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Government of India
Ministry of Environment, Forest and Climate Change
IA Division
(River Valley and Hydroelectric Projects)
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Minutes of 31ST EXPERT APPRAISAL COMMITTEE meeting River Valley and Hydroelectric Projects held from 14/05/2025 to 14/05/2025

Date: 22/05/2025

MoM ID: EC/MOM/EAC/517401/5/2025

Agenda ID: EC/AGENDA/EAC/517401/5/2025

Meeting Venue: MOEFCC

Meeting Mode: Physical

Date & Time:

14/05/2025	10:30 AM	05:30 PM

1. Opening remarks

The 31st meeting of the EAC for River Valley & Hydroelectric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 14th May, 2025 through Virtual mode, under the Chairmanship of Prof. G. J. Chakrapani.

2. Confirmation of the minutes of previous meeting

The Minutes of the Meeting held on 30th EAC meeting on 30th April, 2025 were confirmed.

3. Details of proposals considered by the committee

Day 1 -14/05/2025

3.1. Agenda Item No 1:

3.1.1. Details of the proposal

GREENKO ASSAM -01 OFF-STREAM CLOSED LOOP PUMPED STORAGE PROJECT by **GREENKO EN ERGIES PRIVATE LIMITED** located at **KARBI ANGLONG,ASSAM**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/AS/RIV/534107/2025	J-12011/21/2025-IA.I(R)	23/04/2025	River Valley/Irrigation projects

			(1(c))

3.1.2. Project Salient Features

31.1.1 The proposal is for grant of Terms of References (ToR) to the project for Greenko Assam - 01 Closed Loop Pumped Storage Project (900 MW) in an area of 251.94 Ha in Village Amguri, Baithalangso, Kiling Bagicha, Nali Bagicha No. and Sardangang, Sub District Marigaon and Donka, District Morigaon and West Karbi Anglong, Assam by M/s Greenko Energies Private Limited.

31.1.2 The Project Proponent and the accredited Consultant M/s. R S Envirolink Technologies Pvt. Ltd., made a detailed presentation on the salient features of the project and informed that:

i. Greenko Energies Pvt. Ltd., hereinafter referred as GEPL, proposes to develop Pumped Storage Project (PSP) near located at Tharakhunji Village, Donka subdivision of Karbi Anglong District and Amguri, Killing Bagicha villages, Marigaon Circle subdivision of Marigaon District in Assam.

ii. The total capacity of proposed PSP is 900 MW (5481 MWH) and it is proposed that One-time requirement of 0.833 TMC of water will be lifted from existing nearby Umiam River (which is located about 2 Km away from the proposed Lower reservoir) and will be stored in the lower reservoir to be constructed and used cyclically for energy storage and discharge, out of which 0.217 TMC of water will be used for power generation by re-circulation with 6.09 hours storage capacity. Evaporation losses if any will be recouped periodically from Umiam River.

iii. The geographical co-ordinate of the project are:
Upper Reservoir : 26° 0'5.34"N & 92°16'19.23"E
Lower Reservoir: 26° 0'12.00"N & 92°15'8.00"E

iv. The proposed scheme involves creation of new upper reservoir & lower reservoir. It is proposed to construct Geomembrane Faced Rockfill Dam (GFRD) embankment for the weighted average height of around 20m (with maximum height of 43m) for the length of 648 m with gross storage of 0.242 TMC capacity and Lower reservoir of Geomembrane Faced Rockfill Dam (GFRD) embankment for the average height of 17m (with maximum height of 43m) for the length of 675 m with gross storage of 0.220 TMC capacity. Intake structure and trash rack with four number of independent pressure shafts from Power block of upper reservoir is connected to Undeground Powerhouse located at about 883.97 m. The Power house is equipped with two Three (3) phase, alternating current synchronous/ generator motor semi umbrella type with vertical shaft type units composed with generator/motor and a pump/turbine having generated/pumping capacity of 300MW / 330MW respectively and two Three (3) phase, alternating current synchronous/ generator motor semi umbrella type with vertical shaft type units composed each of a generator/motor and a pump/turbine having generated/pumping capacity of 150MW / 165MW.

v. The Project will generate 900 MW by utilizing a design discharge of 280.50 Cumec and rated head of 367.50m. The cycle efficiency of the project is expected to be around 80%. One 400 KV Double Circuit transmission line with Twin Moose Conductor of length 55 KMs (appx.) from PSP will be connected to 400 / 220 kV MISA Substation PGCIL, Dighaljar, Assam for evacuation of power during turbine mode and pumping of power from grid during pumping mode.

vi. Land requirement:
Forest Land : 134.24 Ha
Non-forest Land : 117.70 Ha
Total Land : 251.94 Ha

vii. Demographic details in 10 km radius of project area:

The proposed project area is located in Tharakhunji Village, Donka Subdivision of Karbi Anglong District, and in Amguri and Killing Bagicha villages, Marigaon Subdivision, Marigaon District, Assam.

According to Mission Antyodaya 2020, the total population of the villages in the project proximity area is 1837, comprising 889 males (48.39%) and 948 females (51.60%). There are 418 households in total, with an average household size of 4 to 5 members. The sex ratio is 1066 females per 1,000 males. Village-wise demographic details are provided in the table below.

The Scheduled Caste (SC) population constitutes 31.77% of the total population, whereas the Scheduled Tribe (ST) population accounts for 31.77%.

Demographic Profile of the Project Proximity area Villages

Village Name	No_T.P	TOT_M	TOT_F	TOT_HH	P_SC%	P_ST%
Kilingbagicha	1259	610	649	310	6.97	6.97
Amguri	258	119	139	53	28.90	28.90
Tharakunchi	320	160	160	55	96.32	96.32
Total	**1837**	**889**	**948**	**418**	**31.77**	**31.77**

(Source Mission Antyodaya 2020)
(*No_HH-Total House Hold, TOP_P-Total Population, TOT_M-Total Male, TOT_F-Total Female, P_SC-Scheduled Caste population, P_ST-Scheduled Tribe Population)*

Villages in the project proximity area is mainly inhabited by the Karbi tribe. The people practice shifting cultivation, growing paddy, maize and vegetables, rearing animals and collecting firewood, medicinal plants and bamboo for use and sale. The village has a close-knit social life, including the extended family, traditional festivals such as Rongkar and Chomkan, folk dances, music and oral stories. Village councils and elders guide local governance.

Alternative -1 Layout

The Alternative – 1 layout has been proposed with underground powerhouse between Site – 1

Upper reservoir and Site – 1 lower reservoir and is shown in **Fig. - 4**. The proposed upper reservoir site which is to be constructed newly is located on natural depression which is suitable for creating the desired storage capacity keeping FRL & MDDL at EL 685.00m & EL 655.00m respectively. Similarly, the lower reservoir which is to be constructed newly is proposed to be located in the natural depression which is suitable for creating the desired gross storage capacity keeping FRL and MDDL at EL 310.00m & EL 275.00m respectively. The rated head available in this alternative is about 367.50m and the rating of pumped storage project is estimated to 900 MW for which the live storage requirement is 0.217 TMC. An underground powerhouse has been proposed considering the topography of the project area and requirement of depth of excavation is more than 200m in case of surface powerhouse. Moreover, all project components are located far away from the populated area and there will not be any social and environmental issues are envisaged. The length of embankment for upper and lower reservoirs are 648 m and 675 m respectively. Similarly, the total length of Penstock / Pressure Shaft and Tail Race Tunnel are 1258.52m and 335m respectively. The total area of land required for this Alternative is estimated to 251.94 Ha which is completely in forest land.

Except Upper and Lower reservoir, all other components including Adits are in underground. Therefore, for this alternative, the investigation time and preparation of DPR required will be about 2 years and construction time for completion of this Alternative is estimated to around 42 months excluding pre-construction works.

Alternative – 2 Layout

The Alternative – 2 layout has been proposed with underground powerhouse between Site-2 upper reservoir and Site – 2 lower reservoir and is shown in **Fig. - 5**. The proposed Site-2 upper reservoir location is towards south side of Site-1 upper reservoir which is to be constructed newly and is located on natural depression which is suitable for creating the desired storage capacity keeping FRL & MDDL at EL 700.00m & EL 675.00m respectively. Similarly, the lower reservoir which is to be constructed newly is proposed to be located in the natural depression which is suitable for creating the desired gross storage capacity keeping FRL and MDDL at EL 300.00m & EL 275.00m respectively. The rated head available in this alternative is about 390.00 m and the rating of pumped storage project is estimated to 900 MW for which the live storage requirement is 0.203 TMC.

An underground powerhouse has been proposed considering the topography of the project area and requirement of depth of excavation is more than 340m in case of surface Powerhouse. The length of the embankment for upper and lower reservoirs are 498 m and 411 m respectively. Similarly, the length of Penstock / Pressure Shaft is about 1278 m. The length of TRT is 557m which is about 222m more than Alternative - 1. With respect to 4 nos. of TRT, the increase in total length of tunnel is around 888m which will increase the cost of project as well as construction time considerably. Other than this, technically, there is no much difference between Alternative – 1 & Alternative – 2 layout. But in Alternative – 2 layout of Upper reservoir, Water channels are flowing within the reservoir area and is being used for feeding the crops. Chala water falls is also lying within this reservoir. This will lead to create Social and Environmental issues. The total area of land required for this alternative is estimated to 258.90 Ha which is completely in forest land.

Except Upper and Lower reservoir, all other components including Adits are in underground. Therefore, for this alternative, the investigation time and preparation of DPR required will be about 2 years and construction time for completion of this Alternative is estimated to around 42 months excluding pre-construction works.

Selection of Final Layout

As discussed above, Alternative – 1 layout has been preferred considering the following reasons:

- Technically, there is no much difference between Alternative – 1 & Alternative – 2 layout except

in length of Tail Race Tunnel. In Alternative – 1 layout, the length of TRT is (335m) less than Alternative – 2 layout (557m) which will increase the cost project and construction time considerably.

- In Alternative – 2layout upper reservoir, Water channels are flowing within the reservoir area and is being used for feeding the crops. Chala waterfalls is also lying within this reservoir. This will lead to create Social and Environmental issues.

- The total area of land in both Alternative – 1 & Alternative – 2 are completely in forest land and the area of land required for Alternative – 1 layout (i.e., 251.94 Ha) is less than Alternative – 2 layout (i.e., 258.74 Ha). Going for Alternative – 1 layout, there will be a reduction of about 10.29 Ha of forest land.

xiv. Status of Litigation Pending against the proposal, if any. **No**

xv. The salient features of the project are as under:

Name of the Proposal	Greenko Assam-01 Off-Stream Closed Loop P umped Storage Project
Location (Including coordinates)	The proposed project involves the creation of Upper Reservoir 26° 0'5.34"N & 92°16'19.23"E Lower Reservoir 26° 0'12.00"N & 92°15'8.00"E
Inter- State Issue involved	Yes
Seismic zone	Zone -V (High Risk)
Category of the project	1(c) River Valley Projects
Provisions	
Capacity / Cultural command area (CCA)	900 MW
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	Nil
Powerhouse Installed Capacity	900 MW (5481 MWH)
Generation of Electricity Annually	1899 MU
No. of Units	4 Nos. (2 X 300 MW) + (2 X 150 MW)
Additional information (if any)	Nil
Cost of project	5849.49 Cr.
Total area of Project	251.94 Ha
Height of Dam from River Bed (EL)	Height of Embankment

	• Upper reservoir max- 43 m & Avg-20 m • Lower reservoir max- 43 m & Avg-17 m
Length of Tunnel/Channel	335 mts TRC & 257Mts Intake
Details of Submergence area	108.44 Ha
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Off-Stream Closed L oop Pumped Storage Project (OCPSP)
Is Projects earlier studies in Cumulative Impact a ssessment & Carrying Capacity studies (CIA&C C) for River in which project located. If yes, then	No

No. of proposed disposal area/ (type of land- Forest/Pvt. land)	Two Locations of 25 Ha in Non-Forest Ar ea
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

Private land	117.70 ha
Government land	-
Forest Land	134.24 ha
Total Land	251.94 ha
Submergence area/Reservoir area	108.44 Ha-Upper & Lower reservoirs
Additional information (if any)	Nil

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate / lette r/ Remarks**
Reserve Forest/Protected Forest Land	--	Distance from nearest protect ed area (Pobitora WLS) is 24. 0 Km.
National Park	--	
Wildlife Sanctuary	--	

Particulars	**Details**
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSE T) (NABET Accredited Consultant Organization)

	Certificate No : NABET/EIA/2225/RA0274 Validity : August 15, 2025 Contact Person : Mr. Ravinder Bhatia Name of Sector : River Valley and Hydroelectric Projects Category : A MoEF Schedule : 1(C) Address : 402, Radisson Suites Commercial Plaza, B Block, Sushant Lok Phase I, Gurugram, Haryana - 122009. E-mail : ravi@rstechnologies.co.in
Project Benefits	o Least expensive source of electricity, not requiring fossil fuel for generation o An emission-free renewable source o Balancing grid for demand driven variations o Balancing generation driven variations o Voltage support and grid stability
Status of other statutory clearances	**Forest Clearance:** Online application seeking forest diversion for around 117.70 Ha after receipt of ToR Approval. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studies

3.1.3. Deliberations by the committee in previous meetings

N/A

3.1.4. Deliberations by the EAC in current meetings

The EAC during deliberations noted the following:

The Expert Appraisal Committee (EAC) deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR for conducting EIA/EMP and Public hearing for Greenko Assam - 01 Closed Loop Pumped Storage Project (900 MW) in an area of 251.94 Ha in Village Amguri, Baithalangso, Kiling Bagicha, Nali Bagicha No. and Sardangang, Sub District Marigaon and Donka, District Morigaon and West Karbi Anglong, Assam by M/s Greenko Energies Private Limited.

The project/activity falls under Category A of item 1(c), 'River Valley Projects,' as per the Schedule of the Environmental Impact Assessment Notification, 2006, and requires appraisal at the Central level by the sectoral EAC in the Ministry.

The EAC noted that the total land required for the proposed project is about 251.94 Hectares, which includes 134.24 Hectares of forest land and 117.70 Hectares of private land. However, it was observed that the application for Stage-I Forest Clearance (FC) has not yet been submitted, which necessitates further action from the Project Proponent.

The EAC noted that the proposed Greenko Assam - 01 Closed Loop Pumped Storage Project (900 MW)

is planned in ecologically sensitive regions which falls within a transitional zone of the Indo-Burma Biodiversity Hotspot, an area globally recognized for its rich and endemic flora and fauna. These forested tracts, often inhabited by species of conservation concern, serve as important ecological corridors and breeding grounds for numerous endemic and migratory species. The landscape includes semi-evergreen and moist deciduous forests, frequently used by tribal communities for sustenance, adding a layer of socio-ecological complexity.
The Project Proponent indicated that there is no Protected Area in the vicinity of the proposed project. Pobitora WLS is 24.0 km far from the proposed project area. River/ water body, Water will be pumped from Umiam River. However, deliberations by the Expert Appraisal Committee (EAC) highlighted concerns w.r.t the proximity to notified forest areas and potential wildlife movement routes, underscoring the vulnerability of local ecosystems to habitat fragmentation, hydrological disruption, and loss of biodiversity. Considering the regional ecological sensitivity, the Committee called for a very intensive ecological study to be incorporated in the Environmental Impact Assessment (EIA) report. This study is critical for a comprehensive understanding of the site's ecological dynamics and informed decision-making. In light of these observations, the EAC recommended that a site visit be undertaken by a sub-group of the Committee before grant of EC. The purpose of the visit would be to physically assess the ecological character of the area and verify forest dependencies.

It has been observed that Memorandum of Understanding has been signed between Greenko Energies Private Limited and Govt. of Assam for establishment of 900 MW PSP at Tharakhunji Village, Sub division Donka, District Karbi Anglong on 25.02.2025.

The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Close Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Greenko Assam - 01 Closed Loop Pumped Storage Project (900 MW) in an area of 251.94 Ha in Village Amguri, Baithalangso, Kiling Bagicha, Nali Bagicha No. and Sardangang, Sub District Marigaon and Donka, District Morigaon and West Karbi Anglong, Assam by M/s Greenko Energies Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

3.1.5. Recommendation of EAC

Recommended

3.1.6. Details of Terms of Reference

3.1.6.1. Specific

Miscellaneous	
1.	Both capital and recurring expenditure under EMP shall be submitted.
2.	Approved Layout as per pre-DPR chapter duly approved by CEA/CWC shall be submitted.
3.	The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.
4.	Drone video of project site shall be recorded and to be submitted.
5.	Undertaking need to be submitted on affidavit stating that no activities has been started on the project site.

6.	Detailed plan to restore wider roads and convert them into narrow up to 10m after construction of the project.
7.	Specific Terms of Reference (ToRs) issued by the Ministry vide Office Memorandum No. F. No. IA3-22/33/2022-IA.III dated 14.08.2023 for Pumped storage projects shall be used for preparation of EIA/ EMP reports.
8.	As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.
Disaster Management	
1.	Impact of Project activities (specially blasting and drilling) on the aquatic and terrestrial ecosystem, within study area to be studied and be incorporated in EIA/EMP report.
2.	The muck dumping sites shall be located with a distance of 100 mts from HFL. The PP shall submit the detailed action plan for transportation of muck along with monitoring mechanism of movement of muck carrying trucks.
Muck Management	
1.	Details of quantity of muck generation component wise, types of muck (Excavation in tunnels, pressure shaft and powerhouse etc.) and disposal site/ transportation to be provided.
2.	Details of muck management such as dumping sites and its locations, transportation plan along with monitoring mechanism for muck transportation, detailing the road map of project construction site/ indicating the distances from HFL, river, project construction site along with types of road etc.
3.	Safety measures for avoiding spill over muck into the riverbed/streams and its flow into the river during the high discharge/ flood or monsoon period. Prepare plan for stabilization of muck disposal sites using biological and engineering measures to ensure that muck does not roll down the slopes and shall be disposed safely and that it does not pollute the natural streams and water bodies in surrounding area.
4.	Restoration plan for construction area including dumping site of excavated materials by levelling, filling up of burrow pits, landscaping etc.
Socio-economic Study	
1.	Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
2.	All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. A comparative chart of issues raised by General Public during Public Hearing and commitments made by the Project Proponent will be prepared and submitted in the relevant chapter of EIA/EMP report.
3.	PP shall submit the credible documents to show the status of land acquisition w.r.t project site from/through the concerned State Government as required under Ministry's OM dated 7th October, 2014 for the project land to be acquired.

4.	Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land (if any) shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. Budget earmarked for R&R, CSR shall not be included in the cost of EMP.
Environmental Management and Biodiversity Conservation	
1.	PP shall submit the Water Utilization Mapping within a 10 km radius of the project for examining the impacts on sustainability of ecosystem of the region after withdrawal of water for proposed project.
2.	Detailed action plan for large scale plantation of native species of plant sapling within 10 km radius of the project shall be prepared in consultation with State Forest Department.
3.	Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 117.70 ha of forest land involved in the project shall be submitted within stipulated time.
4.	Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area.
5.	Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.
6.	PP shall submit the detailed plan for filling the reservoir from the Umiam River along with necessary approval form water resource department. Necessary clearance/ approval for interstate issues/ water availability/water sharing issues shall be obtained.
7.	Transportation Plan for transporting construction materials shall be submitted.
8.	Environmental Cost Benefit Analysis shall be done in terms of loss of Forest ecosystem due to diversion of Forest land/loss of biodiversity, water availability, water uses for generation of hydro power and Ecological flows.
9.	The baseline data collection will cover the changes in biological and ecological profile of the region after monsoon with worst-case scenario study and critical mineral assessment.
10.	Calculation and values of GHGs (CO2, CH4 etc.) emissions during construction and during operation till the life of the project shall be estimated and submitted.
11.	The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report. Presence of any critical mineral zone in the proposed area be clarified from GSI.
12.	Details of mineral zone, if any, in the study area, certified by Geological Survey of India or any other concerned Government Organization shall be submitted. The project area should not come up on any critical mineral zone, the same shall to be verified by GSI/NMDC.
13.	Quantitative values of Impact modelling of environmental parameters shall be submitted for during construction and operation. Also, mitigation measures shall be submitted in terms of construction and operation phase.
14.	Conducting site-specific ecological study emphasizing on riverine ecology viz. fishes diversity, fish migration, habitat and aquatic biota due to construction PSP. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.

15.	Cumulative Impact of projects in the basin on carrying capacity and sustainability of Reservoir/ River /nala of catchment area due to tapping of water for filling reservoir shall be studied.
16.	Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Specific ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.
17.	A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.
18.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
19.	Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Indian Council of Agriculture Research (ICAR) Institutes/ Expert Govt. institutions and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
20.	Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI.

3.1.6.2. Standard

1(c)	**River Valley/Irrigation projects**
Scope of EIA Study	
1.	The EIA Report should identify the relevant environmental concerns and focus on potential impacts that may change due to the construction of proposed project. Based on the baseline data collected for three (3) seasons (Pre-monsoon, Monsoon and Winter seasons), the status of the existing environment in the area and capacity to bear the impact on this should be analysed. Based on this analysis, the mitigation measures for minimizing the impact shall be suggested in the EIA/EMP study.
Details of the Project and Site	
1.	General introduction about the proposed project.
2.	Details of Project and site giving L-Sections of all U/S and D/S Projects with all relevant maps and figures. Connect such information as to establish the total length of interference of Natural River and the committed unrestricted release from the site of Dam/Barrage into the main river.
3.	A map of boundary of the project site giving details of protected areas in the vicinity of 25 km of project location.
4.	Location details on a map of the project area with contours indicating main project features. The project layout shall be superimposed on a contour map of ground elevation showing main project features (viz. location of dam, Head works, main canal, branch canals, quarrying etc.) shall be depicted in a scaled map.
5.	Layout details and map of the project along with contours with project components clearly marked with proper scale maps of at least 1:50,000 scale and printed at least on A3 scale for clarity.

6.	Existence of National Park, Sanctuary, Biosphere Reserve etc. in the study area, if any, should be detailed and presented on a map with distinct distances from the project components.
7.	Drainage pattern and map of the river catchment up to the proposed project site.
8.	Delineation of critically degraded areas in the directly draining catchment on the basis of Silt Yield Index as per the methodology of Soil and Land use Survey of India.
9.	Soil characteristics and map of the project area.
10.	Geological and Seismo-tectonic details and maps of the area surrounding the proposed project site showing location of dam site and canal sites.
11.	Remote Sensing studies, interpretation of satellite imagery, topographic sheets along with ground verification shall be used to develop the land use/land cover pattern of the study using overlaying mapping techniques viz. Geographic Information System (GIS), False Color Composite (FCC) generated from satellite data of project area.
12.	Land details including forests, private and other land.
13.	Demarcation of snow fed and rain fed areas for a realistic estimate of the water availability.
14.	Different riverine habitats like rapids, pools, side pools and variations in the river substratum bedrocks, rocks, boulders, sand/silt or clay etc. need to be covered under the study
Description of Environment and Baseline Data	
1.	To know the present status of environment in the area, baseline data with respect to environmental components air, water, noise, soil, land and biology & biodiversity (flora & fauna), wildlife, socioeconomic status etc. should be collected within 10 km radius of the main components of the project/site i.e. dam site and power house site. The air quality and noise are to be monitored at such locations which are environmentally & ecologically more sensitive in the study area. The baseline studies should be collected for 1 season (Preferably Monsoon season). Flora-Fauna in the catchment and command area should be documented. The study area should comprise of the following:
2.	(i) Catchment area up to the dam/barrage site.
3.	(ii) Submergence Area.
4.	(iii) Project area or the direct impact area should comprise of area within 10 km radius of the main project components like dam, canals etc.
5.	(iv) Downstream upto 10 km from the tip of the reservoir.
Details of the Methology	
1.	The methodology followed for collection of base line data along with details of number of samples and their locations in the map should be included. Study area should be demarcated properly on the appropriate scale map. Sampling sites should be depicted on map for each parameter with proper legends. For Forest Classification, Champion and Seth (1968) methodology should be followed.
Methodology for Collection of Biodiversity Data	
1.	The number of sampling locations should be adequate to get a reasonable idea of the diversity and other attributes of flora and fauna. The guiding principles should be the size of the study area (larger area should have larger

	number of sampling locations) and inherent diversity at the location, as known from secondary sources (e.g. eastern Himalayan and low altitude sites should have a larger number of sampling locations owing to higher diversity).
2.	The entire area should be divided in grids of 5kmX5km preferably on a GIS domain. There after 25% of the grids should be randomly selected for sampling of which half should be in the directly affected area (grids including project components such as reservoir, dam, powerhouse, tunnel, canal etc.) and the remaining in the rest of the area (areas of influence in 10 km radius form project components). At such chosen location, the size and number of sampling units (e.g. quadrates in case of flora/transects in case of fauna) must be decided by species area curves and the details of the same (graphs and cumulative number of species in a tabulated form) should be provided in the EIA report. Some of the grids on the edges may not be completely overlapping with the study area boundaries. However, these should be counted and considered for selecting 25% of the grids. The number of grids to be surveyed may come out as a decimal number (i.e. it has an integral and a fractional part) which should be rounded to the next whole number.
3.	The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.
4.	The R.E.T. species referred to in this point should include species listed in Schedule I and II of Wildlife (Protection) Act, 1972 and those listed in the red data books (BSI, ZSI and IUCN).
Components of the EIA Study: Various aspects to be studied and provided in the EIA/EMP report are as follow s:	
1.	null
2.	null
3.	Physical geography, Topography, Regional Geological aspects and structure of the Catchment.
4.	Tectonics, seismicity and history of past earthquakes in the area. A site specific study of the earthquake parameters will be done. The results of the site specific earthquake design shall be sent for approval of the NCSDP (National Committee of Seismic Design Parameters, Central water Commission, New Delhi for large dams.

5.	Landslide zone or area prone to landslide existing in the study area should be examined.
6.	Presence of important economic mineral deposit, if any.
7.	Justification for location & execution of the project in relation to structural components (dam /barrage height).
8.	Impact of project on geological environment.
9.	null
10.	Meteorology (viz. Temperature, Relative humidity, wind speed/direction etc.) to be collected from nearest IMD station.
11.	Ambient Air Quality with parameters viz. Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM) i.e. suspended particulate materials < 10 microns, Sulphur dioxide (SO2) and Oxides of Nitrogen (NOX) in the study area at 5-6 Locations.
12.	Existing Noise Levels and traffic density in the study area at 5-6 Locations.
13.	null
14.	Soil classification, physical parameters (viz., texture, Porosity, Bulk Density and water holding capacity) and chemical parameters (viz. pH, electrical conductivity, magnesium, calcium, total alkalinity, chlorides, sodium, potassium, organic carbon, available potassium, available phosphorus, SAR, nitrogen and salinity, etc.) at @ one sample/ha of command area.
15.	null
16.	(i) Generation of thematic maps viz, slope map, drainage map, soil map, land use and land cover map, etc. Based on these, thematic maps, an erosion intensity map should be prepared.
17.	null
18.	History of the ground water table fluctuation in the study area.
19.	Water quality for both surface water and ground water for (i) Physical parameters (pH, temperature, electrical conductivity, TSS); (ii) Chemical parameters (Alkalinity, Hardness, BOD, COD, NO2, PO4, CI, SO4, Na, K, Ca, Mg, Silica, Oil & Grease, phenolic compounds, residual sodium carbonate); (iii) Bacteriological parameter (MPN, Total coliform) and (iv) Heavy Metals (Pb, As, Hg, Cd, Cr-6, total Cr, Cu, Zn, Fe) (6 locations).
20.	Delineation of sub and micro-watersheds, their locations and extent based on the All India Soil and Land Use Survey of India (AISLUS), Department of Agriculture, Government of India. Erosion levels in each micro-watershed and prioritization of micro-watershed through silt yield index (SYI) method of AISLUS
21.	Hydro-Meteorology of the project viz. precipitation (snowfall, rainfall), temperature, relative humidity, etc. Hydro-meteorological studies in the catchment area should be established along-with real time telemetry and data acquisition system for inflows monitoring.
22.	Run off, discharge, water availability for the project, sedimentation rate, etc.

23.	Basin characteristics
24.	Catastrophic events like cloud bursts and flash floods, if any, should be documented.
25.	For estimation of Sedimentation Rate, direct sampling of river flow is to be done during the EIA study. The study should be conducted for minimum one year. Actual silt flow rate to be expressed in ha-m km2 year-1.
26.	Set up a G&D monitoring station and a few rain gauge stations in the catchment area for collecting data during the investigation.
27.	Flow series, 10 daily with 90%, 75% and 50% dependable years discharges.
28.	Information on the 10-daily flow basis for the 90 per cent dependable year the flow intercepted at the dam, the flow diverted to the power house and the spill comprising the environmental flow and additional flow towards downstream of the dam for the project may be given.
29.	The minimum environmental flow shall be 20% of the flow of four consecutive lean months of 90% dependable year, 30% of the average monsoon flow. The flow for remaining months shall be in between 20-30%, depending on the site specific requirements. A site specific study shall be carried out by an expert organization.
30.	Sedimentation data available with CWC may be used to find out the loss in storage over the years.
31.	Hydrological studies/data as approved by CWC shall be utilized in the preparation of EIA/EMP report. Actual hydrological annual yield may also be given in the report. Sedimentation data available with CWC may be used to find out the loss in storage over the years.
32.	A minimum of 1 km distance from the tip of the reservoir to the tail race tunnel should be maintained between upstream and downstream projects.
33.	Besides primary studies, review of secondary data/literature published for project area on flora & fauna including RET species shall be reported in EIA/EMP report.
34.	null
35.	Characterization of forest types (as per Champion and Seth method) in the study area and extent of each forest type as per the Forest Working Plan.
36.	Documentation of all plant species i.e. Angiosperm, Gymnosperm, Pteriodophytes, Bryophytes (all groups).
37.	General vegetation profile and floral diversity covering all groups of flora including lichens and orchids. A species wise list may be provided.
38.	Assessment of plant species with respect to dominance, density, frequency, abundance, diversity index, similarity index, importance value index (IVI) , Shannon Weiner index etc. of the species to be provided. Methodology used for calculating various diversity indices along with details of locations of quadrates, size of quadrates etc. to be reported within the study area in different ecosystems.
39.	Existence of National park, Sanctuary, Biosphere Reserve etc in the study area, if any, should be detailed.
4	Economically important species like medicinal plants, timber, fuel wood etc.

0.	
41.	Details of endemic species found in the project area.
42.	Flora under RET categories should be documented using International Union for the Conservation of Nature and Natural Resources (IUCN) criteria and Botanical Survey of India's Red Data list along-with economic significance. Species diversity curve for RET species should be given.
43.	Cropping pattern and Horticultural Practices in the study area.
44.	null
45.	Fauna study and inventorisation should be carried out for all groups of animals in the study area. Their present status alongwith Schedule of the species.
46.	Documentation of fauna plankton (phyto and zooplankton), periphyton, benthos and fish should be done and analysed.
47.	Information (authenticated) on Avi-fauna and wildlife in the study area.
48.	Status of avifauna their resident/ migratory/ passage migrants etc.
49.	Documentation of butterflies, if any, found in the area.
50.	Details of endemic species found in the project area.
51.	RET species-voucher specimens should be collected along-with GPS readings to facilitate rehabilitation. RET faunal species to be classified as per IUCN Red Data list and as per different schedule of Indian Wildlife (Protection) Act, 1972.
52.	Existence of barriers and corridors, if any, for wild animals.
53.	Compensatory afforestation to compensate the green belt area that will be removed, if any, as part of the proposed project development and loss of biodiversity.
54.	Collection of primary data on agricultural activity, crop and their productivity and irrigation facilities components.
55.	For categorization of sub-catchment into various erosion classes and for the consequent CAT plan, the entire catchment (Indian Portion) is to be considered and not only the directly the draining catchment.
56.	Documentation of aquatic fauna like macro-invertebrates, zooplankton, phytoplantktons, benthos etc.
57.	Fish and fisheries, their migration and breeding grounds.
5	Fish diversity composition and maximum length & weight of the measured populations to be studies for

8.	estimation of environmental flow.
59.	Conservation status of aquatic fauna.
60.	Sampling for aquatic ecology and fisheries and fisheries must be conducted during three seasons Pre-monsoon (summer), monsoon and winter. Sizes (length & weight) of important fish species need to be collected and breeding and feeding grounds should also be identified along the project site or in vicinity.
61.	Collection of baseline data on human settlements, health status of the community and existing infrastructure facilities for social welfare including sources of livelihood, job opportunities and safety and security of workers and surroundings population.
62.	Collection of information with respect to social awareness about the developmental activity in the area and social welfare measures existing and proposed by project proponent.
63.	Collection of information on sensitive habitat of historical, cultural and religious and ecological importance.
64.	The socio-economic survey/ profile within 10 km of the study area for demographic profile; Economic Structure; Developmental Profile; Agricultural Practices; Infrastructure, education facilities; health and sanitation facilities; available communication network etc.
65.	Documentation of demographic, Ethnographic, Economic Structure and development profile of the area.
66.	Information on Agricultural Practices, Cultural and aesthetic sites, Infrastructure facilities etc.
67.	Information on the dependence of the local people on minor forest produce and their cattle grazing rights in the forest land.
68.	List of all the Project Affected Families with their name, age, educational qualification, family size, sex, religion, caste, sources of income, land & house holdings, other properties, occupation, source of income, house/land to be acquired for the project and house/land left with the family, any other property, possession of cattle, type of house etc.
69.	Special attention has to be given to vulnerable groups like women, aged persons etc. and to any ethnic/indigenous groups that are getting affected by the project.
Impact Prediction and Mitigation Measures	
1.	The adverse impact due to the proposed project should be assessed and effective mitigation steps to abate these impacts should be described.
2.	Changes in ambient and ground level concentrations due to total emissions from point, line and area sources.
3.	Effect on soil, material, vegetation and human health.
4.	Impact of emissions from DG set used for power during the construction, if any, on air environment.
5.	Pollution due to fuel combustion in equipments and vehicles
6.	Fugitive emissions from various sources
7.	Changes in surface and ground water quality

8.	Steps to develop pisci-culture and recreational facilities
9.	Changes in hydraulic regime and downstream flow.
10.	Water pollution due to disposal of sewage
11.	Water pollution from labour colonies/ camps and washing equipment.
12.	Adverse impact on land stability, catchment of soil erosion, reservoir sedimentation and spring flow (if any) (a) due to considerable road construction / widening activity (b) interference of reservoir with the inflowing stream (c) blasting for commissioning of HRT, TRT and some other structures.
13.	Changes in land use / land cover and drainage pattern
14.	Immigration of labour population
15.	Quarrying operation and muck disposal
16.	Changes in land quality including effects of waste disposal
17.	River bank and their stability
18.	Impact due to submergence.
19.	Impact on forests, flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc.
20.	Pressure on existing natural resources
21.	Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors
22.	Compensatory afforestation-identification of suitable native tree species for compensatory afforestation and green belt.
23.	Impact on fish migration and habitat degradation due to decreased flow of water
24.	Impact on breeding and nesting grounds of animals and fish.
25.	Impact on local community including demographic profile.
26.	Impact on socio-economic status

27.	Impact on economic status.
28.	Impact on human health due to water / vector borne disease
29.	Impact on increase traffic
30.	Impact on Holy Places and Tourism
31.	Impacts of blasting activity during project construction which generally destabilize the land mass and leads to landslides, damage to properties and drying up of natural springs and cause noise population will be studies. Proper record shall be maintained of the baseline information in the post project period.
32.	Positive and negative impacts likely to be accrued due to the project are listed.
Environmental Management Plan	
1.	null
2.	Biodiversity and Wildlife Conservation and Management Plan for the conservation and preservation of rare, endangered or endemic floral/faunal species or some National Park/Sanctuary/ Biosphere Reserve or other protected area is going to get affected directly or indirectly by construction of the project, then suitable conservation measures should be prepared in consultation with the State Forest Department and with the physical and financial details. Suitable conservation techniques (in-situ/ ex-situ) will be proposed under the plan and the areas where such conservation is proposed will be marked on a project layout map.
3.	Compensatory Afforestation shall be prepared by the State Forest Department in lieu of the forest land proposed to be diverted for construction of the project as per the Forest (Conservation) Act, 1980. Choice of plants for afforestation should include native and RET species, if any. This will be a part of the forest clearance proposal.
4.	Fisheries Conservation and Management Plan - a specific fisheries management measures should be prepared for river and reservoir. If the construction of fish ladder/ fish-way etc. is not feasible then measures for reservoir fisheries will be proposed. The plan will detail out the number of hatcheries, nurseries, rearing ponds etc. proposed under the plan with proper drawings. If any migratory fish species is getting affected then the migratory routes, time/season of upstream and downstream migration, spawning grounds etc will be discussed in details.
5.	Green Belt Development Plan along the periphery of the reservoir, approach roads around the colonies and other project components, local plant species must be suggested with physical and financial details. A layout map showing the proposed sites for developing the green belt should be prepared.
6.	Environmental Monitoring Programme to monitor the mitigatory measures implemented at the project site is required will be prepared. Provision for Environment Management Cell should be made. The plan will spell out the aspects required to be monitored, monitoring indicators/parameters with respect to each aspect and the agency responsible for the monitoring of that particular aspect throughout the project implementation.
7.	Catchment Area Treatment (CAT) Plan should be prepared micro-watershed wise. Identification of free draining/ directly draining catchment based upon Remote Sensing and Geographical Information System (GIS) methodology and Sediment Yield Index (SYI) method of AISLUS, Deptt. of Agriculture, Govt. of India coupled with ground survey. Areas or watersheds falling under 'very severe' and 'severe' erosion categories should be provided and required to be treated. Both biological as well as engineering measures should be proposed in consultation with State Forest Department for areas requiring treatment. Year-wise schedule of work and monetary allocation should be provided. Mitigation measures to check shifting cultivation in the catchment area with provision for alternative and better agricultural practices should be included.

