EXECUTIVE SUMMARY

PROPOSED EXPANSION OF KAWAI THERMAL POWER PLANT UNDER PHASE–II BY ADDING 3200 (4x800) MW ULTRA SUPER CRITICAL THERMAL POWER PLANT TO EXISTING 1320 (2x660) MW AT VILLAGE KAWAI, TEHSIL ATRU, DISTRICT BARAN, RAJASTHAN

PROJECT PROPONENT

Adani Power Limited

ENVIRONMENTAL CONSULTANT

GAURANG ENVIRONMENTAL SOLUTIONS PVT. LTD.

(NABET/EIA/23-26/RA 0338)

May'2025

EXECUTIVE SUMMARY

1. INTRODUCTION

Adani Power Limited (APL), a part of the diversified Adani Group, is the largest private thermal power producer in India. Having thermal power plants generation capacity of 17,510 MW comprising coal based thermal power plants in Gujarat, Maharashtra, Karnataka, Tamil Nadu, Rajasthan, Chhattisgarh, Madhya Pradesh, Jharkhand states of India.

Adani Power Limited (APL), Kawai has proposed Expansion of Kawai Thermal Power Plant under Phase–II by adding 3200 (4x800) MW Ultra Super Critical Thermal Power Plant to Existing 1320 (2x660) MW at Village Kawai, Tehsil Atru, District Baran, Rajasthan.

The proposal for Terms of Reference (ToR) was considered & appraised in 9th meeting & 11th meeting of Expert Appraisal Committee (Thermal Power Projects), MoEF&CC held on 07.05.2024 & 27-28. 05. 2024. The project was granted with Terms of Reference (ToR) vide F no. J-13012/154/2008-IA.II (T) dated 29.07.2024 by the MoEF&CC, New Delhi. Copy of ToR Letter for proposed expansion project of APL is enclosed as **Annexure 1.**

2. DESCRIPTION OF THE PROJECT

The salient features of the project are given below: -

Table 1: Salient features of the project

S. No.	Particular		Details		
1.	Project sector & category	:	1(d), Thermal Power Plants & Category "A"		
			Existing	**Proposed**	Total
2.	Plant capacity	:	1320 MW (2 x 660) MW	**3200 MW** **(4 x 800) MW**	4520 MW (1320+3200) MW
3.	Land requirement (In Hectare)	:	350	**472.45** *(includes 1.758 Ha. Forest Area outside power plant premises for Coal Conveyor after Forest dept. inspection)*	822.45

4.	Greenbelt & Plantation (In Hectare)	:	120	**169.44**	289.44 Ha (35%)
5.	Technology	:	Super-critical	**Ultra Super-critical**	Super-Critical & Ultra Super-Critical
6.	Coal requirement in (Million MTPA)	:	5.50	**12.9**	18.4
7.	Source of fuel	:	Coal from Coal Mines of Jitpur, Rampia, Ujheni & e-auction for proposed project.		
8.	Coal transportation	:	Through Rail.		
9.	Ash Generation (Million MTPA)	:	5.16		
10.	Project Cost (Crores)	:	8264.59	**36,600**	44864.59
11.	Water requirement & Water allocation	:	34	**56**	90
			WRD permission for 34 MCM has already been obtained and the application for additional water allocation of 56 MCM has been submitted to WRD, Jaipur.		
12.	Water Source	:	From Parwan River/Dam through water pipeline		

Table 2: Details of Environmental Setting & Site Connectivity

S. No.	Particular	Particulars with Aerial distance & Direction
1.	Project Address	Village Kawai, Tehsil Atru, District Baran, Rajasthan
2.	Geographical Coordinates	S.NO. / Latitude / Longitude: 1 – 24°48'49.45" – 76°43'52.90"; 2 – 24°49'52.57" – 76°43'13.78"; 3 – 24°49'18.09" – 76°43'9.64"; 4 – 24°50'16.91" – 76°42'16.70"; 5 – 24°50'17.26" – 76°41'49.49"; 6 – 24°48'52.21" – 76°42'36.87"; 7 – 24°48'12.53" – 76°43'23.90"; 8 – 24°48'7.23" – 76°43'44.16"; 9 – 24°47'20.05" – 76°43'34.43"; 10 – 24°47'17.07" – 76°43'58.42"; 11 – 24°47'2.40" – 76°44'42.01"; 12 – 24°45'43.52" – 76°44'29.90"
3.	SOI Toposheet	G43W9, G43W10, G43W13 & G43W14

