds or weirs may be constructed across selected nala sections such that the flow of surface water in the stream channel is impeded and water is retained on pervious soil/rock surface for a longer duration. A nala bund acts like a mini percolation pond. A typical section of a check dam/Gulley Plugs is given in Figure 4.2**.**

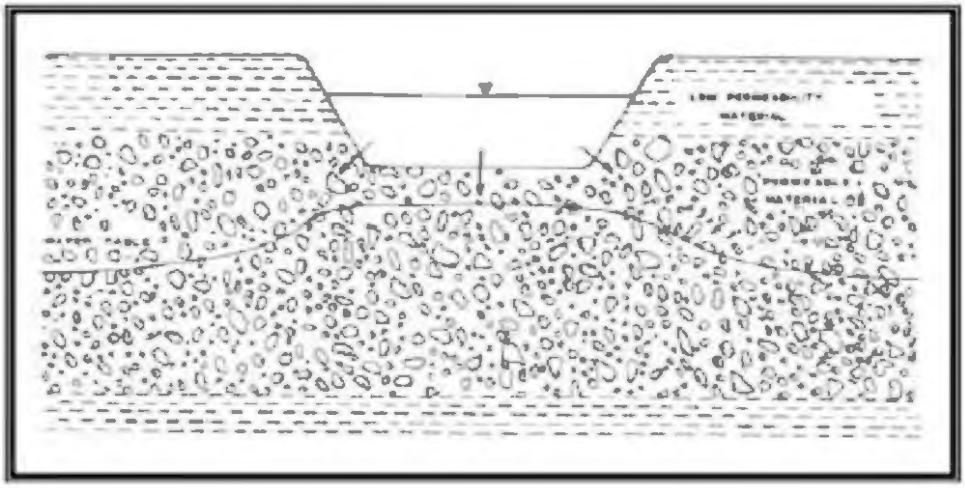
FIGURE 4.2: TYPICAL SECTION OF A CHECK DAM/GULLEY PLUGS



Recharge Pit/Recharge Shaft

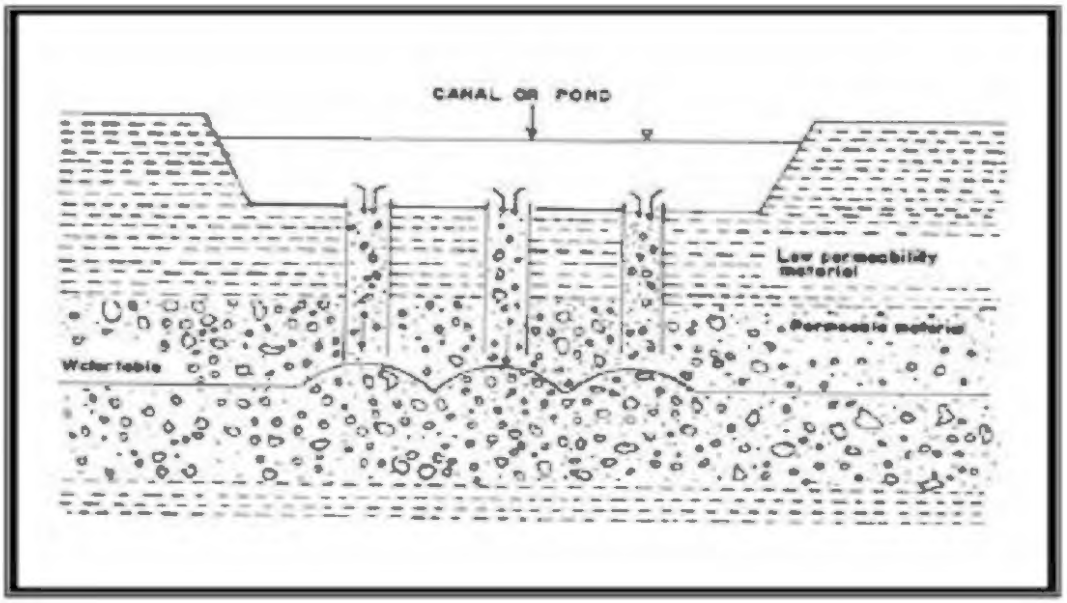
Recharge pits are normally excavated pits, which are sufficiently deep to penetrate the low-permeability layers overlying the unconfined aquifers (Figure 5.3). They are similar to recharge basins in principle, with the only difference being deeper and having restricted bottom area.