8.	Study of Design Earthquake Parameters: A site specific study of earthquake parameters should be done. Results of the site specific earthquake design parameters should be approved by National Committee of Seismic Design Parameters, Central Water Commission (NCSDP), New Delhi.
9.	Dam Break Analysis and Disaster Management Plan The outputs of dam break model should be illustrated with appropriate graphs and maps clearly bringing out the impact of Dam Break scenario. To identify inundation areas, population and structures likely to be affected due to catastrophic floods in the event of dam failure. DMP will be prepared with the help of Dam Break Analysis. Maximum water level that would be attained at various points on the downstream in case of dam break will be marked on a detailed contour map of the downstream area, to show the extent of inundation. The action plan will include Emergency Action and Management plan including measures like preventive action notification, warning procedure and action plan for co-ordination with various authorities.
10.	Reservoir Rim Treatment Plan for stabilization of land slide / land slip zones, if any, around the reservoir periphery is to be prepared based on detailed survey of geology of the reservoir rim area. Suitable engineering and biological measures for treatment of identified slip zones to be suggested with physical and financial schedule. Layout map showing the landslide/landslip zones shall be prepared and appended in the chapter.
11.	Muck Disposal Plan- suitable sites for dumping of excavated material should be identified in consultation with the State Pollution Control Board and Forest Department. All Muck disposal sites should be minimum 30 m away from the HFL of river. Plan for rehabilitation of muck disposal sites should also be given. The L- section/ cross section of muck disposal sites and approach roads to be given. Financial out lay for this may be given separately. Deatailed muck transportation plan delinating the path ways, number of trucks, quantity of muck to be transportated along with monitoring mechanism using latest technology, shall be prepared.
12.	Restoration Plan for Quarry Sites and landscaping of colony areas, working areas, roads etc. Details of the coarse/fine aggregate/clay etc. required for construction of the project and the rock/clay quarries/river shoal sites identified for the project should be discussed along-with the Engineering and Biological measures proposed for their restoration with physical and financial details. Layout map showing quarry sites vis-à-vis other project components, should be prepared.
13.	Resettlement and Rehabilitation Plan needed to be prepared on the basis of findings of the socio- economic survey coupled with the outcome of public consultation held. The R&R package shall be prepared after consultation with the representatives of the project affected families and the State Government. Detailed budgetary estimates are to be provided. Resettlements site should be identified. The plan will also incorporate community development strategies.
14.	Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local populace.
15.	Local Area Development Plan to be formulated in consultation with the Revenue Officials and Village Pancahayats. Appropriate schemes shall be prepared under EMP for the Local Area Development Plan with sufficient financial provisions.
16.	Labour Management Plan for their Health and Safety.
17.	Sanitation and Solid waste management plan for domestic waste from colonies and labour camps etc.
18.	Energy Conservation Measures for the work force during construction with physical and financial details. Alternatives will be proposed for the labour force so that the exploitation of the natural resource (wood) for the domestic and commercial use is curbed.
19.	Environmental safeguards during construction activities including Road Construction.

20.	A summary of Cost Estimates for all the plans, cost for implementing all the Environmental Management Plans.
21.	Water, Air and Noise Management Plans to be implemented during construction and post-construction periods.

3.2. Agenda Item No 2:

3.2.1. Details of the proposal

ENVIRONMENTAL CLEARANCE FOR GURUVARYA LATE LAXMANRAOJI INAMDAR LIFT IRRIGATION SCHEME (JIHE KATHAPUR), PHASE I & II, DIST; SATARA, STATE- MAHARASHTRA BY JIHE KATHAPUR LIFT IRRIGATION DIVISION, SATARA by **EX ENGR JIHE KATHAPUR LI DIVISION SATARA** located at **SATARA,MAHARASHTRA**

Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/MH/RIV/535277/2025	J-12011/19/2025-IA.I(R)	28/04/2025	River Valley/Irrigation projects (1(c))

3.2.2. Project Salient Features

31.2.1: The proposal is for grant of Terms of Reference (TOR) to the project for Guruvarya Late Laxmanraoji Inamdar Lift Irrigation Scheme (Jihe Kathapur), Phase I & II (CCA: 60437 Ha) in an area of 173.614 Ha in Sub district Man, Koregaon, Khatav and Satara, District Satara, Maharashtra by M/s Ex Engr Jihe Kathapur Li Division Satara.

31.2.1: The Project Proponent and the accredited Consultant M/s Techknowgreen Solutions Limited, Pune, made a detailed presentation on the salient features of the project and informed that:

i. Guruvarya Late Laxmanraoji Inamdar Lift Irrigation Scheme envisages to irrigate the land of 60437 Ha. (Existing ICA of 27500 Ha. + Proposed expansion ICA of 32937 Ha.) of Khatav, Man, Satara and Koregaon Taluka of Satara District, Maharashtra. Under this scheme, a Jihe Kathapur barrage of 0.35 T.M.C. capacity has been constructed on Krishna River at Tal. Koregaon to lift 179.25 M.Cum. (6.332 T.M.C.) and new barrages (capacity 0.60 TMC) are proposed on upstream side of existing Jihe Kathapur barrage to feed water in existing barrage.

ii. Water lifted in three (3) stages to height of 209.84 m to irrigate Command area of 23354.41 Ha. (ICA) in Khatav taluka, 27258 Ha. (ICA) in Maan taluka, 2276.75 Ha. (ICA) in Satara taluka and 7547.68 (ICA) Ha. in Koregaon taluka of drought prone areas of Satara district. Total 60437 Ha. area will be irrigated through Phase I & Phase II of scheme. The total water utilization is 179.25 M.Cum. (6.332 T.M.C.).

iii. The geographical co-ordinate of the project are : Jihe Kathapur Barrage Coordinates: 17°38’30”N and 74°07’42”E.

iv. The Ministry had issued EC earlier vide letter no. J.12011/85/2007-IA-I dated 13/06/2008 to the existing project Jihe Kathapur Lift Irrigation Scheme in the Dist. Satara of Maharashtra in favour of M/s. Kukadi Irrigation Project Division No.6.

v. The Project envisages construction of: Pump houses, rising main, closed distribution arrangement system for Main Jihe Kathapur Lift Irrigation Scheme No. 2 and 8 newly proposed LIS viz. Tasgaon Lift Irrigation Scheme, Bhadale Lift Irrigation Scheme, Ner Lift Irrigation Scheme No. 3, Ner Lift Irrigation Scheme No. 4, Ransingwadi Lift Irrigation Scheme, Shiravli Lift Irrigation Scheme, West Maan Lift Irrigation Scheme, North Maan Lift Irrigation Scheme; 3 Direct Gravity Irrigation Scheme viz. Pressure release tank (PRT) to Bhadale Side Gravity Pipe Scheme, Pressure release tank (PRT) to

Jaigaon side gravity Pipe scheme and Ner Direct Closed Gravity Pipe, barrages, rising main.

vi. **Land requirement**:

Type of area	**Total Area requirement (Ha.)**	**Acquired area (Ha.)**	**Need to be acquired (Ha.)**
Private	172.54	56.34	116.2
Government	0.22	0.22	0
Forest land	0.854	0.854	0

Note: No forest land will be required for expansion (Phase II)

vii. **Water requirement: 6.332 T.M.C.**

viii. **Project Cost:** The estimated project cost is Rs. 5409.72 Crores including existing investment of Rs. 1330.74 crores.

ix. **Project Benefit:**

x. **Environmental Sensitive area:** There are Western Ghats Eco- sensitive area [0km (SW) from Bhadale LIS command boundary] and Mahableshwar-Panchgani Eco-sensitive Zone [6.8km (NW) from Barrage-II] within 10 km distance from the project site. River/ water body – Krishna river is flowing at a distance of 1.3Km in NNE direction from Tasgaon LIS command boundary.

xi. **MoU / any other clearance/ permission signed with State government: Administrative approval**

Water Resource Department, Govt. of Maharashtra vide Government Resolution No. - 0924/..421/24/-1 dated 11/10/2024 accorded administrative approval to the project at the cost of Rs. 5409.72 crore

Water Resource Department, Govt. of Maharashtra vide Government Resolution No. 0924/(.. 432/24) - dated 15/10/2024 approved revised water usage of 6.332 T.M.C. water to this project.

Forest Clearance:

1. Ministry of Environment and Forests, Regional Office, Western Region, Bhopal vide letter No. BB/23/2003-Fcw/1446 dated 26/07/2004 accorded Forest Clearance.

xii. **Resettlement and rehabilitation**: No R and R work. Water storage in the barrage on the Krishna river

xiii. **Details of Solid waste/ Hazardous waste generation/ Muck and its management:** The muck generated will be utilized for backfilling of trenches and land levelling.

xiv. **Status of Litigation Pending against the proposal, if any.:** NA

xv. The salient features of the project are as under:-

Name of the Proposal	Environmental Clearance for Guruvarya Late Laxmanraoji Inamdar Lift Irrigation Scheme (Jihe Kathapur), Phase I & II, Dist; Satara, State- Maharashtra
Cost of project	5409.72 Cr.
Total area of Project	179.614 Ha.
Height of Dam from River Bed (EL)	Existing barrage – 9.5m height Proposed Barrage I – 6m and Barrage II – 5.5m
Location (Including coordinates)	State: Maharashtra Region: Western Maharashtra District: Satara Taluka: Maan, Khatav, Koregaon and Satara Jihe Kathapur Barrage Coordinates: 17°38'30"N, 74° 07'42"E
Length of Tunnel/Channel	No new tunnel. Existing Vardhangad and Andhali Tunnel will be used.
Details of Submergence area	30 Ha.
Inter- state issue involved	No

Seismic zone	III
Category of the project	A
Provisions	(ii) ≥ 50,000 ha. of culturable command area under (ii) Irrigation projects of project 1 (c)
Capacity / Cultural command area (CCA)	76700 Ha.
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	

Types of Waste and quantity of generation during construction/ Operation	Muck generation during construction phase : 1689711 Cu.m.
E-Flows for the Project	NA
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. If not the E-Flows maintain criteria for sustaining river ecosystem.	No
No. of proposed disposal area/(type of land-Forest/Pvt. land)	Lands will be identified for disposal of muck
Muck Management Plan	Muck will be utilized for backfilling of trenches and land levelling. Detailed Muck Management Plan including monitoring mechanism for its disposal will be provided in the EIA report
Monitoring mechanism for Muck Disposal	

Private land	172.54 Ha.
Government land	0.22 Ha.
Forest Land	0.854 Ha.
Total Land	173.614 Ha.
Submergence area/Reservoir area	30 Ha.
Additional information (if any)	-

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate/letter/Remarks**

Reserve Forest/Protected Forest Land	Yes	Details of environmentally sensitive areas mentioned as below
National Park	No	
Wildlife Sanctuary	No	

Details of environmentally sensitive areas

Salient Features / Environmental features	Name	Aerial distance (km) within 10 km buffer of the Command Boundary	Direction from Command Boundary
National Park/ Wild life sanctuary/ Protected Area Notified Under the Wildlife (Protection) Act.1972/ Biosphere reserve/ Tiger Reserve/ Elephant Corridor/ Migratory routes for Birds	NA	NA	NA
Notified Eco-Sensitive Area (as per MoEF)	Western Ghats ESA Village: Rautwadi, Tehsil: Koregaon	Western Ghats ESA 6.97km from Bhadale LIS command boundary	NW from Bhadale LIS command boundary
	Western Ghats ESA Village: Gujarwadi, Tehsil: Koregaon	0km from Bhadale LIS command boundary	SW from Bhadale LIS command boundary
	Western Ghats ESA Village: Yavateshwari, Tehsil: Satara	8.63km from Tasgaon LIS command boundary	NW from Tasgaon LIS command boundary
Notified Eco-Sensitive Zone (as per MoEF&CC, GoI)	Mahableshwar-Panchgani Eco-Sensitive Zone	6.8km from Bhuinj Barrage	NW from Bhuinj Barrage
Reserve forest/Protected forest	RF within Ner 4 LIS Command boundary (Toposheet no: 47K/6)	0km	NA
	RF within Ner 4 LIS Command boundary (Toposheet no: 47K/6)	0km	NA
	PF & RF within Rashingwadi LIS Command boundary (Toposheet no: 47K/5, 47K/6)	0km	NA
	PF & RF within Shirvali LIS Command boundary	0km	NA

Salient Features / Environmental features	Name	Aerial distance (km) within 10 km buffer of the Command Boundary	Direction from Command Boundary
	(Toposheet no: 47K/5, 47 K/6)		
	PF within West Man LIS Command boundary (Toposheet no: 47K/6)	0km	NA
	RF within Tasgoan LIS Command boundary (Topo sheet no: 47K/2)	0km	NA
	RF within Bhadale LIS Command boundary (Topo sheet no: 47K/1)	0km	NA
	RF within Ner 3 LIS Command boundary (Toposheet no: 47K/1 & 47K/5)	0km	NA
	RF within North Man LIS Command boundary (Toposheet no: 47K/5)	0km	NA

Particulars	Letter no. and date
Certified EC compliance report (if applicable)	Certified EC compliance report will be obtained from the Regional Office, MoEF&CC, GoI, Nagpur
Status of Stage- I FC	MoEF, GoI vide letter No. 8B/23/2003-FCW/1446 dated 26/07/2004 accorded Forest Clearance
Additional detail (If any)	Water Resource Department, Govt. of Maharashtra vide Government Resolution No. dated 11/10/2024 accorded administrative approval to the project at the cost of Rs. 5409.72 crore
Is FRA (2006) done for FC-I	NA

Particulars	Details
Details of consultant	Techknowgreen Solutions Limited, Pune; Maharashtra 202, Hem Opal, Ekta Park Society,

	Wakdewadi, Shivaji nagar, Pune, Maharashtra- 411005 NABET Accreditation: NABET/EIA/24-27/RA 0364; Valid up to July 05, 2027
Project Benefits	• The proposed scheme is envisaged to benefit 175 villages in the Satara, Koregaon, Khatav and Maan Talukas by irrigating 60437 Ha. of drought-prone areas of Satara District, Maharashtra. • Increased crop production will lead to socio-economic upliftment and subsequent improvement in the livelihood of the farmers of 175 villages. • The increase in irrigation in the post-project phase will lead to development of agribusinesses and allied infrastructure in the region.
Status of other statutory clearances	Environmental Clearance: 1. Ministry of Environment & Forest, GoI vide letter No. J.12011/85/2007-IA-I dated 13/06/2008 accorded Environmental Clearance to the Jihe Kathapur Lift irrigation Scheme (Original Irrigation Plan) for irrigating an Irrigable Command Area (I.C.A.) of 27500 Ha Forest Clearance: 1. Ministry of Environment and Forests, Regional Office, Western Region, Bhopal vide letter No. BB/23/2003-Fcw/1446 dated 26/07/2004 accorded Forest Clearance 2. Revenue and Forest Department, Mantralaya, Mumbai vide letter No. FLD-2003/ CR-2/ F-10, dated 6.10.2007 accorded approval for land transfer
R&R details	No R and R work. Water storage in the barrage on the Krishna river
Additional detail (If any)	No

3.2.3. Deliberations by the committee in previous meetings

N/A

3.2.4. Deliberations by the EAC in current meetings

The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the

meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Guruvarya Late Laxmanraoji Inamdar Lift Irrigation Scheme (Jihe Kathapur), Phase I & II (CCA: 60437 Ha) in an area of 173.614 Ha in Sub district Man, Koregaon, Khatav and Satara, District Satara, Maharashtra by M/s Ex Engr Jihe Kathapur Li Division Satara.

The EAC noted that the as per the provisions the project comes under "B1" category as it is a major irrigation project because the CCA lies between ≥10,000 ha i.e. 76700 Ha. However due to presence of Mahanaleshwar Panchgani Eco-sensitive Zone is located within 10 km distance i.e. 6.8 km from the project site the project transformed to category 'A' project and will be appraised at central level.

The EAC noted that the Ministry had issued EC vide letter no. J.12011/85/2007-IA-I dated 13/06/2008 to the existing project Jihe Kathapur Lift Irrigation Scheme in the Dist. Satara of Maharashtra in favour of M/s. Kukadi Irrigation Project Division No.6. The proposal is for expansion Irrigation Scheme envisages to irrigate the land of 60437 Ha. (Existing ICA of 27500 Ha. + Proposed expansion ICA of 32937 Ha.) of Satara District, Maharashtra.

The EAC noted that the total land requirement for the project is 173.614 Ha. out of which
172.76 Ha (56.56 Ha existing area and 116.2 Ha to be acquired) is non forest land and 0.854 ha forest land. The Ministry of Environment and Forests, Regional Office, Western Region, Bhopal vide letter No. BB/23/2003-Fcw/1446 dated 26/07/2004 accorded Forest Clearance for 0.854 Ha.

The committee observed that Western Ghats Eco- sensitive area is 0km (SW) from Bhadale LIS command boundary and Mahableshwar-Panchgani Eco-sensitive Zone is 6.8km (NW) from Barrage-II from the project site. River/ water body – Krishna river is flowing at a distance of 1.3Km in NNE direction from Tasgaon LIS command boundary.

31.2.3 The EAC based on the information submitted and as presented during the meeting, **recommended** the proposal for grant of Standard ToR issued by the Ministry for conducting EIA/EMP and Public Consultation with Public hearing for Guruvarya Late Laxmanraoji Inamdar Lift Irrigation Scheme (Jihe Kathapur), Phase I & II (CCA: 60437 Ha) in an area of 173.614 Ha in Sub district Man, Koregaon, Khatav and Satara, District Satara, Maharashtra by M/s Ex Engr Jihe Kathapur Li Division Satara, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR.

3.2.5. Recommendation of EAC

Recommended

3.2.6. Details of Terms of Reference

3.2.6.1. Specific

Miscellaneous.	
1.	Pre-DPR Chapters viz. Layout Map and Hydrology duly approved by CWC/CEA shall be submitted.
2.	Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
3.	Both capital and recurring expenditure under EMP shall be submitted.
4.	The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.

5.	Arial view video of project site shall be recorded and to be submitted.
Muck Management/ Disaster Management	
1.	Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.
2.	Details of Muck Management plan prepared along with estimated cost incorporated in EIA/EMP report.
3.	Techno-economic viability of the project must be recommended from CEA/ CWC.
Socio-economic Study	
1.	Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local population.
2.	Declaration by the Project Proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
3.	All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.
4.	Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F. No. 22- 65/2017-IA.III dated 30th September, 2020 shall be submitted.
5.	Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.
6.	Details of settlement in 10 km area shall be submitted.
7.	Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F. No. 22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.
Environmental Management and Biodiversity Conservation:	
1.	Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.
2.	Prepare Wildlife conservation plan specifically for avi-fauna with mitigation measures for minimizing the human–animal conflict and be suitably incorporated in the wildlife conservation plan in consultation with reputed government expert institute and State Forest Department.
3.	Prepare Environmental Cost Benefit Analysis in terms of ecological damage due to diversion of Forest land/ loss of biodiversity and its impacts on ecosystem, water availability, water uses for generation of hydro power in study area 10 km from periphery of Project components.
4.	A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem,

	within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted and thermal stratification. Accordingly, Environment Management plan shall be prepared.
5.	Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/EMP report.
6.	Source of construction material and its distance from the project site along with detailed transportation plan for construction material be elaborated in the EIA EMP report. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
7.	A detailed wildlife conservation plan for Schedule –I species, duly approved by the Chief Wildlife Warden, be submitted.
8.	In case any wildlife corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.

3.2.6.2. Standard

1(c)	**River Valley/Irrigation projects**
Scope of EIA Study	
1.	The EIA Report should identify the relevant environmental concerns and focus on potential impacts that may change due to the construction of proposed project. Based on the baseline data collected for three (3) seasons (Pre-monsoon, Monsoon and Winter seasons), the status of the existing environment in the area and capacity to bear the impact on this should be analysed. Based on this analysis, the mitigation measures for minimizing the impact shall be suggested in the EIA/EMP study.
Details of the Project and Site	
1.	General introduction about the proposed project.
2.	Details of Project and site giving L-Sections of all U/S and D/S Projects with all relevant maps and figures. Connect such information as to establish the total length of interference of Natural River and the committed unrestricted release from the site of Dam/Barrage into the main river.
3.	A map of boundary of the project site giving details of protected areas in the vicinity of 25 km of project location.
4.	Location details on a map of the project area with contours indicating main project features. The project layout shall be superimposed on a contour map of ground elevation showing main project features (viz. location of dam, Head works, main canal, branch canals, quarrying etc.) shall be depicted in a scaled map.
5.	Layout details and map of the project along with contours with project components clearly marked with proper scale maps of at least 1:50,000 scale and printed at least on A3 scale for clarity.
6.	Existence of National Park, Sanctuary, Biosphere Reserve etc. in the study area, if any, should be detailed and presented on a map with distinct distances from the project components.
7.	Drainage pattern and map of the river catchment up to the proposed project site.
8.	Delineation of critically degraded areas in the directly draining catchment on the basis of Silt Yield Index as per the methodology of Soil and Land use Survey of India.

9.	Soil characteristics and map of the project area.
10.	Geological and Seismo-tectonic details and maps of the area surrounding the proposed project site showing location of dam site and canal sites.
11.	Remote Sensing studies, interpretation of satellite imagery, topographic sheets along with ground verification shall be used to develop the land use/land cover pattern of the study using overlaying mapping techniques viz. Geographic Information System (GIS), False Color Composite (FCC) generated from satellite data of project area.
12.	Land details including forests, private and other land.
13.	Demarcation of snow fed and rain fed areas for a realistic estimate of the water availability
Description of Environment and Baseline Data	
1.	To know the present status of environment in the area, baseline data with respect to environmental components air, water, noise, soil, land and biology & biodiversity (flora & fauna), wildlife, socioeconomic status etc. should be collected within 10 km radius of the main components of the project/site i.e. dam site and power house site. The air quality and noise are to be monitored at such locations which are environmentally & ecologically more sensitive in the study area. The baseline studies should be collected for 1 season (Preferably Monsoon season). Flora-Fauna in the catchment and command area should be documented. The study area should comprise of the following:
2.	(i) Catchment area up to the dam/barrage site.
3.	(ii) Submergence Area.
4.	(iii) Project area or the direct impact area should comprise of area within 10 km radius of the main project components like dam, canals etc.
5.	(iv) Downstream upto 10 km from the tip of the reservoir.
Details of the Methology	
1.	The methodology followed for collection of base line data along with details of number of samples and their locations in the map should be included. Study area should be demarcated properly on the appropriate scale map. Sampling sites should be depicted on map for each parameter with proper legends. For Forest Classification, Champion and Seth (1968) methodology should be followed.
Methodology for Collection of Biodiversity Data	
1.	The number of sampling locations should be adequate to get a reasonable idea of the diversity and other attributes of flora and fauna. The guiding principles should be the size of the study area (larger area should have larger number of sampling locations) and inherent diversity at the location, as known from secondary sources (e.g. eastern Himalayan and low altitude sites should have a larger number of sampling locations owing to higher diversity).
2.	The entire area should be divided in grids of 5kmX5km preferably on a GIS domain. There after 25% of the grids should be randomly selected for sampling of which half should be in the directly affected area (grids including project components such as reservoir, dam, powerhouse, tunnel, canal etc.) and the remaining in the rest of the area (areas of influence in 10 km radius form project components). At such chosen location, the size and number of sampling units (e.g. quadrates in case of flora/transects in case of fauna) must be decided by species area curves and the details of the same (graphs and cumulative number of species in a tabulated form) should be provided in the EIA report. Some of the grids on the edges may not be completely overlapping with the study area boundaries. However, these should be counted and considered for selecting 25% of the grids. The number of grids to be

	surveyed may come out as a decimal number (i.e. it has an integral and a fractional part) which should be rounded to the next whole number.
3.	The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.
4.	The R.E.T. species referred to in this point should include species listed in Schedule I and II of Wildlife (Protection) Act, 1972 and those listed in the red data books (BSI, ZSI and IUCN).
Components of the EIA Study: Various aspects to be studied and provided in the EIA/EMP report are as follow s:	
1.	null
2.	null
3.	null
4.	Physical geography, Topography, Regional Geological aspects and structure of the Catchment.
5.	Tectonics, seismicity and history of past earthquakes in the area. A site specific study of the earthquake parameters will be done. The results of the site specific earthquake design shall be sent for approval of the NCSDP (National Committee of Seismic Design Parameters, Central water Commission, New Delhi for large dams.
6.	Landslide zone or area prone to landslide existing in the study area should be examined.
7.	Presence of important economic mineral deposit, if any.
8.	Justification for location & execution of the project in relation to structural components (dam /barrage height).
9.	Impact of project on geological environment.

10.	null
11.	Meteorology (viz. Temperature, Relative humidity, wind speed/direction etc.) to be collected from nearest IMD station.
12.	Ambient Air Quality with parameters viz. Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM) i.e. suspended particulate materials < 10 microns, Sulphur dioxide (SO2) and Oxides of Nitrogen (NOX) in the study area at 5-6 Locations.
13.	Existing Noise Levels and traffic density in the study area at 5-6 Locations.
14.	null
15.	Soil classification, physical parameters (viz., texture, Porosity, Bulk Density and water holding capacity) and chemical parameters (viz. pH, electrical conductivity, magnesium, calcium, total alkalinity, chlorides, sodium, potassium, organic carbon, available potassium, available phosphorus, SAR, nitrogen and salinity, etc.) at @ one sample/ha of command area.
16.	null
17.	Generation of thematic maps viz, slope map, drainage map, soil map, land use and land cover map, etc. Based on these, thematic maps, an erosion intensity map should be prepared.
18.	New configuration map to be given in the EIA Report
19.	null
20.	History of the ground water table fluctuation in the study area.
21.	Water Quality for both surface water and ground water for [i] Physical parameters (pH, Temperature, Electrical Conductivity, TSS); [ii] Chemical parameters (Alkalinity, Hardness, BOD, COD, NO3, PO4, Cl, So4, Na, K, Ca, Mg, Silica, Oil & grease, phenolic compounds, residual sodium carbonate);[iii] Bacteriological parameter (MPN, Total coliform); and [iv] Heavy Metals (Pb, As, Hg, Cd, Cr6,Total Cr, Cu, Zn, Fe) at minimum10 Locations, however, the sampling numbers should be increased depending on the command area.
22.	Delineation of sub and micro watersheds, their locations and extent based on the Soil and Land Use Survey of India (SLUSOI), Department of Agriculture, Government of India. Erosion levels in each micro-watershed and prioritization of micro-watershed through Silt Yield Index (SYI) method of SLUSOI.
23.	Hydro-Meteorology of the project viz. precipitation (snowfall, rainfall), temperature, relative humidity, etc. Hydro-meteorological studies in the catchment area should be established along-with real time telemetry and data acquisition system for inflows monitoring.
24.	Run off, discharge, water availability for the project, sedimentation rate, etc.
25.	Basin characteristics
2	Catastrophic events like cloud bursts and flash floods, if any, should be documented.

6.	
27.	For estimation of Sedimentation Rate, direct sampling of river flow is to be done during the EIA study. The study should be conducted for minimum one year. Actual silt flow rate to be expressed in ha-m km2 year-1.
28.	Set up a G&D monitoring station and a few rain gauge stations in the catchment area for collecting data during the investigation.
29.	Flow series, 10 daily with 90%, 75% and 50% dependable years discharges.
30.	Environmental flow release should be 20% of the average of the 4 lean months of 90% dependable year during the lean season and 30% of Monsoon flow during monsoon season. For remaining months, the flow shall be decided by the Committee based on the hydrology and available discharge.
31.	A site specific study on minimum environment flow should be carried
32.	null
33.	null
34.	Characterization of forest types (as per Champion and Seth method) in the study area and extent of each forest type as per the Forest Working Plan.
35.	General vegetation profile and floral diversity covering all groups of flora including Bryophytes, Pteridophytes, Lichens and Orchids. A species wise list may be provided.
36.	Assessment of plant species with respect to dominance, density, frequency, abundance, diversity index, similarity index, importance value index [IVI], Shannon Weiner Index etc. of the species to be provided. Methodology used for calculating various diversity indices along with details of locations of quadrats, size of quadrats etc. to be reported within the study area in different ecosystems.
37.	Existence of National Park, Sanctuary, Biosphere Reserve etc in the study area, if any, should be detailed.
38.	Economically important species like medicinal plants, timber, fuel wood etc.
39.	Details of endemic species found in the project area.
40.	Flora under RET categories should be documented using International Union for the Conservation of Nature and Natural Resources (IUCN) criteria and Botanical Survey of India's Red Data list along with economic significance. Species diversity curve for RET species should be given.
41.	Fauna study and inventorisation should be carried out for all groups of animals including reptiles and nocturnal animals in the study area. Their present status along with Schedule of the species.
42.	Information (authenticated) on Avi-fauna and wild life in the study area.
43.	Status of avifauna their resident/migratory/ passage migrants etc.

44.	Documentation of butterflies, if any, found in the area.
45.	Details of endemic species found in the project area.
46.	RET species- voucher specimens should be collected along with GPS readings to facilitate rehabilitation. RET faunal species to be classified as per IUCN Red Data list and as per different schedule of Indian Wildlife (Protection) Act, 1972.
47.	Existence of barriers and corridors, if any, for wild animals.
48.	Compensatory afforestation to compensate the green belt area that will be removed, if any, as part of the proposed project development and loss of biodiversity.
49.	For categorization of sub-catchments into various erosion classes and for the consequent CAT plan, the entire catchment (Indian Portion) is to be considered and not only the directly the draining catc
50.	Documentation of aquatic fauna like macro-invertebrates, zooplankton, phytoplanktons, benthos etc.
51.	Fish and fisheries, their migration and breeding grounds.
52.	Fish diversity, composition and maximum length & weight of the measured populations to be studied for estimation of environmental flow.
53.	Conservation status of aquatic fauna.
54.	Cropping pattern and Horticultural practices in the study area.
55.	Collection of primary data on agricultural activity, crop and their productivity and irrigation facilities component.
56.	Component of pressurized/drip irrigation and micro irrigation.
57.	Details of Conjunctive use of water for irrigation
58.	Collection of Baseline data on human settlements, health status of the community and existing infrastructure facilities for social welfare including sources of livelihood, job opportunities and safety and security of workers and surrounding population.
59.	Collection of information with respect to social awareness about the developmental activity in the area and social welfare measures existing and proposed by project proponent.
60.	Collection of information on sensitive habitat of historical, cultural and religious and ecological importance.
61.	The Socio-economic survey/profile within 10 Km of the study area for Demographic profile; Economic Structure; Development Profile; Agricultural Practices; Infrastructure, education facilities; health and sanitation facilities; available communication network etc.

62.	Documentation of Demographic, Ethnographic, Economic structure and development profile of the area
63.	Information on Agricultural practices, Cultural and aesthetic sites, Infrastructure facilities etc
64.	Information on the dependence of the local people on minor forest produce and their cattle grazing rights in the forest land.
65.	List of all the Project Affected Families with their names, education, land holdings, other properties, occupation, source of income, land and other properties to be acquired, etc.
66.	In addition to Socio-economic aspects of the study area, a separate chapter on socio-cultural aspects based upon study on Ethnography of the area should be provided.
Impact Prediction and Mitigation Measures	
1.	The adverse impact due to the proposed project should be assessed and effective mitigation steps to abate these impacts should be described.
2.	Changes in ambient and ground level concentrations due to total emissions from point, line and area sources
3.	Effect on soils, material, vegetation and human health
4.	Impact of emissions from DG sets used for power during the construction, if any, on air environment.
5.	Pollution due to fuel combustions in equipments & vehicles
6.	Fugitive emissions from various sources.
7.	Impact on micro climate
8.	Changes in surface & ground water quality. Steps to develop pisci-culture and recreational facilities.
9.	Changes in hydraulic regime and down stream flow.
10.	Water pollution due to disposal of sewage.
11.	Water pollution from labour colony/camps and washing equipment.
12.	Adverse impact on land stability, catchment of soil erosion, reservoir sedimentation and spring flow (if any) [a] due to considerable road construction/widening activity [b] interference of reservoir with the inflowing streams [c] blasting for excavation of canals and some other structures
13.	Changes in land use/land cover and drainage pattern.
14.	Immigration of labour population.
15.	Quarrying operation and muck disposal.
1	Changes in land quality including effects of waste disposal

6.	
17.	River bank and their stability
18.	Impact due to submergence
19.	Impact on forests, flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc.
20.	Pressure on existing natural resources
21.	Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors
22.	Compensatory afforestation-Identification of suitable native tree species for compensatory afforestation & green belt.
23.	Impact on fish migration and habitat degradation due to decreased flow of water
24.	Impact on breeding and nesting grounds of animal
25.	Impact on local community including demographic profile.
26.	Impact on socio-economic status.
27.	Impact on economic status.
28.	Impact on human health due to water / vector borne disease.
29.	Impact on increases traffic.
30.	Impact on Holy Places and Tourism.
31.	Impacts of blasting activity during project construction which generally destabilize the land mass and lead to landslides, damage to properties and drying up of natural springs and cause noise pollution, will be studied. Proper record shall be maintained of the base line information in the post project period.
32.	Positive as well as negative impacts likely to be accrued due to the project are to be listed.
Environment Impact Analysis	
1.	Environmental Impact Analysis due to the project on the above mentioned components should be carried out for construction and operation phases using qualitative or quantitative methods.

Environmental Management Plan	
1.	Environmental Management Plan aimed at minimizing the negative impacts of the project should be given in detail. The mitigation measures are to be presented for all the likely adverse impacts on the environment. The following suggestive mitigating plans should be included
2.	Biodiversity and Wild Life Conservation & Management Plan for conservation and preservation of endemic, rare and endangered species of flora and fauna to be prepared in consultation with State Forest Department.
3.	Compensatory Afforestation in lieu of the forest land required for the project needs to be proposed.Choice of plants should be made in consultation with State Forest Department including native and RET species, if any.
4.	Fisheries Conservation & Management Plan-Fish fauna inhabiting the affected stretch of river, a specific fisheries management plan should be prepared for river and reservoir.
5.	Plan for Green Belt Development along the periphery of reservoir, colonies, approach road, canals etc. to be prepared in consultation with the State Forest Department. Local plant species suitable for greenbelt development should be selected.
6.	Environmental Monitoring Programme with physical & financial details covering all the aspects of EMP. A summary of cost estimate for all the plans, cost for implementing all Environmental Management Plans including the cost for implementing environmental monitoring programme should be given. Provision for an Environmental Management Cell should be made.
7.	Catchment Area Treatment (CAT) Plan should be prepared micro-watershed wise. Identification of area for treatment based upon Remote Sensing & GIS methodology and Silt Yield Index (SYI) method of SLUSOI coupled with ground survey. Areas/watersheds falling under 'very severe' and `severe' erosion categories are required to be treated. Both biological and engineering measures should be proposed in consultation with State Forest Department. Year-wise schedule of work and monetary allocation should be provided. CAT plan is to be completed prior to reservoir impoundment. Mitigations measures to check shifting cultivation in the catchment area with provision for alternative and better agricultural practices should be include.
8.	Study of Design Earthquake Parameters: A site specific study of earthquake parameters should be done. The results of the site specific earth quake design parameters should be approval by National Committee of Seismic Design Parameters, Central Water Commission (NCSDP), New Delhi.
9.	Dam Break Analysis and Disaster Management Plan: The outputs of Dam Break Model should be illustrated with appropriate graphs and maps clearly bringing out the impact of Dam break scenario. Provision for early warning systems should be provided.
10.	Reservoir Rim Treatment Plan for stabilization of land slide/land slip zones if any, around the reservoir periphery to be prepared. Suitable engineering and biological measures for treatment of the identified slip zones to be provided with physical and financial schedule.
11.	Muck Disposal Plan- suitable sites for dumping of excavated material should be identified in consultation with the State Pollution Control Board and Forest Department. All Muck disposal sites should be minimum 30 m away from the HFL of river. Plan for rehabilitation of muck disposal sites should also be given. The L- section/ cross section of muck disposal sites and approach roads to be given. Financial out lay for this may be given separately. Deatailed muck transportation plan delinating the path ways, number of trucks, quantity of muck to be transportated along with monitoring mechanism using latest technology, shall be prepared.
12.	Plan for Restoration of quarry sites and landscaping of colony areas, working areas, roads, etc.
13.	Command Area Development (CAD) Plan giving details of implementation schedule with a sample CAD plan.
1	In the EMP, also include a sample CAD plan for a distributary outlet command. Such a plan is to show the

4.	alignment of irrigation and drainage channels. The components of the OFD works to be undertaken may be clearly mentioned along with a time schedule for their completion vis-à-vis the progress of irrigation development.
15.	Mitigating measures for impacts due to Blasting on the structures in the vicinity.
16.	Resettlement and Rehabilitation (R&R) Plan need to be prepared with due consultation with Project Affected Families (PAFs). The provision of the d R&R plan should be according to the National Resettlement and Rehabilitation Policy (NRRP-2007) as well as State Resettlement and Rehabilitation Policy. Detailed budgetary estimates are to be provided. Resettlements sites should be identified.
17.	Public Health Delivery Plan including the provisions for drinking water facility for the local community.
18.	Local Area Development Plan to be formulated in consultation with the Revenue Officials and Village Panchayats. Local skill development schemes should be given. Details of various activities to be undertaken along with its financial out lay should be provided.
19.	Labour Management Plan for their Health and Safety.
20.	Sanitation and Solid Waste Management Plan for domestic waste from colonies and labour camps etc.
21.	Plan for Land Restoration and Landscaping of project sites.
22.	Energy Conservation Measures.
23.	Environmental safeguards during construction activities including Road Construction.
24.	Ground Water Management Plan.
25.	Water and Air Quality & Noise Management Plans to be implemented during construction and post-construction periods.