<table>
<tr><th>S. No.</th><th>Particular</th><th>Particulars with Aerial distance & Direction</th></tr>
<tr><td>4.</td><td>Site elevation</td><td>Average site elevation – 315 m AMSL</td></tr>
<tr><td>1.</td><td>Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value.</td><td>There are no protected areas under international conventions in study area for their landscape & cultural value. There are 15 no. of PF & R.F. within 10 km of the project site.</td></tr>
<tr><td>2.</td><td>Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests.</td><td>
<table>
<tr><th>Particulars</th><th>Distance (In km)</th><th>Direction</th></tr>
<tr><td colspan="3">Reserve Forest (R.F), Protected Forest (P.F)</td></tr>
<tr><td>Kheldi birdagaddiyan block forest</td><td>Adjoining</td><td>E</td></tr>
<tr><td>Kawai kalan block forest</td><td>Adjoining</td><td>SSE</td></tr>
<tr><td>Dara block forest</td><td>Adjoining</td><td>W</td></tr>
<tr><td>Bir daranimoda block (R.F.)</td><td>Adjoining</td><td>N</td></tr>
<tr><td>Kawai block forest</td><td>0.12</td><td>W</td></tr>
<tr><td>Bir sunda umriwala block (R.F.)</td><td>0.4</td><td>E</td></tr>
<tr><td>Baldevpura block</td><td>0.55</td><td>N</td></tr>
<tr><td>Chhatarpura block forest</td><td>0.85</td><td>WNW</td></tr>
<tr><td>Bir parlya block forest</td><td>3</td><td>WSW</td></tr>
<tr><td>Ratan block forest</td><td>3.1</td><td>NNW</td></tr>
<tr><td>Dilod block (P.F.)</td><td>3.2</td><td>N</td></tr>
<tr><td>Narsinghpura (P.F.)</td><td>3.2</td><td>ENE</td></tr>
<tr><td>Ugrapura (P.F.)</td><td>6.3</td><td>WSW</td></tr>
<tr><td>Bir govindpura block</td><td>7.8</td><td>NNW</td></tr>
<tr><td>Sigri block (P.F.)</td><td>7.9</td><td>N</td></tr>
<tr><td colspan="3">Rivers, Nala, Water Bodies</td></tr>
<tr><td>Particulars</td><td>Distance (in km)</td><td>Direction</td></tr>
<tr><td>Lhasi nadi</td><td>0.35</td><td>SSE</td></tr>
<tr><td>Andheri nadi</td><td>0.55</td><td>E</td></tr>
<tr><td>Rhupsi nala</td><td>5</td><td>WSW</td></tr>
<tr><td>Kukar talav</td><td>6.9</td><td>WSW</td></tr>
<tr><td>Ghoghra nala</td><td>7.5</td><td>W</td></tr>
<tr><td>Prabati canal</td><td>7.7</td><td>NNW</td></tr>
</table>
</td></tr>
<tr><td>3.</td><td>Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging,</td><td>None in 10 km radius</td></tr>
</table>