FIGURE 4.3: A TYPICAL SECTION OF A RECHARGE PIT



Recharge Shafts are similar to recharge pits but are constructed to augment recharge into phreatic aquifers where water levels are much deeper and the aquifer zones are overlain by strata having low permeability (Figure 4.4).

FIGURE 4.4: A TYPICAL SECTION OF A RECHARGE SHAFT



A comprehensive rainwater harvesting system is vital for sustainable water management. The system proposed to be installed within buffer zone of Mahan TPP would encompass various components to maximize rainwater capture and recharge groundwater levels along with the stream network in the buffer zone.

Surface runoff collection channels: Construction of surface runoff collection channels would be done that would involve creating channels or swales to redirect surface runoff from paved or compacted surfaces, such as roads and pathways, towards recharge structures. These channels would help to prevent erosion, reduce flooding, and facilitate ground and surface water replenishment by directing runoff to designated recharge areas.

Storage tanks: Storage tanks play a crucial role in rainwater harvesting systems by storing collected rainwater for later use or infiltration into the ground. Placement of properly sized storage tanks would ensure sufficient storage capacity to accommodate rainwater runoff during peak precipitation events, thereby maximizing groundwater recharge potential.

4.2 ACTION PLAN

The micro-watershed development plan can be tailored to address the specific environmental challenges and opportunities within the area that include:

1. Reforestation: Planting native tree species in the buffer zone to restore degraded forest areas and enhance vegetative cover. This would help reduce soil erosion, regulate water flow, and promote ground water recharge.

Miyawaki Plantation Technique

In the proposed development of micro watershed within the identified wasteland areas around Mahan TPP, the innovative Miyawaki technique is proposed for implementation as a measure for reforestation. The method involves densely planting native species in multiple layers to accelerate forest growth and biodiversity thereby promoting ground water recharge. By harnessing this technique, the wasteland areas can be transformed into lush green spaces teeming with diverse flora, contributing significantly to environmental restoration by reducing soil erosion and regulating water flow. The detail of the Miyawaki plantation technique is as follows:

Integrating the concepts of ecological successions, potential natural vegetation (PNV), cooperative processes of high-density plating in humus rich soils, Dr. Akira Miyawaki developed the ecological engineering technique popularly known as “Miyawaki method” in the early 1970s for the restoration of indigenous forests in Japan using native tree species. This crowd foresting technique built a dense and efficient forest ecosystem as equivalent as that of a 100–150-year-old forest in a short span of 20-30 years if developed in compliance with the recommended steps. Four stages of the Miyawaki foresting technique for development of a forest includes:

Initial Survey of the Locality:

The initial survey of the study area would be undertaken to develop an understanding about the soil characteristics of the site and the potential natural vegetation of the locality. According to different definitions PNV covers either the original vegetation or the subsequent vegetation established naturally in the area subsequent to any major environment al changes like soil erosion. The underlying idea is the planting native vegetation would help forest cover to get established even under no human interference in later stages of the forest development process.

Collection of Seeds:

The stage commences once the tree species for plantation have been identified. Identification of trees should be planned in such a way that the forest after establishment be a multilayered one. Hence, identified tree species are divided into four layers such as shrub, tree, sub tree and canopy layers and percentage of each tree species would be decided accordingly. Seeds

of the selected vegetation are collected in large numbers from a natural forest locally or from a similar geo-climatic area and germinate them properly in a nursery bed. The seedlings would be transplanted at 2-3 leaves stage to grow in bags filled with potting mixture prepared using equal amount of soil, coir pith/wood chips, rice/wheat hull and dry cow dung. The plants would be kept under partial shade for a minimum period of 2-3 months before planting in the main field.

Preparation of the Planting Site:

The stage begins with loosening the soil by incorporating organic biomass like wood chips, coir pith, bagasse, rice or wheat hull etc. so that the soil holds more water. For this, the first step would be digging the soil up to one metre deep. Then, the soil to a depth of 50 cm would be taken out and filled with a mixture of soil (20-30 cm topsoil of the site), locally available organic biomass, and dry cow dung. Additionally, microorganisms isolated from a natural forest soil would be used to enhance the soil fertility of the new forest. This loosened fertile soil would help the samplings to grow fast with better spread of roots deep into the soil.

Plantation:

Plantation would be done densely where one square meter area accommodates at least 4 trees with different layers (1 canopy level,1 tree level, 1 sub tree level and 1 shrub level) for a multilayered forest.The site would be mulched using any organic mulch preferably rice/wheat straw to protect the soil from being eroded. As the soil is loose, saplings need to be supported with sticks to withstand conditions like wind, heavy rain etc. The planted site would be managed with timely irrigation and weeding in the first 2-3 years. Once the trees attain a height of 2 meters or more the forest would not require any human interference to grow further.