3.3. Agenda Item No 3:

3.3.1. Details of the proposal

Kalu Patti Pumped Storage Project by **RENEW HYDRO POWER PRIVATE LIMITED** located at **MIRZAPUR, UTTAR PRADESH**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/UP/RIV/536186/2025	J-12011/18/2025-IA.I(R)	05/05/2025	River Valley/Irrigation projects (1(c))

3.3.2. Project Salient Features

The proposal is for grant of Terms of References (ToR) to the project for Kalu Patti Pumped Storage Project (600 MW) in an area of 267 Ha in Village Devhat, Mudel, Lain, etc, Sub District Lalganj, District Mirzapur, Uttar Pradesh by M/s Renew Hydro Power Private Limited.

- The proposed project area is located near Kalu Patti village in Lalganj tehsil of Mirzapur district. Kalu Patti is an uninhabited village.
- The surrounding region is primarily rural, with agriculture as the main livelihood. Residents primarily cultivate crops such as wheat, rice, pulses, and various seasonal vegetables, depending on soil conditions and climate.
- In addition to farming, some villagers engage in animal husbandry, rearing cattle, goats, and poultry. Small-scale businesses, artisanal crafts, and local trade also contribute to the village economy.
- Some communities in the project area rely on nearby forests for resources such as firewood, medicinal plants, and livestock fodder.

Sl. No.	Description	Alternative-1	Alternative-2	Alternative-3
1	**Type of Powerhouse**	Surface	Underground	Surface
2	**Water Source**	**Adwa Dam/ Baraundha weir**		
3	**Location Village**	**Kalu Patti**		
4	**District**	**Mirzapur**		
5	**Upper Reservoir**			
	Lattitude/Longitude	24°51'29.91"N,	24°51'8.70"N,	24°51'29.91"N,
		82° 9'27.71"E	82° 9'16.11"E	82° 9'27.71"E
	Bed Level (m)	350	350	350
	Max.Dam Height (m)	25	25	25
	Length of Dam (m)	2892.00	2773.00	2912.00
	Type of Dam	CFRD	CFRD	CFRD
	Top of the Dam (m)	375	375	375
	FRL (m)	370	370	370
	MDDL (m)	354	352	352
	Area at FRL (Ha)	45.67	47.4	49.09
	Area at MDDL (Ha)	39.09	40.33	41.65
	Live Storage capacity (M CM)	6.78	7.89	8.16
6	**Lower Reservoir**			

	Lattitude/Longitude	24°51'21.63"N,	24°50'30.42"N,	24°52'15.18"N,
		82°10'33.41"E	82°10'22.74"E	82° 9'9.40"E
	Bed Level (m)	128	148	153
	Max.Dam Height (m)	22	22	22
	Length of Dam (m)	1955.00	3217.00	3341.00
	Type of Dam	CFRD	CFRD	CFRD
	Top of the Dam (m)	150	170	175
	FRL (m)	145	165	170
	MDDL (m)	130	150	155
	Area at FRL (Ha)	57.78	67.89	69.39
	Area at MDDL (Ha)	51.18	61.02	62.19
	Live Storage capacity (M CM)	8.17	9.67	9.86
7	**Total Discharge(cumecs)**	**309.27**	**347.10**	**356.07**
8	Max Head (m)	240	220	215
9	Min Head (m)	209	187	182
10	Rated Net Head (m)	219.72	198.5	193.5
11	Max Min Head ratio	1.18	1.18	1.18
12	**IC (MW)**	**600**	**600**	**600**
13	Nos. of Turbine Units	3	3	3
14	Unit Capacity (MW)	3 no.s of 200 MW	3 no.s of 200 MW	3 no.s of 200 MW
15	Unit Discharge (cumecs)	**103.09**	**115.70**	**118.69**
16	**Length of The WCS**	**1180.23**	**1515.68**	**864.98**
	Main Pressure shaft			
	Nos.	3	3	3

	Diameter (m)	5.4	5.7	5.7
	Avg. Length (m)	1038.59	562.68	722.52
	Main Tail Race Tunnel			
	Nos.	3	3	3
	Diameter (m)	6	6.3	6.3
	Avg.Length (m)	141.64	830.5	142.46
17	Upstream L/H Ratio	4.7	2.8	3.7
18	Upstream Surge Tank	Not Required	Not Required	Not Required
19	Downstream Surge Gallery	Not Required	Required	Not Required
20	Max Excavation in Power House (m)	81	_	110
21	Storage Capacity (MWh)		3600.00	
22	Annual Energy (MU)	1257.90	1257.90	1257.90

1. Project details:

Name of the Proposal	Kalu Patti Pumped Storage Project
Location (Including coordinates)	Lower Reservoir : Latitude: 24° 51' 21.63" N Longitude: 82° 10' 33.41" E; Upper Reservoir : Latitude: 24° 51' 29.91" N Longitude: 82° 9' 27.71" E;
Inter- state issue involved	No
Seismic zone	Zone-III

2. Category details:

Category of the project	A
Provisions	
Capacity / Cultural command area (CCA)	600 MW
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	Nil

3. Electricity generation capacity:

Powerhouse Installed Capacity	600 MW
Generation of Electricity Annually	1257.9 MU
No. of Units	3 nos. (3 x 200 MW)
Additional information (if any)	Nil

4. ToR/EC Details:

Cost of project	3350 Cr.
Total area of Project	267 ha
Height of Dam from River Bed (EL)	Lower Dam – 20.0 m Upper Dam –25.0 m
Length of Tunnel/Channel	1038.59 m
Details of Submergence area	103.45
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Closed Loop Pumped Storage Project (PSP)
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA& CC) for River in which project located. If yes, th en a) E-flow with TOR /Recommendation by E AC as per CIA&CC study of River Basi n. b) If not the E-Flows maintain criteria for sus taining river ecosystem.	No

5. Land Area Breakup:

Private Land	117.0 ha
Government land	-
Forest Land	150.0 ha
Total Land	267.0 ha
Submergence area/Reservoir area	103.45 ha
Additional information (if any)	Nil

6. Presence of Environmentally Sensitive areas in the study area

7. Court case details: Nil

8.

Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/No	Details of Certificate / letter/ Remarks
Reserve Forest/Protected Forest Land	--	There is no Protected Area in the vicinity of the proposed project. Kaimur WLS is approx. 11.8 km far from the proposed project area.
National Park	--- --	
Wildlife Sanctuary	--- --	

Miscellaneous

Particulars	Details
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (*NABET* Accredited *Consultant Organization*) Certificate No : NABET/EIA/2225/RA0274 Validity : August 15, 2025 Contact Person : Mr. Ravinder Bhatia Name of Sector : River Valley and Hydroelectric Projects Category : A MoEF Schedule : I(C) Address : 403, Bestech Chambers, Block-B, Sushant Lok Phase I, Sector 43, Gurugram, Haryana - 122009 E-mail : ravi@rstechnologies.co.in Land Line : (0124) 4295383 Cellular : (+91) 9810136853
Project Benefits	• Pumped storage hydropower is a modified use of conventional hydropower technology to store and manage energy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 80%, comparing favorably to other energy storage technologies and thermal technologies. This effectively shifts, stores, and reuses energy generated until there is corresponding demand for system reserves and variable energy integration. This shifting can also occur to avoid transmission congestion periods, to help more efficiently manage transmission grid, and to avoid potential interruptions to energy supply. This is important because many of the renewable energy resources being developed (e.g., wind and solar) are generated at times of low demand and off-peak energy demand periods are still being met with fossil fuel resources, often at inefficient performance levels that in

	crease the release of greenhouse gas emissio ns. • Further, pumped storage projects are critical to t he national economy and overall energy relia bility because it's: o Least expensive source of electricity, n ot requiring fossil fuel for generation o An emission-free renewable source o Balancing grid for demand driven varia tions o Balancing generation driven variations o Voltage support and grid stability Apart from this, proposed PSP will also bene fit the local community by creating employm ent opportunities and will result in upliftmen t of livelihood and socio-economic condition s.

3.3.3. Deliberations by the committee in previous meetings

N/A

3.3.4. Deliberations by the EAC in current meetings

31.3.3 The EAC during deliberations noted the following:

The Expert Appraisal Committee (EAC) deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Kalu Patti Pumped Storage Project (600 MW) in an area of 267 Ha in Village Devhat, Mudel, Lain, etc, Sub District Lalganj, District Mirzapur, Uttar Pradesh by M/s Renew Hydro Power Private Limited.

The project/activity falls under Category A of item 1(c), 'River Valley Projects,' as per the Schedule of the Environmental Impact Assessment Notification, 2006, and requires appraisal at the central level by the sectoral EAC in the Ministry.

The EAC noted that the total land required for the proposed project is about 267.0 ha, out of which 117.0 ha is non-forest land and 150.0 ha is forest land. However, it was observed that the application for Stage-I Forest Clearance (FC) has not yet been submitted, which necessitates further action from the Project Proponent. There is no Protected Area in the vicinity of the proposed project. Kaimur WLS is 11.80 km far from the proposed project area. River/ water body, Water will be pumped from Belan River.

In view of the significant forest land involvement, reliance on river water, and proximity to ecologically sensitive areas, the Committee emphasized the need for a detailed ground-level assessment.

It has been observed that Memorandum of Understanding has been signed between Government of Uttar Pradesh and M/s Renew Hydro Power Pvt. Ltd. to build PSP with a capacity of 600 MW vide MoU No. 24/REN/0000028267 dated June 25, 2024.

33.3.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Close Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Kalu Patti Pumped Storage Project (600 MW) in an area of 267 Ha in Village Devhat, Mudel, Lain, etc, Sub District Lalganj, District Mirzapur, Uttar Pradesh by M/s Renew Hydro Power Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

3.3.5. Recommendation of EAC

Recommended

3.3.6. Details of Terms of Reference

3.3.6.1. Specific

Miscellaneous	
1.	Both capital and recurring expenditure under EMP shall be submitted.
2.	Approved Layout as per pre-DPR chapter duly approved by CEA/CWC shall be submitted.
3.	The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.
4.	Drone video of project site shall be recorded and to be submitted.
5.	Undertaking need to be submitted on affidavit stating that no activities has been started on the project site.
6.	Detailed plan to restore wider roads and convert them into narrow up to 10m after construction of the project.
7.	Specific Terms of Reference (ToRs) issued by the Ministry vide Office Memorandum No. F. No. IA3-22/33/2022-IA.III dated 14.08.2023 for Pumped storage projects shall be used for preparation of EIA/ EMP reports.
8.	As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.
Disaster Management	
1.	Impact of Project activities (specially blasting and drilling) on the aquatic and terrestrial ecosystem, within study area to be studied and be incorporated in EIA/EMP report.
2.	The muck dumping sites shall be located with a distance of 100 mts from HFL. The PP shall submit the detailed action plan for transportation of muck along with monitoring mechanism of movement of muck carrying trucks.
Muck Management	
1.	Details of quantity of muck generation component wise, types of muck (Excavation in tunnels, pressure shaft and powerhouse etc.) and disposal site/ transportation to be provided.
2.	Details of muck management such as dumping sites and its locations, transportation plan along with monitoring mechanism for muck transportation, detailing the road map of project construction site/ indicating the distances from HFL, river, project construction site along with types of road etc.

3.	Safety measures for avoiding spill over muck into the riverbed/streams and its flow into the river during the high discharge/ flood or monsoon period. Prepare plan for stabilization of muck disposal sites using biological and engineering measures to ensure that muck does not roll down the slopes and shall be disposed safely and that it does not pollute the natural streams and water bodies in surrounding area.
4.	Restoration plan for construction area including dumping site of excavated materials by levelling, filling up of burrow pits, landscaping etc.
Socio-economic Study	
1.	Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
2.	All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. A comparative chart of issues raised by General Public during Public Hearing and commitments made by the Project Proponent will be prepared and submitted in the relevant chapter of EIA/EMP report.
3.	PP shall submit the credible documents to show the status of land acquisition w.r.t project site from/through the concerned State Government as required under Ministry's OM dated 7th October, 2014 for the project land to be acquired.
4.	Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land (if any) shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. Budget earmarked for R&R, CSR shall not be included in the cost of EMP.
Environmental Management and Biodiversity Conservation	
1.	PP shall submit the Water Utilization Mapping within a 10 km radius of the project for examining the impacts on sustainability of ecosystem of the region after withdrawal of water for proposed project.
2.	Detailed action plan for large scale plantation of native species of plant sapling within 10 km radius of the project shall be prepared in consultation with State Forest Department.
3.	Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 150.0 ha of forest land involved in the project shall be submitted within stipulated time.
4.	Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area.
5.	Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.
6.	PP shall submit the detailed plan for filling the reservoir from the Belan River along with necessary approval form water resource department. Necessary clearance/ approval for interstate issues/ water availability/water sharing issues shall be obtained.
7.	Transportation Plan for transporting construction materials shall be submitted.
8.	Environmental Cost Benefit Analysis shall be done in terms of loss of Forest ecosystem due to

	diversion of Forest land/loss of biodiversity, water availability, water uses for generation of hydro power and Ecological flows.
9.	The baseline data collection will cover the changes in biological and ecological profile of the region after monsoon with worst-case scenario study and critical mineral assessment.
10.	Calculation and values of GHGs (CO2, CH4 etc.) emissions during construction and during operation till the life of the project shall be estimated and submitted.
11.	The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report. Presence of any critical mineral zone in the proposed area be clarified from GSI.
12.	Details of mineral zone, if any, in the study area, certified by Geological Survey of India or any other concerned Government Organization shall be submitted. The project area should not come up on any critical mineral zone, the same shall to be verified by GSI/NMDC.
13.	Quantitative values of Impact modelling of environmental parameters shall be submitted for during construction and operation. Also, mitigation measures shall be submitted in terms of construction and operation phase.
14.	Conducting site-specific ecological study emphasizing on riverine ecology viz. fishes diversity, fish migration, habitat and aquatic biota due to construction PSP. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.
15.	Cumulative Impact of projects in the basin on carrying capacity and sustainability of Reservoir/ River /nala of catchment area due to tapping of water for filling reservoir shall be studied.
16.	Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Specific ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.
17.	A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.
18.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
19.	Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Indian Council of Agriculture Research (ICAR) Institutes/ Expert Govt. institutions and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
20.	Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI.

3.3.6.2. Standard

1(c)	**River Valley/Irrigation projects**
Scope of EIA Study	

1.	The EIA Report should identify the relevant environmental concerns and focus on potential impacts that may change due to the construction of proposed project. Based on the baseline data collected for three (3) seasons (Pre-monsoon, Monsoon and Winter seasons), the status of the existing environment in the area and capacity to bear the impact on this should be analysed. Based on this analysis, the mitigation measures for minimizing the impact shall be suggested in the EIA/EMP study.
Details of the Project and Site	
1.	General introduction about the proposed project.
2.	Details of Project and site giving L-Sections of all U/S and D/S Projects with all relevant maps and figures. Connect such information as to establish the total length of interference of Natural River and the committed unrestricted release from the site of Dam/Barrage into the main river.
3.	A map of boundary of the project site giving details of protected areas in the vicinity of 25 km of project location.
4.	Location details on a map of the project area with contours indicating main project features. The project layout shall be superimposed on a contour map of ground elevation showing main project features (viz. location of dam, Head works, main canal, branch canals, quarrying etc.) shall be depicted in a scaled map.
5.	Layout details and map of the project along with contours with project components clearly marked with proper scale maps of at least 1:50,000 scale and printed at least on A3 scale for clarity.
6.	Existence of National Park, Sanctuary, Biosphere Reserve etc. in the study area, if any, should be detailed and presented on a map with distinct distances from the project components.
7.	Drainage pattern and map of the river catchment up to the proposed project site.
8.	Delineation of critically degraded areas in the directly draining catchment on the basis of Silt Yield Index as per the methodology of Soil and Land use Survey of India.
9.	Soil characteristics and map of the project area.
10.	Geological and Seismo-tectonic details and maps of the area surrounding the proposed project site showing location of dam site and canal sites.
11.	Remote Sensing studies, interpretation of satellite imagery, topographic sheets along with ground verification shall be used to develop the land use/land cover pattern of the study using overlaying mapping techniques viz. Geographic Information System (GIS), False Color Composite (FCC) generated from satellite data of project area.
12.	Land details including forests, private and other land.
13.	Demarcation of snow fed and rain fed areas for a realistic estimate of the water availability.
14.	Different riverine habitats like rapids, pools, side pools and variations in the river substratum bedrocks, rocks, boulders, sand/silt or clay etc. need to be covered under the study
Description of Environment and Baseline Data	
1.	To know the present status of environment in the area, baseline data with respect to environmental components air, water, noise, soil, land and biology & biodiversity (flora & fauna), wildlife, socioeconomic status etc. should be collected within 10 km radius of the main components of the project/site i.e. dam site and power house site. The air quality and noise are to be monitored at such locations which are environmentally & ecologically more sensitive in the study area. The baseline studies should be collected for 1 season (Preferably Monsoon season). Flora-Fauna in the catchment and command area should be documented. The study area should comprise of the

	following:
2.	(i) Catchment area up to the dam/barrage site.
3.	(ii) Submergence Area.
4.	(iii) Project area or the direct impact area should comprise of area within 10 km radius of the main project components like dam, canals etc.
5.	(iv) Downstream upto 10 km from the tip of the reservoir.
Details of the Methology	
1.	The methodology followed for collection of base line data along with details of number of samples and their locations in the map should be included. Study area should be demarcated properly on the appropriate scale map. Sampling sites should be depicted on map for each parameter with proper legends. For Forest Classification, Champion and Seth (1968) methodology should be followed.
Methodology for Collection of Biodiversity Data	
1.	The number of sampling locations should be adequate to get a reasonable idea of the diversity and other attributes of flora and fauna. The guiding principles should be the size of the study area (larger area should have larger number of sampling locations) and inherent diversity at the location, as known from secondary sources (e.g. eastern Himalayan and low altitude sites should have a larger number of sampling locations owing to higher diversity).
2.	The entire area should be divided in grids of 5kmX5km preferably on a GIS domain. There after 25% of the grids should be randomly selected for sampling of which half should be in the directly affected area (grids including project components such as reservoir, dam, powerhouse, tunnel, canal etc.) and the remaining in the rest of the area (areas of influence in 10 km radius form project components). At such chosen location, the size and number of sampling units (e.g. quadrates in case of flora/transects in case of fauna) must be decided by species area curves and the details of the same (graphs and cumulative number of species in a tabulated form) should be provided in the EIA report. Some of the grids on the edges may not be completely overlapping with the study area boundaries. However, these should be counted and considered for selecting 25% of the grids. The number of grids to be surveyed may come out as a decimal number (i.e. it has an integral and a fractional part) which should be rounded to the next whole number.
3.	The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing

	of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.
4.	The R.E.T. species referred to in this point should include species listed in Schedule I and II of Wildlife (Protection) Act, 1972 and those listed in the red data books (BSI, ZSI and IUCN).
Components of the EIA Study: Various aspects to be studied and provided in the EIA/EMP report are as follow s:	
1.	null
2.	null
3.	Physical geography, Topography, Regional Geological aspects and structure of the Catchment.
4.	Tectonics, seismicity and history of past earthquakes in the area. A site specific study of the earthquake parameters will be done. The results of the site specific earthquake design shall be sent for approval of the NCSDP (National Committee of Seismic Design Parameters, Central water Commission, New Delhi for large dams.
5.	Landslide zone or area prone to landslide existing in the study area should be examined.
6.	Presence of important economic mineral deposit, if any.
7.	Justification for location & execution of the project in relation to structural components (dam /barrage height).
8.	Impact of project on geological environment.
9.	null
10.	Meteorology (viz. Temperature, Relative humidity, wind speed/direction etc.) to be collected from nearest IMD station.
11.	Ambient Air Quality with parameters viz. Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM) i.e. suspended particulate materials < 10 microns, Sulphur dioxide (SO2) and Oxides of Nitrogen (NOX) in the study area at 5-6 Locations.
12.	Existing Noise Levels and traffic density in the study area at 5-6 Locations.
13.	null
14.	Soil classification, physical parameters (viz., texture, Porosity, Bulk Density and water holding capacity) and chemical parameters (viz. pH, electrical conductivity, magnesium, calcium, total alkalinity, chlorides, sodium, potassium, organic carbon, available potassium, available phosphorus, SAR, nitrogen and salinity, etc.) at @ one sample/ha of command area.
15.	null
16.	(i) Generation of thematic maps viz, slope map, drainage map, soil map, land use and land cover map, etc. Based on these, thematic maps, an erosion intensity map should be prepared.

17.	null
18.	History of the ground water table fluctuation in the study area.
19.	Water quality for both surface water and ground water for (i) Physical parameters (pH, temperature, electrical conductivity, TSS); (ii) Chemical parameters (Alkalinity, Hardness, BOD, COD, NO2, PO4, CI, SO4, Na, K, Ca, Mg, Silica, Oil & Grease, phenolic compounds, residual sodium carbonate); (iii) Bacteriological parameter (MPN, Total coliform) and (iv) Heavy Metals (Pb, As, Hg, Cd, Cr-6, total Cr, Cu, Zn, Fe) (6 locations).
20.	Delineation of sub and micro-watersheds, their locations and extent based on the All India Soil and Land Use Survey of India (AISLUS), Department of Agriculture, Government of India. Erosion levels in each micro-watershed and prioritization of micro-watershed through silt yield index (SYI) method of AISLUS
21.	Hydro-Meteorology of the project viz. precipitation (snowfall, rainfall), temperature, relative humidity, etc. Hydro-meteorological studies in the catchment area should be established along-with real time telemetry and data acquisition system for inflows monitoring.
22.	Run off, discharge, water availability for the project, sedimentation rate, etc.
23.	Basin characteristics
24.	Catastrophic events like cloud bursts and flash floods, if any, should be documented.
25.	For estimation of Sedimentation Rate, direct sampling of river flow is to be done during the EIA study. The study should be conducted for minimum one year. Actual silt flow rate to be expressed in ha-m km2 year-1.
26.	Set up a G&D monitoring station and a few rain gauge stations in the catchment area for collecting data during the investigation.
27.	Flow series, 10 daily with 90%, 75% and 50% dependable years discharges.
28.	Information on the 10-daily flow basis for the 90 per cent dependable year the flow intercepted at the dam, the flow diverted to the power house and the spill comprising the environmental flow and additional flow towards downstream of the dam for the project may be given.
29.	The minimum environmental flow shall be 20% of the flow of four consecutive lean months of 90% dependable year, 30% of the average monsoon flow. The flow for remaining months shall be in between 20-30%, depending on the site specific requirements. A site specific study shall be carried out by an expert organization.
30.	Sedimentation data available with CWC may be used to find out the loss in storage over the years.
31.	Hydrological studies/data as approved by CWC shall be utilized in the preparation of EIA/EMP report. Actual hydrological annual yield may also be given in the report. Sedimentation data available with CWC may be used to find out the loss in storage over the years.
32.	A minimum of 1 km distance from the tip of the reservoir to the tail race tunnel should be maintained between upstream and downstream projects.
33.	Besides primary studies, review of secondary data/literature published for project area on flora & fauna including RET species shall be reported in EIA/EMP report.

34.	null
35.	Characterization of forest types (as per Champion and Seth method) in the study area and extent of each forest type as per the Forest Working Plan.
36.	Documentation of all plant species i.e. Angiosperm, Gymnosperm, Pteriodophytes, Bryophytes (all groups).
37.	General vegetation profile and floral diversity covering all groups of flora including lichens and orchids. A species wise list may be provided.
38.	Assessment of plant species with respect to dominance, density, frequency, abundance, diversity index, similarity index, importance value index (IVI) , Shannon Weiner index etc. of the species to be provided. Methodology used for calculating various diversity indices along with details of locations of quadrates, size of quadrates etc. to be reported within the study area in different ecosystems.
39.	Existence of National park, Sanctuary, Biosphere Reserve etc in the study area, if any, should be detailed.
40.	Economically important species like medicinal plants, timber, fuel wood etc.
41.	Details of endemic species found in the project area.
42.	Flora under RET categories should be documented using International Union for the Conservation of Nature and Natural Resources (IUCN) criteria and Botanical Survey of India's Red Data list along-with economic significance. Species diversity curve for RET species should be given.
43.	Cropping pattern and Horticultural Practices in the study area.
44.	null
45.	Fauna study and inventorisation should be carried out for all groups of animals in the study area. Their present status alongwith Schedule of the species.
46.	Documentation of fauna plankton (phyto and zooplankton), periphyton, benthos and fish should be done and analysed.
47.	Information (authenticated) on Avi-fauna and wildlife in the study area.
48.	Status of avifauna their resident/ migratory/ passage migrants etc.
49.	Documentation of butterflies, if any, found in the area.
50.	Details of endemic species found in the project area.
51.	RET species-voucher specimens should be collected along-with GPS readings to facilitate rehabilitation. RET faunal species to be classified as per IUCN Red Data list and as per different schedule of Indian Wildlife (Protection) Act, 1972.

52.	Existence of barriers and corridors, if any, for wild animals.
53.	Compensatory afforestation to compensate the green belt area that will be removed, if any, as part of the proposed project development and loss of biodiversity.
54.	Collection of primary data on agricultural activity, crop and their productivity and irrigation facilities components.
55.	For categorization of sub-catchment into various erosion classes and for the consequent CAT plan, the entire catchment (Indian Portion) is to be considered and not only the directly the draining catchment.
56.	Documentation of aquatic fauna like macro-invertebrates, zooplankton, phytoplantktons, benthos etc.
57.	Fish and fisheries, their migration and breeding grounds.
58.	Fish diversity composition and maximum length & weight of the measured populations to be studies for estimation of environmental flow.
59.	Conservation status of aquatic fauna.
60.	Sampling for aquatic ecology and fisheries and fisheries must be conducted during three seasons Pre-monsoon (summer), monsoon and winter. Sizes (length & weight) of important fish species need to be collected and breeding and feeding grounds should also be identified along the project site or in vicinity.
61.	Collection of baseline data on human settlements, health status of the community and existing infrastructure facilities for social welfare including sources of livelihood, job opportunities and safety and security of workers and surroundings population.
62.	Collection of information with respect to social awareness about the developmental activity in the area and social welfare measures existing and proposed by project proponent.
63.	Collection of information on sensitive habitat of historical, cultural and religious and ecological importance.
64.	The socio-economic survey/ profile within 10 km of the study area for demographic profile; Economic Structure; Developmental Profile; Agricultural Practices; Infrastructure, education facilities; health and sanitation facilities; available communication network etc.
65.	Documentation of demographic, Ethnographic, Economic Structure and development profile of the area.
66.	Information on Agricultural Practices, Cultural and aesthetic sites, Infrastructure facilities etc.
67.	Information on the dependence of the local people on minor forest produce and their cattle grazing rights in the forest land.
68.	List of all the Project Affected Families with their name, age, educational qualification, family size, sex, religion, caste, sources of income, land & house holdings, other properties, occupation, source of income, house/land to be acquired for the project and house/land left with the family, any other property, possession of cattle, type of house etc.
6	Special attention has to be given to vulnerable groups like women, aged persons etc. and to any ethnic/indigenous

9.	groups that are getting affected by the project.
Impact Prediction and Mitigation Measures	
1.	The adverse impact due to the proposed project should be assessed and effective mitigation steps to abate these impacts should be described.
2.	Changes in ambient and ground level concentrations due to total emissions from point, line and area sources.
3.	Effect on soil, material, vegetation and human health.
4.	Impact of emissions from DG set used for power during the construction, if any, on air environment.
5.	Pollution due to fuel combustion in equipments and vehicles
6.	Fugitive emissions from various sources
7.	Changes in surface and ground water quality
8.	Steps to develop pisci-culture and recreational facilities
9.	Changes in hydraulic regime and downstream flow.
10.	Water pollution due to disposal of sewage
11.	Water pollution from labour colonies/ camps and washing equipment.
12.	Adverse impact on land stability, catchment of soil erosion, reservoir sedimentation and spring flow (if any) (a) due to considerable road construction / widening activity (b) interference of reservoir with the inflowing stream (c) blasting for commissioning of HRT, TRT and some other structures.
13.	Changes in land use / land cover and drainage pattern
14.	Immigration of labour population
15.	Quarrying operation and muck disposal
16.	Changes in land quality including effects of waste disposal
17.	River bank and their stability
18.	Impact due to submergence.
19.	Impact on forests, flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc.
20.	Pressure on existing natural resources

21.	Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors
22.	Compensatory afforestation-identification of suitable native tree species for compensatory afforestation and green belt.
23.	Impact on fish migration and habitat degradation due to decreased flow of water
24.	Impact on breeding and nesting grounds of animals and fish.
25.	Impact on local community including demographic profile.
26.	Impact on socio-economic status
27.	Impact on economic status.
28.	Impact on human health due to water / vector borne disease
29.	Impact on increase traffic
30.	Impact on Holy Places and Tourism
31.	Impacts of blasting activity during project construction which generally destabilize the land mass and leads to landslides, damage to properties and drying up of natural springs and cause noise population will be studies. Proper record shall be maintained of the baseline information in the post project period.
32.	Positive and negative impacts likely to be accrued due to the project are listed.
Environmental Management Plan	
1.	null
2.	Biodiversity and Wildlife Conservation and Management Plan for the conservation and preservation of rare, endangered or endemic floral/faunal species or some National Park/Sanctuary/ Biosphere Reserve or other protected area is going to get affected directly or indirectly by construction of the project, then suitable conservation measures should be prepared in consultation with the State Forest Department and with the physical and financial details. Suitable conservation techniques (in-situ/ ex-situ) will be proposed under the plan and the areas where such conservation is proposed will be marked on a project layout map.
3.	Compensatory Afforestation shall be prepared by the State Forest Department in lieu of the forest land proposed to be diverted for construction of the project as per the Forest (Conservation) Act, 1980. Choice of plants for afforestation should include native and RET species, if any. This will be a part of the forest clearance proposal.
4.	Fisheries Conservation and Management Plan - a specific fisheries management measures should be prepared for river and reservoir. If the construction of fish ladder/ fish-way etc. is not feasible then measures for reservoir fisheries will be proposed. The plan will detail out the number of hatcheries, nurseries, rearing ponds etc. proposed under the plan with proper drawings. If any migratory fish species is getting affected then the migratory routes, time/season of upstream and downstream migration, spawning grounds etc will be discussed in details.

5.	Green Belt Development Plan along the periphery of the reservoir, approach roads around the colonies and other project components, local plant species must be suggested with physical and financial details. A layout map showing the proposed sites for developing the green belt should be prepared.
6.	Environmental Monitoring Programme to monitor the mitigatory measures implemented at the project site is required will be prepared. Provision for Environment Management Cell should be made. The plan will spell out the aspects required to be monitored, monitoring indicators/parameters with respect to each aspect and the agency responsible for the monitoring of that particular aspect throughout the project implementation.
7.	Catchment Area Treatment (CAT) Plan should be prepared micro-watershed wise. Identification of free draining/ directly draining catchment based upon Remote Sensing and Geographical Information System (GIS) methodology and Sediment Yield Index (SYI) method of AISLUS, Deptt. of Agriculture, Govt. of India coupled with ground survey. Areas or watersheds falling under 'very severe' and 'severe' erosion categories should be provided and required to be treated. Both biological as well as engineering measures should be proposed in consultation with State Forest Department for areas requiring treatment. Year-wise schedule of work and monetary allocation should be provided. Mitigation measures to check shifting cultivation in the catchment area with provision for alternative and better agricultural practices should be included.
8.	Study of Design Earthquake Parameters: A site specific study of earthquake parameters should be done. Results of the site specific earthquake design parameters should be approved by National Committee of Seismic Design Parameters, Central Water Commission (NCSDP), New Delhi.
9.	Dam Break Analysis and Disaster Management Plan The outputs of dam break model should be illustrated with appropriate graphs and maps clearly bringing out the impact of Dam Break scenario. To identify inundation areas, population and structures likely to be affected due to catastrophic floods in the event of dam failure. DMP will be prepared with the help of Dam Break Analysis. Maximum water level that would be attained at various points on the downstream in case of dam break will be marked on a detailed contour map of the downstream area, to show the extent of inundation. The action plan will include Emergency Action and Management plan including measures like preventive action notification, warning procedure and action plan for co-ordination with various authorities.
10.	Reservoir Rim Treatment Plan for stabilization of land slide / land slip zones, if any, around the reservoir periphery is to be prepared based on detailed survey of geology of the reservoir rim area. Suitable engineering and biological measures for treatment of identified slip zones to be suggested with physical and financial schedule. Layout map showing the landslide/landslip zones shall be prepared and appended in the chapter.
11.	Muck Disposal Plan- suitable sites for dumping of excavated material should be identified in consultation with the State Pollution Control Board and Forest Department. All Muck disposal sites should be minimum 30 m away from the HFL of river. Plan for rehabilitation of muck disposal sites should also be given. The L- section/ cross section of muck disposal sites and approach roads to be given. Financial out lay for this may be given separately. Deatailed muck transportation plan delinating the path ways, number of trucks, quantity of muck to be transportated along with monitoring mechanism using latest technology, shall be prepared.
12.	Restoration Plan for Quarry Sites and landscaping of colony areas, working areas, roads etc. Details of the coarse/fine aggregate/clay etc. required for construction of the project and the rock/clay quarries/river shoal sites identified for the project should be discussed along-with the Engineering and Biological measures proposed for their restoration with physical and financial details. Layout map showing quarry sites vis-à-vis other project components, should be prepared.
13.	Resettlement and Rehabilitation Plan needed to be prepared on the basis of findings of the socio- economic survey coupled with the outcome of public consultation held. The R&R package shall be prepared after consultation with the representatives of the project affected families and the State Government. Detailed budgetary estimates are to be provided. Resettlements site should be identified. The plan will also incorporate community development strategies.
14.	Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local populace.

15.	Local Area Development Plan to be formulated in consultation with the Revenue Officials and Village Pancahayats. Appropriate schemes shall be prepared under EMP for the Local Area Development Plan with sufficient financial provisions.
16.	Labour Management Plan for their Health and Safety.
17.	Sanitation and Solid waste management plan for domestic waste from colonies and labour camps etc.
18.	Energy Conservation Measures for the work force during construction with physical and financial details. Alternatives will be proposed for the labour force so that the exploitation of the natural resource (wood) for the domestic and commercial use is curbed.
19.	Environmental safeguards during construction activities including Road Construction.
20.	A summary of Cost Estimates for all the plans, cost for implementing all the Environmental Management Plans.
21.	Water, Air and Noise Management Plans to be implemented during construction and post-construction periods.

3.4. Agenda Item No 4:

3.4.1. Details of the proposal

Damanganga (Ekdare)-Godavari instrastate link project by **Minor Irrigation Division** located at **NASHIK,MAHARASHTRA**			
Proposal For		Application for amendment in ToR (for categories A & B1)/Amendment in EC (for category B2)- Form-3	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/MH/RIV/535184/2025	J-12011/03/2019-IA-1 (R)	28/04/2025	River Valley/Irrigation projects (1(c))

3.4.2. Project Salient Features

The proposal is for grant of amendment in Terms of Reference to the project for Damanganga (Ekdare) - Godavari intrastate link project (CCA: 12998 Ha) in an area of 257.85 Ha at Village Ekdare, Gonde, Shinde, etc., Sub District Peth and Dindori, District Nashik, Maharashtra by M/s Minor Irrigation Division.

31.4.2: The Project Proponent made a detailed presentation on the salient features of the project and informed that:

i. The proposal is for amendment in the Terms of Reference granted by the Ministry vide letter dated 13/02/2023 for the Damanganga (Ekdare) – Godavari intrastate link project located at Village Ekdare, Tehsil Peint, District Nashik (Maharashtra) in favour of M/s Minor Irrigation Division, Nashik, Maharashtra.

ii. The Project was appraised and recommended for grant of TOR in 38th meeting of EAC held on

15/12/2022. TOR was issued by MoEF&CC vide its letter dated 13/02/2023.

iii. At the stage of TOR application, the total area to be benefitted by the project was 18404 ha for irrigation out of which 687 ha command was in Damanganga basin for local use and remaining 17717 ha to be benefitted in Upper Godavari sub basin in command of existing Jayakwadi project in Marathwada region. During detailed survey and investigation, total command area has been revised as 12998 ha.

iv. There are changes in other components of salient features as well. The total land area has decreased (261.99 ha to 257.85 ha) and forest land has increased from 44.76 ha to 120.0 ha. This is due to reduction of quantum of total water available for the link project from 143 MCM to 100.569 MCM. There is an increase in the forest area, because earlier estimation was based on preliminary survey and didn't include the river area which was mentioned separately; after detailed working using forest maps and latest 7/12 extracts (a land record document maintained by the Revenue Department). Details of the revised project layout are given below.

v. The Damanganga (Ekdare) - Godavari (Waghad) link project envisages diversion of surplus flows of west flowing Damanganga basin by lift from the proposed Ekdare project to serve the water short Marathwada region in Maharashtra through Existing Jayakwadi Reservoir project. The water available for utilization is 100.569 MCM out of which 15% of the quantity of diversion (15.085 MCM) is reserved for local use as per Govt. of Maharashtra resolution and remaining 85.484 MCM will be lifted in three stages to existing Waghad reservoir in Upper Godavari sub-basin. The diversion is proposed during the months July to October (123 days).

vi. The link system comprises of the headworks viz the proposed Ekdare dam (FRL:374m), Hatti Weir (CL: 452.50 m), Nirgude weir (CL 440.0m), Circular sump (FPL 595.0m) and the existing Inambari (FPL:516.0m), Jharlipada diversion scheme (FPL 672.4m) and Waghad (FRL: 668.50m).

vii. Ekdare dam is proposed on Damanganga basin near Ekdare village, Peint taluk of Nashik district. FRL of the proposed Ekdare dam is 374.0 m and corresponding live storage capacity of 29.56 MCM. The length of the dam is 292.367 m. and the height is 77.50 m with submergence area of 231.30 ha. 13 villages (only land) are affected due to the reservoir. Protection bund (dyke) of 800m long is proposed near Ekdare village to protect from reservoir submergence at full reservoir level. The total land acquisition required for the whole project will be about 257.85 ha of which 120.0 ha is under forest.

viii. The conveyance system comprises of 14.04 km long 2 MS raising mains of 1.80 to 2.10m dia between Ekdare and existing Jharlipada diversion scheme via Nirgude weir and PH 3 near Jharlipada; the existing link cut of 1.30km from Jharlipada diversion scheme up to Kadwa river and 1.90 km long natural Kadwa river stream upto Waghad existing dam. The further conveyance will be through water flows through Kadwa river and Godavari river upto Jayakwadi reservoir.

ix. The augmentation storages of Hatti and Inambari are connected to main conveyance at Nirgude with 800m and 400 m pipelines. The distribution to Aad and Lingavane is proposed from PH-3 near Jharlipada through 12.0km long pipe with dia 0.50m. The maximum discharge in the conveyance varies between 13.06 cumec at the head and attains 14.19 cumec at Nirgude. Lifting arrangements comprises of sump, pump house and delivery cistern, at Ekdare, Nirgude and PH-3 at Jharlipada with static head of 110.13m, 158.65 m, and 82.65m respectively and the total static lift will be

351.43 m. The power requirement will be about 106 MU.

x. Out of the total utilisation, 68.786 MCM will be used for irrigation, 13.76 MCM for domestic, 9.17MCM for industrial uses and the remaining 8.853 MCM will be lost in transmission. The link project will provide irrigation to about 12998 ha annually (2987ha in local villages) in Nashik district and 10011 ha in Aurangabad district under Jayakwadi command. The project is proposed to be constructed in 7 years. The economic parameters of the link project are furnished below.