<table>
<tr><th>S. No.</th><th>Particular</th><th>Particulars with Aerial distance & Direction</th></tr>
<tr><td></td><td>resting, over wintering, migration.</td><td></td></tr>
<tr><td>4.</td><td>Inland, coastal, marine or underground waters.</td><td>List of water bodies within the 10 km radius is given above.</td></tr>
<tr><td>5.</td><td>State, National boundaries</td><td>Rajasthan-Madhya Pradesh inter-state boundary at a distance of about 7.5 km in East direction.</td></tr>
<tr><td>6.</td><td>Nearest highway/major road/routes or facilities used by the public for access to recreation or other tourist, pilgrim areas</td><td>
<table>
<tr><th>Particulars</th><th>Distance (in km)</th><th>Direction</th></tr>
<tr><td>SH 37A</td><td>0.2</td><td>West</td></tr>
<tr><td>SH51</td><td>1.0</td><td>SW</td></tr>
<tr><td>MDR 4</td><td>4.9</td><td>NW</td></tr>
</table>
**Source: Distance taken from Google earth imagery.*
</td></tr>
<tr><td>7.</td><td>Défense installations</td><td>None in 10 km radius</td></tr>
<tr><td>8.</td><td>Densely populated or built-up area / Major Town</td><td>There is no densely populated habitation that exists near the proposed site. Atru town is located about 4.10 km in the NNW direction.</td></tr>
<tr><td>9.</td><td>Nearest habitation</td><td>
<table>
<tr><th>Habitation /Village</th><th>Distance (Km)</th><th>Direction</th></tr>
<tr><td>Kawai</td><td>1.0</td><td>SW</td></tr>
<tr><td>Phulbaroda</td><td>1.4</td><td>ESE</td></tr>
<tr><td>Bilkhera</td><td>2.0</td><td>E</td></tr>
<tr><td>Barlan</td><td>2.0</td><td>WSW</td></tr>
</table>
**Source: - Distance taken from Google earth imagery.*
</td></tr>
<tr><td>10.</td><td>Major industries / manufacturing units</td><td>None in 10 km radius</td></tr>
<tr><td>10.</td><td>Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)</td><td>
<table>
<tr><th>Particulars</th><th>Distance (in km)</th><th>Direction</th></tr>
<tr><td colspan="3">Education Facilities</td></tr>
<tr><td>Government primary school Atru,</td><td>4.0</td><td>NW</td></tr>
<tr><td>Govt. Sr. Sec. School, Atru</td><td>5.6</td><td>NW</td></tr>
<tr><td>Govt. upper primary school Barawda</td><td>8.2</td><td>WSW</td></tr>
<tr><td>Govt. School Nayagav</td><td>2.8</td><td>E</td></tr>
<tr><td colspan="3">Worship Places</td></tr>
<tr><td>Hindu temple, Kawai</td><td>1.1</td><td>SW</td></tr>
<tr><td>Radhe krishna mandir, Kawai</td><td>0.9</td><td>WSW</td></tr>
<tr><td>Narbadeshvar mahadev, Kawai</td><td>0.3</td><td>W</td></tr>
<tr><td>Hanuman mandir, Dilod</td><td>4.6</td><td>ENE</td></tr>
<tr><td colspan="3">Health Facilities</td></tr>
<tr><td>Govt. Hospital Atru</td><td>5.4</td><td>NW</td></tr>
<tr><td>Govt. Hospital, Kolukhera</td><td>1.8</td><td>ENE</td></tr>
<tr><td>Govt. Hospital Kawai</td><td>0.9</td><td>WSW</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S. No.</th><th>Particular</th><th>Particulars with Aerial distance & Direction</th></tr>
<tr><td></td><td></td><td>*Source: - Distance taken from Google earth imagery</td></tr>
<tr><td>16.</td><td>Areas already subjected to pollution or environmental damage.</td><td>The project area of APL does not comes under any CPCB declared Critically or Severely Polluted Areas.</td></tr>
<tr><td>17.</td><td>Areas susceptible to natural hazard which could cause the project to present environmental problems.</td><td>The project falls in Baran district of Rajasthan. The entire Baran District of Rajasthan falls under Seismic Zone II, low damage risk zone as per BMTPC, Vulnerability atlas Seismic Zone of India IS: 1893-2002.</td></tr>
<tr><td colspan="3">Site Connectivity (aerial distance as per google earth imagery from project boundary and direction from centre of project)</td></tr>
<tr><td>S. No.</td><td>Description</td><td>Details</td></tr>
<tr><td>1.</td><td>Nearest Highway / Major Road</td><td>
<table>
<tr><th>Particulars</th><th>Distance (in km)</th><th>Direction</th></tr>
<tr><td>SH 37A</td><td>0.2</td><td>West</td></tr>
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<tr><td>MDR 4</td><td>4.9</td><td>NW</td></tr>
</table>
*Source:-All distances are taken with respect to S.O.I. Toposheet
</td></tr>
<tr><td>2.</td><td>Nearest Railway Station</td><td>
<table>
<tr><th>Particulars</th><th>Distance (in km)</th><th>Direction</th></tr>
<tr><td>Salpura Railway Station on Katni-Bina line</td><td>Adjacent to the plant boundary</td><td>SW</td></tr>
</table>
</td></tr>
<tr><td>3.</td><td>Nearest Airport</td><td>
<table>
<tr><th>Particulars</th><th>Distance (in km)</th><th>Direction</th></tr>
<tr><td>Jaipur International Airport</td><td>238</td><td>NNE</td></tr>
</table>
</td></tr>
</table>