The subsequent section meticulously outlines a comprehensive, step-by-step process for implementing the Miyawaki plantation technique, providing detailed guidance for the successful development of green cover within the identified wasteland areas around Mahan TPP.

Step 1: Soil Analysis and Soil Preparation

Understanding the texture of the soil helps to analyse the water holding capacity of the soil, the capacity of root perforation, water infiltration, and retention of nutrients by the soil. This includes assessment of soil parameters like physical texture, organic carbon, nitrogen, soil pH, potassium, phosphorus and visible evidence of micro or macro fauna in the soil. This analysis helps to design natural methods for treatment of soil. This includes use of perforation material such as wheat, groundnut shells, corn husk, rice husk which will significantly improve perforation and help the roots to grow. Water retention materials like coco peat and sugarcane stock help the soil retain water and moisture. Addition of vermicompost, cow manure helps to improve the soil nutrient conditions. Addition of cultures of bacteria and mycorrhiza can also be decided based on the assessment results. Soils that are deficient in

nitrogen would benefit immensely through Arbuscular Mycorrhizal Fungi (AMF) and nitrogen fixing bacteria like Rhizobium. AMF is available commercially and can even be cultured. Nitrogen fixing bacteria can be cultured and can also be added to the soil by planting nitrogen fixing leguminous plants. Soil texture also needs to be studied. Loamy soils are the most preferred as they contain a good mix of sand, clay and organic matter and provide the ideal balance of water, nutrients as well as drainage, thereby supporting good plant growth. At the end, it is essential to add a layer of mulch. This will protect and insulate the soil, thereby preventing excessive water loss due to evaporation. Some excellent options are dried grass, dried leaves, barley stalk, wheat stalk, rice straw, and corn stalk.

For preparation of the soil for afforestation, various biomass materials can be added which includes:

• **Ingredients for the Soil-**

(i) Adding perforator materials such as wheat, groundnut shells, corn husk, rice husk will significantly improve perforation and help the roots to grow.

(ii) Water retainers should be added next to help the soil retain water and moisture. Materials such as sugarcane stalk and cocopeat are recommended.

(iii) For the soil to receive nutrition, organic fertilizers such as vermicompost, cow manure can be used.

(iv) The final step would be to add a layer of mulch as it protects and insulates the soil. It also prevents sun rays to fall directly on the soil and ensures that the water in the soil does not evaporate. Some excellent options are dried grass, dried leaves, barley stalk, wheat stalk, rice straw, and corn stalk.

• Organic fertilizers- The ground requires fertilizer to provide nutrients for plant growth. Some organic fertilizers are cowpat, goat muck and vermicompost.

• Perforating materials- These materials are helpful for plants to penetrate their roots deeper into the ground. Rice husk, wheat husk, or groundnut shells can be an excellent resource to increase perforation.

• Water retainers- A ground must have significant water retention power to develop a forest. An afforest can add coconut coir and peat moss to strengthen the soil's water retention power.

• Mulch- It is usually layered over the ground to protect it from the scorching sun. It is vital, especially for saplings, as their growth may be affected in dried soil. Afforests can use decaying leaves, dried bark, or even composts.

Step 2: Determination of Native Species and Floral Composition through Quadrat Survey

This step involves developing a database of the floral diversity through a quadrat survey in a native forest in the same agroclimatic zone as the site where the Miyawaki forest is aimed to be developed. Through this survey, the potential natural vegetation can be determined. The same also needs to be validated using secondary information such as the published flora of the region (in India, the Botanical Survey of India regularly updates the flora of different regions and the same should be referred to). The data (quantitative and qualitative), thus collected will help to develop the plant community composition that will be developed through the Miyawaki technique. The community composition should comprise of plants of all forms (trees, shrubs, herbs) in order to develop a natural forest. Species selection should be done in a manner that a mix of flowering, medicinal, timber, and fruiting species are chosen. While choosing the trees for the Miyawaki forest to be developed, emphasis should be given on selecting the 5 most dominant native trees (based on the results from the quadrat analysis). These trees will constitute around 50 percent of the floral diversity of the forest. The next abundant native species (based on the results from the quadrat analysis) will constitute 25-40 percent of the forest. The rest of the forest will be comprised of native species which have been found in the next level of abundance in the quadrat study.