Estimated cost (Crore)	Annual cost	Annual benefits	BCR	IRR	GST, Labour insurance, QC and Royalty	Total project cost (Crore)
1871.12	275.01	459.64	1.67	14.48%	342.41	2213.53

xi. The total land required will be 257.85 ha out of which, 120.0 ha is of forest land. In all, 13 villages are affected partly and no population is affected.

xii. Comparison of revised layout with earlier approved layout is given below:

Sl no	Parameter		As per TOR	Actual	Deviation
1	**Purpose**	**:**	**Diversion of surplus water from Damanganga basin to Godavari basin**	**Diversion of surplus water from Damanganga basin to Godavari basin**	**No change**
2	**Quantum of utilization (MCM)**	**:**	**143.00**	**100.569**	**-42.43**
i	Local use (15%) (MCM)	:	4.40	15.09	**10.69**
ii	Diversion to Waghad (MCM)	:	138.60	85.48	**-53.12**
3	**Irrigation (Annual irrigation /CCA) (ha)**	**:**	**18404.00**	**12998.00**	**-5406.00**
i	Damanganga basin (ha)	:	687.00	2987.00	**2300.00**
ii	Upper Godavari basin (ha)	:	17717.00	10011.00	**-7706.00**
4	**Land Acquisition Details**				
	Total Area (ha)	:	261.99	257.85	**-4.14**
	Forest area (ha)	:	44.76	120.00	**75.24**

	River portion (ha)	:	53.40	0.00	**-53.40**
	Other areas (ha)	:	163.83	137.85	**-25.98**
	Total No. of Villages affected	:	13	13	**No change**
5	**Ekdare reservoir (Proposed)**				
i	State	:	Maharashtra	Maharashtra	**No change**
ii	District	:	Nasik	Nasik	**No change**
iii	Location	:	Near Ekdare village, Peint Taluk	Near Ekdare village, Peint Taluk	**No change**
iv	Name of river	:	Damanganga river	Damanganga river	**No change**
v	Basin/sub basin	:	Damanganga	Damanganga	**No change**
vi	Latitude	:	20° 11’ 17.03” N	20° 11’ 17.03” N	**No change**
vii	Longitude	:	73° 32’ 23.12” E	73° 32’ 23.12” E	**No change**
viii	Top of dam level (m)	:	375.50	375.50	**No change**
ix	Length of the dam (m)	:	302.00	293.00	**-9.00**
x	Height of the dam (m)	:	69.50	77.50	**8.00**
xi	Catchment area (sq km)	:	182.00	182.00	**No change**
xii	75% Dependability surplus yield at dam site	:	125.00 (as per CWC)	100.569	**-24.43**
xiii	Maximum water level (m)	:	374.50	375.50	**1.00**
xiv	Full reservoir level (m)	:	374.00	374.00	**No change**
xv	MDDL (m)	:	345.00	331.87	**-13.13**
xvi	Gross storage capacity (MCM)	:	36.41	32.95	**-3.46**
xvii	Live storage capacity (MCM)	:	29.37	29.56	**0.19**
xviii	Dead storage capacity (	:	7.04	3.39	**-3.65**

	MCM)				
xix	Area of submergence at F.R.L (ha)	:	247.40	231.30	**-16.10**
xx	Forest area (ha)	:	41.91	115.45	**73.54**
xxi	River portion (ha)	:	53.40	0.00	**-53.40**
xxii	Other areas (ha)	:	152.09	115.85	**-36.24**
xxiii	No. of Villages affected in submergence (only la nd)	:	4	4	**No change**
6	**Hatti weir (Proposed)**				
i	Location	:	Near Hatti village, Peint taluk, Nasik d istrict, Maharashtra	Near Hatti village, Peint taluk, Nasik d istrict, Maharashtra	**No change**
ii	Name of river	:	Hatti Nala	Hatti Nala	**No change**
iii	Basin/sub basin	:	Damanganga upstre am of Ekdare	Damanganga upstre am of Ekdare	**No change**
iv	Latitude	:	20° 13’21.08”	20° 13’21.08”	**No change**
v	Longitude	:	73° 35’45.45”	73° 35’45.45”	**No change**
vi	Catchment Area up to H atti weir (sq.km)	:	14.41	14.41	**No change**
vii	River bed level (m)	:	460.00	449.00	**-11.00**
viii	Weir Crest level (m)	:	461.50	452.50	**-9.00**
ix	Height of the weir (m)	:	1.50	3.50	**2.00**
x	Length of weir (m)	:	17.40	73.90	**56.50**
xi	75% monsoon yield (M CM)	:	11.62	11.62	**0.00**
xii	Upstream projects utiliz ation (MCM)	:	1.17 (Shinde MIP)	1.17	**0.00**
xiii	Balance available for di version (MCM)	:	10.45	10.45	**0.00**

xiv	Submergence area (ha)	:	Confined to river course.	Confined to river	**No change**
xv	Villages affected (No.)	:	9	9	**No change**
7	**Nirgude weir (Proposed)**				
i	Location	:	Near Nirgude village, Peint taluk, Nasik district, Maharashtra	Near Nirgude village, Peint taluk, Nasik district, Maharashtra	**No change**
ii	Name of river	:	Nirgude nala (a small right bank stream of Damanganga river)	Nirgude nala (a small right bank stream of Damanganga river)	**No change**
iii	Basin/sub basin	:	Right bank stream of Damanganga river	Right bank stream of Damanganga river	**No change**
iv	Latitude	:	20° 13’36.79”	20° 13’36.79”	**No change**
v	Longitude	:	73° 35’25.45”	73° 35’25.45”	**No change**
vi	Catchment Area up to Nirgude weir (sq.km)	:	11.48	11.48	**No change**
vii	River bed level (m)	:	443.00	430.70	**-12.30**
viii	Weir Crest level (m)	:	445.00	440.00	**-5.00**
ix	Height of the weir (m)	:	2.00	9.30	**7.30**
x	Length of weir (m)	:	34.80	63.00	**28.20**
xi	75% monsoon yield (MCM)	:	9.25	9.25	**0.00**
xii	Upstream projects utilization	:	Nil	Nil	
xiii	Balance available for diversion (MCM)	:	9.25	9.25	**No change**
xiv	Submergence area (ha)	:	Confined to river course.	Confined to river course	**No change**
xv	Villages affected (No.)	:	Nil	Nil	**No change**

8	**Waghad project (Existing)**				
i	State	:	Maharashtra	Maharashtra	**No change**
ii	District	:	Nasik	Nasik	**No change**
iii	Latitude	:	20° 14’N	20° 14’N	**No change**
iv	Longitude	:	73° 44’E	73° 44’E	**No change**
v	Name of river	:	Kadwa river (a small tributary of Godavari river)	Kadwa river (a small tributary of Godavari river)	**No change**
vi	Catchment area (sq km)	:	119.00	119.00	**No change**
vii	Top of dam level (m)	:	673.60	673.60	**No change**
viii	Maximum water level (m)	:	671.20	671.20	**No change**
ix	Full reservoir level (m)	:	668.50	668.50	**No change**
x	MDDL (m)	:	650.50	650.50	**No change**
xi	Gross storage capacity (MCM)	:	76.48	76.48	**No change**
xii	Live storage capacity (MCM)	:	70.00 (revised to 65.18)	70.00 (revised to 65.18)	**No change**
xiii	Area of submergence at F.R.L (ha)	:	1090.00	1090.00	**No change**
9	**Damanganga (Ekdare)- Godavari (Waghad) link project**				
A	**Features of link canal (pipe line)**				
i	Total length of the link canal (pipe line) (Km)	:	13.62	14.04	**0.42**
ii	Length of pipe line up to Jharlipada Diversion Scheme (km)	:	10.42	10.84	**0.42**
iii	Ridge cut link (Km)	:	1.30	1.30	**No change**

iv	Natural stream (Km)	:	1.90	1.90	**No change**
v	RCC underground pipe l ine between (Hatti to Ni rgude) (Km)	:	0.80	0.80	**No change**
B	**Land Required for pip e line and pumphouses**				
i	Total Area (ha)	:	14.59	26.55	**11.96**
ii	Forest area (ha)	:	2.85	4.55	**1.70**
iii	Other Area (ha)	:	11.74	22.00	**10.26**
iv	Villages/Population affe cted	:	Nil	Nil	**No change**
C	**Lift at first stage from RD 0.00 km to 5.970 k m**				
i	Maximum quantum of d iversion (MCM)	:	30.51 MCM	27.88	**-2.63**
ii	Designed discharge (cu mec)	:	12.84	10.41	**-2.43**
iii	Length of Pipe line (k m)	:	5.97	6.10	**0.13**
iv	Nos. and Diameter of th e pipe	:	4 x 1.40 m	2x1.80 m	**-2.00**
v	Velocity (m/s)	:	2.09 m/s	2.05	**-0.04**
vi	Off take level (m)	:	345.00	331.87	**-13.13**
vii	Outfall level (m)	:	445.00	442.00	**-3.00**
viii	Lift (m)	:	100.00	110.13	**10.13**
D	**Lift at 2nd stage from RD 5.97 km to 9.25 km**				
i	Maximum quantum of d iversion (MCM)	:	33.92	38.00	**4.08**
ii	Designed discharge (cu mec)	:	14.28	14.19	**-0.09**

iii	Length of Pipe line (km)	:	3.28	4.018	**0.738**
iv	Nos. and Diameter of the pipe	:	4 x 1.40 m	2x2.10 m	**-2.00**
v	Velocity (m/s)	:	2.32	2.05	**-0.27**
vi	Off take level (m)	:	445.00	438.33	**-6.67**
vii	Outfall level (m)	:	560.00	597.00	**37.00**
viii	Lift (m)	:	115.00	158.67	**43.67**
E	**Lift at 3rd stage from RD 9.25 km to 10.42 km**				
i	Maximum quantum of diversion (MCM)	:	33.92	38.00	**4.08**
ii	Designed discharge (cumec)	:	14.28	14.19	**-0.09**
iii	Length of Pipe line (km)	:	1.17	716.00	**714.83**
iv	Nos. and Diameter of the pipe	:	4 x 1.40 m	2x2.10 m	**-2.00**
v	Velocity (m/s)	:	2.32	2.05	**-0.27**
vi	Off take level (m)	:	560.00	593.33	**33.33**
vii	Outfall level (m)	:	672.00	676.00	**3.60**
viii	Lift (m)	:	112.40	82.65	**-29.75**
F	**Power required for lifting**				
i	At stage I (MU)	:	68.10	27.53	**-40.57**
ii	At stage II (MU)	:	76.11	51.17	**-24.94**
iii	At stage III (MU)	:	66.93	26.60	**-40.33**
iv	**Total energy required (MU)**	**:**	**211.14**	**105.70**	**-105.44**

v	Total cost for energy required (Rs.Lakh)	:	3801.00		
G	**Installed capacity**				
i	Stage I (MW)	:	23.43	16.36	**-7.07**
ii	Stage II (MW)	:	26.62	30.37	**3.75**
iii	Stage III (MW)	:	23.04	15.79	**-7.25**
iv	**Total (MW)**	:	**73.09**	**62.52**	**-10.57**
10	**Economic analysis**				
i	Net annual benefit from irrigation (Lakhs)	:	6154.00	9675.00	**3521.00**
ii	Benefit from Domestic water supply (Lakhs)	:	105.00	62.00	**-43.00**
iii	Benefit from Industrial water supply (Lakhs)	:	33600.00	30294.00	**-3306.00**
iv	Benefit from water charges(Irrigation service fee) (Lakhs)	:	276.00	0.00	**-276.00**
v	Benefit from Pisciculture and lease amount (Lakhs)	:	47.00	5582.00	**5535.00**
vi	Benefit from Animal husbandry (Lakhs)	:	1953.00	351.00	**-1602.00**
vii	**Total Annual Benefit of the project (Lakhs)**	**:**	**42135.00**	**45964.00**	**3829.00**
viii	Annual cost (Lakhs)	:	24042.00		
ix	Cost of Unit-I Head Works (Lakhs)	:	119953.00	113608.00	**-6345.00**
	Unit II: Conveyance			29020.00	**29020.00**
	Cost of Unit-III Lifting Arrangements (lakh)	:	37395.00	44484.00	**7089.00**
	Total cost of project (2019-2020 price level)(l	**:**	**157348 / 2019-20**	**187112/ 2022-23**	**29764.00**

	akh)				
x	B.C. Ratio (considering annual benefit and annual cost)	:	1.75	1.67	**-0.08**
xi	Internal Rate of Return (IRR)	:	11.11%	14.48%	**Increased**

3.4.3. Deliberations by the committee in previous meetings

N/A

3.4.4. Deliberations by the EAC in current meetings

The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of amendment in Terms of Reference (ToR) to the project for Damanganga (Ekdare) - Godavari intrastate link project (CCA: 12998 Ha) in an area of 257.85 Ha at Village Ekdare, Gonde, Shinde, etc., Sub District Peth and Dindori, District Nashik, Maharashtra by M/s Minor Irrigation Division..

The project/activity is covered under Category B1 of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 as CCA is 12998 Ha. However, Irrigation projects involving Inter-State issues shall be appraised at Central level without change in category therefore, it requires appraisal at Central level by the sectoral EAC in the Ministry.

The Ministry granted Terms of Reference vide letter dated 13/02/2023 for the proposed project and PP has submitted the proposal for amendment in ToR for modification in project components and change in the land area requirement.

During the meeting the EAC noted with concern that the presentation lacked sufficient detail and clarity on the proposal. PP failed comprehensively address the key aspects of the proposed amendment. Furthermore, the Project Proponent was unable to provide specific and satisfactory justifications for the proposed changes. Additionally, the EAC observed that the Project Proponent was unable to respond satisfactorily to several queries raised by the Committee members. The committed noted that PP had appeared unprepared and lacked the necessary due diligence expected at this stage of the appraisal process. This reflected a lack of preparedness and understanding of PP.

After deliberation, the project was deferred. EAC opined that the PP shall have to come prepared with a detailed presentation about the proposed amendment and ensure that all technical and regulatory aspects are comprehensively addressed, and come prepared with clear justifications and supporting documentation in any future deliberations.

The proposal ***deferred*** on the above lines.

3.4.5. Recommendation of EAC

Deferred for ADS

4. Any Other Item(s)

N/A

5. List of Attendees

Sr. No.	Name	Designation	Email ID	Remarks
1	Prof G J Chakrapani	Chairman, EAC	cha**********@gmail.com	
2	Dr Mukesh Sharma	Member (EAC)	muk***@iitk.ac.in	Absent
3	Dr Uday Kumar R Y	Member (EAC)	uda********@yahoo.com	
4	Dr J A Johnson	Member (EAC)	jaj@wii.gov.in	Absent
5	Dr J V Tyagi	Member (EAC)	jvt******@gmail.com	
6	Shri Kartik Sapre	Member (EAC)	kar********@gmail.com	
7	Shri Ajay Kumar Lal	Member (EAC)	akl****@gmail.com	
8	Dr A K Sahoo	Member (EAC)	ami***@gmail.com	Absent
9	Shri Rakesh Goyal	Member	goy*********@nic.in	
10	Shri Balram Kumar	Member	emo***@nic.in	
11	Yogendra Pal Singh	Scientist - F	yog*******@nic.in	

MINUTES OF THE 31ST MEETING OF THE EXPERT APPRAISAL COMMITTEE FOR RIVER VALLEY AND HYDROELECTRIC PROJECTS HELD ON 14TH MAY 2025 THROUGH VIDEO CONFERENCE

The 31st meeting of the EAC for River Valley & Hydroelectric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 14th May, 2025 through Virtual mode, under the Chairmanship of Prof. G. J. Chakrapani. The list of Members present in the meeting is at **Annexure**.

Confirmation of the Minutes of the 30th EAC meeting:

The Minutes of the Meeting held on 30th EAC meeting on 30th April, 2025 were confirmed.

Agenda Item No. 31.1

Greenko Assam - 01 Closed Loop Pumped Storage Project (900 MW) in an area of 251.94 Ha in Village Amguri, Baithalangso, Kiling Bagicha, Nali Bagicha No. and Sardangang, Sub District Marigaon and Donka, District Morigaon and West Karbi Anglong, Assam by M/s Greenko Energies Private Limited - Terms of Reference (ToR) - reg.

[Proposal No. IA/AS/RIV/534107/2025; F. No. J-12011/21/2025-IA.I (R)]

31.1.1 The proposal is for grant of Terms of References (ToR) to the project for Greenko Assam - 01 Closed Loop Pumped Storage Project (900 MW) in an area of 251.94 Ha in Village Amguri, Baithalangso, Kiling Bagicha, Nali Bagicha No. and Sardangang, Sub District Marigaon and Donka, District Morigaon and West Karbi Anglong, Assam by M/s Greenko Energies Private Limited.

31.1.2 The Project Proponent and the accredited Consultant M/s. R S Envirolink Technologies Pvt. Ltd., made a detailed presentation on the salient features of the project and informed that:

i. Greenko Energies Pvt. Ltd., hereinafter referred as GEPL, proposes to develop Pumped Storage Project (PSP) near located at Tharakhunji Village, Donka subdivision of Karbi Anglong District and Amguri, Killing Bagicha villages, Marigaon Circle subdivision of Marigaon District in Assam.

ii. The total capacity of proposed PSP is 900 MW (5481 MWH) and it is proposed that One-time requirement of 0.833 TMC of water will be lifted from existing nearby Umiam River (which is located about 2 Km away from the proposed Lower reservoir) and will be stored in the lower reservoir to be constructed and used cyclically for energy storage and discharge, out of which

0.217 TMC of water will be used for power generation by re-circulation with 6.09 hours storage capacity. Evaporation losses if any will be recouped periodically from Umiam River.

iii. The geographical co-ordinate of the project are:

Upper Reservoir : 26° 0'5.34"N & 92°16'19.23"E
Lower Reservoir: 26° 0'12.00"N & 92°15'8.00"E

iv. The proposed scheme involves creation of new upper reservoir & lower reservoir. It is proposed to construct Geomembrane Faced Rockfill Dam (GFRD) embankment for the weighted average height of around 20m (with maximum height of 43m) for the length of 648 m with gross storage of 0.242 TMC capacity and Lower reservoir of Geomembrane Faced Rockfill Dam (GFRD) embankment for the average height of 17m (with maximum height of 43m) for the length of 675 m with gross storage of 0.220 TMC capacity. Intake structure and trash rack with four number of independent pressure shafts from Power block of upper reservoir is connected to Undeground Powerhouse located at about 883.97 m. The Power house is equipped with two Three (3) phase, alternating current synchronous/ generator motor semi umbrella type with vertical shaft type units composed with generator/motor and a pump/turbine having generated/pumping capacity of 300MW / 330MW respectively and two Three (3) phase, alternating current synchronous/ generator motor semi umbrella type with vertical shaft type units composed each of a generator/motor and a pump/turbine having generated/pumping capacity of 150MW / 165MW.

v. The Project will generate 900 MW by utilizing a design discharge of 280.50 Cumec and rated head of 367.50m. The cycle efficiency of the project is expected to be around 80%. One 400 KV Double Circuit transmission line with Twin Moose Conductor of length 55 KMs (appx.) from PSP will be connected to 400 / 220 kV MISA Substation PGCIL, Dighaljar, Assam for evacuation of power during turbine mode and pumping of power from grid during pumping mode.

vi. Land requirement:

Forest Land : 134.24 Ha
Non-forest Land : 117.70 Ha
Total Land : 251.94 Ha

vii. Demographic details in 10 km radius of project area:

The proposed project area is located in Tharakhunji Village, Donka Subdivision of Karbi Anglong District, and in Amguri and Killing Bagicha villages, Marigaon Subdivision, Marigaon District, Assam.

According to Mission Antyodaya 2020, the total population of the villages in the project proximity area is 1837, comprising 889 males (48.39%) and 948 females (51.60%). There are 418 households in total, with an average household size of 4 to 5 members. The sex ratio is 1066 females per 1,000 males. Village-wise demographic details are provided in the table below.

The Scheduled Caste (SC) population constitutes 31.77% of the total population, whereas the Scheduled Tribe (ST) population accounts for 31.77%.

Demographic Profile of the Project Proximity area Villages

Village Name	No_ T.P	TOT_M	TOT_F	TOT_HH	P_SC%	P_ST%
Killing Bagicha	1259	610	649	310	6.97	6.97
Amguri	258	119	139	53	28.90	28.90
Tharakunchi	320	160	160	55	96.32	96.32
Total	**1837**	**889**	**948**	**418**	**31.77**	**31.77**

(Source Mission Antyodaya 2020)
(*No_HH-Total House Hold, TOP_P-Total Population, TOT_M-Total Male, TOT_F-Total Female, P_SC-Scheduled Caste population, P_ST-Scheduled Tribe Population)*

Villages in the project proximity area is mainly inhabited by the Karbi tribe. The people practice shifting cultivation, growing paddy, maize and vegetables, rearing animals and collecting firewood, medicinal plants and bamboo for use and sale. The village has a close-knit social life, including the extended family, traditional festivals such as Rongkar and Chomkan, folk dances, music and oral stories. Village councils and elders guide local governance.

viii. **Water requirement:** Greenko Assam-01 Off-Stream Closed Loop Pumped Storage Project PSP (900 MW) will require 6.94 MCM (0.245 TMC) for initial reservoir filling and thereafter ~ 1.13 MCM (0.04 TMC) power generation by re-circulation. Evaporation losses if any will be recouped periodically from nearby Umiam River for restoring the storage capacity lost due to evaporation.

ix. **Project Cost:** The estimated project cost is Rs 5849.49 crore. Total capital cost earmarked towards environmental pollution control measures will be worked out during EIA study as well as the Recurring cost (operation and maintenance).

x. **Project Benefit:** Total Employment will be 2000 persons as direct & 150 persons indirect after expansion.

xi. **Environmental Sensitive area:** There is no Protected Area in the vicinity of the proposed project. Pobitora WLS is 24.0 km far from the proposed project area. River/ water body, Water will be pumped from Umiam River.

xii. MoU signed with the State Government on 25-02-2025.

xiii. Alternative Studies: 2 alternative layouts have been evaluated and compared for development of PSP.

Alternative -1 Layout

The Alternative – 1 layout has been proposed with underground powerhouse between Site – 1 Upper reservoir and Site – 1 lower reservoir and is shown in **Fig. - 4**. The proposed upper reservoir site which is to be constructed newly is located on natural depression which is suitable for creating the desired storage capacity keeping FRL & MDDL at EL 685.00m & EL 655.00m respectively. Similarly, the lower reservoir which is to be constructed newly is proposed to be located in the natural depression which is suitable for creating the desired gross storage capacity keeping FRL and MDDL at EL 310.00m & EL 275.00m respectively. The rated head available in this alternative is about 367.50m and the rating of pumped storage project is estimated to 900 MW for which the live storage requirement is 0.217 TMC. An underground powerhouse has been proposed considering the topography of the project area and requirement of depth of excavation is more than 200m in case of surface powerhouse. Moreover, all project components are located far away from the populated area and there will not be any social and environmental issues are envisaged. The length of embankment for upper and lower reservoirs are 648 m and 675 m respectively. Similarly, the total length of Penstock / Pressure Shaft and Tail Race Tunnel are 1258.52m and 335m respectively. The total area of land required for this Alternative is estimated to 251.94 Ha which is completely in forest land.

Except Upper and Lower reservoir, all other components including Adits are in underground. Therefore, for this alternative, the investigation time and preparation of DPR required will be about 2 years and construction time for completion of this Alternative is estimated to around 42 months excluding pre-construction works.

Alternative – 2 Layout

The Alternative – 2 layout has been proposed with underground powerhouse between Site-2 upper reservoir and Site – 2 lower reservoir and is shown in **Fig. - 5**. The proposed Site-2 upper reservoir location is towards south side of Site-1 upper reservoir which is to be constructed newly and is located on natural depression which is suitable for creating the desired storage capacity keeping FRL & MDDL at EL 700.00m & EL 675.00m respectively.

Similarly, the lower reservoir which is to be constructed newly is proposed to be located in the natural depression which is suitable for creating the desired gross storage capacity keeping FRL and MDDL at EL 300.00m & EL 275.00m respectively. The rated head available in this alternative is about 390.00 m and the rating of pumped storage project is estimated to 900 MW for which the live storage requirement is 0.203 TMC.

An underground powerhouse has been proposed considering the topography of the project area and requirement of depth of excavation is more than 340m in case of surface Powerhouse. The length of the embankment for upper and lower reservoirs are 498 m and 411 m respectively. Similarly, the length of Penstock / Pressure Shaft is about 1278 m. The length of TRT is 557m which is about 222m more than Alternative - 1. With respect to 4 nos. of TRT, the increase in total length of tunnel is around 888m which will increase the cost of project as well as construction time considerably. Other than this, technically, there is no much difference between Alternative – 1 & Alternative – 2 layout. But in Alternative – 2 layout of Upper reservoir, Water channels are flowing within the reservoir area and is being used for feeding the crops. Chala water falls is also lying within this reservoir. This will lead to create Social and Environmental issues. The total area of land required for this alternative is estimated to 258.90 Ha which is completely in forest land.

Except Upper and Lower reservoir, all other components including Adits are in underground. Therefore, for this alternative, the investigation time and preparation of DPR required will be about 2 years and construction time for completion of this Alternative is estimated to around 42 months excluding pre-construction works.

Selection of Final Layout

As discussed above, Alternative – 1 layout has been preferred considering the following reasons:

- Technically, there is no much difference between Alternative – 1 & Alternative – 2 layout except in length of Tail Race Tunnel. In Alternative – 1 layout, the length of TRT is (335m) less than Alternative – 2 layout (557m) which will increase the cost project and construction time considerably.
- In Alternative – 2layout upper reservoir, Water channels are flowing within the reservoir area and is being used for feeding the crops. Chala waterfalls is also lying within this reservoir. This will lead to create Social and Environmental issues.
- The total area of land in both Alternative – 1 & Alternative – 2 are completely in forest land and the area of land required for Alternative – 1 layout (i.e., 251.94 Ha) is less than Alternative – 2 layout (i.e., 258.74 Ha). Going for Alternative – 1 layout, there will be a reduction of about 10.29 Ha of forest land.

xiv. Status of Litigation Pending against the proposal, if any. **No**

xv. The salient features of the project are as under:

1. Project details:

Name of the Proposal	Greenko Assam-01 Off-Stream Closed Loop Pumped Storage Project
Location (Including coordinates)	The proposed project involves the creation of Upper Reservoir 26° 0'5.34"N & 92°16'19.23"E Lower Reservoir 26° 0'12.00"N & 92°15'8.00"E
Inter- State Issue involved	Yes
Seismic zone	Zone -V (High Risk)

2. Category details:

Category of the project	1(c) River Valley Projects
Provisions	
Capacity / Cultural command area (CCA)	900 MW
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	Nil

3. Electricity generation capacity:

Powerhouse Installed Capacity	900 MW (5481 MWH)
Generation of Electricity Annually	1899 MU
No. of Units	4 Nos. (2 X 300 MW) + (2 X 150 MW)
Additional information (if any)	Nil

4. ToR/EC Details:

Cost of project	5849.49 Cr.
Total area of Project	251.94 Ha
Height of Dam from River Bed (EL)	Height of Embankment • Upper reservoir max- 43 m & Avg-20 m • Lower reservoir max- 43 m & Avg-17 m
Length of Tunnel/Channel	335 mts TRC & 257Mts Intake
Details of Submergence area	108.44 Ha
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Off-Stream Closed Loop Pumped Storage Project (OCPSP)
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	No

5. Muck Management Details:

No. of proposed disposal area/ (type of land-Forest/Pvt. land)	Two Locations of 25 Ha in Non-Forest Area
Muck Management Plan	Will be Provided in EIA/EMP report

Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

6. Land Area Breakup:

Private land	117.70 ha
Government land	-
Forest Land	134.24 ha
Total Land	251.94 ha
Submergence area/Reservoir area	108.44 Ha-Upper & Lower reservoirs
Additional information (if any)	Nil

7. Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate / letter/ Remarks**
Reserve Forest/Protected Forest Land	--	Distance from nearest protected area (Pobitora WLS) is 24.0 Km.
National Park	--	
Wildlife Sanctuary	--	

8. Court case details: Nil

9. Miscellaneous

Particulars	**Details**
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (NABET Accredited Consultant Organization) Certificate No : NABET/EIA/2225/RA0274

	Validity : August 15, 2025 Contact Person : Mr. Ravinder Bhatia Name of Sector : River Valley and Hydroelectric Projects Category : A MoEF Schedule : 1(C) Address : 402, Radisson Suites Commercial Plaza, B Block, Sushant Lok Phase I, Gurugram, Haryana - 122009. E-mail : ravi@rstechnologies.co.in
Project Benefits	• Pumped storage hydropower is a modified use of conventional hydropower technology to store and manage energy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 80%, comparing favorably to other energy storage technologies and thermal technologies. This effectively shifts, stores, and reuses energy generated until there is corresponding demand for system reserves and variable energy integration. This shifting can also occur to avoid transmission congestion periods, to help more efficiently manage transmission grid, and to avoid potential interruptions to energy supply. This is important because many of the renewable energy resources being developed (e.g., wind and solar) are generated at times of low demand and off-peak energy demand periods are still being met with fossil fuel resources, often at inefficient performance levels that increase the release of greenhouse gas emissions.

	• Further, pumped storage projects are critical to the national economy and overall energy reliability because it's: o Least expensive source of electricity, not requiring fossil fuel for generation o An emission-free renewable source o Balancing grid for demand driven variations o Balancing generation driven variations o Voltage support and grid stability • Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.
Status of other statutory clearances	**Forest Clearance:** Online application seeking forest diversion for around 117.70 Ha after receipt of ToR Approval. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studies

31.1.3 The EAC during deliberations noted the following:

The Expert Appraisal Committee (EAC) deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR for conducting EIA/EMP and Public hearing for Greenko Assam - 01 Closed Loop Pumped Storage Project (900 MW) in an area of 251.94 Ha in Village Amguri, Baithalangso, Kiling Bagicha, Nali Bagicha No. and Sardangang, Sub District Marigaon and Donka, District Morigaon and West Karbi Anglong, Assam by M/s Greenko Energies Private Limited.

The project/activity falls under Category A of item 1(c), 'River Valley Projects,' as per the Schedule of the Environmental Impact Assessment Notification, 2006, and requires appraisal at the Central level by the sectoral EAC in the Ministry.

The EAC noted that the total land required for the proposed project is about 251.94 Hectares, which includes 134.24 Hectares of forest land and 117.70 Hectares of private land. However, it

was observed that the application for Stage-I Forest Clearance (FC) has not yet been submitted, which necessitates further action from the Project Proponent.

The EAC noted that the proposed Greenko Assam - 01 Closed Loop Pumped Storage Project (900 MW) is planned in ecologically sensitive regions which falls within a transitional zone of the Indo-Burma Biodiversity Hotspot, an area globally recognized for its rich and endemic flora and fauna. These forested tracts, often inhabited by species of conservation concern, serve as important ecological corridors and breeding grounds for numerous endemic and migratory species. The landscape includes semi-evergreen and moist deciduous forests, frequently used by tribal communities for sustenance, adding a layer of socio-ecological complexity.

The Project Proponent indicated that there is no Protected Area in the vicinity of the proposed project. Pobitora WLS is 24.0 km far from the proposed project area. River/ water body, Water will be pumped from Umiam River. However, deliberations by the Expert Appraisal Committee (EAC) highlighted concerns w.r.t the proximity to notified forest areas and potential wildlife movement routes, underscoring the vulnerability of local ecosystems to habitat fragmentation, hydrological disruption, and loss of biodiversity. Considering the regional ecological sensitivity, the Committee called for a very intensive ecological study to be incorporated in the Environmental Impact Assessment (EIA) report. This study is critical for a comprehensive understanding of the site's ecological dynamics and informed decision-making. In light of these observations, the EAC recommended that a site visit be undertaken by a sub-group of the Committee before grant of EC. The purpose of the visit would be to physically assess the ecological character of the area and verify forest dependencies.

It has been observed that Memorandum of Understanding has been signed between Greenko Energies Private Limited and Govt. of Assam for establishment of 900 MW PSP at Tharakhunji Village, Sub division Donka, District Karbi Anglong on 25.02.2025.

31.1.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Close Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Greenko Assam - 01 Closed Loop Pumped Storage Project (900 MW) in an area of 251.94 Ha in Village Amguri, Baithalangso, Kiling Bagicha, Nali Bagicha No. and Sardangang, Sub District Marigaon and Donka, District Morigaon and West Karbi Anglong, Assam by M/s Greenko Energies Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. PP shall submit the Water Utilization Mapping within a 10 km radius of the project for examining the impacts on sustainability of ecosystem of the region after withdrawal of water for proposed project.

ii. Detailed action plan for large scale plantation of native species of plant sapling within 10 km radius of the project shall be prepared in consultation with State Forest Department.

iii. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 117.70 ha of forest land involved in the project shall be submitted within stipulated time.

iv. Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area.

v. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.

vi. PP shall submit the detailed plan for filling the reservoir from the Umiam River along with necessary approval form water resource department. Necessary clearance/ approval for interstate issues/ water availability/water sharing issues shall be obtained.

vii. Transportation Plan for transporting construction materials shall be submitted.

viii. Environmental Cost Benefit Analysis shall be done in terms of loss of Forest ecosystem due to diversion of Forest land/loss of biodiversity, water availability, water uses for generation of hydro power and Ecological flows.

ix. The baseline data collection will cover the changes in biological and ecological profile of the region after monsoon with worst-case scenario study and critical mineral assessment.

x. Calculation and values of GHGs (CO2, CH4 etc.) emissions during construction and during operation till the life of the project shall be estimated and submitted.

xi. The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report. Presence of any critical mineral zone in the proposed area be clarified from GSI.

xii. Details of mineral zone, if any, in the study area, certified by Geological Survey of India or any other concerned Government Organization shall be submitted. The project area

should not come up on any critical mineral zone, the same shall to be verified by GSI/NMDC.

xiii. Quantitative values of Impact modelling of environmental parameters shall be submitted for during construction and operation. Also, mitigation measures shall be submitted in terms of construction and operation phase.

xiv. Conducting site-specific ecological study emphasizing on riverine ecology viz. fishes diversity, fish migration, habitat and aquatic biota due to construction PSP. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.

xv. Cumulative Impact of projects in the basin on carrying capacity and sustainability of Reservoir/ River /nala of catchment area due to tapping of water for filling reservoir shall be studied.

xvi. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Specific ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.

xvii. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.

xviii. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.

xix. Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Indian Council of Agriculture Research (ICAR) Institutes/ Expert Govt. institutions and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.

xx. Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI.

[B] Socio-economic Study

i. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.

ii. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. A comparative chart of issues raised by General Public during Public Hearing and commitments made by the Project Proponent will be prepared and submitted in the relevant chapter of EIA/EMP report.

iii. PP shall submit the credible documents to show the status of land acquisition w.r.t project site from/through the concerned State Government as required under Ministry's OM dated 7th October, 2014 for the project land to be acquired.

iv. Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land (if any) shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. Budget earmarked for R&R, CSR shall not be included in the cost of EMP.

[C] Muck Management

i. Details of quantity of muck generation component wise, types of muck (Excavation in tunnels, pressure shaft and powerhouse etc.) and disposal site/ transportation to be provided.

ii. Details of muck management such as dumping sites and its locations, transportation plan along with monitoring mechanism for muck transportation, detailing the road map of project construction site/ indicating the distances from HFL, river, project construction site along with types of road etc.

iii. Safety measures for avoiding spill over muck into the riverbed/streams and its flow into the river during the high discharge/ flood or monsoon period. Prepare plan for stabilization of muck disposal sites using biological and engineering measures to ensure that muck does not roll down the slopes and shall be disposed safely and that it does not pollute the natural streams and water bodies in surrounding area.

iv. Restoration plan for construction area including dumping site of excavated materials by levelling, filling up of burrow pits, landscaping etc.

[D] Disaster Management

i. Impact of Project activities (specially blasting and drilling) on the aquatic and terrestrial ecosystem, within study area to be studied and be incorporated in EIA/EMP report.

ii. The muck dumping sites shall be located with a distance of 100 mts from HFL. The PP shall submit the detailed action plan for transportation of muck along with monitoring mechanism of movement of muck carrying trucks.