2.1 Process & Methodology

The proposed expansion project of 4x800 MW capacity power plant is mooted to deploy the state-of-art technology and accordingly four units of 800 MW are being considered with ultra-supercritical steam parameters to attain high cycle efficiency.

MAIN TECHNICAL FEATURES OF THE PROPOSAL

Power Generating Unit	:	Four 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 through Indian Railway, with in-plant coal handling system and finally feeding the bunker level conveyors.

Ash Disposal System	:	The Fly Ash will be collected in dry form in silos for all efforts will be made for 100% utilization of ash. Ash will be used for Cement manufacturing industries, abandoned mine, filling of low-lying area, manufacturing bricks, road construction, aggregate placement in concrete, etc. in compliance of Fly Ash Notification, 31.12.2021 and amendments. Provision will be made for disposal of un-utilized ash in high concentration slurry form to ash dyke.
Power Evacuation	:	At 400 kV level to State Transmission Utility (STU) or Central Transmission Utility (CTU)
Environmental Aspects	:	Elaborate arrangements for adequately designed electrostatic precipitator with more than 99.99% efficiency and Selective Catalytic Reduction (SCR)/SOFA systems complying with emission norms as per latest MoEF&CC are envisaged. Wastewater quality to be maintained as per MoEF&CC notification. Zero Plant Discharge facility shall be present since the cooling water, blow down water, wastewater and ash water would be recycled back to the system for Ash Handling after suitable treatment for reuse.

2.2 Ash Handling System

For each unit, Bottom ash will be collected in wet form; while fly ash will be collected in dry form to facilitate utilization. Fly ash and bottom ash shall be disposed via lean slurry /High Concentration Slurry disposal (HCSD/MCSD) system to Ash dyke in case of exigencies; Ash extraction system is unitized basis and ash disposal systems will be common for 4x800MW. Provision for truck disposal of both bottom and fly ash is provided.

For the design of the Ash Handling System, the following data has been considered for each Unit. Necessary design margin shall be considered while selecting the equipment capacity.

Table 3: Quantum of Ash Generation

Parameter	4x800MW
Hourly coal (3,200-4300 kCal/kg GCV) firing rate at TMCR condition based on 85% PLF, per Unit (Approx.)	368.15 TPH
Total ash content	40%
Bottom ash (BA + Eco. Ash) generation @ 20% (T/day)	2,828
Fly ash (ESP + APH Ash) generation @ 80% (T/day)	11,308
Total Ash generation (T/day)	14,136
Annual ash generation @ 85% PLF (MMTPA)	5.16

An MoU has been signed between APL and Ashtech (India) Private Limited, Mumbai, India for utilization of Fly ash for the proposed project.