The detailed step by step approach for the second step is as follows:

• Afforests must select the native plant species and identify their genus (deciduous or evergreen), height and influence on nature.

• Foresters must allocate those plants in layers, depending on all the above factors.

• 40 to 50 per cent of the total number of trees must comprise the most commonly found species in one's neighborhood. Foresters must choose at least 5 different genera that would be the significant species in that forest.

• Some moderately found native species will compose 25 to 40 per cent as supporting plants. Finally, some other minor species will constitute the rest of the forest.

• Afforests need to collect saplings of these species, which must be in a minimum height of 60 to 80 cm.

Step 3: Preparation of the Ground and Equip the Afforestation Area

The step involves meticulous preparation of the ground and equipping the afforestation area for optimal growth and development of the green belt. This crucial phase entails clearing the land of any debris or obstacles, ensuring a clean and uniform surface for planting. The soil is then carefully prepared through techniques such as loosening, aeration, and soil amendment to create a nutrient-rich substrate conducive to plant growth. Additionally, irrigation infrastructure may be installed to provide adequate water supply, essential for the establishment of young saplings. Furthermore, protective measures such as fencing or barriers may be implemented to safeguard the afforestation area from potential disturbances

or encroachments. By meticulously preparing the ground and equipping the site with essential resources, it sets the stage for the successful implementation of the Miyawaki technique, facilitating robust growth and biodiversity enhancement within the green belt.

The subsequent section presents the detailed step by step approach for ground preparation and equipping the area proposed for afforestation.

• Before starting the planting process, afforests must inspect the ground to determine the possibilities and practicality of this project.

• The soil of this area must be clean from any debris and weed.

• It also must catch sunlight for at least 8-9 hours a day to start afforestation under the Miyawaki method.

• Foresters must install irrigation facilities, create 100 sq meter mounds and demark those before sowing.

Step 4: Undertaking Plantation

This is the most critical step for the successful establishment of a Miyawaki forest. The sub-steps that need to be followed are: In the plantation area, separate plantation bed area needs to be drawn out. The soil needs to be excavated for 3-4 feet. This excavated soil then needs to be mixed with the appropriate amounts of perforators, organic fertilizers and water retainers. The mixed soil should then be put back into the land. Care needs to be taken that the land does not get compressed at this stage and should be left aerated and loose. The levelled soil needs to be marked with chalk and pits (12”X12”) should be dug at every 1.5-2 feet, in a triangular manner. The saplings should then be placed in these pits, taking care that saplings of the same species are not planted next to each other. After the sapling is planted, 4-5 feet bamboo sticks should be inserted in the soil, close to the sapling. This will help prevent the sapling from drooping or bending in the first few months. Finally, a 5-7-inch-thick layer of mulch should be added to the soil (a minimum of half kg of mulch per tree needs to be added). For the first time, the saplings must be watered for an hour to make sure the mulching and the soil settle down. Tree density of 3trees/m^2 is ideal.

The subsequent section presents step by step approach for undertaking plantation.

● Outline the area to plant with chalk powder.

● Within the area of planting, draw out the plantation bed area and sperate the service area.

● Excavate the soil for about 3-4 feet and keep the excavated soil on the side.

● Mix the perforators, organic fertilizers, and water retainers, without any clumps. Ensure that they are mixed in the same ratios for each mound.

● Push back the mixed soil to fill the land. Ensure that the land is not compressed or walked upon. The idea is to leave the soil aerated and loose.

● Level the soil with hand tools.

● Mark the leveled soil with chalked powder for creating pits every 1.5-2 feet, in a triangular formation.

● Dig pits that are 12 inches wide and 12 inches deep.

● Place the saplings depending on the number of varieties you have and how your grid is created. For instance, if you have 30 species of trees, then mark the grid based on 30 pits.

● Before removing the saplings from their bags, dip the bags in a bucket that is filled with 20 part water, and 1 part Jeeva Amrut, or gaumutra, or coffee mix. Ensure that all the bubbles are settled before removing the sapling bags.

● Remove the sapling from the bag, place it in the pit, and loosely cover it with soil.

● Try not to plant two similar species next to each other and don't follow any pattern while planting. Maintain a 60cm distance between each sapling.

● After planting the saplings, insert 4-5 feet of bamboo sticks into the soil, close to the plant. These support sticks will ensure the saplings don't bend or droop during the first few months.

● Add a 5–7-inch layer of mulch in the soil. Consider at least half a kilo of mulch per tree. Tie it down with jute ropes to ensure the mulch doesn't fly around during strong winds. Tie the ropes on bamboo pegs that are nailed at the forest periphery. This will ensure that the rope is pressed down on the mulch.