[E] Miscellaneous

i. Both capital and recurring expenditure under EMP shall be submitted.

ii. Approved Layout as per pre-DPR chapter duly approved by CEA/CWC shall be submitted.

iii. The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.

iv. Drone video of project site shall be recorded and to be submitted.

v. Undertaking need to be submitted on affidavit stating that no activities has been started on the project site.

vi. Detailed plan to restore wider roads and convert them into narrow up to 10m after construction of the project.

vii. Specific Terms of Reference (ToRs) issued by the Ministry vide Office Memorandum No. F. No. IA3-22/33/2022-IA.III dated 14.08.2023 for Pumped storage projects shall be used for preparation of EIA/ EMP reports.

viii. As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.

Agenda Item No. 31.2

Guruvarya Late Laxmanraoji Inamdar Lift Irrigation Scheme (Jihe Kathapur), Phase I & II (CCA: 60437 Ha) in an area of 173.614 Ha in Sub district Man, Koregaon, Khatav and Satara, District Satara, Maharashtra by M/s Ex Engr Jihe Kathapur Li Division Satara - Terms of Reference (ToR) - reg.

[Proposal No. IA/MH/RIV/535277/2025; F. No. J-12011/19/2025-IA.I (R)]

31.2.1: The proposal is for grant of Terms of Reference (TOR) to the project for Guruvarya Late Laxmanraoji Inamdar Lift Irrigation Scheme (Jihe Kathapur), Phase I & II (CCA: 60437 Ha) in an area of 173.614 Ha in Sub district Man, Koregaon, Khatav and Satara, District Satara, Maharashtra by M/s Ex Engr Jihe Kathapur Li Division Satara.

31.2.1: The Project Proponent and the accredited Consultant M/s Techknowgreen Solutions Limited, Pune, made a detailed presentation on the salient features of the project and informed that:

i. Guruvarya Late Laxmanraoji Inamdar Lift Irrigation Scheme envisages to irrigate the land of 60437 Ha. (Existing ICA of 27500 Ha. + Proposed expansion ICA of 32937 Ha.) of Khatav, Man, Satara and Koregaon Taluka of Satara District, Maharashtra. Under this scheme, a Jihe Kathapur barrage of 0.35 T.M.C. capacity has been constructed on Krishna River at Tal. Koregaon to lift 179.25 M.Cum. (6.332 T.M.C.) and new barrages (capacity 0.60 TMC) are proposed on upstream side of existing Jihe Kathapur barrage to feed water in existing barrage.

ii. Water lifted in three (3) stages to height of 209.84 m to irrigate Command area of 23354.41 Ha. (ICA) in Khatav taluka, 27258 Ha. (ICA) in Maan taluka, 2276.75 Ha. (ICA) in Satara taluka and 7547.68 (ICA) Ha. in Koregaon taluka of drought prone areas of Satara district. Total 60437 Ha. area will be irrigated through Phase I & Phase II of scheme. The total water utilization is 179.25 M.Cum. (6.332 T.M.C.).

iii. The geographical co-ordinate of the project are : Jihe Kathapur Barrage Coordinates: 17°38’30”N and 74°07’42”E.

iv. The Ministry had issued EC earlier vide letter no. J.12011/85/2007-IA-I dated 13/06/2008 to the existing project Jihe Kathapur Lift Irrigation Scheme in the Dist. Satara of Maharashtra in favour of M/s. Kukadi Irrigation Project Division No.6.

v. The Project envisages construction of: Pump houses, rising main, closed distribution arrangement system for Main Jihe Kathapur Lift Irrigation Scheme No. 2 and 8 newly proposed

LIS viz. Tasgaon Lift Irrigation Scheme, Bhadale Lift Irrigation Scheme, Ner Lift Irrigation Scheme No. 3, Ner Lift Irrigation Scheme No. 4, Ransingwadi Lift Irrigation Scheme, Shiravli Lift Irrigation Scheme, West Maan Lift Irrigation Scheme, North Maan Lift Irrigation Scheme; 3 Direct Gravity Irrigation Scheme viz. Pressure release tank (PRT) to Bhadale Side Gravity Pipe Scheme, Pressure release tank (PRT) to Jaigaon side gravity Pipe scheme and Ner Direct Closed Gravity Pipe, barrages, rising main.

vi. **Land requirement**:

Type of area	**Total Area requirement (Ha.)**	**Acquired area (Ha.)**	**Need to be acquired (Ha.)**
Private	172.54	56.34	116.2
Government	0.22	0.22	0
Forest land	0.854	0.854	0

Note: No forest land will be required for expansion (Phase II)

vii. **Water requirement: 6.332 T.M.C.**

viii. **Project Cost:** The estimated project cost is Rs. 5409.72 Crores including existing investment of Rs. 1330.74 crores.

ix. **Project Benefit:**

- The proposed scheme is envisaged to benefit 175 villages in the Satara, Koregaon, Khatav and Maan Talukas by irrigating 60437 Ha. of land.
- Increased crop production will lead to socio-economic upliftment and subsequent improvement in the livelihood of the farmers of 175 villages.
- The increase in irrigation in the post-project phase will lead to development of agribusinesses and allied infrastructure in the region.

x. **Environmental Sensitive area:** There are Western Ghats Eco- sensitive area [0km (SW) from Bhadale LIS command boundary] and Mahableshwar-Panchgani Eco-sensitive Zone [6.8km (NW) from Barrage-II] within 10 km distance from the project site. River/ water body – Krishna river is flowing at a distance of 1.3Km in NNE direction from Tasgaon LIS command boundary.

xi. **MoU / any other clearance/ permission signed with State government: Administrative approval**

Water Resource Department, Govt. of Maharashtra vide Government Resolution No. सुप्रमा-0924/प्र.क्र.421/24/मोप्र-1 dated 11/10/2024 accorded administrative approval to the project at the cost of Rs. 5409.72 crore

Water utilization Plan

Water Resource Department, Govt. of Maharashtra vide Government Resolution No. कृष्णाप्र 0924/(प्र.क्र. 432/24) मोप्र-१ dated 15/10/2024 approved revised water usage of 6.332 T.M.C. water to this project.

Forest Clearance:

1. Ministry of Environment and Forests, Regional Office, Western Region, Bhopal vide letter No. BB/23/2003-Fcw/1446 dated 26/07/2004 accorded Forest Clearance.
2. Revenue and Forest Department, Mantralaya, Mumbai vide letter No. FLD-2003/ CR-2/ F-10, dated 6.10.2007 accorded approval for land transfer

xii. **Resettlement and rehabilitation**: No R and R work. Water storage in the barrage on the Krishna river

xiii. **Details of Solid waste/ Hazardous waste generation/ Muck and its management:** The muck generated will be utilized for backfilling of trenches and land levelling.

xiv. **Status of Litigation Pending against the proposal, if any.:** NA

xv. The salient features of the project are as under:-

1. Project details

Name of the Proposal	Environmental Clearance For Guruvarya Late Laxmanraoji Inamdar Lift Irrigation Scheme (Jihe Kathapur), Phase I & II, Dist; Satara, State- Maharashtra
Location (Including coordinates)	State: Maharashtra Region: Western Maharashtra District: Satara Taluka: Maan, Khatav, Koregaon and Satara Jihe Kathapur Barrage Coordinates: 17°38'30"N, 74° 07'42"E
Inter- state issue involved	No
Seismic zone	III

2. Category Details

Category of the project	A
Provisions	(ii) ≥ 50,000 ha. of culturable command area under (ii) Irrigation projects of project 1 (c)
Capacity / Cultural command area (CCA)	76700 Ha.
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	

3. ToR/ EC details

Cost of project	5409.72 crore
Total area of Project	173.614 Ha.
Height of Dam from River Bed (EL)	Existing barrage – 9.5m height Proposed Barrage I – 6m and Barrage II – 5.5m
Length of Tunnel/Channel	No new tunnel. Existing Vardhangad and Andhali Tunnel will be used.
Details of Submergence area	30 Ha.
Types of Waste and quantity of generation during construction/ Operation	Muck generation during construction phase : 1689711 Cu.m.
E-Flows for the Project	NA
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. If not the E-Flows maintain criteria for sustaining river ecosystem.	No

4. Muck Management Details:

No. of proposed disposal area/(type of land-Forest/Pvt. land)	Lands will be identified for disposal of muck
Muck Management Plan	Muck will be utilized for backfilling of trenches and land levelling. Detailed Muck Management Plan including monitoring mechanism for its disposal will be provided in the EIA report
Monitoring mechanism for Muck Disposal	

5. Land area Backup

Private land	172.54 Ha.
Government land	0.22 Ha.
Forest Land	0.854 Ha.
Total Land	173.614 Ha.
Submergence area/Reservoir area	30 Ha.
Additional information (if any)	-

6. Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate/letter/Remarks**
Reserve Forest/Protected Forest Land	Yes	Details of environmentally sensitive areas mentioned as below
National Park	No	
Wildlife Sanctuary	No	

Details of environmentally sensitive areas

Salient Features / Environmental features	**Name**	**Aerial distance (km) within 10 km buffer of the Command Boundary**	**Direction from Command Boundary**
National Park/ Wild life sanctuary/ Protected Area Notified Under the Wildlife (Protection) Act.1972/ Biosphere reserve/ Tiger Reserve/ Elephant Corridor/ Migratory routes for Birds	NA	NA	NA
Notified Eco-Sensitive Area (as per MoEF)	Western Ghats ESA Village: Rautwadi, Tehsil: Koregaon	Western Ghats ESA 6.97km from Bhadale LIS command boundary	NW from Bhadale LIS command boundary
	Western Ghats ESA Village: Gujarwadi, Tehsil: Koregaon	0km from Bhadale LIS command boundary	SW from Bhadale LIS command boundary

Salient Features / Environmental features	Name	Aerial distance (km) within 10 km buffer of the Command Boundary	Direction from Command Boundary
	Western Ghats ESA Village: Yavateshwari, Tehsil: Satara	8.63km from Tasgaon LIS command boundary	NW from Tasgaon LIS command boundary
Notified Eco-Sensitive Zone (as per MoEF&CC, GoI)	Mahableshwar-Panchgani Eco-Sensitive Zone	6.8km from Bhuinj Barrage	NW from Bhuinj Barrage
Reserve forest/Protected forest	RF within Ner 4 LIS Command boundary (Toposheet no: 47K/6)	0km	NA
	RF within Ner 4 LIS Command boundary (Toposheet no: 47K/6)	0km	NA
	PF & RF within Rashingwadi LIS Command boundary (Toposheet no: 47K/5, 47K/6)	0km	NA
	PF & RF within Shirvali LIS Command boundary (Toposheet no: 47K/5, 47K/6)	0km	NA
	PF within West Man LIS Command boundary (Toposheet no: 47K/6)	0km	NA
	RF within Tasgoan LIS Command boundary (Toposheet no: 47K/2)	0km	NA

Salient Features / Environmental features	Name	Aerial distance (km) within 10 km buffer of the Command Boundary	Direction from Command Boundary
	RF within Bhadale LIS Command boundary (Toposheet no: 47K/1)	0km	NA
	RF within Ner 3 LIS Command boundary (Toposheet no: 47K/1 & 47K/5)	0km	NA
	RF within North Man LIS Command boundary (Toposheet no: 47K/5)	0km	NA

7. Court case details: Nil

8. Previous EC compliance and necessary approvals:

Particulars	Letter no. and date
Certified EC compliance report (if applicable)	Certified EC compliance report will be obtained from the Regional Office, MoEF&CC, GoI, Nagpur
Status of Stage- I FC	MoEF, GoI vide letter No. 8B/23/2003-FCW/1446 dated 26/07/2004 accorded Forest Clearance
Additional detail (If any)	Water Resource Department, Govt. of Maharashtra vide Government Resolution No. dated 11/10/2024 accorded administrative approval to the project at the cost of Rs. 5409.72 crore
Is FRA (2006) done for FC-I	NA

9. Miscellaneous

Particulars	Details
Details of consultant	Techknowgreen Solutions Limited, Pune; Maharashtra

	202, Hem Opal, Ekta Park Society, Wakdewadi, Shivaji nagar, Pune, Maharashtra- 411005 NABET Accreditation: NABET/EIA/24-27/RA 0364; Valid up to July 05, 2027
Project Benefits	• The proposed scheme is envisaged to benefit 175 villages in the Satara, Koregaon, Khatav and Maan Talukas by irrigating 60437 Ha. of drought-prone areas of Satara District, Maharashtra. • Increased crop production will lead to socio-economic upliftment and subsequent improvement in the livelihood of the farmers of 175 villages. • The increase in irrigation in the post-project phase will lead to development of agribusinesses and allied infrastructure in the region.
Status of other statutory clearances	Environmental Clearance: 1. Ministry of Environment & Forest, GoI vide letter No. J.12011/85/2007-IA-I dated 13/06/2008 accorded Environmental Clearance to the Jihe Kathapur Lift irrigation Scheme (Original Irrigation Plan) for irrigating an Irrigable Command Area (I.C.A.) of 27500 Ha Forest Clearance: 1. Ministry of Environment and Forests, Regional Office, Western Region, Bhopal vide letter No. BB/23/2003-Fcw/1446 dated 26/07/2004 accorded Forest Clearance 2. Revenue and Forest Department, Mantralaya, Mumbai vide letter No. FLD-2003/ CR-2/ F-10, dated 6.10.2007 accorded approval for land transfer
R&R details	No R and R work. Water storage in the barrage on the Krishna river
Additional detail (If any)	No

31.2.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Guruvarya Late Laxmanraoji Inamdar Lift Irrigation Scheme (Jihe Kathapur), Phase I & II (CCA: 60437 Ha) in an area of 173.614 Ha in Sub district Man, Koregaon, Khatav and Satara, District Satara, Maharashtra by M/s Ex Engr Jihe Kathapur Li Division Satara.

The EAC noted that the as per the provisions the project comes under "B1" category as it is a major irrigation project because the CCA lies between ≥10,000 ha i.e. 76700 Ha. However due to presence of Mahanaleshwar Panchgani Eco-sensitive Zone is located within 10 km distance i.e. 6.8 km from the project site the project transformed to category 'A' project and will be appraised at central level.

The EAC noted that the Ministry had issued EC vide letter no. J.12011/85/2007-IA-I dated 13/06/2008 to the existing project Jihe Kathapur Lift Irrigation Scheme in the Dist. Satara of Maharashtra in favour of M/s. Kukadi Irrigation Project Division No.6. The proposal is for expansion Irrigation Scheme envisages to irrigate the land of 60437 Ha. (Existing ICA of 27500 Ha. + Proposed expansion ICA of 32937 Ha.) of Satara District, Maharashtra.

The EAC noted that the total land requirement for the project is 173.614 Ha. out of which 172.76 Ha (56.56 Ha existing area and 116.2 Ha to be acquired) is non forest land and 0.854 ha forest land. The Ministry of Environment and Forests, Regional Office, Western Region, Bhopal vide letter No. BB/23/2003-Fcw/1446 dated 26/07/2004 accorded Forest Clearance for 0.854 Ha.

The committee observed that Western Ghats Eco- sensitive area is 0km (SW) from Bhadale LIS command boundary and Mahableshwar-Panchgani Eco-sensitive Zone is 6.8km (NW) from Barrage-II from the project site. River/ water body – Krishna river is flowing at a distance of 1.3Km in NNE direction from Tasgaon LIS command boundary.

31.2.3 The EAC based on the information submitted and as presented during the meeting, **recommended** the proposal for grant of Standard ToR issued by the Ministry for conducting EIA/EMP and Public Consultation with Public hearing for Guruvarya Late Laxmanraoji Inamdar Lift Irrigation Scheme (Jihe Kathapur), Phase I & II (CCA: 60437 Ha) in an area of 173.614 Ha in Sub district Man, Koregaon, Khatav and Satara, District Satara, Maharashtra by M/s Ex Engr Jihe Kathapur Li Division Satara, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR.

[A] Environmental Management and Biodiversity Conservation:

i. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.

ii. Prepare Wildlife conservation plan specifically for avi-fauna with mitigation measures for minimizing the human–animal conflict and be suitably incorporated in the wildlife conservation plan in consultation with reputed government expert institute and State Forest Department.

iii. Prepare Environmental Cost Benefit Analysis in terms of ecological damage due to diversion of Forest land/ loss of biodiversity and its impacts on ecosystem, water availability, water uses for generation of hydro power in study area 10 km from periphery of Project components.

iv. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted and thermal stratification. Accordingly, Environment Management plan shall be prepared.

v. Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/EMP report.

vi. Source of construction material and its distance from the project site along with detailed transportation plan for construction material be elaborated in the EIA EMP report. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.

vii. A detailed wildlife conservation plan for Schedule –I species, duly approved by the Chief Wildlife Warden, be submitted.

viii. In case any wildlife corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.

ix. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.

x. Detail of rivulets around the project area and action plan for their survival shall be incorporated in EIA/EMP.

[B] Socio-economic Study

i. Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local population.

ii. Declaration by the Project Proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.

iii. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.

iv. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F. No. 22- 65/2017-IA.III dated 30th September, 2020 shall be submitted.

v. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.

vi. Details of settlement in 10 km area shall be submitted.

vii. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F. No. 22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.

[C] Muck Management/ Disaster Management

i. Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.

ii. Details of Muck Management plan prepared along with estimated cost incorporated in EIA/EMP report.

iii. Techno-economic viability of the project must be recommended from CEA/ CWC.

[D] Miscellaneous.

i. Pre-DPR Chapters viz. Layout Map and Hydrology duly approved by CWC/CEA shall be submitted.
ii. Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
iii. Both capital and recurring expenditure under EMP shall be submitted.
iv. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.
v. Arial view video of project site shall be recorded and to be submitted.

Agenda Item No. 31.3

Kalu Patti Pumped Storage Project (600 MW) in an area of 267 Ha in Village Devhat, Mudel, Lain, etc, Sub District Lalganj, District Mirzapur, Uttar Pradesh by M/s Renew Hydro Power Private Limited - Terms of Reference (ToR) - reg.
[Proposal No. IA/UP/RIV/536186/2025; F. No. J-12011/18/2025-IA.I (R)]

31.3.1 The proposal is for grant of Terms of References (ToR) to the project for Kalu Patti Pumped Storage Project (600 MW) in an area of 267 Ha in Village Devhat, Mudel, Lain, etc, Sub District Lalganj, District Mirzapur, Uttar Pradesh by M/s Renew Hydro Power Private Limited.

31.3.2 The Project Proponent and the accredited Consultant M/s. R S Envirolink Technologies Pvt. Ltd., made a detailed presentation on the salient features of the project and informed that:

i. The proposed Kalu Patti Pumped Storage Project (600 MW) is envisioned as an Off-stream Closed Loop Pumped Storage Plant in Mirzapur district of Uttar Pradesh. Kalu Patti Pumped Storage Project envisages construction of two artificial reservoirs at village Devhat, Mudel, Lain, etc, Sub District Lalganj, District Mirzapur, Uttar Pradesh.

ii. The upper reservoir is located in Mahugari village (Near Drummondganj) of Mirzapur district which is about 98 km from Prayagraj airport and lower reservoir is located near Kalu Patti village in Mirzapur district which is about 96 km from Prayagraj airport.

iii. The geographical coordinates of the proposed upper reservoir are at latitude 24°51'29.91" North and longitude 82°9’27.71” East and that of lower reservoir are at 24°51'21.63" North and 82°10'33.41" East. The proposed rating of Pumped Storage Project is 600 MW.

iv. The upper reservoir is proposed to be located on nearly flat plateau having average EL 365 m, which is suitable for creating the desired gross storage capacity of 8.31 MCM by doing

excavation up to EL. 375 m. Out of 8.31 MCM, the live storage capacity is 6.78 MCM and the dead storage capacity is 1.53 MCM by keeping FRL & MDDL at EL 370.00m & EL 354.00m respectively. For creating this storage, it is proposed to construct CFRD for the weighted average height of around 22 m (with maximum height of 25m) for the length of 2892 m. Similarly, the lower reservoir is proposed to be located on a nearly flat plateau having average EL.150 m, which is suitable for creating the desired gross storage capacity of 9.18 MCM. Out of 9.18 MCM, the live storage capacity is 8.17 MCM and dead storage capacity is 1.01 MCM by keeping FRL and MDDL at EL 145.00m & EL 130.00m respectively. For creating this storage, it is proposed to construct CFRD for the weighted average height of around 18 m (with maximum height of 20m) for the length of 1955m.

v. **Land requirement:** The total land required for the construction of various components and related works for Kalu Patti PSP is estimated to be around 267.0 ha, out of which 117.0 ha is non-forest land and 150.0 ha is forest land. Diversion of forest land for non-forest purpose will be involved for construction of Kalu Patti project components. Therefore, Forest Clearance is required to be obtained under Forest Conservation Act.

vi. Demographic details in 10 km radius of project area :

- The proposed project area is located near Kalu Patti village in Lalganj tehsil of Mirzapur district. Kalu Patti is an uninhabited village.
- The surrounding region is primarily rural, with agriculture as the main livelihood. Residents primarily cultivate crops such as wheat, rice, pulses, and various seasonal vegetables, depending on soil conditions and climate.
- In addition to farming, some villagers engage in animal husbandry, rearing cattle, goats, and poultry. Small-scale businesses, artisanal crafts, and local trade also contribute to the village economy.
- Some communities in the project area rely on nearby forests for resources such as firewood, medicinal plants, and livestock fodder.

vii. **Water requirement:** Water requirement for Kalu Patti PSP is proposed to be sourced from existing Baraundha weir at Belan River, situated approximately 12.5 km northeast of the designated lower reservoir site. The Kalu Patti PSP is envisioned with a total storage capacity of 9.18 MCM in the lower reservoir and 8.31 MCM in the upper reservoir. The annual evaporation loss for the upper reservoir and lower reservoir has been calculated as 0.542 million cubic meters (MCM) and 0.697 MCM, respectively. Therefore, the Kalu Patti Pumped Storage Plant (PSP) with a capacity of 600 MW will require 10.79 MCM for the initial reservoir filling. Subsequently, an additional 1.24 MCM per year will be necessary from the Belan River to replenish the storage capacity lost to evaporation.

viii. **Project Cost**: The estimated project cost is Rs 3350 crore. Total capital cost earmarked towards environmental pollution control measures will be worked out during EIA study as well as the Recurring cost (operation and maintenance).

ix. **Project Benefit:** Total Employment will be 1000 nos during construction & 55 nos during O&M persons as direct & indirect.

x. **Environmental Sensitive area**: There is no Protected Area in the vicinity of the proposed project. Kaimur WLS is 11.80 km far from the proposed project area. River/ water body, Water will be pumped from Belan River.

xi. MOU has been signed between Government of Uttar Pradesh and M/s Renew Hydro Power Pvt. Ltd. to build PSP with a capacity of 600 MW vide MoU No. 24/REN/0000028267 dated June 25, 2024.

xii. **Alternative Studies:** Three (3) potential reservoir sites have been identified within the study area.

Alternative-1 with Surface Powerhouse:
The WCS comprises of three numbers of 5.4 m diameter, 1038.59 m long, circular steel lined Pressure Shafts connected to a common surface pit Powerhouse. The water after power generation shall be conveyed into lower reservoir through 3 nos. of 6 m diameter of length 141.64 m concrete lined Tail Race Tunnels (TRT's).

Alternative-2 with Underground Powerhouse:
The WCS comprises of three numbers of 5.7 m diameter, 562.68 m long, circular steel lined Pressure Shafts connected to a Underground Powerhouse. The water after power generation shall be conveyed
into lower reservoir through 3 nos. of 6.3 m diameter of length 830.50 m concrete lined Tail Race Tunnels (TRT's).

Alternative-3 with Surface Powerhouse:
The WCS comprises of three numbers of 5.7 m diameter, 722.52 m long, circular steel lined Pressure Shafts connected to a Surface Powerhouse. The water after power generation shall be conveyed into ower reservoir through 3 nos. of 6.3 m diameter of length 142.46 m concrete lined Tail Race Tunnels
(TRT's).

Sl. No.	Description	Alternative-1	Alternative-2	Alternative-3
1	**Type of Powerhouse**	Surface	Underground	Surface
2	**Water Source**	**Adwa Dam/ Baraundha weir**		
3	**Location Village**	**Kalu Patti**		
4	**District**	**Mirzapur**		
5	**Upper Reservoir**			
	Lattitude/Longitude	24°51'29.91"N, 82° 9'27.71"E	24°51'8.70"N, 82° 9'16.11"E	24°51'29.91"N, 82° 9'27.71"E
	Bed Level (m)	350	350	350
	Max.Dam Height (m)	25	25	25
	Length of Dam (m)	2892.00	2773.00	2912.00
	Type of Dam	CFRD	CFRD	CFRD
	Top of the Dam (m)	375	375	375
	FRL (m)	370	370	370
	MDDL (m)	354	352	352
	Area at FRL (Ha)	45.67	47.4	49.09
	Area at MDDL (Ha)	39.09	40.33	41.65
	Live Storage capacity (MCM)	6.78	7.89	8.16
6	**Lower Reservoir**			
	Lattitude/Longitude	24°51'21.63"N, 82°10'33.41"E	24°50'30.42"N, 82°10'22.74"E	24°52'15.18"N, 82° 9'9.40"E
	Bed Level (m)	128	148	153
	Max.Dam Height (m)	22	22	22
	Length of Dam (m)	1955.00	3217.00	3341.00
	Type of Dam	CFRD	CFRD	CFRD
	Top of the Dam (m)	150	170	175
	FRL (m)	145	165	170
	MDDL (m)	130	150	155

	Area at FRL (Ha)	57.78	67.89	69.39
	Area at MDDL (Ha)	51.18	61.02	62.19
	Live Storage capacity (MCM)	8.17	9.67	9.86
7	**Total Discharge(cumecs)**	**309.27**	**347.10**	**356.07**
8	Max Head (m)	240	220	215
9	Min Head (m)	209	187	182
10	Rated Net Head (m)	219.72	198.5	193.5
11	Max Min Head ratio	1.18	1.18	1.18
12	**IC (MW)**	**600**	**600**	**600**
13	Nos. of Turbine Units	3	3	3
14	Unit Capacity (MW)	3 no.s of 200 MW	3 no.s of 200 MW	3 no.s of 200 MW
15	Unit Discharge (cumecs)	**103.09**	**115.70**	**118.69**
16	**Length of The WCS**	**1180.23**	**1515.68**	**864.98**
	Main Pressure shaft			
	Nos.	3	3	3
	Diameter (m)	5.4	5.7	5.7
	Avg. Length (m)	1038.59	562.68	722.52
	Main Tail Race Tunnel			
	Nos.	3	3	3
	Diameter (m)	6	6.3	6.3
	Avg.Length (m)	141.64	830.5	142.46
17	Upstream L/H Ratio	4.7	2.8	3.7
18	Upstream Surge Tank	Not Required	Not Required	Not Required
19	Downstream Surge Gallery	Not Required	Required	Not Required
20	Max Excavation in Power House (m)	81	_	110

21	Storage Capacity (MWh)		3600.00	
22	Annual Energy (MU)	1257.90	1257.90	1257.90

Alternative 1 is technically superior and environmentally better because:

- The Forest land needed for Alternatives 2 and 3 exceeds that of Alternative 1 by roughly 7 ha and 2 ha respectively.
- In alternative 2 with underground PH, the construction time will be much more than alternative 1 & 3 (both being surface PH); hence more construction phase impacts.
- Due to presence of a few houses in lower reservoir of Alternative 2, rehabilitation and resettlement issues will be involved, therefore, not preferred
- In Alternative 3, the open excavation depth in the powerhouse pit is about 110 m which will create slope stability issues, therefore not preferred.
- *Alternative 1 with surface powerhouse* has been considered for preparation of pre-feasibility report owing to its advantages over Alternatives 2 & 3 as mentioned above.

xiii. Status of Litigation Pending against the proposal, if any. **No**

xiv. The salient features of the project are as under: -

1. Project details:

Name of the Proposal	Kalu Patti Pumped Storage Project
Location (Including coordinates)	Lower Reservoir : Latitude: 24° 51' 21.63" N Longitude: 82° 10' 33.41" E; Upper Reservoir : Latitude: 24° 51' 29.91" N Longitude: 82° 9' 27.71" E;
Inter- state issue involved	No
Seismic zone	Zone-III

2. Category details:

Category of the project	A

Provisions	
Capacity / Cultural command area (CCA)	600 MW
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	Nil

3. Electricity generation capacity:

Powerhouse Installed Capacity	600 MW
Generation of Electricity Annually	1257.9 MU
No. of Units	3 nos. (3 x 200 MW)
Additional information (if any)	Nil

4. ToR/EC Details:

Cost of project	3350 Cr.
Total area of Project	267 ha
Height of Dam from River Bed (EL)	Lower Dam – 20.0 m Upper Dam –25.0 m
Length of Tunnel/Channel	1038.59 m
Details of Submergence area	103.45
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Closed Loop Pumped Storage Project (PSP)
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	No

5. Land Area Breakup:

Private Land	117.0 ha
Government land	-
Forest Land	150.0 ha

Total Land	267.0 ha
Submergence area/Reservoir area	103.45 ha
Additional information (if any)	Nil

6. Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate / letter/ Remarks**
Reserve Forest/Protected Forest Land	--	There is no Protected Area in the vicinity of the proposed project. Kaimur WLS is approx. 11.8 km far from the proposed project area.
National Park	--	
Wildlife Sanctuary	--	

7. Court case details: Nil

8. Miscellaneous

Particulars	**Details**
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (*NABET* Accredited *Consultant Organization*) Certificate No : NABET/EIA/2225/RA0274 Validity : August 15, 2025 Contact Person : Mr. Ravinder Bhatia Name of Sector : River Valley and Hydroelectric Projects Category : A MoEF Schedule : I(C) Address : 403, Bestech Chambers, Block-B, Sushant Lok Phase I, Sector 43, Gurugram, Haryana -

	122009 E-mail : ravi@rstechnologies.co.in Land Line : (0124) 4295383 Cellular : (+91) 9810136853
Project Benefits	• Pumped storage hydropower is a modified use of conventional hydropower technology to store and manage energy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 80%, comparing favorably to other energy storage technologies and thermal technologies. This effectively shifts, stores, and reuses energy generated until there is corresponding demand for system reserves and variable energy integration. This shifting can also occur to avoid transmission congestion periods, to help more efficiently manage transmission grid, and to avoid potential interruptions to energy supply. This is important because many of the renewable energy resources being developed (e.g., wind and solar) are generated at times of low demand and off-peak energy demand periods are still being met with fossil fuel resources, often at inefficient performance levels that increase the release of greenhouse gas emissions. • Further, pumped storage projects are critical to the national economy and overall energy reliability because it's: o Least expensive source of electricity, not requiring fossil fuel for generation o An emission-free renewable source o Balancing grid for demand driven variations o Balancing generation driven variations o Voltage support and grid stability Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in

	upliftment of livelihood and socio-economic conditions.

31.3.3 The EAC during deliberations noted the following:

The Expert Appraisal Committee (EAC) deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Kalu Patti Pumped Storage Project (600 MW) in an area of 267 Ha in Village Devhat, Mudel, Lain, etc, Sub District Lalganj, District Mirzapur, Uttar Pradesh by M/s Renew Hydro Power Private Limited.

The project/activity falls under Category A of item 1(c), 'River Valley Projects,' as per the Schedule of the Environmental Impact Assessment Notification, 2006, and requires appraisal at the central level by the sectoral EAC in the Ministry.

The EAC noted that the total land required for the proposed project is about 267.0 ha, out of which 117.0 ha is non-forest land and 150.0 ha is forest land. However, it was observed that the application for Stage-I Forest Clearance (FC) has not yet been submitted, which necessitates further action from the Project Proponent. There is no Protected Area in the vicinity of the proposed project. Kaimur WLS is 11.80 km far from the proposed project area. River/ water body, Water will be pumped from Belan River.

In view of the significant forest land involvement, reliance on river water, and proximity to ecologically sensitive areas, the Committee emphasized the need for a detailed ground-level assessment.

It has been observed that Memorandum of Understanding has been signed between Government of Uttar Pradesh and M/s Renew Hydro Power Pvt. Ltd. to build PSP with a capacity of 600 MW vide MoU No. 24/REN/0000028267 dated June 25, 2024.

33.3.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Close Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Kalu Patti Pumped Storage Project (600 MW) in an area of 267 Ha in Village Devhat, Mudel, Lain, etc, Sub District Lalganj, District Mirzapur, Uttar Pradesh by M/s Renew Hydro Power Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. PP shall submit the Water Utilization Mapping within a 10 km radius of the project for examining the impacts on sustainability of ecosystem of the region after withdrawal of water for proposed project.

ii. Detailed action plan for large scale plantation of native species of plant sapling within 10 km radius of the project shall be prepared in consultation with State Forest Department.

iii. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 150.0 ha of forest land involved in the project shall be submitted within stipulated time.

iv. Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area.

v. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.

vi. PP shall submit the detailed plan for filling the reservoir from the Belan River along with necessary approval form water resource department. Necessary clearance/ approval for interstate issues/ water availability/water sharing issues shall be obtained.

vii. Transportation Plan for transporting construction materials shall be submitted.

viii. Environmental Cost Benefit Analysis shall be done in terms of loss of Forest ecosystem due to diversion of Forest land/loss of biodiversity, water availability, water uses for generation of hydro power and Ecological flows.

ix. The baseline data collection will cover the changes in biological and ecological profile of the region after monsoon with worst-case scenario study and critical mineral assessment.

x. Calculation and values of GHGs (CO2, CH4 etc.) emissions during construction and during operation till the life of the project shall be estimated and submitted.

xi. The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report. Presence of any critical mineral zone in the proposed area be clarified from GSI.

xii. Details of mineral zone, if any, in the study area, certified by Geological Survey of India

or any other concerned Government Organization shall be submitted. The project area should not come up on any critical mineral zone, the same shall to be verified by GSI/NMDC.

xiii. Quantitative values of Impact modelling of environmental parameters shall be submitted for during construction and operation. Also, mitigation measures shall be submitted in terms of construction and operation phase.

xiv. Conducting site-specific ecological study emphasizing on riverine ecology viz. fishes diversity, fish migration, habitat and aquatic biota due to construction PSP. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.

xv. Cumulative Impact of projects in the basin on carrying capacity and sustainability of Reservoir/ River /nala of catchment area due to tapping of water for filling reservoir shall be studied.

xvi. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Specific ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.

xvii. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.

xviii. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.

xix. Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Indian Council of Agriculture Research (ICAR) Institutes/ Expert Govt. institutions and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.

xx. Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI.

[B] Socio-economic Study

i. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.

ii. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. A comparative chart of issues raised by General Public during Public Hearing and commitments made by the Project Proponent will be prepared and submitted in the relevant chapter of EIA/EMP report.

iii. PP shall submit the credible documents to show the status of land acquisition w.r.t project site from/through the concerned State Government as required under Ministry's OM dated 7th October, 2014 for the project land to be acquired.

iv. Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land (if any) shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. Budget earmarked for R&R, CSR shall not be included in the cost of EMP.

[C] Muck Management

i. Details of quantity of muck generation component wise, types of muck (Excavation in tunnels, pressure shaft and powerhouse etc.) and disposal site/ transportation to be provided.

ii. Details of muck management such as dumping sites and its locations, transportation plan along with monitoring mechanism for muck transportation, detailing the road map of project construction site/ indicating the distances from HFL, river, project construction site along with types of road etc.

iii. Safety measures for avoiding spill over muck into the riverbed/streams and its flow into the river during the high discharge/ flood or monsoon period. Prepare plan for stabilization of muck disposal sites using biological and engineering measures to ensure that muck does not roll down the slopes and shall be disposed safely and that it does not pollute the natural streams and water bodies in surrounding area.

iv. Restoration plan for construction area including dumping site of excavated materials by levelling, filling up of burrow pits, landscaping etc.

[D] Disaster Management

i. Impact of Project activities (specially blasting and drilling) on the aquatic and terrestrial ecosystem, within study area to be studied and be incorporated in EIA/EMP report.

ii. The muck dumping sites shall be located with a distance of 100 mts from HFL. The PP shall submit the detailed action plan for transportation of muck along with monitoring mechanism of movement of muck carrying trucks.

[E] Miscellaneous

i. Both capital and recurring expenditure under EMP shall be submitted.

ii. Approved Layout as per pre-DPR chapter duly approved by CEA/CWC shall be submitted.

iii. The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.

iv. Drone video of project site shall be recorded and to be submitted.

v. Undertaking need to be submitted on affidavit stating that no activities has been started on the project site.

vi. Detailed plan to restore wider roads and convert them into narrow up to 10m after construction of the project.

vii. Specific Terms of Reference (ToRs) issued by the Ministry vide Office Memorandum No. F. No. IA3-22/33/2022-IA.III dated 14.08.2023 for Pumped storage projects shall be used for preparation of EIA/ EMP reports.

viii. As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.

Agenda Item No. 31.4

Damanganga (Ekdare) - Godavari intrastate link project (CCA: 12998 Ha) in an area of 257.85 Ha at Village Ekdare, Gonde, Shinde, etc., Sub District Peth and Dindori, District Nashik, Maharashtra by M/s Minor Irrigation Division – Amendment in Terms of Reference (TOR) -reg.
[Proposal No. IA/MH/RIV/535184/2025; F. No. J-12011/03/2019-IA.I (R)]

31.4.1: The proposal is for grant of amendment in Terms of Reference to the project for Damanganga (Ekdare) - Godavari intrastate link project (CCA: 12998 Ha) in an area of 257.85 Ha at Village Ekdare, Gonde, Shinde, etc., Sub District Peth and Dindori, District Nashik, Maharashtra by M/s Minor Irrigation Division.