2.3 DESCRIPTION OF THE ENVIRONMENT

The baseline environmental quality of air, water, soil, noise, socio-economic status, and ecology has been assessed during the period of October to December 2024 in the study area of project site.

2.3.1 Baseline data

Ambient air quality:

Eleven ambient air quality monitoring stations were selected in and around the project site. The results of the monitored data indicate that the ambient air quality were well within the prescribed limits by CPCB.

- PM10: The maximum value for PM10 was 69.5 µg/m3 and minimum value for PM10 was 42.5 µg/m3.
- PM2.5: The maximum value for PM2.5 was 48.3 µg/m3 and minimum value for PM2.5 was 24.2 µg/m3.
- SO2: The maximum value for SO2 was 10.9 µg/m3 and minimum value for SO2 was 2.1 µg/m3.
- NOx: The maximum value for NOx was 23.8 µg/m3 and minimum value for was 5.9 µg/m3.
- CO: The maximum value for CO was 0.9 mg/m3 and minimum value for CO was 0.3 mg/m3.
- Hg: Mercury levels were below detection limit at all the locations.

Water quality:

The baseline water quality status in the region is established by analyzing samples at nineteen locations consisting of eight ground water samples and seven surface water samples. It was found that both ground water and surface water quality is well within prescribed limits.

Results

Ground Water

Parameters	:	Results
PH	:	7.65 to 7.76
TDS	:	1038 mg/l – 1214 mg/l
Total Hardness	:	408 mg/l –477 mg/l
Total Alkalinity	:	160 mg/l –176 mg/ l

Surface Water

Parameters	:	Results
PH	:	6.78 to 7.11
DO	:	5.2 mg/l – 6 mg/l
BOD	:	2 mg/l -4 mg/l
COD	:	6 mg/l – 12 mg/l

Noise levels:

The observed noise levels adhere to CPCB standards, indicating acceptable noise pollution levels in the monitored locations.

Daytime Noise Level Leq(day)

Day time (Leqday) noise level is observed within the prescribed limit and standards.

Night time noise level Leq(night)

Night time (Leq night) noise level is observed within the prescribed limit and standards.

Soil Quality:

Samples collected from identified locations indicate that the soil is slightly alkaline with pH ranging from 7.41 to 7.65. The organic matter in the soil ranged from 0.73 % to 0.94%. The texture of soil observed in the study area is mostly sand.

Parameters	:	Results
PH	:	7.41 to 7.65 (Slightly alkaline)
Organic Carbon	:	0.73 % to 0.94%
NPK	:	10.4 to 12.6 mg/kg 10.8 to 14.8 mg/kg 160 to 210 mg/kg

Biological environment:

Core Zone: Flora:

Flora:

Core zone has been reported 22 trees, 9 shrubs, 14 Common Herb, Grasses and Climbers' species were found in core zone during field survey.

Fauna:

2 Mammalian species, 19 avifaunal, 2 herpetofauna, 3 butterflies, were observed.

Buffer zone:

Flora:

Buffer zone of the project area has been reported 110 trees, 42 shrubs & herbs, 13 Grasses, 12 climbers & 24 medicinal species.

11 agricultural species, 9 vegetable species & 10 fruits species were found in buffer zone during field survey.

About 13 aquatic flora, 13 phytoplankton species were reported.

Fauna:

17 Mammalian species, 141 Birds, 14 Herpetofauna, 18 butterflies', 15 moths and 09 aquatic species were observed in the 10 km buffer study area of the project.

Socio-Economic Environment:

Total population

In the study area, there are 20,014 households. The total population falling in the project area is 1,01,964 in 10 km radius. The total male population consists of 51.89% and female population accounts to be 48.11% of the total population. The sex ratio of the 10.0 km study area is 927 females over thousand males. There are approx 4 to 5 members in a family. The 0-6 population comprises of 14.82% of the total population of the study area. The sex ratio of 0-6 population is 898 females over thousand males. Figure shows the sex ratio of total population.