● For the first time, the trees must be watered for an hour to make sure the mulching and the soil settle.

Step 5: Maintenance & Monitoring

The step involves critical tasks aimed at nurturing the newly planted saplings and facilitating their healthy growth. By meticulously levelling the soil and marking out pit locations, the groundwork is laid for the systematic planting of saplings. Careful preparation of saplings, including dipping them in a water-based solution for hydration, precedes their placement in the pits. Once planted, the saplings are secured with support sticks to prevent bending or drooping. Addition of mulch serves to retain moisture and provide essential nutrients to the soil, promoting optimal growth. Finally, watering the newly planted saplings ensures that they are adequately hydrated and settle into their new environment. These meticulous steps are essential for the successful establishment of a thriving green belt using the Miyawaki technique.

FIGURE 4.5: SCHEMATIC DIAGRAM OF MIYAWAKI PLANTATION TECHNIQUE

FIGURE 4.6: IMPLEMENTATION OF MIYAWAKI PLANTTAION TECHNIQUE

2. Soil conservation: Implementing soil conservation measures such as contour bunding, vegetative barriers, and mulching to prevent soil erosion and improve soil moisture retention.

This would contribute to enhancing the resilience of ecosystems and promoting sustainable land use practices.

3. Water management infrastructure: Constructing a variety of water management structures, such as check dams, percolation ponds, recharge wells, and deepening existing ponds, plays a crucial role in harvesting rainwater, controlling surface runoff, and facilitating groundwater recharge. These interventions are essential for mitigating the impacts of water scarcity and ensuring a reliable water supply for local communities and ecosystems.

- **Check dams**: These small barriers are built across streams and rivers to slow down water flow, allowing water to seep into the ground and recharge aquifers. They help in reducing soil erosion and increasing soil moisture content, benefiting agricultural lands and nearby vegetation. Table 4.1 presents the detail of check dams proposed to be constructed for micro-watershed development in Nagwa and other areas within the buffer zone of Mahan TPP.

TABLE 4.1: PROPOSED LOCATIONS FOR CONSTRUCTION OF CHECK DAMS (FY 2024-25)

S.No.	Check Dam	Location
1	Shiv Mandir, Nagwa	Nand Vihar,Nagwa
2	Dhobiyan Tola Nagwa	Nagwa

- **Percolation ponds**: These ponds are designed to capture and hold rainwater, enabling it to percolate slowly into the ground. By enhancing groundwater recharge, percolation ponds help maintain the water table and provide a sustainable source of water for various uses. Table 4.2 presents the detail of ponds proposed to be developed during 2024-25 within the vicinity of Mahan TPP.

TABLE 4.2: DETAIL OF LOCATIONS FOR PROPOSED DEVELOPMENT OF PONDS (FY 2024-25)

S.No.	Pond Name	Location	Area Covered (Cubic meter)
1	Dih baba Pokhara	Raila	3750
2	R&R Colony Pokhara	R&R Colony,Nagwa	1369
3	Bandhaura Shiv Mandir Pokhara	Bandhaura	1674

- **Recharge wells:** These wells are specifically constructed to facilitate the direct infiltration of rainwater into the underground aquifers. By channeling rainwater runoff into recharge wells, we can significantly improve groundwater levels and ensure long-term water availability. The proposed locations for installation of rainwater harvesting system (RWHS) within the study area has been presented in Table 4.3.

FIGURE 4.3: PROPOSED LOCATIONS FOR INSTALLATION OF RWHS (FY 2024-25)

S.No.	Name of Institution	Location
1	SSM School Nagwa	Nand Vihar, Nagwa
2	Primary Health Center,Nagwa	R&R Colony Nagwa