31.4.2: The Project Proponent made a detailed presentation on the salient features of the project and informed that:

i. The proposal is for amendment in the Terms of Reference granted by the Ministry vide letter dated 13/02/2023 for the Damanganga (Ekdare) – Godavari intrastate link project located at Village Ekdare, Tehsil Peint, District Nashik (Maharashtra) in favour of M/s Minor Irrigation Division, Nashik, Maharashtra.

ii. The Project was appraised and recommended for grant of TOR in 38th meeting of EAC held on 15/12/2022. TOR was issued by MoEF&CC vide its letter dated 13/02/2023.

iii. At the stage of TOR application, the total area to be benefitted by the project was 18404 ha for irrigation out of which 687 ha command was in Damanganga basin for local use and remaining 17717 ha to be benefitted in Upper Godavari sub basin in command of existing Jayakwadi project in Marathwada region. During detailed survey and investigation, total command area has been revised as 12998 ha.

iv. There are changes in other components of salient features as well. The total land area has decreased (261.99 ha to 257.85 ha) and forest land has increased from 44.76 ha to 120.0 ha. This is due to reduction of quantum of total water available for the link project from 143 MCM to 100.569 MCM. There is an increase in the forest area, because earlier estimation was based on preliminary survey and didn't include the river area which was mentioned separately; after detailed working using forest maps and latest 7/12 extracts (a land record document maintained by the Revenue Department). Details of the revised project layout are given below.

v. The Damanganga (Ekdare) - Godavari (Waghad) link project envisages diversion of surplus flows of west flowing Damanganga basin by lift from the proposed Ekdare project to serve the water short Marathwada region in Maharashtra through Existing Jayakwadi Reservoir project. The water available for utilization is 100.569 MCM out of which 15% of the quantity of diversion (15.085 MCM) is reserved for local use as per Govt. of Maharashtra resolution and remaining 85.484 MCM will be lifted in three stages to existing Waghad reservoir in Upper Godavari sub-basin. The diversion is proposed during the months July to October (123 days).

vi. The link system comprises of the headworks viz the proposed Ekdare dam (FRL:374m), Hatti Weir (CL: 452.50 m), Nirgude weir (CL 440.0m), Circular sump (FPL 595.0m) and the existing Inambari (FPL:516.0m), Jharlipada diversion scheme (FPL 672.4m) and Waghad (FRL: 668.50m).

vii. Ekdare dam is proposed on Damanganga basin near Ekdare village, Peint taluk of Nashik district. FRL of the proposed Ekdare dam is 374.0 m and corresponding live storage capacity of 29.56 MCM. The length of the dam is 292.367 m. and the height is 77.50 m with submergence area of 231.30 ha. 13 villages (only land) are affected due to the reservoir. Protection bund (dyke) of 800m long is proposed near Ekdare village to protect from reservoir submergence at full reservoir level. The total land acquisition required for the whole project will be about 257.85 ha of which 120.0 ha is under forest.

viii. The conveyance system comprises of 14.04 km long 2 MS raising mains of 1.80 to 2.10m dia between Ekdare and existing Jharlipada diversion scheme via Nirgude weir and PH 3 near Jharlipada; the existing link cut of 1.30km from Jharlipada diversion scheme up to Kadwa river and 1.90 km long natural Kadwa river stream upto Waghad existing dam. The further conveyance will be through water flows through Kadwa river and Godavari river upto Jayakwadi reservoir.

ix. The augmentation storages of Hatti and Inambari are connected to main conveyance at Nirgude with 800m and 400 m pipelines. The distribution to Aad and Lingavane is proposed from PH-3 near Jharlipada through 12.0km long pipe with dia 0.50m. The maximum discharge in the conveyance varies between 13.06 cumec at the head and attains 14.19 cumec at Nirgude. Lifting arrangements comprises of sump, pump house and delivery cistern, at Ekdare, Nirgude and PH-3 at Jharlipada with static head of 110.13m, 158.65 m, and 82.65m respectively and the total static lift will be 351.43 m. The power requirement will be about 106 MU.

x. Out of the total utilisation, 68.786 MCM will be used for irrigation, 13.76 MCM for domestic, 9.17MCM for industrial uses and the remaining 8.853 MCM will be lost in

transmission. The link project will provide irrigation to about 12998 ha annually (2987ha in local villages) in Nashik district and 10011 ha in Aurangabad district under Jayakwadi command. The project is proposed to be constructed in 7 years. The economic parameters of the link project are furnished below.

Estimated cost (Crore)	Annual cost	Annual benefits	BCR	IRR	GST, Labour insurance, QC and Royalty	Total project cost (Crore)
1871.12	275.01	459.64	1.67	14.48%	342.41	2213.53

xi. The total land required will be 257.85 ha out of which, 120.0 ha is of forest land. In all, 13 villages are affected partly and no population is affected.

xii. Comparison of revised layout with earlier approved layout is given below:

Sl no	Parameter		As per TOR	Actual	Deviation
1	**Purpose**	**:**	**Diversion of surplus water from Damanganga basin to Godavari basin**	**Diversion of surplus water from Damanganga basin to Godavari basin**	**No change**
2	**Quantum of utilization (MCM)**	**:**	**143.00**	**100.569**	**-42.43**
i	Local use (15%) (MCM)	:	4.40	15.09	**10.69**
ii	Diversion to Waghad (MCM)	:	138.60	85.48	**-53.12**
3	**Irrigation (Annual irrigation /CCA) (ha)**	**:**	**18404.00**	**12998.00**	**-5406.00**
i	Damanganga basin (ha)	:	687.00	2987.00	**2300.00**
ii	Upper Godavari basin (ha)	:	17717.00	10011.00	**-7706.00**
4	**Land Acquisition Details**				

	Total Area (ha)	:	261.99	257.85	**-4.14**
	Forest area (ha)	:	44.76	120.00	**75.24**
	River portion (ha)	:	53.40	0.00	**-53.40**
	Other areas (ha)	:	163.83	137.85	**-25.98**
	Total No. of Villages affected	:	13	13	**No change**
5	**Ekdare reservoir (Proposed)**				
i	State	:	Maharashtra	Maharashtra	**No change**
ii	District	:	Nasik	Nasik	**No change**
iii	Location	:	Near Ekdare village, Peint Taluk	Near Ekdare village, Peint Taluk	**No change**
iv	Name of river	:	Damanganga river	Damanganga river	**No change**
v	Basin/sub basin	:	Damanganga	Damanganga	**No change**
vi	Latitude	:	20° 11’ 17.03” N	20° 11’ 17.03” N	**No change**
vii	Longitude	:	73° 32’ 23.12” E	73° 32’ 23.12” E	**No change**
viii	Top of dam level (m)	:	375.50	375.50	**No change**
ix	Length of the dam (m)	:	302.00	293.00	**-9.00**
x	Height of the dam (m)	:	69.50	77.50	**8.00**
xi	Catchment area (sq km)	:	182.00	182.00	**No change**
xii	75% Dependability surplus yield at dam site	:	125.00 (as per CWC)	100.569	**-24.43**
xiii	Maximum water level (m)	:	374.50	375.50	**1.00**
xiv	Full reservoir level (m)	:	374.00	374.00	**No change**
xv	MDDL (m)	:	345.00	331.87	**-13.13**
xvi	Gross storage capacity (MCM)	:	36.41	32.95	**-3.46**

xvii	Live storage capacity (MCM)	:	29.37	29.56	**0.19**
xviii	Dead storage capacity (MCM)	:	7.04	3.39	**-3.65**
xix	Area of submergence at F.R.L (ha)	:	247.40	231.30	**-16.10**
xx	Forest area (ha)	:	41.91	115.45	**73.54**
xxi	River portion (ha)	:	53.40	0.00	**-53.40**
xxii	Other areas (ha)	:	152.09	115.85	**-36.24**
xxiii	No. of Villages affected in submergence (only land)	:	4	4	**No change**
6	**Hatti weir (Proposed)**				
i	Location	:	Near Hatti village, Peint taluk, Nasik district, Maharashtra	Near Hatti village, Peint taluk, Nasik district, Maharashtra	**No change**
ii	Name of river	:	Hatti Nala	Hatti Nala	**No change**
iii	Basin/sub basin	:	Damanganga upstream of Ekdare	Damanganga upstream of Ekdare	**No change**
iv	Latitude	:	20° 13’21.08”	20° 13’21.08”	**No change**
v	Longitude	:	73° 35’45.45”	73° 35’45.45”	**No change**
vi	Catchment Area up to Hatti weir (sq.km)	:	14.41	14.41	**No change**
vii	River bed level (m)	:	460.00	449.00	**-11.00**
viii	Weir Crest level (m)	:	461.50	452.50	**-9.00**
ix	Height of the weir (m)	:	1.50	3.50	**2.00**
x	Length of weir (m)	:	17.40	73.90	**56.50**
xi	75% monsoon yield (MCM)	:	11.62	11.62	**0.00**
xii	Upstream projects utilization (MCM)	:	1.17 (Shinde MIP)	1.17	**0.00**

xiii	Balance available for diversion (MCM)	:	10.45	10.45	**0.00**
xiv	Submergence area (ha)	:	Confined to river course.	Confined to river	**No change**
xv	Villages affected (No.)	:	9	9	**No change**
7	**Nirgude weir (Proposed)**				
i	Location	:	Near Nirgude village, Peint taluk, Nasik district, Maharashtra	Near Nirgude village, Peint taluk, Nasik district, Maharashtra	**No change**
ii	Name of river	:	Nirgude nala (a small right bank stream of Damanganga river)	Nirgude nala (a small right bank stream of Damanganga river)	**No change**
iii	Basin/sub basin	:	Right bank stream of Damanganga river	Right bank stream of Damanganga river	**No change**
iv	Latitude	:	20° 13’36.79”	20° 13’36.79”	**No change**
v	Longitude	:	73° 35’25.45”	73° 35’25.45”	**No change**
vi	Catchment Area up to Nirgude weir (sq.km)	:	11.48	11.48	**No change**
vii	River bed level (m)	:	443.00	430.70	**-12.30**
viii	Weir Crest level (m)	:	445.00	440.00	**-5.00**
ix	Height of the weir (m)	:	2.00	9.30	**7.30**
x	Length of weir (m)	:	34.80	63.00	**28.20**
xi	75% monsoon yield (MCM)	:	9.25	9.25	**0.00**
xii	Upstream projects utilization	:	Nil	Nil	
xiii	Balance available for diversion (MCM)	:	9.25	9.25	**No change**
xiv	Submergence area (ha)	:	Confined to river course.	Confined to river course	**No change**
xv	Villages affected (No.)	:	Nil	Nil	**No change**

8	**Waghad project (Existing)**				
i	State	:	Maharashtra	Maharashtra	**No change**
ii	District	:	Nasik	Nasik	**No change**
iii	Latitude	:	20° 14'N	20° 14'N	**No change**
iv	Longitude	:	73° 44'E	73° 44'E	**No change**
v	Name of river	:	Kadwa river (a small tributary of Godavari river)	Kadwa river (a small tributary of Godavari river)	**No change**
vi	Catchment area (sq km)	:	119.00	119.00	**No change**
vii	Top of dam level (m)	:	673.60	673.60	**No change**
viii	Maximum water level (m)	:	671.20	671.20	**No change**
ix	Full reservoir level (m)	:	668.50	668.50	**No change**
x	MDDL (m)	:	650.50	650.50	**No change**
xi	Gross storage capacity (MCM)	:	76.48	76.48	**No change**
xii	Live storage capacity (MCM)	:	70.00 (revised to 65.18)	70.00 (revised to 65.18)	**No change**
xiii	Area of submergence at F.R.L (ha)	:	1090.00	1090.00	**No change**
9	**Damanganga (Ekdare)- Godavari (Waghad) link project**				
A	**Features of link canal (pipe line)**				
i	Total length of the link canal (pipe line) (Km)	:	13.62	14.04	**0.42**
ii	Length of pipe line up to Jharlipada Diversion Scheme (km)	:	10.42	10.84	**0.42**
iii	Ridge cut link (Km)	:	1.30	1.30	**No change**

iv	Natural stream (Km)	:	1.90	1.90	**No change**
v	RCC underground pipe line between (Hatti to Nirgude) (Km)	:	0.80	0.80	**No change**
B	**Land Required for pipe line and pumphouses**				
i	Total Area (ha)	:	14.59	26.55	**11.96**
ii	Forest area (ha)	:	2.85	4.55	**1.70**
iii	Other Area (ha)	:	11.74	22.00	**10.26**
iv	Villages/Population affected	:	Nil	Nil	**No change**
C	**Lift at first stage from RD 0.00 km to 5.970 km**				
i	Maximum quantum of diversion (MCM)	:	30.51 MCM	27.88	**-2.63**
ii	Designed discharge (cumec)	:	12.84	10.41	**-2.43**
iii	Length of Pipe line (km)	:	5.97	6.10	**0.13**
iv	Nos. and Diameter of the pipe	:	4 x 1.40 m	2x1.80 m	**-2.00**
v	Velocity (m/s)	:	2.09 m/s	2.05	**-0.04**
vi	Off take level (m)	:	345.00	331.87	**-13.13**
vii	Outfall level (m)	:	445.00	442.00	**-3.00**
viii	Lift (m)	:	100.00	110.13	**10.13**
D	**Lift at 2nd stage from RD 5.97 km to 9.25 km**				
i	Maximum quantum of diversion (MCM)	:	33.92	38.00	**4.08**
ii	Designed discharge (cumec)	:	14.28	14.19	**-0.09**

iii	Length of Pipe line (km)	:	3.28	4.018	**0.738**
iv	Nos. and Diameter of the pipe	:	4 x 1.40 m	2x2.10 m	**-2.00**
v	Velocity (m/s)	:	2.32	2.05	**-0.27**
vi	Off take level (m)	:	445.00	438.33	**-6.67**
vii	Outfall level (m)	:	560.00	597.00	**37.00**
viii	Lift (m)	:	115.00	158.67	**43.67**
E	**Lift at 3rd stage from RD 9.25 km to 10.42 km**				
i	Maximum quantum of diversion (MCM)	:	33.92	38.00	**4.08**
ii	Designed discharge (cumec)	:	14.28	14.19	**-0.09**
iii	Length of Pipe line (km)	:	1.17	716.00	**714.83**
iv	Nos. and Diameter of the pipe	:	4 x 1.40 m	2x2.10 m	**-2.00**
v	Velocity (m/s)	:	2.32	2.05	**-0.27**
vi	Off take level (m)	:	560.00	593.33	**33.33**
vii	Outfall level (m)	:	672.00	676.00	**3.60**
viii	Lift (m)	:	112.40	82.65	**-29.75**
F	**Power required for lifting**				
i	At stage I (MU)	:	68.10	27.53	**-40.57**
ii	At stage II (MU)	:	76.11	51.17	**-24.94**
iii	At stage III (MU)	:	66.93	26.60	**-40.33**
iv	**Total energy required (MU)**	**:**	**211.14**	**105.70**	**-105.44**
v	Total cost for energy required (Rs.Lakh)	:	3801.00		
G	**Installed capacity**				

i	Stage I (MW)	:	23.43	16.36	**-7.07**
ii	Stage II (MW)	:	26.62	30.37	**3.75**
iii	Stage III (MW)	:	23.04	15.79	**-7.25**
iv	**Total (MW)**	:	**73.09**	**62.52**	**-10.57**
10	**Economic analysis**				
i	Net annual benefit from irrigation (Lakhs)	:	6154.00	9675.00	**3521.00**
ii	Benefit from Domestic water supply (Lakhs)	:	105.00	62.00	**-43.00**
iii	Benefit from Industrial water supply (Lakhs)	:	33600.00	30294.00	**-3306.00**
iv	Benefit from water charges(Irrigation service fee) (Lakhs)	:	276.00	0.00	**-276.00**
v	Benefit from Pisciculture and lease amount (Lakhs)	:	47.00	5582.00	**5535.00**
vi	Benefit from Animal husbandry (Lakhs)	:	1953.00	351.00	**-1602.00**
vii	**Total Annual Benefit of the project (Lakhs)**	**:**	**42135.00**	**45964.00**	**3829.00**
viii	Annual cost (Lakhs)	:	24042.00		
ix	Cost of Unit-I Head Works (Lakhs)	:	119953.00	113608.00	**-6345.00**
	Unit II: Conveyance			29020.00	**29020.00**
	Cost of Unit-III Lifting Arrangements (lakh)	:	37395.00	44484.00	**7089.00**
	Total cost of project (2019-2020 price level)(lakh)	**:**	**157348 / 2019-20**	**187112/ 2022-23**	**29764.00**
x	B.C. Ratio (considering annual	:	1.75	1.67	**-0.08**

	benefit and annual cost)				
xi	Internal Rate of Return (IRR)	:	11.11%	14.48%	**Increased**

xiii. The project proponent has requested for amendment in the ToR/EC with the details are as under:

S. N.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
1.	**TOR Letter Addressed to**	• M/s National Water Development Agency Minor Irrigation Division Sinchan Bhavan Campus Trimbak Road Nashik – 422211 Maharashtra	• Minor Irrigation Division Sinchan Bhavan Campus Trimbak Road Nashik – 422002 Maharashtra	NWDA is DPR consultant and project proponent is Minor Irrigation Division
2.	**Para 4 (ii)**	• **Damanganga (Ekadare)-Godavari (Waghad) link** project envisages diversion of about 138.6 MCM of surplus water available in the catchment of Damanganga basin up to proposed Ekdare dam site to existing Waghad reservoir in Godavari valley, by lift in three stages at Ekdare, Nirgude & at the proposed Circular sump with a total static lift of 327.40 m.	• **Damanganga (Ekadare)-Godavari (Waghad) link** project envisages diversion of about 85.484 MCM of surplus water available in the catchment of Damanganga basin up to proposed Ekdare dam site to existing Waghad reservoir in Godavari valley, by lift in three stages at Ekdare, Nirgude & intermediate sump with a total static lift of 351.43 m.	The transferable quantity reduced based on the fresh upstream reservations reported by Govt of Maharashtra and the subsequent Ekdare reservoir simulation.
3.	**Para 4 (iii)**	• The total conveyance system of 13.62 km comprises a pipe line of 10.42 km (rising main) by lift up to Jharlipada Diversion Scheme and 3.20 km by gravity (1.30 km ridge cut between Damanganga and Godavari	• The total conveyance system of 14.04 km comprises a pipe line of 10.84 km (rising main) by lift up to Jharlipada Diversion Scheme and 3.20 km by gravity (1.30 km ridge cut between Damanganga and Godavari	Pumphouse at Ekdare has been relocated and the rising main recast to minimize cutting while designing the system. Hence, there is a slight

S. N.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		basins) and 1.90 km of natural stream of Kadwa River upto Waghad Reservoir.	basins) and 1.90 km of natural stream of Kadwa River upto Waghad Reservoir.	increase in the length of rising main.
4.	**Para 4 (iv)**	• The structural component of the link system consists of one proposed Ekdare dam, ccmveyance system of 13.62 km length, two proposed weirs, i.e. Hatti & Nirgude, Intermediate Circular sump and underground RCC pipe line between the proposed Hatti & Nirgude weirs. The available water will be lifted by 3 Pump houses at Ekdare, Nirgude & Circular Pump by the rising mains to divert into the existing Jharlipada Diversion scheme.	• The structural component of the link system consists of one proposed Ekdare dam, ccmveyance system of 14.04 km length, two proposed weirs, i.e. Hatti & Nirgude, Intermediate sump and underground RCC pipe line between the proposed Hatti & Nirgude weirs. The available water will be lifted by 3 Pump houses at Ekdare, Nirgude & Intermeidate Sump by the rising mains to divert into the existing Jharlipada Diversion scheme.	Slight change in the length of rising main due to final design for minimizing cutting
5.	**Para 4 (v)**	• **Submergence area**: The submergence area at FRL is 247.4 ha. Out of which about 53.40 ha is river course, 41.91 ha is forest area and 152.09 ha Govt. land & private land. No villages are coming under submergence.	• **Submergence area**: The submergence area at FRL is 231.3 ha. Out of which about 115.45 ha is forest area and 115.85 ha is non forest land (Govt/private land). 13 villages will get affected by submergence (no displacement, only losing land)	The submergence area is recomputed at micro level based on drone output maps and hence the change in submergence area.
6.	**Para 4 (vi)**	• **Use of Water:** The proposed utilization from the Ekdare reservoir is fixed at 143 MCM out of which,4.4 MCM is kept reserved for local use and remaining 138.6 MCM is proposed for lifting to Waghad dam. The link	• **Use of Water:** The proposed utilization from the Ekdare reservoir is fixed at 100.569 MCM out of which, 15.085 MCM is kept reserved for local use and remaining 85.484 MCM is proposed for lifting to Waghad dam. The	The transferable quantity reduced based on the fresh upstream reservations reported by Govt of Maharashtra and the subsequent Ekdare reservoir

S. N.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		project will benefit a total area of 18404 ha irrigation out of which 687 ha will be benefitted in command areas within Damanganga basin for local use in Nasik district and the remaining 17717 ha will be benefitted in Upper Godavari sub-basin in the command of existing Jayakwadi project in Marathwada region.	link project will benefit a total area of 12998 ha irrigation, out of which 2987 ha will be benefitted in command areas within Damanganga basin for local use in Nasik district and the remaining 10,011 ha will be benefitted in Upper Godavari sub-basin in the command of existing Jayakwadi project in Marathwada region.	simulation. Accordingly, the water planning changed, and utilizable quantity reduced.
7.	**Para 4 (vii)**	• **Land requirement:** The total land requirement for the proposed Damaganga (Ekdare)-Godavari (Waghad) link project is **261.99 ha**, out of which **44.76 ha** is forest land, for which forest clearance to be obtained under Forest Conservation Act**.**	• **Land requirement:** The total land requirement for the proposed Damaganga (Ekdare)-Godavari (Waghad) link project is **257.85 ha**, out of which **120 ha** is forest land, for which forest clearance to be obtained under Forest Conservation Act**.**	The land requirement is recomputed at micro level based on drone output maps and hence the change in land requirement.
8.	**Para 5**	• The sectoral Expert Appraisal Committee considered the proposal in its 26th and 38th meeting held on 20th August, 2019 and 15th December, 2022 respectively. The EAC after detailed deliberation recommended the proposal for grant of applicable Standard TOR along with additional TOR for conducting EIA study to the project for Warsgaon Warangi Pumped Storage Project of capacity 1200 MW in an area of 169 ha at Village Teckpole and Warangi, Tehsil Velhe and	• Para to be deleted	The paragraph proposed for deletion pertains to a different project

S. N.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		Mahad, District Pune and Raigad (Maharashtra) by M/ s Adani Green Energy Limited, under the provisions of EIA Notification, 2006 and as amended along with the certain additional/ specific ToR.		

31.4.4 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of amendment in Terms of Reference (ToR) to the project for Damanganga (Ekdare) - Godavari intrastate link project (CCA: 12998 Ha) in an area of 257.85 Ha at Village Ekdare, Gonde, Shinde, etc., Sub District Peth and Dindori, District Nashik, Maharashtra by M/s Minor Irrigation Division..

The project/activity is covered under Category B1 of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 as CCA is 12998 Ha. However, Irrigation projects involving Inter-State issues shall be appraised at Central level without change in category therefore, it requires appraisal at Central level by the sectoral EAC in the Ministry.

The Ministry granted Terms of Reference vide letter dated 13/02/2023 for the proposed project and PP has submitted the proposal for amendment in ToR for modification in project components and change in the land area requirement.

During the meeting the EAC noted with concern that the presentation lacked sufficient detail and clarity on the proposal. PP failed comprehensively address the key aspects of the proposed amendment. Furthermore, the Project Proponent was unable to provide specific and satisfactory justifications for the proposed changes. Additionally, the EAC observed that the Project Proponent was unable to respond satisfactorily to several queries raised by the Committee members. The committed noted that PP had appeared unprepared and lacked the necessary due diligence expected at this stage of the appraisal process. This reflected a lack of preparedness and understanding of PP.

After deliberation, the project was deferred. EAC opined that the PP shall have to come prepared with a detailed presentation about the proposed amendment and ensure that all technical and

regulatory aspects are comprehensively addressed, and come prepared with clear justifications and supporting documentation in any future deliberations.

The proposal ***deferred*** on the above lines.

Additional Agenda Item

Consideration of EAC Sub-Committee Site Visit Report of Saidongar-1 Karjat Pumped Storage Project (3000 MW) (Proposal No. IA/MH/RIV/517008/2025) at village Dhak, Saidongar, Ambot, Bhaliwadi and Pali T. Kothal Khalathi, Taluka Karjat, District Raigad, Maharashtra and,

Saidongar-2 Maval Pumped Storage Project (1200 MW) (Proposal No. IA/MH/RIV/516980/2025) at village Dhak, Kusur, Pali T. Kothal Khalathi and Saidongar, Taluka Karjat, District Raigad, Maharashtra

The Member Secretary, EAC informed to the committee that the Ministry of Environment, Forest and Climate Change (MoEF&CC) granted Terms of Reference (ToR) to Saidongar-1 Karjat Pumped Storage Project (3000 MW) and Saidongar-2 Maval Pumped Storage Project (1200 MW) on 18.02.2025. At the 23rd Meeting of the River Valley and Hydroelectric Projects Sector, held on 29.01.2025 in relation to the aforementioned proposal, it was resolved that a site visit of the proposed project would be undertaken.

2. In accordance with the Ministry's directive vide letter No. J-12011/42/2023-IA.I(R) dated 15th April 2025, a sub-committee was constituted to carry out a site inspection of the Saidongar project area. The committee was tasked with assessing the environmental safeguard measures in place and recommending any additional conditions, if necessary. The sub-committee comprised Prof. G.J. Chakrapani (Chairman), Shri Ajay Kumar Lal (Member), and Dr. Krishnendu Mondal, MoEF&CC. The site visit was conducted from 21st to 23rd April 2025. During the inspection, officials from M/s Torrent Pvt. Ltd., along with their consultants, were present and facilitated the visit.

3. The EAC Sub-Committee has made following observations/recommendations:

1. The PP should re-examine the proposed width of the approach road connecting the lower and upper reservoirs, particularly in forested sections. By aligning the design with IRC guidelines and applying principles of minimal impact engineering (e.g., optimizing turning radius, slope grading, and cut/fill balance), the PP should aim to reduce forest land diversion currently proposed for this component.

2. The PP shall submit a duly approved Wildlife Conservation Plan and as well as the Biodiversity Management Plan, specifically addressing the conservation of Schedule-I species if found within or around the project area, duly approved by the Chief Wildlife Warden (CWLW) of Maharashtra. The conservation measures should be integrated with the project's overall Environmental Management Plan (EMP) and implemented in coordination with the Forest Department.

3. The PP shall ensure that the allocated water for both initial reservoir filling and annual recoupment is tapped exclusively during the monsoon season, thereby avoiding any adverse impact on the dry-season flow regime and ensuring protection of downstream water users and ecosystems. The water management strategy should include clear monitoring mechanisms and coordination with existing hydropower releases in the Pej and Ulhas rivers. Coordination with Tata Power for sustained tailrace releases and seasonal flow monitoring of the Pej and Ulhas rivers may be explored as part of a transparent, adaptive water management plan.

4. Given the significant excavation required for the deep-seated surface powerhouse, the PP revisit its comprehensive Muck Management Plan, detailing the volume, handling, reuse potential, and final disposal locations, with preference for non-forest land. Appropriate measures be taken to prevent erosion or habitat degradation and to ensure that site vegetated and stabilized.

5. All Assurances made during the site visit—especially those related to drone mapping findings, vegetation types, reservoir site conditions, and community interface—must be reflected in the final EIA/EMP. This includes precise mapping, justification of layout alternatives, compliance with ToR conditions, and risk mitigation measures.

The site visit reports are annexed at **Annexure –I** and **Annexure-II** respectively.

The EAC deliberated on the site visit reports of both PSPs and recommended that observations raised by the EAC Sub-Committee may be suitably addressed while preparing EIA/EMP report so as to assess the environmental and social concerns comprehensively.

The meeting ended with vote of thanks to the Chair.

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ANNEXURE

ATTENDANCE

S. No.	Name of Member	Role
1.	Prof. Govind Chakrapani	Chairman
2.	Dr. Uday Kumar R Y	Member
3.	DR. J. V. Tyagi	Member
4.	Shri Kartik Sapre	Member
5.	Shri Ajay Kumar Lal	Member
6.	Shri Rakesh Goyal	Member Representative of Central Electricity Authority (CEA)
7.	Shri Balram Kumar	Member Representative of Central Water Commission (CWC)
8.	Shri Yogendra Pal Singh	Member Secretary

APPROVAL OF THE CHAIRMAN

========== Forwarded message ==========
From: chakrapani govind <chakrapani.govind@gmail.com>
To: "Yogendra Pal Singh"<yogendra78@nic.in>
Date: Thu, 22 May 2025 12:22:52 +0530
Subject: Re: Draft MOM of the 31st EAC (RVHEP) meeting held on 14.05.2025-reg.
========== Forwarded message ==========

Approved.
Chakrapani

On Thu, 22 May, 2025, 11:56 Yogendra Pal Singh, <yogendra78@nic.in> wrote:

> Dear Sir,
>
> The draft MOM of the EAC meeting held on 14.05.2025 was circulated to all EAC members. The corrections suggested by the Goyal Sir, CEA have been duly incorporated. No other comments received so far. Accordingly, draft MOM of the EAC meeting held on 14.05.2025 are attached herewith for approval please.
>
> With Regards,
>
> **Yogendra Pal Singh**
> **Scientist 'F'**
> **Government of India**
> **M/o Environment, Forest and Climate Change**
> **Room No. 236, 2nd Floor, Vayu Wing**
> **Indira Paryavaran Bhawan**
> **Jor Bagh, New Delhi-110003**
> **Tele-fax: 011-20819364**

Annexure-I

Report of the field site visit undertaken by EAC sub-Committee from 21st to 23rd April 2025 at Saidongar-1 Karjat Pumped Storage Project (3000 MW) (Proposal No. IA/MH/RIV/517008/2025) at village Dhak, Saidongar, Ambot, Bhaliwadi and Pali T. Kothal Khalathi, Taluka Karjat, District Raigad, Maharashtra

At the 23rd Meeting of the River Valley and Hydroelectric Projects Sector, held on 29th January 2025 in relation to the aforementioned proposal, it was resolved that a site visit of the proposed project would be undertaken. Accordingly, the Ministry constituted a sub-committee, comprising the following members, to carry out the site inspection with the objective of assessing the environmental safeguard measures and recommending any additional conditions, as per letter No. J-12011/42/2023-IA.I(R) dated 15th April 2025.

Sr.No	Members of Expert Committee visiting Saidongar Sites
1	Prof. G.J. Chakrapani, Chairman
2	Shri Ajay Kumar Lal, Member
3	Dr. Krishnendu Mondal, Joint Director, MoEFCC

The aforesaid committee undertook the visit from 21st to 23rd April 2025 and during the site visit the following officers from M/s Torrent PSH3 Pvt Ltd along with their consultants were present: -

1. Shri Lachman Lalwani, Executive Director
2. Shri Kalachand Mahalik, Vice President
3. Shri R S Negi, Vice President
4. Shri Jitendra Thakur, General Manager
5. Shri Basavraj Munnoli, Assistant General Manager
6. Shri Ravinder Bhatia, RS Envirolink Technologies Pvt. Ltd. (ToR Consultant)
7. Dr. Rajdeep, Aarvee Associates (EC Consultant)
8. Shri Umesh Hegde, Tata Consulting Engineers Limited (DPR Consultant)
9. Torrent PSH3 Site team members.

Project Overview

The Project Proponent (PP) made a detailed presentation ~~to~~ before the Sub-committee. The Presentation covered technical layout of the off-river open loop system, salient features, environmental baseline data, status of ToR compliance, and findings of the EIA and EMP studies, along with Torrent initiatives taken/to be taken in the field of Environment conservation, health sector and other CSR activities. Special mention made on project geology, hydrology, catchment characteristics, water availability certification, and biodiversity conservation plans. The presentation was followed by discussions. The main features of the proposed Project as placed before the sub-committee are summarised in the following points:

- The Saidongar-1 Karjat Open Loop Pumped Storage Project is proposed as a large-scale energy storage infrastructure, strategically located in the villages of Potal, Saidongar, Ambot, Dhak, and Bhaliwadi within the Karjat Sub-District of Raigad District, Maharashtra. The project is designed to have an installed capacity of 3000 MW and an energy storage potential of 18,000 MWh, aimed at enhancing grid reliability and supporting renewable energy integration. The proposed project involves the construction of two artificial reservoirs – an upper and a lower – located at coordinates 73°24'32" E, 18°54'15" N and 73°25’34” E, 18°54’37” N respectively.
- The project entails the creation of a new upper reservoir with a gross storage capacity of 0.56 TMC (15.87 MCM) and a new lower reservoir with a gross storage capacity of 1.02 TMC (28.96 MCM). The upper reservoir will be constructed with a maximum embankment height of 27.0 meters from the natural surface level, while the lower reservoir will have a maximum dam height of 59.0 meters from the deepest riverbed. This configuration enables daily peak power generation for six hours and allows for water to be pumped back during 6.88 off-peak hours, making the project a crucial component in balancing energy supply and demand. The lower reservoir is to be constructed on a seasonal stream that is a tributary of the Ulhas River, with the upper reservoir located on a plateau to the west.
- The total land requirement for the project is estimated at 377.0 hectares, of which 144.0 hectares is non-forest land and 233.0 hectares is forest land. Consequently, diversion of forest land is required, necessitating Forest Clearance under the Forest Conservation Act. There are no protected areas

within immediate proximity; however, the Bhimashankar Wildlife Sanctuary lies approximately 15 km from the project site.

- The demographic profile of the project area reveals a predominantly tribal population, with communities such as the Thakurs, Mahadev Kolis, and Katkaris forming the majority in the surrounding villages. Agriculture, mainly subsistence-based, is the primary livelihood, supported by rainfed crops such as paddy, millets, and pulses during the monsoon season. Additionally, dependence on forest resources for firewood, fodder, and minor forest produce plays a vital role in sustaining local livelihoods.
- The project's initial water requirement for reservoir filling is estimated at 23 MCM, with an annual replenishment need of approximately 3 MCM due to evaporation. The total estimated cost of the project stands at ₹13,017.302 crore.
- The proposed dam at LR is a Concrete Gravity structure with a total length of approximately 718 meters and a height of 59 meters above NSL. The catchment area contributing to the LR is about 23.4 sq. km, yielding approximately 40 million Cubic Meters (MCM) of water annually at 75% dependability. This yield has been certified by the State Water Resources Department, Government of Maharashtra, which has also issued the Water Availability Certificate vide letter dated 13.01.2025.
- The project requires 36 MCM of water for initial one-time filling (23 MCM for S-1 and 13 MCM for S-2), which will be impounded in a phased manner over 2 to 3 years, synchronized with the staggered commissioning schedule of the Saidongar-1 and Saidongar-2 PSPs. Additionally, only 5 MCM of water will be required annually for recoupment of operational losses. Thus, the total requirement remains well within the sustainable yield of the catchment, ensuring no stress on the resource.
- Importantly, the downstream region, extending up to the confluence of the Pej and Ulhas rivers, approximately 20 km downstream—receives perennial flow contributions from the Bhivpuri Hydro Power Station (72 MW) of Tata Power. The tailrace discharge from this station, located just 5.5 km downstream of the project site, provides continuous flow to the Pej River. This ensures uninterrupted water availability for the downstream irrigation canal drawn from the left bank of Pej, which caters to the irrigation and domestic water requirements of local communities.
- The project awaits statutory clearances including Stage-I Forest Clearance (proposal number FP/MH/HYD/IRRIG/515850/2024). The project proponent has signed a Memorandum of Understanding (MoU) with the Government of Maharashtra on 03.09.2024.

Main Observations

Lower Reservoir

- The proposed site encompasses undulating but stable land surface due to rocky base–mainly consisting of basalt and other solid formation of Sahyadri range.
- The common Lower Reservoir is proposed across the Pej River, a seasonal tributary of the Ulhas River, which is one of the major west-flowing rivers in Maharashtra. During the site visit, the riverbed was observed to be dry, showing its non-perennial nature. The reservoir area consists primarily of rocky terrain with ~~negligible~~ sparse vegetation, making it a feasible location.

- Main tree species consist of Careya arborea, Terminalia alata, Terminalia arjuna, Terminalia bellerica, Euphorbia nivvulia Madhuca longifolia var. latifolia, and Diospyros melanoxylon, and Ficus hispida.
- Given this hydrological setup, the allocation of water to the Saidongar PSPs will might not compromise the competing needs of downstream users. The catchment yield is appeared at a glance adequate to support the project without affecting ecological flows or community entitlements. The integration of project scheduling with natural monsoon cycles and existing downstream contributions offers a balanced water management strategy.
- At a glance, no evidence of big mammals or cats could be found. However, available documents and certificates relating to their presence, movements or corridors will lead to drawing conclusions on this aspect.
- The proposed site for the Lower Reservoir, located across the Pej River, is non eco sensitive as such.
- There is only a single household found in the vicinity, and no displacement is anticipated as a result of the project activities.
- During the site visit, the project proponent presented core samples from boreholes extending to depths of approximately 50 to 100 meters. These samples indicate the presence of basalt rock formations, characterized by minimal fractures or joints, which is favorable from a geotechnical standpoint. The forest cover in the area is not dense, further supporting site suitability.

Other Locations

- The Representatives of the Project demonstrated drone mapping across key locations including Upper Reservoir areas of Saidongar-1 Karjat PSP and Saidongar-2 Maval PSP, Common Lower Reservoir, Escarpment zones, and alignment of the proposed water conductor system. The drone footage revealed that both the Upper Reservoirs are flat table-land area with minimal grassland vegetation and rocky outcrops indicating very shallow depth of overburden. No habitation, cultivation, or signs of wildlife were observed by the Committee members. The drone mapping provided a global view of the Project areas which were not accessible during the site visit.

I. Powerhouse

- As per the information provided by the project proponent, the project comprises of Deep-seated surface Powerhouse. The surface will be excavated to achieve the required depth for turbine placement. Excavated muck will be reused, subject to confirmation of material suitability from CSMRS, in embankment construction or disposed of scientifically in pre-identified muck disposal sites in the non-forest area.