Literacy

Persons aged seven years and above, who can both read and write with understanding in any language, are considered literate. In the study area, the literate people are 1,03,634 which is 57.80% of the total population. The male literates are 69.49% of the total male population, and female literates are 45.18 % of the total female population.

In the study area, the illiterate people are 75,670 which is 42.20 % of the total population. The male illiterates are 30.50% of the total male population, and female literates are 54.81% of the total female population. Figure literates & illiterates within 10.0 km of the study area.

Working population

The work participation in the study area is 84,002 which accounts to be 46.85 % of the total population. The male work participation is 52.17 % with respect to male population and female work participation accounts to be 41.11 % with respect to female population in the study area. Figure shows the Total work participation population over the total population.

4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

During Construction Phase:

No significant impact is envisaged on the soil quality of the project area. Construction activities would be confined to the plant boundary. Therefore, no impact on the soil quality of the study area located beyond the plant boundary has been envisaged.

During Operational Phase:

4.1 Air Environment

PM from boilers will be controlled by the installation of ESP Dust suppression and bag filters for the coal handling systems will control PM emissions. De-NOx systems shall be provided to effectively control emission levels. Ash silos will be provided for collection of fly ash in dry form for further transportation to utilities.

Mitigation measures

APL, Kawai will comply as per the norms of MoEFCC, CPCB/SPCB standards for SO2, Nox & PM. Electrostatic Precipitator (ESP), De NOx system of SCR/ SOFA with low NOx burner, adequate Stack height is proposed with these controls, Hg emission is

expected to be brought below the emission limits as measured in various other TPPs in India.

Necessary dust suppression arrangement and bag filters will be used in railway siding and coal handling plant. The top surface of coal wagons will be adequately sprinkled to reduce fugitive emissions during transportation. Belt conveyors will be covered to minimize the fugitive dust emissions. Auxiliary fuel transportation will be occasional; hence its impact will be for a limited time period. The fly ash silos will be provided with bag filters to control emission. Regular housekeeping will be done at plant roads, platforms, and storage area.

4.2 Water Environment

Total wastewater from the project will be recycled, focusing on effluents from CW blowdown, WT plant, coal pile area runoff, and plant drains. Domestic sewage will be treated in the STP will be utilized in greenbelt/ plantation. Total Annual Recharge to Ground Water Regime of the area through rainwater harvesting structure would be **1,349,537.04 m^3/ annum**. No groundwater extraction, ensuring minimal impact on water resources.

The water requirement of 56 MCM/Year for makeup to the closed cycle re-circulation system of condenser cooling will be drawn from Parwan River/ Dam to plant site through existing water pipeline of about 18.4 km in length. The water drawl permission from WRD Jaipur, Rajasthan for 34 MCM/Year vide letter no. CEWR/TA (W)/1482 dated 11.08.2009 has already been obtained for 2x660 MW TPP. The application for additional water allocation of 56 MCM /annum has been submitted on 03.06.2024 to WRD, Jaipur (R.J) and will be obtained. It is proposed to utilise the power plant wastewater for plant reuse to achieve the Zero Liquid Discharge (ZLD) concept. It is envisaged to utilize cooling water blow down for ash handling purposes and treated wastewater will be used for plantation and gardening activities.

4.3 Noise Environment

- Noise reduction measures include insulation, damping pads, and acoustic enclosures.
- Regular equipment maintenance and safety gear for workers will be provided.
- Noise levels will comply with regulations, not exceeding 75 dB (A) at 1 m distance.
- Extensive oiling, lubrication, and preventive maintenance will minimize noise generation.
- Earplugs will be provided in areas where noise levels may exceed permissible limits.
- Supervisors will ensure machinery conditions and silencers are maintained.
- Adequate greenbelt will be developed within the project premises and around the plant boundary.