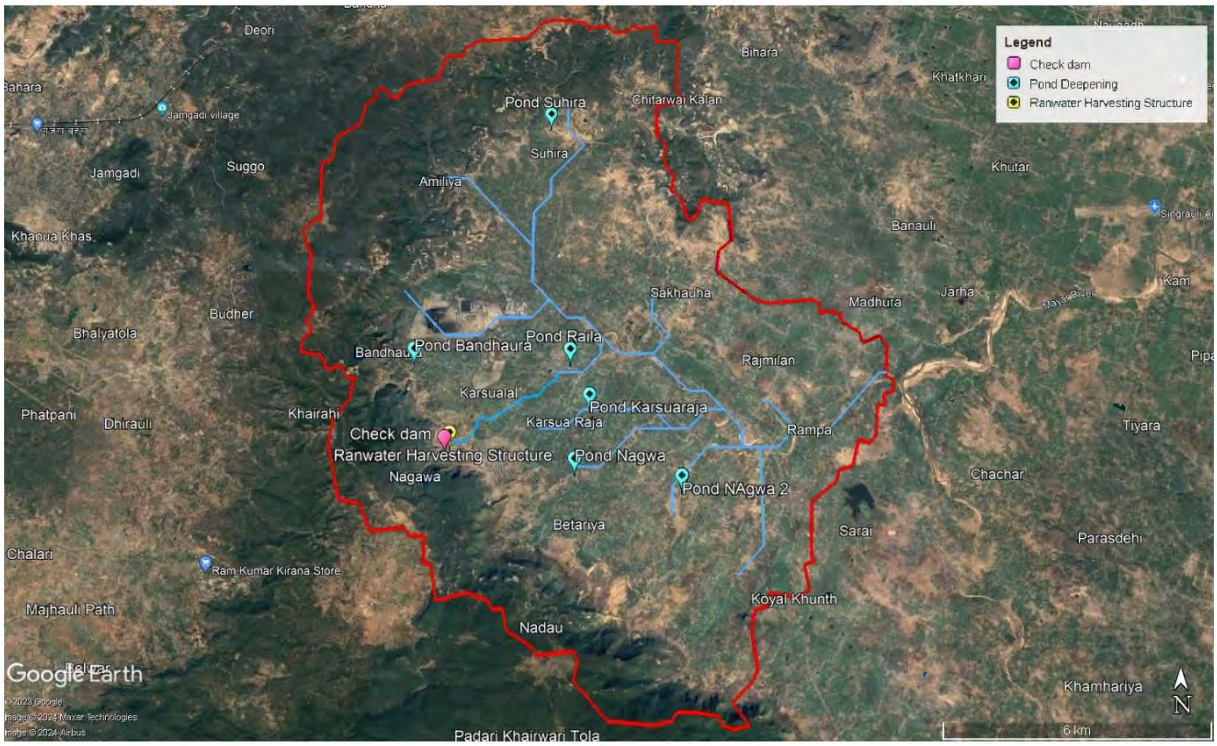
- **Pond deepening:** Deepening existing ponds increases their storage capacity, allowing them to capture and hold more rainwater during the monsoon season. This additional water can then percolate into the ground, contributing to groundwater recharge and providing a reliable water source during dry periods. Table 4.4 presents the detail of ponds identified for deepening within the buffer zone of Mahan TPP.

TABLE 4.4: DETAIL OF LOCATIONS FOR PROPOSED DEEPENING OF PONDS FY 2024-25

S.No.	Pond Name	Location	Praposed Area Covered (Cubic meter)
1	Gau Shala Pokhara,	Suhira	1200
2	Pokhari tola Pokhara	Amiliya	1200
3	Bazar Pokhara Karsua	Karsuaraja	1200
4	Talab Jamgarhi	Jamgarhi	1200
5	Dhobiyan Tola Pokhara	Nagwa	1200
6	Chhotaki Pokhara	Nagwa Gate	1200

Integration of watershed development plan into the management of the buffer zone of Mahan TPP would lead to the conservation of natural resources, promotion of ecological sustainability, and enhancement of community resilience in the surrounding area. Figure 4.5 depicts the potential areas identified for development of micro-watershed in the buffer zone.

FIGURE 4.7: PROPOSED LOCATIONS FOR DEVELOPMENT OF MICRO WATERSHED IN THE BUFFER ZONE OF MAHAN TPP



4.3 COST ESTIMATE

The estimated cost of reforestation, construction of check dams, groundwater recharge and deepening of ponds for development of micro watershed within 10 Km buffer zone of Mahan TPP has been calculated. The total estimated budget for the implementation of green belt development plan is **92.00 Lakhs INR.**

TABLE 4.5: BUDGET FOR MICRO WATERSHED DEVELOPMENT PLAN

Sl No.	Components	Budget (Rs. in Lakhs)
1	Cost of reforestation including maintenance for 5 years and establishment charges @ Rs 60,000/ha for 22.00 ha	13.00
2	Construction of check dams (2nos. @Rs 1500000)	30.00
3	Pond Deepening (6nos. @Rs 500000)	30.00
4	Rainwater Harvesting Structure (2nos. @750000)	15.00
5	Contingency	4.00
Total		**92.00**

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