II. Upper Reservoir

- Upper Reservoir is located apparently on open table land, free of habitation and agricultural activity. The area has sparse vegetation and visible rock outcrops, supporting limited topsoil depth. No wildlife sightings or evidence of habitat corridors were recorded. The embankment at Upper

Reservoir 1 is also proposed to be a GFRD (Geomembrane Faced Rockfill Dam) in a closed ring configuration.

- The site identified for Upper Reservoir 1 primarily comprises mainly of barren land, as also substantiated by photographic evidence. The selection of this location appears to be non-vulnerable or sensitive from environmental perspectives, and also no human habitation observed in the surrounding area.

III. Approach Road

- The approach road from Lower Reservoir to Upper Reservoir is proposed through forest land with a maximum width of 17 meters (average ~12 meters). The PP has been advised to explore scope for optimization of this width as per IRC guidelines, considering turning radius, slope gradient, and type of vehicular movement required during construction. This effort will help minimize forest land diversion (17 Ha out of 233 Ha proposed forest land) and should be reflected in the final layout.

Recommendations

1. The PP should re-examine the proposed width of the approach road connecting the lower and upper reservoirs, particularly in forested sections. By aligning the design with IRC guidelines and applying principles of minimal impact engineering (e.g., optimizing turning radius, slope grading, and cut/fill balance), the PP should aim to reduce forest land diversion currently proposed for this component.
2. The PP shall submit a duly approved Wildlife Conservation Plan ~~and~~ as well as the Biodiversity Management Plan, specifically addressing the conservation of Schedule-I species if found within or around the project area, duly approved by the Chief Wildlife Warden (CWLW) of Maharashtra. The conservation measures should be integrated with the project's overall Environmental Management Plan (EMP) and implemented in coordination with the Forest Department.
3. The PP shall ensure that the allocated water for both initial reservoir filling and annual recoupment is tapped exclusively during the monsoon season, thereby avoiding any adverse impact on the dry-season flow regime and ensuring protection of downstream water users and ecosystems. The water management strategy should include clear monitoring mechanisms and coordination with existing hydropower releases in the Pej and Ulhas rivers. Coordination with Tata Power for sustained tailrace releases and seasonal flow monitoring of the Pej and Ulhas rivers may be explored as part of a transparent, adaptive water management plan.
4. Given the significant excavation required for the deep-seated surface powerhouse, the PP revisit its comprehensive Muck Management Plan, detailing the volume, handling, reuse potential, and final disposal locations, with preference for non-forest land. Appropriate measures be taken to prevent erosion or habitat degradation and to ensure that site vegetated and stabilized
5. All Assurances made during the site visit—especially those related to drone mapping findings, vegetation types, reservoir site conditions, and community interface—must be reflected in the final EIA/EMP. This includes precise mapping, justification of layout alternatives, compliance with ToR conditions, and risk mitigation measures.

Endorsed by EAC site visit team:

1. Krishnendu Mondal
2. A.K. Lal
3. G. J.Chakrapani

Photo 1. The project proponent (PP) delivered a comprehensive presentation followed by an interactive Q&A session, during which all committee queries were addressed. The PP highlighted Torrent Group's environmental initiatives and ongoing CSR activities focused on children's health and nearby villages.

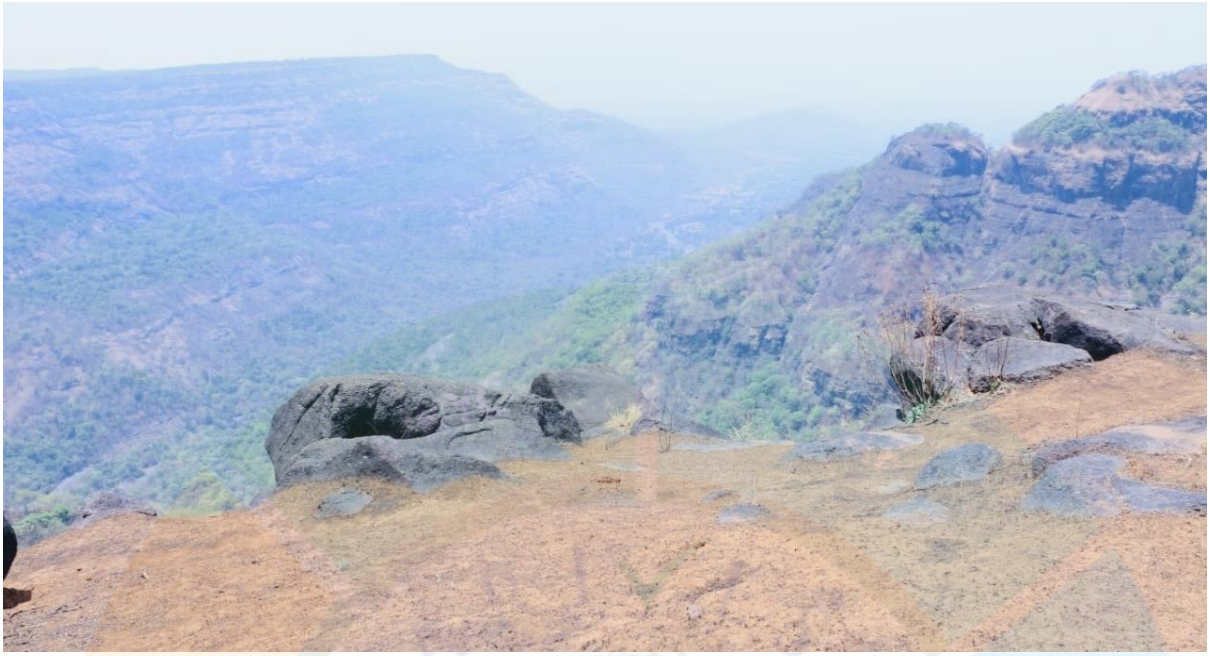


Photo 2. The Saidongar-1 Karjat Pumped Storage Project (PSP) Upper Reservoir is situated on an open tableland with minimal soil cover and sparse vegetation, as evidenced by visible rock surfaces, and is free from habitation and agricultural use. No wildlife sightings or indications of habitat corridors were observed during the site assessment.

Photo 3. Committee members inspected the site along the Lower Dam Axis, where the proposed Lower Reservoir Dam is planned as a 57 m high Concrete Gravity Dam above NSL. It was observed that the Pej River was completely dry during the visit, and the project proponent informed that it is a seasonal stream with negligible flow for most of the year, except during the monsoon. A detailed discussion was also held on the initial water requirement and the staggered plan to fill the reservoir over a 3 to 5-year period.

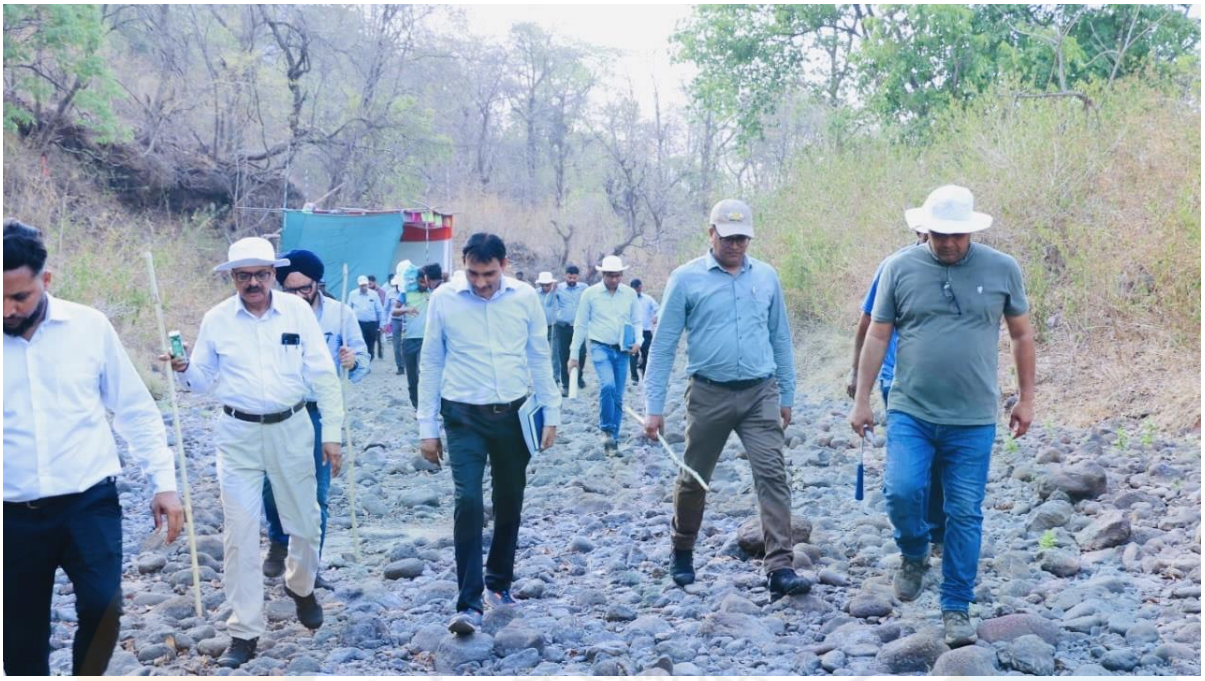


Photo 4. Project proponent walking the expert team through the proposed alignment of powerhouse, tail race tunnel (TRT) and Lower Reservoir (LR) Dam axis as part of the on-site assessment of the S1 project. The walk-through highlights the key geographical and technical aspects of each component.

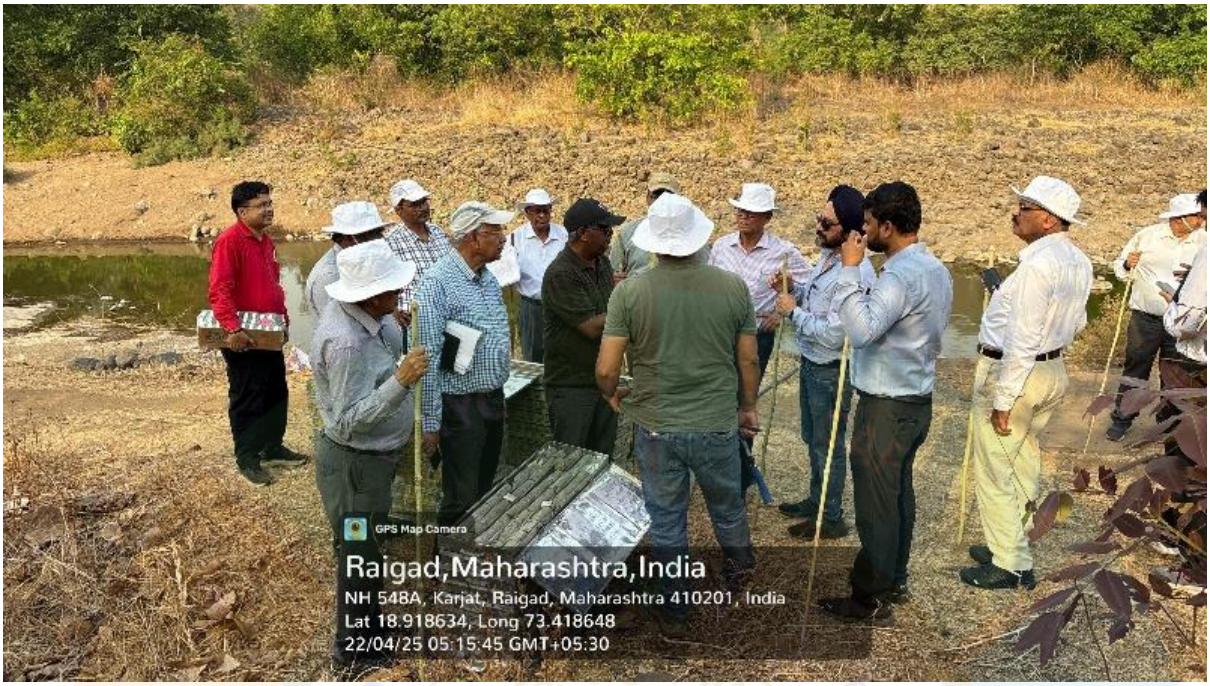


Photo 5. Discussions covered core samples inspection and the potential reuse of excavated material in embankment construction, subjected to the suitability confirmation from CSMRS, rest of the material will be disposed of scientifically at designated muck disposal sites in non-forest areas.

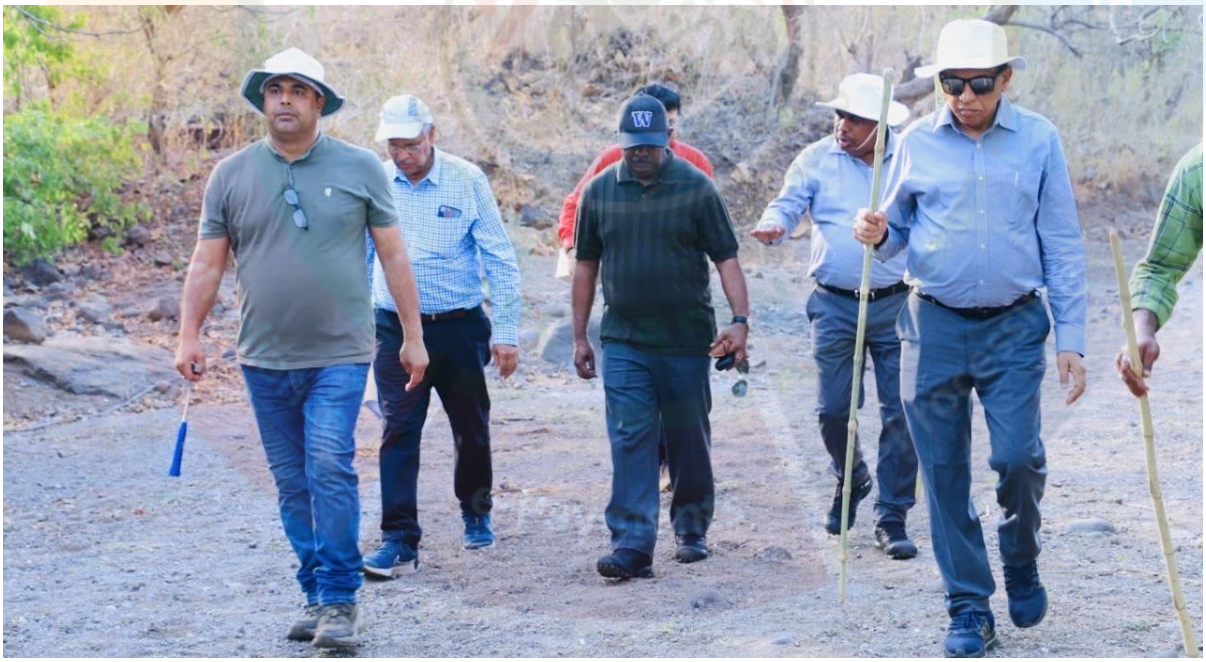


Photo 6. The EAC team conducted an on-site assessment of the local geomorphology and vegetation within the project area. The Torrent team provided a detailed explanation of the regional geology, highlighting the presence of basalt formations—massive, amygdaloidal, and vesicular types—typical of extrusive igneous rock. Geomorphologically, the area comprises of dissected hills and plateau features with three major sets of discontinuities. The EAC team also discussed the planned initiation of sub-surface geological investigations.

Annexure-II

Field site Visit Report undertaken by EAC sub-Committee from 21st to 23rd April 2025 at Saidongar-2 Maval Pumped Storage Project (1200 MW) (Proposal No. IA/MH/RIV/516980/2025) at village Dhak, Kusur, Pali T. Kothal Khalathi and Saidongar, Taluka Karjat, District Raigad, Maharashtra

At the 23rd Meeting of the River Valley and Hydroelectric Projects Sector, held on 29th January 2025 in relation to the aforementioned proposal, it was resolved that a site visit of the proposed project would be undertaken. Accordingly, the Ministry constituted a sub-committee, comprising the following members, to carry out the site inspection with the objective of assessing the environmental safeguard measures and recommending any additional conditions, as per letter No. J-12011/42/2023-IA.I(R) dated 15th April 2025.

Sr.No	Members of Expert Committee visiting Saidongar Sites
1	Prof. G.J. Chakrapani, Chairman
2	Shri Ajay Kumar Lal, Member
3	Dr. Krishnendu Mondal, Joint Director, MoEFCC

The aforesaid committee undertook the visit from 21st to 23rd April 2025 and during the site visit the following officers from M/s Torrent PSH3 Pvt Ltd along with their consultants were present.

10. Shri Lachman Lalwani, Executive Director
11. Shri Kalachand Mahalik, Vice President
12. Shri R S Negi, Vice President
13. Shri Jitendra Thakur, General Manager
14. Shri Basavraj Munnoli, Assistant General Manager
15. Shri Ravinder Bhatia, RS Envirolink Technologies Pvt. Ltd. (ToR Consultant)
16. Dr. Rajdeep, Aarvee Associates (EC Consultant)
17. Shri Umesh Hegde, Tata Consulting Engineers Limited (DPR Consultant)
18. Torrent PSH3 Site team members.

Project Overview

The Project Proponent (PP) commenced the site visit with a comprehensive presentation to the EAC sub-committee. The presentation covered the technical layout of the off-river open loop projects, salient features, environmental baseline data, status of ToR compliance, and findings of the EIA and EMP studies, along with Torrent initiatives in the field of Environment friendliness, health sector and other CSR activities presently in progress. Special emphasis was given to project geology, hydrology, catchment characteristics, water availability certification, and biodiversity conservation plans. The session was followed by an interactive Q&A session, where the PP responded to all queries raised by the committee related to CSR activities, project features, timelines etc. The following details of the project were deliberated before the EAC.

- The Saidongar 2 - Maval Open Loop Pumped Storage Project (PSP) is a 1200 MW (7200 MWH) hydroelectric project proposed by M/s Torrent PSH 4 Private Limited in Raigad district, Maharashtra. The project spans an area of approximately 141.44 hectares, involving five villages—Dhak, Kusur, Pali T. Kothal Khalathi, and Saidongar. The scheme involves the construction of a new upper reservoir (0.26 TMC or 7.22 MCM) and a new lower reservoir (1.02 TMC or 28.96 MCM) as part of an off-stream, open-loop system. The plant is designed to operate with six hours of daily peak power generation and approximately 6.87 hours of water pumping back to the upper reservoir. The initial water requirement will be met from the catchment yield, which will also compensate for evaporation and seepage losses.

- Major civil components include a 29 m high Rockfill Upper Dam, a 59 m high Concrete Gravity Lower Dam with gated spillway, and several associated hydraulic and underground structures such as a powerhouse, transformer hall, intake/outlet tunnels, pressure shafts, tailrace tunnels, and multiple construction adits. The underground powerhouse will house generating units of 3 x 300 MW and 2 x 150 MW, while a detailed layout including main access tunnels and pothead yard is planned.
- The total land requirement includes 105.84 ha of non-forest land and 35.6 ha of forest land, necessitating forest clearance under the Forest (Conservation) Act. There are no protected areas in the immediate vicinity, with the nearest being Bhimashankar Wildlife Sanctuary located about 15

km away. The total estimated cost of the project is approximately Rs. 6088.67 crore, and the anticipated construction period is five years from the commencement of civil works.

Main Observations

IV. Lower Reservoir

- The Subcommittee visited the proposed site and observed that the undulating land surface with considerable stability due to rocky surface mainly consisting of basalt and other solid formation of Sahyadri range.
- The common Lower Reservoir is proposed across the Pej River, a seasonal tributary of the Ulhas River, which is one of the major west-flowing rivers in Maharashtra. During the site visit, the riverbed was observed to be completely dry, reaffirming its non-perennial nature. The reservoir area consists primarily of rocky terrain with negligible vegetation, making it a technically and environmentally feasible location.
- The tree canopy majorly consists of Careya arborea, Terminalia alata, Terminalia arjuna, Terminalia bellerica, Euphorbia nivvulia Madhuca longifolia var. latifolia, and Diospyros melanoxylon, and Ficus hispida.
- The proposed dam at LR is a Concrete Gravity structure with a total length of approximately 718 meters and a height of 59 meters above NSL. The catchment area contributing to the LR is about 23.4 sq. km, yielding approximately 40 million Cubic Meters (MCM) of water annually at 75% dependability. This yield has been certified by the State Water Resources Department, Government of Maharashtra, which has also issued the Water Availability Certificate vide letter dated 13.01.2025.
- The project requires 36 MCM of water for initial one-time filling (23 MCM for S-1 and 13 MCM for S-2), which will be impounded in a phased manner over 2 to 3 years, synchronized with the staggered commissioning schedule of the Saidongar-1 and Saidongar-2 PSPs. Additionally, only 5 MCM of water will be required annually for recoupment of operational losses. Thus, the total requirement remains well within the sustainable yield of the catchment, ensuring no stress on the resource.
- Importantly, the downstream region, extending up to the confluence of the Pej and Ulhas rivers, approximately 20 km downstream—receives perennial flow contributions from the Bhivpuri Hydro Power Station (72 MW) of Tata Power. The tailrace discharge from this station, located just 5.5 km downstream of the project site, provides continuous flow to the Pej River. This ensures uninterrupted water availability for the downstream irrigation canal drawn from the left bank of Pej, which caters to the irrigation and domestic water requirements of local communities.
- Given this hydrological setup, the allocation of water to the Saidongar PSPs will not compromise the competing needs of downstream users. The catchment yield is adequate to support the project without affecting ecological flows or community entitlements. The integration of project scheduling with natural monsoon cycles and existing downstream contributions offers a balanced water management strategy.
- At a glance, no evidence of big mammals or cats could be traced or found. Available documents and certificates relating to their presence, movements or corridors will lead to drawing conclusions on this aspect.

- The proposed site for the Lower Reservoir, located across the Pej River, is assessed to be suitable. There is only a single household in the vicinity, and no displacement is anticipated as a result of the project activities.
- During the site visit, the project proponent presented core samples from boreholes extending to depths of approximately 50 to 100 meters (to be cross-verified with the project proponent and photographic documentation). These samples indicate the presence of basalt rock formations, characterized by minimal fractures or joints, which is favorable from a geotechnical standpoint. The forest cover in the area is not dense, further supporting site suitability.

V. Other locations

- The site team demonstrated drone mapping across key locations including Upper Reservoir areas of Saidongar-1 Karjat PSP and Saidongar-2 Maval PSP, Common Lower Reservoir, Escarpment zones, and alignment of the proposed water conductor system. The drone footage revealed that both the Upper Reservoirs are flat table-land area with minimal grassland vegetation and rocky outcrops indicating very shallow depth of overburden. No habitation, cultivation, or signs of wildlife were observed by the Committee members. The drone mapping provided a global view of the Project areas which were not accessible during the site visit.

VI. Powerhouse

- As per the information provided by the project proponent the Main Access Tunnel & adits will be excavated to reach the required elevation of turbine level. Excavated muck will be reused, subject to confirmation of material suitability from CSMRS, in embankment construction or disposed of scientifically in pre-identified muck disposal sites in the non-forest area.

VII. Upper Reservoir

- With regard to Upper Reservoir 2, the site is currently not accessible by road or foot. However, its location was presented through real-time drone (UAV) footage and photographic images. The selection of this site also appears appropriate. It is noted that the construction of Upper Reservoirs 1 and 2 is planned in a phased manner. Reservoir 2 will be taken up for development following the completion of Reservoir 1. This phased approach allows for any necessary course corrections based on observations and outcomes from the first phase of development.
- The area has sparse vegetation and visible rock outcrops, confirming limited topsoil depth. No wildlife sightings or evidence of habitat corridors were recorded.

VIII. Approach Road

- The approach road from Lower Reservoir to Upper Reservoir 2 is proposed through forest land with a maximum width of 17 meters (average ~12 meters). The PP has been advised to explore scope for optimization of this width as per IRC guidelines, considering turning radius, slope gradient, and type of vehicular movement required during construction. This effort will help minimize forest land diversion (15.09 Ha out of 35.60 Ha proposed forest land) and should be reflected in the final layout.

Recommendations

6. The PP should re-examine the proposed width of the approach road connecting the lower and upper reservoirs, particularly in forested sections. By aligning the design with IRC guidelines and applying principles of minimal impact engineering (e.g., optimizing turning radius, slope grading, and cut/fill balance), the PP should aim to reduce forest land diversion currently proposed for this component.

7. The PP shall prepare and submit a duly approved Wildlife Conservation Plan and Biodiversity Management Plan, specifically addressing the conservation of Schedule-I species if found within or around the project area. These plans must be submitted to and approved by the Chief Wildlife Warden (CWLW) of Maharashtra. The conservation measures should be integrated with the project's overall Environmental Management Plan (EMP) and implemented in coordination with the Forest Department.

8. The PP shall ensure that the allocated water for both initial reservoir filling and annual recoupment is tapped exclusively during the monsoon season, thereby avoiding any adverse impact on the dry-season flow regime and ensuring protection of downstream water users and ecosystems. The water management strategy should include clear monitoring mechanisms and coordination with existing hydropower releases in the Pej and Ulhas rivers. Coordination with Tata Power for sustained tailrace releases and seasonal flow monitoring of the Pej and Ulhas rivers should be part of a transparent, adaptive water management plan.

9. Given the significant excavation required for the deep-seated surface powerhouse, the PP shall develop a comprehensive Muck Management Plan, detailing the volume, handling, reuse potential, and final disposal locations, with preference for non-forest land. Disposal sites must be scientifically stabilized and rehabilitated with appropriate vegetation cover to prevent erosion or habitat degradation.

10. All observations and commitments made during the site visit—especially those related to drone mapping findings, vegetation types, reservoir site conditions, and community interface—must be reflected in the final EIA/EMP. This includes precise mapping, justification of layout alternatives, compliance with ToR conditions, and risk mitigation measures.

    Endorsed by EAC site visit team:

    1. Krishnendu Mondal
    2. A.K. Lal
    3. G. J.Chakrapani

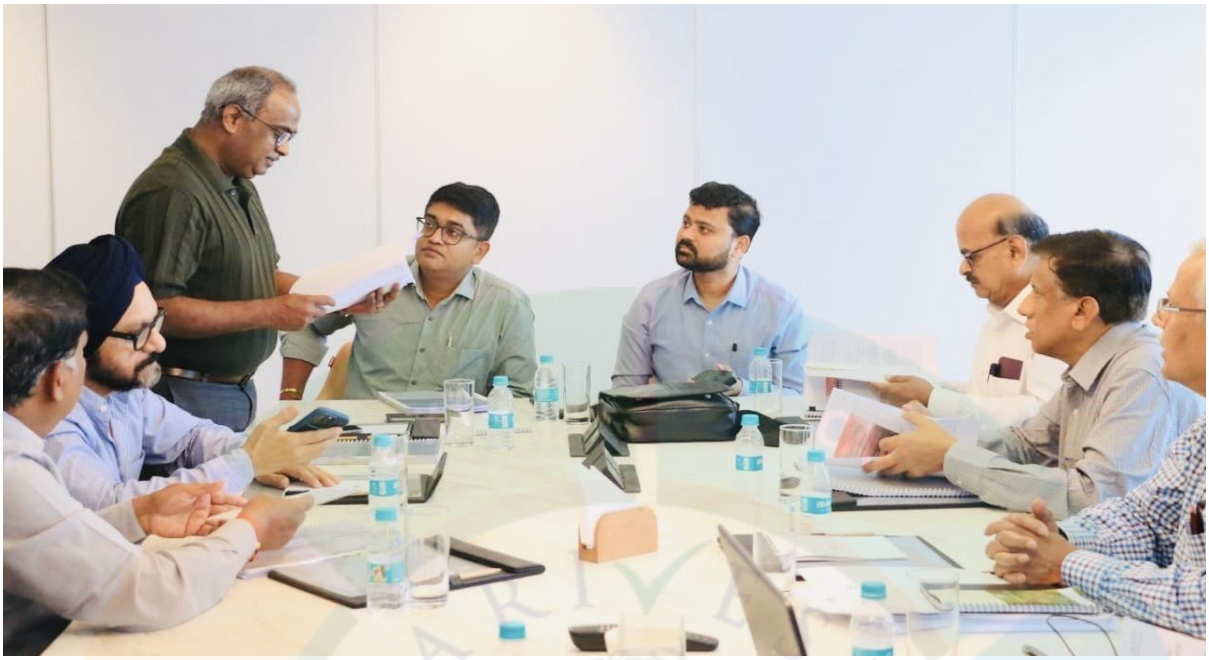
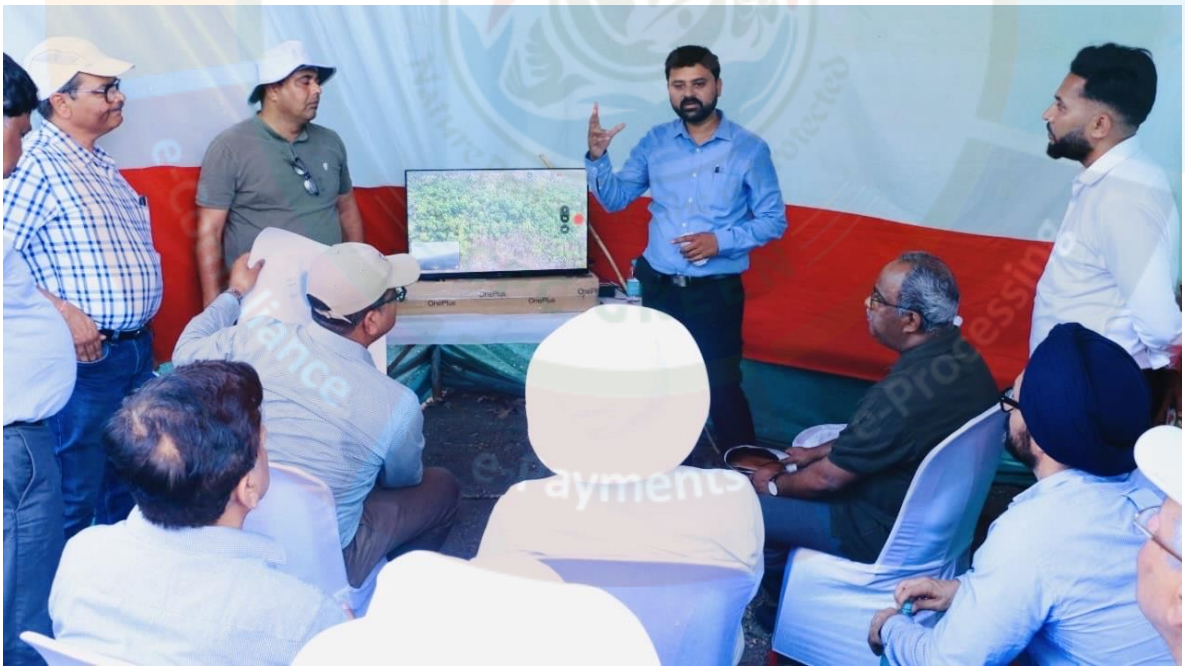


Photo 1. The project proponent (PP) delivered a comprehensive presentation followed by an interactive Q&A session, during which all committee queries were addressed. The PP highlighted Torrent Group's environmental initiatives and ongoing CSR activities focused on children's health and nearby villages.



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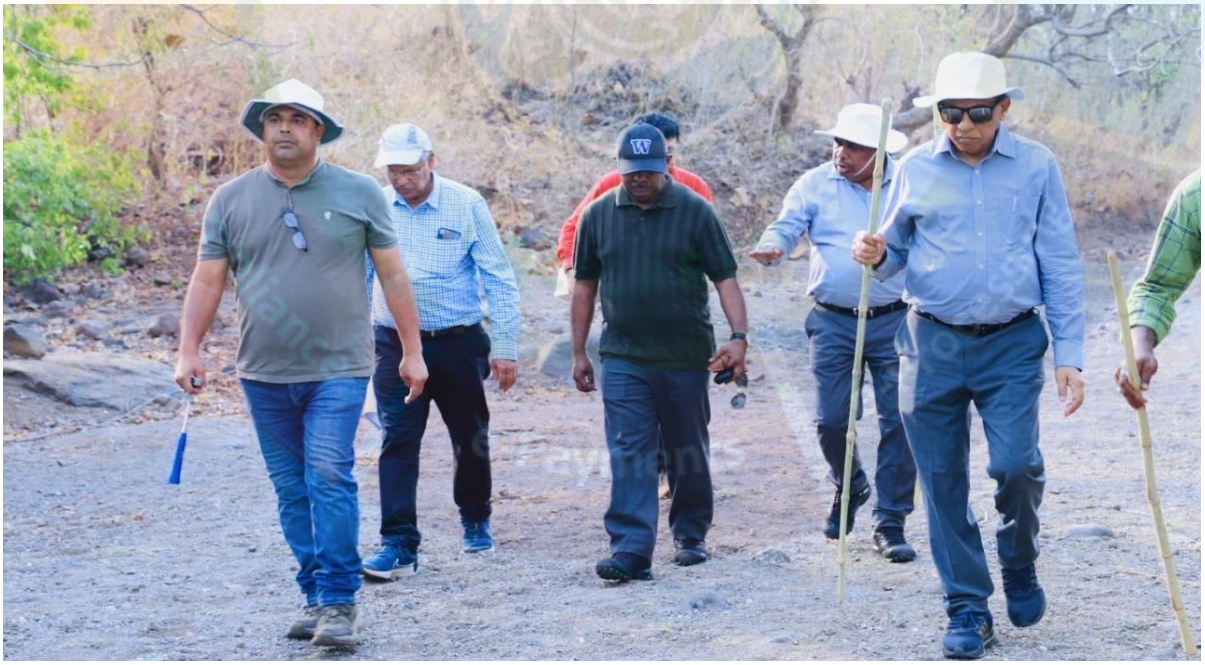

Photo 4. Project proponent walking the expert team through the proposed alignment of powerhouse, tail race tunnel (TRT) and Lower Reservoir (LR) Dam axis as part of the on-site assessment of the S1 project. The walk-through highlights the key geographical and technical aspects of each component.

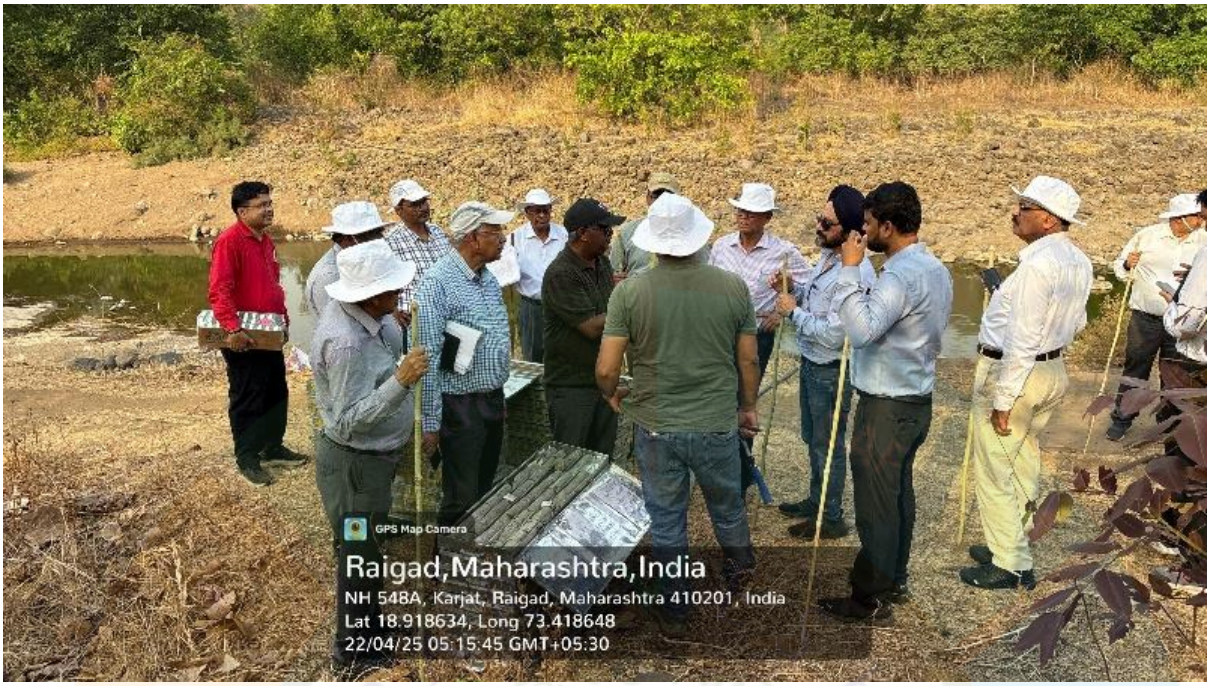

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Photo 6. The EAC team conducted an on-site assessment of the local geomorphology and vegetation within the project area. The Torrent team provided a detailed explanation of the regional geology, highlighting the presence of basalt formations—massive, amygdaloidal, and vesicular types—typical of extrusive igneous rock. Geomorphologically, the area comprises dissected hills and plateau features with three major sets of discontinuities. The EAC team also discussed the planned initiation of sub-surface geological investigations.

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KYA
PARIVESH
CPC GREEN

MINUTES OF THE 31ST MEETING OF THE EXPERT APPRAISAL COMMITTEE FOR RIVER VALLEY AND HYDROELECTRIC PROJECTS HELD ON 14TH MAY 2025 THROUGH VIDEO CONFERENCE

The 31st meeting of the EAC for River Valley & Hydroelectric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 14th May, 2025 through Virtual mode, under the Chairmanship of Prof. G. J. Chakrapani. The list of Members present in the meeting is at **Annexure**.

Confirmation of the Minutes of the 30th EAC meeting:

The Minutes of the Meeting held on 30th EAC meeting on 30th April, 2025 were confirmed.