4.4 Socio-Economic Environment

The company will take various steps for social & environmental development for the villagers in more then one ways. The details of the various activities undertakto be taken by the company's CSR activities are described in detail in Chapter 8 of "Project Benefits" of the report. The company will continue to work for development of the society in future also. The additional economic opportunities for local population will create a long term positive impact in the society. Project also does not involve discharge of any pollutant and follows zero discharge, thus the environment will not be negatively impacted. All due care will also be taken to manage the odour as per present practices and the same will be improved to match the best industry practices.

4.4.1 Solid & Hazardous Waste

- Fly ash and bottom ash will be main solid waste to be generated from the plant. The details of the ash generated from the proposed power plant are given in Table 4.16. 100% utilization of fly ash as per MoEF&CC guidelines is proposed.
- The bottom ash will be collected in wet form and fly ash in dry form. Fly ash will be collected in dry form to facilitate utilization.

- Ash Dyke is proposed in 57.06 Ha, which is less than **0.1 Ha./MW** (i.e 320 Ha. for 3200 MW) allowed as per Fly Ash Notification dated 31.12.2021.
- Unutilized Fly ash and bottom ash shall be disposed via High Concentration Slurry disposal (HCSD/MCSD) system to Ash dyke in case of exigencies.
- Bottom ash generated shall be supplied to the Road Mix Concrete (RMC) / brick producers / filling of low lying area / filling of mine voids as per the statutory guidelines thereby eliminating the need for separate area shall be explored.

Table 4: Ash generation from the Proposed Plant

S. No.	Description	Ash quantity in Million TPA	Management & disposal
1.	Fly ash	4.12	Collection in dry form, pneumatic transfer to closed silos & sent to cement manufacturing, Construction work (RMC plant, Roads, Highways), Brick Manufacturing, etc.
2.	Bottom ash	1.04	Collection in wet form & Road Mix Concrete (RMC) / brick producers / filling of low lying area / filling of mine voids
Unutilized Fly ash and bottom ash shall be disposed via High Concentration Slurry disposal (HCSD/MCSD) system to Ash dyke in case of exigencies.			

IMPACT

- Improper storage, handling and disposal of solid & hazardous waste leads to contamination of soil, ground water and surface water.
- Contamination may also be caused by spillage of hazardous waste, run-off from hazardous waste storage area etc.
- Plants may take up contaminants from soil and accumulate toxic substances ultimately adversely affecting human / animal health due to ingestion.

Hazardous Waste

- Hazardous waste will be handled, stored & disposed off in line with Hazardous & Other waster (management & transboundary movement) Rules 2016, amended till date.
- Separate covered storage area with impervious flooring and catch drains connecting to WTP will be provided with Hazardous waste storage area.

- E-Waste (~2.0 TPA), Battery waste (~3 TPA), Bio-medical waste (0.02 TPA) will be handled, stored & disposed of as per applicable rules & guidelines.
- Used batteries will be will be given back to the supplier under buy back agreement with supplier.
- Bio-medical waste generated from medical unit will be handed over to nearest CBWTF &/or hospital having BMW disposal agreement with CBWTF.

Municipal Solid waste generation & management

Improper disposal of MSW may cause contamination of soil, ground water and surface water over time. It may lead to odour nuisance as well as increased disease vectors in the area.

Table 5: Municipal Solid waste generation & disposal

Particulars	Population	Basis	Quantity of waste generated (in kg/day)
Workers	2700	@0.3 kg/day	810.0
Landscaping	714.91 acre	@0.2kg/acre/day	143.0
STP sludge (dry)	--	--	50
Total			**1003**

MSW generated to the tune of ~1.0 TPD will be collected, segregated at source itself using color coded bin collection system placed strategically in the plant premises.

The organic component of MSW will be segregated and composted in Organic waste converters proposed at site. The remaining waste will be handed over to contractor for final disposal to municipal waste dump site.

5. ANALYSIS OF ALTERNATE SITE & TECHNOLOGY

The proposed expansion is proposed in an area of 470.70 Ha adjacent to the existing Thermal Power Plant with area admeasuring 350 Ha. The total area of Thermal Power plant after expansion will be 820.70 Ha. The Forest Area outside plant boundary (1.758 Ha.) is involved in the Coal Convey System for Proposed Project. Since the expansion is proposed of the already operational Kawai Thermal Power Plant in Village Kawai, Tehsil Atru, District Baran, Rajasthan, no alternative sites have been examined for the Thermal

Power Plant. However, alternative route analysis has been carried out for proposed Coal Conveyor Belt route to transfer coal from coal handling plant to BTG area.

Ultra Super Critical thermal power plants combine high efficiency, reduced emissions, and operational flexibility, making them a compelling choice for large-scale power generation projects aiming for both economic and environmental sustainability.

6. ENVIRONMENTAL MONITORING PROGRAMME

Environmental Management Division

Monitoring is as important as that of control of pollution since the efficiency of control measures can only be determined by monitoring. The following routine monitoring program will be implemented under the post-project monitoring as per CECB/CPCB guidelines. The major environmental considerations involved in the construction and operation of the thermal power station will be taken up by a full-fledged multi-disciplinary Environmental Management Division (EMD) with key functions of environmental, safety and occupational health for management of the entire plant and surrounding environment. It is predicted that socio-economic impact due to the proposed expansion project will positively increase the employment opportunities for local inhabitants. The project infrastructure will be of use to the people of the area. The contribution to the revenue of the State Govt. will be put in public welfare and augmented growth. The entire project area is devoid of any endangered flora and fauna. Thus, the proposed project is not likely to affect the environment or adjacent staff etc. This EMD will take up additional responsibility of environmental functions related to proposed mega power plant.

Operation Head would represent the Company's interest in the operation & maintenance of the power station and would oversee the functioning of O&M Cell.

Green Belt:-

The greenbelt development will be as per the CPCB guidelines with re-densification of existing greenbelt.

EMP costing

The heads for EMP are: Electrostatic Precipitator, Chimney/Stack, Cooling Tower including civil works, Ash Handling including ash water recirculation, Ash disposal civil work, Dust extraction & suppression system, DM Plant Waste Treatment System, Sewerage collection, treatment & disposal, Green Belt & landscaping, SCR/SOFA, Rainwater harvesting, Solar power harnessing, Enhancing Environmental Laboratory & Environmental Monitoring, CEMS, CAAQMS, EQMS monitoring system & Main gate display board and Wind Breaking Wall, Dry Fog System & RCC Flooring in Coal Storage Area.

A cost provision of Rs. 5,992.94 Cr. has been earmarked towards environmental measures.

7. ADDITIONAL STUDIES

Risk Assessment, Hazard Analysis: Risk associated with process and raw materials (LDO/HSD) was anticipated and proper mitigation measures provided.

Hazard due to toxic release of Chlorine and Aqueous Ammonia has been assessed with the help of ALOHA software and the threat zone marked on google earth.

Within the plant: Personnel working in the plant during the operational phase.

Outside the plant: There are no major habitation within 1.0 km of project site.

However, by implementing all the possible risk mitigation measures the same could be minimized

Disaster Management Plan: On Site & Offsite Emergency Plan with level I, II and III emergency has been prepared and detailed in chapter 7 of this EIA/ EMP report.

8. PROJECT BENEFITS

Adani Foundation is the CSR arm of Adani Group of companies implementing CSR projects and activities at different locations in India. A separate budget Rs. 66.00 crore towards CER activities (as per Ministry's OM dated 01.05.2018) is allocated for CER activities, and efforts will be made to address concerns raised after the public consultation during the final EIA ensuring responsible corporate practices.

9. CONCLUSIONS

It is predicted that socio-economic impact due to the proposed expansion project will positively increase the employment opportunities for local inhabitants. The proposed expansion project will be within the existing plant premises. The project infrastructure will be of use to the people of the area. The contribution to the revenue of the State Govt. will be put in public welfare and augmented growth. The entire project area is devoid of any endangered flora and fauna. Thus, the proposed expansion project is not likely to affect the environment or adjacent ecosystem adversely.

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