Agenda Item No. 31.1

Greenko Assam - 01 Closed Loop Pumped Storage Project (900 MW) in an area of 251.94 Ha in Village Amguri, Baithalangso, Kiling Bagicha, Nali Bagicha No. and Sardangang, Sub District Marigaon and Donka, District Morigaon and West Karbi Anglong, Assam by M/s Greenko Energies Private Limited - Terms of Reference (ToR) - reg.

[Proposal No. IA/AS/RIV/534107/2025; F. No. J-12011/21/2025-IA.I (R)]

31.1.1 The proposal is for grant of Terms of References (ToR) to the project for Greenko Assam - 01 Closed Loop Pumped Storage Project (900 MW) in an area of 251.94 Ha in Village Amguri, Baithalangso, Kiling Bagicha, Nali Bagicha No. and Sardangang, Sub District Marigaon and Donka, District Morigaon and West Karbi Anglong, Assam by M/s Greenko Energies Private Limited.

31.1.2 The Project Proponent and the accredited Consultant M/s. R S Envirolink Technologies Pvt. Ltd., made a detailed presentation on the salient features of the project and informed that:

i. Greenko Energies Pvt. Ltd., hereinafter referred as GEPL, proposes to develop Pumped Storage Project (PSP) near located at Tharakhunji Village, Donka subdivision of Karbi Anglong District and Amguri, Killing Bagicha villages, Marigaon Circle subdivision of Marigaon District in Assam.

ii. The total capacity of proposed PSP is 900 MW (5481 MWH) and it is proposed that One-time requirement of 0.833 TMC of water will be lifted from existing nearby Umiam River (which is located about 2 Km away from the proposed Lower reservoir) and will be stored in the lower reservoir to be constructed and used cyclically for energy storage and discharge, out of which

0.217 TMC of water will be used for power generation by re-circulation with 6.09 hours storage capacity. Evaporation losses if any will be recouped periodically from Umiam River.

iii. The geographical co-ordinate of the project are:

Upper Reservoir : 26° 0'5.34"N & 92°16'19.23"E
Lower Reservoir: 26° 0'12.00"N & 92°15'8.00"E

iv. The proposed scheme involves creation of new upper reservoir & lower reservoir. It is proposed to construct Geomembrane Faced Rockfill Dam (GFRD) embankment for the weighted average height of around 20m (with maximum height of 43m) for the length of 648 m with gross storage of 0.242 TMC capacity and Lower reservoir of Geomembrane Faced Rockfill Dam (GFRD) embankment for the average height of 17m (with maximum height of 43m) for the length of 675 m with gross storage of 0.220 TMC capacity. Intake structure and trash rack with four number of independent pressure shafts from Power block of upper reservoir is connected to Undeground Powerhouse located at about 883.97 m. The Power house is equipped with two Three (3) phase, alternating current synchronous/ generator motor semi umbrella type with vertical shaft type units composed with generator/motor and a pump/turbine having generated/pumping capacity of 300MW / 330MW respectively and two Three (3) phase, alternating current synchronous/ generator motor semi umbrella type with vertical shaft type units composed each of a generator/motor and a pump/turbine having generated/pumping capacity of 150MW / 165MW.

v. The Project will generate 900 MW by utilizing a design discharge of 280.50 Cumec and rated head of 367.50m. The cycle efficiency of the project is expected to be around 80%. One 400 KV Double Circuit transmission line with Twin Moose Conductor of length 55 KMs (appx.) from PSP will be connected to 400 / 220 kV MISA Substation PGCIL, Dighaljar, Assam for evacuation of power during turbine mode and pumping of power from grid during pumping mode.

vi. Land requirement:

Forest Land : 134.24 Ha
Non-forest Land : 117.70 Ha
Total Land : 251.94 Ha

vii. Demographic details in 10 km radius of project area:

The proposed project area is located in Tharakhunji Village, Donka Subdivision of Karbi Anglong District, and in Amguri and Killing Bagicha villages, Marigaon Subdivision, Marigaon District, Assam.

According to Mission Antyodaya 2020, the total population of the villages in the project proximity area is 1837, comprising 889 males (48.39%) and 948 females (51.60%). There are 418 households in total, with an average household size of 4 to 5 members. The sex ratio is 1066 females per 1,000 males. Village-wise demographic details are provided in the table below.

The Scheduled Caste (SC) population constitutes 31.77% of the total population, whereas the Scheduled Tribe (ST) population accounts for 31.77%.

Demographic Profile of the Project Proximity area Villages

Village Name	No_ T.P	TOT_M	TOT_F	TOT_HH	P_SC%	P_ST%
Killing Bagicha	1259	610	649	310	6.97	6.97
Amguri	258	119	139	53	28.90	28.90
Tharakunchi	320	160	160	55	96.32	96.32
Total	**1837**	**889**	**948**	**418**	**31.77**	**31.77**

(Source Mission Antyodaya 2020)
(*No_HH-Total House Hold, TOP_P-Total Population, TOT_M-Total Male, TOT_F-Total Female, P_SC-Scheduled Caste population, P_ST-Scheduled Tribe Population)*

Villages in the project proximity area is mainly inhabited by the Karbi tribe. The people practice shifting cultivation, growing paddy, maize and vegetables, rearing animals and collecting firewood, medicinal plants and bamboo for use and sale. The village has a close-knit social life, including the extended family, traditional festivals such as Rongkar and Chomkan, folk dances, music and oral stories. Village councils and elders guide local governance.

viii. **Water requirement:** Greenko Assam-01 Off-Stream Closed Loop Pumped Storage Project PSP (900 MW) will require 6.94 MCM (0.245 TMC) for initial reservoir filling and thereafter ~ 1.13 MCM (0.04 TMC) power generation by re-circulation. Evaporation losses if any will be recouped periodically from nearby Umiam River for restoring the storage capacity lost due to evaporation.

ix. **Project Cost:** The estimated project cost is Rs 5849.49 crore. Total capital cost earmarked towards environmental pollution control measures will be worked out during EIA study as well as the Recurring cost (operation and maintenance).

x. **Project Benefit:** Total Employment will be 2000 persons as direct & 150 persons indirect after expansion.

xi. **Environmental Sensitive area:** There is no Protected Area in the vicinity of the proposed project. Pobitora WLS is 24.0 km far from the proposed project area. River/ water body, Water will be pumped from Umiam River.

xii. MoU signed with the State Government on 25-02-2025.

xiii. Alternative Studies: 2 alternative layouts have been evaluated and compared for development of PSP.

Alternative -1 Layout

The Alternative – 1 layout has been proposed with underground powerhouse between Site – 1 Upper reservoir and Site – 1 lower reservoir and is shown in **Fig. - 4**. The proposed upper reservoir site which is to be constructed newly is located on natural depression which is suitable for creating the desired storage capacity keeping FRL & MDDL at EL 685.00m & EL 655.00m respectively. Similarly, the lower reservoir which is to be constructed newly is proposed to be located in the natural depression which is suitable for creating the desired gross storage capacity keeping FRL and MDDL at EL 310.00m & EL 275.00m respectively. The rated head available in this alternative is about 367.50m and the rating of pumped storage project is estimated to 900 MW for which the live storage requirement is 0.217 TMC. An underground powerhouse has been proposed considering the topography of the project area and requirement of depth of excavation is more than 200m in case of surface powerhouse. Moreover, all project components are located far away from the populated area and there will not be any social and environmental issues are envisaged. The length of embankment for upper and lower reservoirs are 648 m and 675 m respectively. Similarly, the total length of Penstock / Pressure Shaft and Tail Race Tunnel are 1258.52m and 335m respectively. The total area of land required for this Alternative is estimated to 251.94 Ha which is completely in forest land.

Except Upper and Lower reservoir, all other components including Adits are in underground. Therefore, for this alternative, the investigation time and preparation of DPR required will be about 2 years and construction time for completion of this Alternative is estimated to around 42 months excluding pre-construction works.

Alternative – 2 Layout

The Alternative – 2 layout has been proposed with underground powerhouse between Site-2 upper reservoir and Site – 2 lower reservoir and is shown in **Fig. - 5**. The proposed Site-2 upper reservoir location is towards south side of Site-1 upper reservoir which is to be constructed newly and is located on natural depression which is suitable for creating the desired storage capacity keeping FRL & MDDL at EL 700.00m & EL 675.00m respectively.

Similarly, the lower reservoir which is to be constructed newly is proposed to be located in the natural depression which is suitable for creating the desired gross storage capacity keeping FRL and MDDL at EL 300.00m & EL 275.00m respectively. The rated head available in this alternative is about 390.00 m and the rating of pumped storage project is estimated to 900 MW for which the live storage requirement is 0.203 TMC.

An underground powerhouse has been proposed considering the topography of the project area and requirement of depth of excavation is more than 340m in case of surface Powerhouse. The length of the embankment for upper and lower reservoirs are 498 m and 411 m respectively. Similarly, the length of Penstock / Pressure Shaft is about 1278 m. The length of TRT is 557m which is about 222m more than Alternative - 1. With respect to 4 nos. of TRT, the increase in total length of tunnel is around 888m which will increase the cost of project as well as construction time considerably. Other than this, technically, there is no much difference between Alternative – 1 & Alternative – 2 layout. But in Alternative – 2 layout of Upper reservoir, Water channels are flowing within the reservoir area and is being used for feeding the crops. Chala water falls is also lying within this reservoir. This will lead to create Social and Environmental issues. The total area of land required for this alternative is estimated to 258.90 Ha which is completely in forest land.

Except Upper and Lower reservoir, all other components including Adits are in underground. Therefore, for this alternative, the investigation time and preparation of DPR required will be about 2 years and construction time for completion of this Alternative is estimated to around 42 months excluding pre-construction works.

Selection of Final Layout

As discussed above, Alternative – 1 layout has been preferred considering the following reasons:

- Technically, there is no much difference between Alternative – 1 & Alternative – 2 layout except in length of Tail Race Tunnel. In Alternative – 1 layout, the length of TRT is (335m) less than Alternative – 2 layout (557m) which will increase the cost project and construction time considerably.
- In Alternative – 2layout upper reservoir, Water channels are flowing within the reservoir area and is being used for feeding the crops. Chala waterfalls is also lying within this reservoir. This will lead to create Social and Environmental issues.
- The total area of land in both Alternative – 1 & Alternative – 2 are completely in forest land and the area of land required for Alternative – 1 layout (i.e., 251.94 Ha) is less than Alternative – 2 layout (i.e., 258.74 Ha). Going for Alternative – 1 layout, there will be a reduction of about 10.29 Ha of forest land.

xiv. Status of Litigation Pending against the proposal, if any. **No**

xv. The salient features of the project are as under:

1. Project details:

Name of the Proposal	Greenko Assam-01 Off-Stream Closed Loop Pumped Storage Project
Location (Including coordinates)	The proposed project involves the creation of Upper Reservoir 26° 0'5.34"N & 92°16'19.23"E Lower Reservoir 26° 0'12.00"N & 92°15'8.00"E
Inter- State Issue involved	Yes
Seismic zone	Zone -V (High Risk)

2. Category details:

Category of the project	1(c) River Valley Projects
Provisions	
Capacity / Cultural command area (CCA)	900 MW
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	Nil

3. Electricity generation capacity:

Powerhouse Installed Capacity	900 MW (5481 MWH)
Generation of Electricity Annually	1899 MU
No. of Units	4 Nos. (2 X 300 MW) + (2 X 150 MW)
Additional information (if any)	Nil

4. ToR/EC Details:

Cost of project	5849.49 Cr.
Total area of Project	251.94 Ha
Height of Dam from River Bed (EL)	Height of Embankment • Upper reservoir max- 43 m & Avg-20 m • Lower reservoir max- 43 m & Avg-17 m
Length of Tunnel/Channel	335 mts TRC & 257Mts Intake
Details of Submergence area	108.44 Ha
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Off-Stream Closed Loop Pumped Storage Project (OCPSP)
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	No

5. Muck Management Details:

No. of proposed disposal area/ (type of land-Forest/Pvt. land)	Two Locations of 25 Ha in Non-Forest Area
Muck Management Plan	Will be Provided in EIA/EMP report

Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

6. Land Area Breakup:

Private land	117.70 ha
Government land	-
Forest Land	134.24 ha
Total Land	251.94 ha
Submergence area/Reservoir area	108.44 Ha-Upper & Lower reservoirs
Additional information (if any)	Nil

7. Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate / letter/ Remarks**
Reserve Forest/Protected Forest Land	--	Distance from nearest protected area (Pobitora WLS) is 24.0 Km.
National Park	--	
Wildlife Sanctuary	--	

8. Court case details: Nil

9. Miscellaneous

Particulars	**Details**
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (NABET Accredited Consultant Organization) Certificate No : NABET/EIA/2225/RA0274

	Validity : August 15, 2025 Contact Person : Mr. Ravinder Bhatia Name of Sector : River Valley and Hydroelectric Projects Category : A MoEF Schedule : 1(C) Address : 402, Radisson Suites Commercial Plaza, B Block, Sushant Lok Phase I, Gurugram, Haryana - 122009. E-mail : ravi@rstechnologies.co.in
Project Benefits	• Pumped storage hydropower is a modified use of conventional hydropower technology to store and manage energy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 80%, comparing favorably to other energy storage technologies and thermal technologies. This effectively shifts, stores, and reuses energy generated until there is corresponding demand for system reserves and variable energy integration. This shifting can also occur to avoid transmission congestion periods, to help more efficiently manage transmission grid, and to avoid potential interruptions to energy supply. This is important because many of the renewable energy resources being developed (e.g., wind and solar) are generated at times of low demand and off-peak energy demand periods are still being met with fossil fuel resources, often at inefficient performance levels that increase the release of greenhouse gas emissions.

	• Further, pumped storage projects are critical to the national economy and overall energy reliability because it's: o Least expensive source of electricity, not requiring fossil fuel for generation o An emission-free renewable source o Balancing grid for demand driven variations o Balancing generation driven variations o Voltage support and grid stability • Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.
Status of other statutory clearances	**Forest Clearance:** Online application seeking forest diversion for around 117.70 Ha after receipt of ToR Approval. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studies

31.1.3 The EAC during deliberations noted the following:

The Expert Appraisal Committee (EAC) deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR for conducting EIA/EMP and Public hearing for Greenko Assam - 01 Closed Loop Pumped Storage Project (900 MW) in an area of 251.94 Ha in Village Amguri, Baithalangso, Kiling Bagicha, Nali Bagicha No. and Sardangang, Sub District Marigaon and Donka, District Morigaon and West Karbi Anglong, Assam by M/s Greenko Energies Private Limited.

The project/activity falls under Category A of item 1(c), 'River Valley Projects,' as per the Schedule of the Environmental Impact Assessment Notification, 2006, and requires appraisal at the Central level by the sectoral EAC in the Ministry.

The EAC noted that the total land required for the proposed project is about 251.94 Hectares, which includes 134.24 Hectares of forest land and 117.70 Hectares of private land. However, it

was observed that the application for Stage-I Forest Clearance (FC) has not yet been submitted, which necessitates further action from the Project Proponent.

The EAC noted that the proposed Greenko Assam - 01 Closed Loop Pumped Storage Project (900 MW) is planned in ecologically sensitive regions which falls within a transitional zone of the Indo-Burma Biodiversity Hotspot, an area globally recognized for its rich and endemic flora and fauna. These forested tracts, often inhabited by species of conservation concern, serve as important ecological corridors and breeding grounds for numerous endemic and migratory species. The landscape includes semi-evergreen and moist deciduous forests, frequently used by tribal communities for sustenance, adding a layer of socio-ecological complexity.

The Project Proponent indicated that there is no Protected Area in the vicinity of the proposed project. Pobitora WLS is 24.0 km far from the proposed project area. River/ water body, Water will be pumped from Umiam River. However, deliberations by the Expert Appraisal Committee (EAC) highlighted concerns w.r.t the proximity to notified forest areas and potential wildlife movement routes, underscoring the vulnerability of local ecosystems to habitat fragmentation, hydrological disruption, and loss of biodiversity. Considering the regional ecological sensitivity, the Committee called for a very intensive ecological study to be incorporated in the Environmental Impact Assessment (EIA) report. This study is critical for a comprehensive understanding of the site's ecological dynamics and informed decision-making. In light of these observations, the EAC recommended that a site visit be undertaken by a sub-group of the Committee before grant of EC. The purpose of the visit would be to physically assess the ecological character of the area and verify forest dependencies.

It has been observed that Memorandum of Understanding has been signed between Greenko Energies Private Limited and Govt. of Assam for establishment of 900 MW PSP at Tharakhunji Village, Sub division Donka, District Karbi Anglong on 25.02.2025.

31.1.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Close Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Greenko Assam - 01 Closed Loop Pumped Storage Project (900 MW) in an area of 251.94 Ha in Village Amguri, Baithalangso, Kiling Bagicha, Nali Bagicha No. and Sardangang, Sub District Marigaon and Donka, District Morigaon and West Karbi Anglong, Assam by M/s Greenko Energies Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. PP shall submit the Water Utilization Mapping within a 10 km radius of the project for examining the impacts on sustainability of ecosystem of the region after withdrawal of water for proposed project.

ii. Detailed action plan for large scale plantation of native species of plant sapling within 10 km radius of the project shall be prepared in consultation with State Forest Department.

iii. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 117.70 ha of forest land involved in the project shall be submitted within stipulated time.

iv. Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area.

v. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.

vi. PP shall submit the detailed plan for filling the reservoir from the Umiam River along with necessary approval form water resource department. Necessary clearance/ approval for interstate issues/ water availability/water sharing issues shall be obtained.

vii. Transportation Plan for transporting construction materials shall be submitted.

viii. Environmental Cost Benefit Analysis shall be done in terms of loss of Forest ecosystem due to diversion of Forest land/loss of biodiversity, water availability, water uses for generation of hydro power and Ecological flows.

ix. The baseline data collection will cover the changes in biological and ecological profile of the region after monsoon with worst-case scenario study and critical mineral assessment.

x. Calculation and values of GHGs (CO2, CH4 etc.) emissions during construction and during operation till the life of the project shall be estimated and submitted.

xi. The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report. Presence of any critical mineral zone in the proposed area be clarified from GSI.

xii. Details of mineral zone, if any, in the study area, certified by Geological Survey of India or any other concerned Government Organization shall be submitted. The project area

should not come up on any critical mineral zone, the same shall to be verified by GSI/NMDC.

xiii. Quantitative values of Impact modelling of environmental parameters shall be submitted for during construction and operation. Also, mitigation measures shall be submitted in terms of construction and operation phase.

xiv. Conducting site-specific ecological study emphasizing on riverine ecology viz. fishes diversity, fish migration, habitat and aquatic biota due to construction PSP. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.

xv. Cumulative Impact of projects in the basin on carrying capacity and sustainability of Reservoir/ River /nala of catchment area due to tapping of water for filling reservoir shall be studied.

xvi. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Specific ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.

xvii. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.

xviii. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.

xix. Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Indian Council of Agriculture Research (ICAR) Institutes/ Expert Govt. institutions and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.

xx. Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI.

[B] Socio-economic Study

i. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.

ii. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. A comparative chart of issues raised by General Public during Public Hearing and commitments made by the Project Proponent will be prepared and submitted in the relevant chapter of EIA/EMP report.

iii. PP shall submit the credible documents to show the status of land acquisition w.r.t project site from/through the concerned State Government as required under Ministry's OM dated 7th October, 2014 for the project land to be acquired.

iv. Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land (if any) shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. Budget earmarked for R&R, CSR shall not be included in the cost of EMP.

[C] Muck Management

i. Details of quantity of muck generation component wise, types of muck (Excavation in tunnels, pressure shaft and powerhouse etc.) and disposal site/ transportation to be provided.

ii. Details of muck management such as dumping sites and its locations, transportation plan along with monitoring mechanism for muck transportation, detailing the road map of project construction site/ indicating the distances from HFL, river, project construction site along with types of road etc.

iii. Safety measures for avoiding spill over muck into the riverbed/streams and its flow into the river during the high discharge/ flood or monsoon period. Prepare plan for stabilization of muck disposal sites using biological and engineering measures to ensure that muck does not roll down the slopes and shall be disposed safely and that it does not pollute the natural streams and water bodies in surrounding area.

iv. Restoration plan for construction area including dumping site of excavated materials by levelling, filling up of burrow pits, landscaping etc.

[D] Disaster Management

i. Impact of Project activities (specially blasting and drilling) on the aquatic and terrestrial ecosystem, within study area to be studied and be incorporated in EIA/EMP report.

ii. The muck dumping sites shall be located with a distance of 100 mts from HFL. The PP shall submit the detailed action plan for transportation of muck along with monitoring mechanism of movement of muck carrying trucks.

[E] Miscellaneous

i. Both capital and recurring expenditure under EMP shall be submitted.

ii. Approved Layout as per pre-DPR chapter duly approved by CEA/CWC shall be submitted.

iii. The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.

iv. Drone video of project site shall be recorded and to be submitted.

v. Undertaking need to be submitted on affidavit stating that no activities has been started on the project site.

vi. Detailed plan to restore wider roads and convert them into narrow up to 10m after construction of the project.

vii. Specific Terms of Reference (ToRs) issued by the Ministry vide Office Memorandum No. F. No. IA3-22/33/2022-IA.III dated 14.08.2023 for Pumped storage projects shall be used for preparation of EIA/ EMP reports.

viii. As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.

Agenda Item No. 31.2

Guruvarya Late Laxmanraoji Inamdar Lift Irrigation Scheme (Jihe Kathapur), Phase I & II (CCA: 60437 Ha) in an area of 173.614 Ha in Sub district Man, Koregaon, Khatav and Satara, District Satara, Maharashtra by M/s Ex Engr Jihe Kathapur Li Division Satara - Terms of Reference (ToR) - reg.

[Proposal No. IA/MH/RIV/535277/2025; F. No. J-12011/19/2025-IA.I (R)]

31.2.1: The proposal is for grant of Terms of Reference (TOR) to the project for Guruvarya Late Laxmanraoji Inamdar Lift Irrigation Scheme (Jihe Kathapur), Phase I & II (CCA: 60437 Ha) in an area of 173.614 Ha in Sub district Man, Koregaon, Khatav and Satara, District Satara, Maharashtra by M/s Ex Engr Jihe Kathapur Li Division Satara.

31.2.1: The Project Proponent and the accredited Consultant M/s Techknowgreen Solutions Limited, Pune, made a detailed presentation on the salient features of the project and informed that:

i. Guruvarya Late Laxmanraoji Inamdar Lift Irrigation Scheme envisages to irrigate the land of 60437 Ha. (Existing ICA of 27500 Ha. + Proposed expansion ICA of 32937 Ha.) of Khatav, Man, Satara and Koregaon Taluka of Satara District, Maharashtra. Under this scheme, a Jihe Kathapur barrage of 0.35 T.M.C. capacity has been constructed on Krishna River at Tal. Koregaon to lift 179.25 M.Cum. (6.332 T.M.C.) and new barrages (capacity 0.60 TMC) are proposed on upstream side of existing Jihe Kathapur barrage to feed water in existing barrage.

ii. Water lifted in three (3) stages to height of 209.84 m to irrigate Command area of 23354.41 Ha. (ICA) in Khatav taluka, 27258 Ha. (ICA) in Maan taluka, 2276.75 Ha. (ICA) in Satara taluka and 7547.68 (ICA) Ha. in Koregaon taluka of drought prone areas of Satara district. Total 60437 Ha. area will be irrigated through Phase I & Phase II of scheme. The total water utilization is 179.25 M.Cum. (6.332 T.M.C.).

iii. The geographical co-ordinate of the project are : Jihe Kathapur Barrage Coordinates: 17°38’30”N and 74°07’42”E.

iv. The Ministry had issued EC earlier vide letter no. J.12011/85/2007-IA-I dated 13/06/2008 to the existing project Jihe Kathapur Lift Irrigation Scheme in the Dist. Satara of Maharashtra in favour of M/s. Kukadi Irrigation Project Division No.6.

v. The Project envisages construction of: Pump houses, rising main, closed distribution arrangement system for Main Jihe Kathapur Lift Irrigation Scheme No. 2 and 8 newly proposed

LIS viz. Tasgaon Lift Irrigation Scheme, Bhadale Lift Irrigation Scheme, Ner Lift Irrigation Scheme No. 3, Ner Lift Irrigation Scheme No. 4, Ransingwadi Lift Irrigation Scheme, Shiravli Lift Irrigation Scheme, West Maan Lift Irrigation Scheme, North Maan Lift Irrigation Scheme; 3 Direct Gravity Irrigation Scheme viz. Pressure release tank (PRT) to Bhadale Side Gravity Pipe Scheme, Pressure release tank (PRT) to Jaigaon side gravity Pipe scheme and Ner Direct Closed Gravity Pipe, barrages, rising main.

vi. **Land requirement**:

Type of area	**Total Area requirement (Ha.)**	**Acquired area (Ha.)**	**Need to be acquired (Ha.)**
Private	172.54	56.34	116.2
Government	0.22	0.22	0
Forest land	0.854	0.854	0

Note: No forest land will be required for expansion (Phase II)

vii. **Water requirement: 6.332 T.M.C.**

viii. **Project Cost:** The estimated project cost is Rs. 5409.72 Crores including existing investment of Rs. 1330.74 crores.

ix. **Project Benefit:**

- The proposed scheme is envisaged to benefit 175 villages in the Satara, Koregaon, Khatav and Maan Talukas by irrigating 60437 Ha. of land.
- Increased crop production will lead to socio-economic upliftment and subsequent improvement in the livelihood of the farmers of 175 villages.
- The increase in irrigation in the post-project phase will lead to development of agribusinesses and allied infrastructure in the region.

x. **Environmental Sensitive area:** There are Western Ghats Eco- sensitive area [0km (SW) from Bhadale LIS command boundary] and Mahableshwar-Panchgani Eco-sensitive Zone [6.8km (NW) from Barrage-II] within 10 km distance from the project site. River/ water body – Krishna river is flowing at a distance of 1.3Km in NNE direction from Tasgaon LIS command boundary.

xi. **MoU / any other clearance/ permission signed with State government: Administrative approval**

Water Resource Department, Govt. of Maharashtra vide Government Resolution No. सुप्रमा-0924/प्र.क्र.421/24/मोप्र-1 dated 11/10/2024 accorded administrative approval to the project at the cost of Rs. 5409.72 crore

Water utilization Plan

Water Resource Department, Govt. of Maharashtra vide Government Resolution No. कृष्णाप्र 0924/(प्र.क्र. 432/24) मोप्र-१ dated 15/10/2024 approved revised water usage of 6.332 T.M.C. water to this project.

Forest Clearance:

1. Ministry of Environment and Forests, Regional Office, Western Region, Bhopal vide letter No. BB/23/2003-Fcw/1446 dated 26/07/2004 accorded Forest Clearance.
2. Revenue and Forest Department, Mantralaya, Mumbai vide letter No. FLD-2003/ CR-2/ F-10, dated 6.10.2007 accorded approval for land transfer

xii. **Resettlement and rehabilitation**: No R and R work. Water storage in the barrage on the Krishna river

xiii. **Details of Solid waste/ Hazardous waste generation/ Muck and its management:** The muck generated will be utilized for backfilling of trenches and land levelling.

xiv. **Status of Litigation Pending against the proposal, if any.:** NA

xv. The salient features of the project are as under:-

1. Project details

Name of the Proposal	Environmental Clearance For Guruvarya Late Laxmanraoji Inamdar Lift Irrigation Scheme (Jihe Kathapur), Phase I & II, Dist; Satara, State- Maharashtra
Location (Including coordinates)	State: Maharashtra Region: Western Maharashtra District: Satara Taluka: Maan, Khatav, Koregaon and Satara Jihe Kathapur Barrage Coordinates: 17°38'30"N, 74° 07'42"E
Inter- state issue involved	No
Seismic zone	III

2. Category Details

Category of the project	A
Provisions	(ii) ≥ 50,000 ha. of culturable command area under (ii) Irrigation projects of project 1 (c)
Capacity / Cultural command area (CCA)	76700 Ha.
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	

3. ToR/ EC details

Cost of project	5409.72 crore
Total area of Project	173.614 Ha.
Height of Dam from River Bed (EL)	Existing barrage – 9.5m height Proposed Barrage I – 6m and Barrage II – 5.5m
Length of Tunnel/Channel	No new tunnel. Existing Vardhangad and Andhali Tunnel will be used.
Details of Submergence area	30 Ha.
Types of Waste and quantity of generation during construction/ Operation	Muck generation during construction phase : 1689711 Cu.m.
E-Flows for the Project	NA
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. If not the E-Flows maintain criteria for sustaining river ecosystem.	No

4. Muck Management Details:

No. of proposed disposal area/(type of land-Forest/Pvt. land)	Lands will be identified for disposal of muck
Muck Management Plan	Muck will be utilized for backfilling of trenches and land levelling. Detailed Muck Management Plan including monitoring mechanism for its disposal will be provided in the EIA report
Monitoring mechanism for Muck Disposal	

5. Land area Backup

Private land	172.54 Ha.
Government land	0.22 Ha.
Forest Land	0.854 Ha.
Total Land	173.614 Ha.
Submergence area/Reservoir area	30 Ha.
Additional information (if any)	-

6. Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate/letter/Remarks**
Reserve Forest/Protected Forest Land	Yes	Details of environmentally sensitive areas mentioned as below
National Park	No	
Wildlife Sanctuary	No	

Details of environmentally sensitive areas

Salient Features / Environmental features	**Name**	**Aerial distance (km) within 10 km buffer of the Command Boundary**	**Direction from Command Boundary**
National Park/ Wild life sanctuary/ Protected Area Notified Under the Wildlife (Protection) Act.1972/ Biosphere reserve/ Tiger Reserve/ Elephant Corridor/ Migratory routes for Birds	NA	NA	NA
Notified Eco-Sensitive Area (as per MoEF)	Western Ghats ESA Village: Rautwadi, Tehsil: Koregaon	Western Ghats ESA 6.97km from Bhadale LIS command boundary	NW from Bhadale LIS command boundary
	Western Ghats ESA Village: Gujarwadi, Tehsil: Koregaon	0km from Bhadale LIS command boundary	SW from Bhadale LIS command boundary

Salient Features / Environmental features	Name	Aerial distance (km) within 10 km buffer of the Command Boundary	Direction from Command Boundary
	Western Ghats ESA Village: Yavateshwari, Tehsil: Satara	8.63km from Tasgaon LIS command boundary	NW from Tasgaon LIS command boundary
Notified Eco-Sensitive Zone (as per MoEF&CC, GoI)	Mahableshwar-Panchgani Eco-Sensitive Zone	6.8km from Bhuinj Barrage	NW from Bhuinj Barrage
Reserve forest/Protected forest	RF within Ner 4 LIS Command boundary (Toposheet no: 47K/6)	0km	NA
	RF within Ner 4 LIS Command boundary (Toposheet no: 47K/6)	0km	NA
	PF & RF within Rashingwadi LIS Command boundary (Toposheet no: 47K/5, 47K/6)	0km	NA
	PF & RF within Shirvali LIS Command boundary (Toposheet no: 47K/5, 47K/6)	0km	NA
	PF within West Man LIS Command boundary (Toposheet no: 47K/6)	0km	NA
	RF within Tasgoan LIS Command boundary (Toposheet no: 47K/2)	0km	NA

Salient Features / Environmental features	Name	Aerial distance (km) within 10 km buffer of the Command Boundary	Direction from Command Boundary
	RF within Bhadale LIS Command boundary (Toposheet no: 47K/1)	0km	NA
	RF within Ner 3 LIS Command boundary (Toposheet no: 47K/1 & 47K/5)	0km	NA
	RF within North Man LIS Command boundary (Toposheet no: 47K/5)	0km	NA

7. Court case details: Nil

8. Previous EC compliance and necessary approvals:

Particulars	Letter no. and date
Certified EC compliance report (if applicable)	Certified EC compliance report will be obtained from the Regional Office, MoEF&CC, GoI, Nagpur
Status of Stage- I FC	MoEF, GoI vide letter No. 8B/23/2003-FCW/1446 dated 26/07/2004 accorded Forest Clearance
Additional detail (If any)	Water Resource Department, Govt. of Maharashtra vide Government Resolution No. dated 11/10/2024 accorded administrative approval to the project at the cost of Rs. 5409.72 crore
Is FRA (2006) done for FC-I	NA

9. Miscellaneous

Particulars	Details
Details of consultant	Techknowgreen Solutions Limited, Pune; Maharashtra

	202, Hem Opal, Ekta Park Society, Wakdewadi, Shivaji nagar, Pune, Maharashtra- 411005 NABET Accreditation: NABET/EIA/24-27/RA 0364; Valid up to July 05, 2027
Project Benefits	• The proposed scheme is envisaged to benefit 175 villages in the Satara, Koregaon, Khatav and Maan Talukas by irrigating 60437 Ha. of drought-prone areas of Satara District, Maharashtra. • Increased crop production will lead to socio-economic upliftment and subsequent improvement in the livelihood of the farmers of 175 villages. • The increase in irrigation in the post-project phase will lead to development of agribusinesses and allied infrastructure in the region.
Status of other statutory clearances	Environmental Clearance: 1. Ministry of Environment & Forest, GoI vide letter No. J.12011/85/2007-IA-I dated 13/06/2008 accorded Environmental Clearance to the Jihe Kathapur Lift irrigation Scheme (Original Irrigation Plan) for irrigating an Irrigable Command Area (I.C.A.) of 27500 Ha Forest Clearance: 1. Ministry of Environment and Forests, Regional Office, Western Region, Bhopal vide letter No. BB/23/2003-Fcw/1446 dated 26/07/2004 accorded Forest Clearance 2. Revenue and Forest Department, Mantralaya, Mumbai vide letter No. FLD-2003/ CR-2/ F-10, dated 6.10.2007 accorded approval for land transfer
R&R details	No R and R work. Water storage in the barrage on the Krishna river
Additional detail (If any)	No

31.2.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Guruvarya Late Laxmanraoji Inamdar Lift Irrigation Scheme (Jihe Kathapur), Phase I & II (CCA: 60437 Ha) in an area of 173.614 Ha in Sub district Man, Koregaon, Khatav and Satara, District Satara, Maharashtra by M/s Ex Engr Jihe Kathapur Li Division Satara.

The EAC noted that the as per the provisions the project comes under "B1" category as it is a major irrigation project because the CCA lies between ≥10,000 ha i.e. 76700 Ha. However due to presence of Mahanaleshwar Panchgani Eco-sensitive Zone is located within 10 km distance i.e. 6.8 km from the project site the project transformed to category 'A' project and will be appraised at central level.

The EAC noted that the Ministry had issued EC vide letter no. J.12011/85/2007-IA-I dated 13/06/2008 to the existing project Jihe Kathapur Lift Irrigation Scheme in the Dist. Satara of Maharashtra in favour of M/s. Kukadi Irrigation Project Division No.6. The proposal is for expansion Irrigation Scheme envisages to irrigate the land of 60437 Ha. (Existing ICA of 27500 Ha. + Proposed expansion ICA of 32937 Ha.) of Satara District, Maharashtra.

The EAC noted that the total land requirement for the project is 173.614 Ha. out of which 172.76 Ha (56.56 Ha existing area and 116.2 Ha to be acquired) is non forest land and 0.854 ha forest land. The Ministry of Environment and Forests, Regional Office, Western Region, Bhopal vide letter No. BB/23/2003-Fcw/1446 dated 26/07/2004 accorded Forest Clearance for 0.854 Ha.

The committee observed that Western Ghats Eco- sensitive area is 0km (SW) from Bhadale LIS command boundary and Mahableshwar-Panchgani Eco-sensitive Zone is 6.8km (NW) from Barrage-II from the project site. River/ water body – Krishna river is flowing at a distance of 1.3Km in NNE direction from Tasgaon LIS command boundary.

31.2.3 The EAC based on the information submitted and as presented during the meeting, **recommended** the proposal for grant of Standard ToR issued by the Ministry for conducting EIA/EMP and Public Consultation with Public hearing for Guruvarya Late Laxmanraoji Inamdar Lift Irrigation Scheme (Jihe Kathapur), Phase I & II (CCA: 60437 Ha) in an area of 173.614 Ha in Sub district Man, Koregaon, Khatav and Satara, District Satara, Maharashtra by M/s Ex Engr Jihe Kathapur Li Division Satara, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR.

[A] Environmental Management and Biodiversity Conservation:

i. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.

ii. Prepare Wildlife conservation plan specifically for avi-fauna with mitigation measures for minimizing the human–animal conflict and be suitably incorporated in the wildlife conservation plan in consultation with reputed government expert institute and State Forest Department.

iii. Prepare Environmental Cost Benefit Analysis in terms of ecological damage due to diversion of Forest land/ loss of biodiversity and its impacts on ecosystem, water availability, water uses for generation of hydro power in study area 10 km from periphery of Project components.

iv. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted and thermal stratification. Accordingly, Environment Management plan shall be prepared.

v. Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/EMP report.

vi. Source of construction material and its distance from the project site along with detailed transportation plan for construction material be elaborated in the EIA EMP report. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.

vii. A detailed wildlife conservation plan for Schedule –I species, duly approved by the Chief Wildlife Warden, be submitted.

viii. In case any wildlife corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.

ix. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.

x. Detail of rivulets around the project area and action plan for their survival shall be incorporated in EIA/EMP.

[B] Socio-economic Study

i. Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local population.

ii. Declaration by the Project Proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.

iii. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.

iv. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F. No. 22- 65/2017-IA.III dated 30th September, 2020 shall be submitted.

v. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.

vi. Details of settlement in 10 km area shall be submitted.

vii. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F. No. 22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.

[C] Muck Management/ Disaster Management

i. Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.

ii. Details of Muck Management plan prepared along with estimated cost incorporated in EIA/EMP report.

iii. Techno-economic viability of the project must be recommended from CEA/ CWC.

[D] Miscellaneous.

i. Pre-DPR Chapters viz. Layout Map and Hydrology duly approved by CWC/CEA shall be submitted.
ii. Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
iii. Both capital and recurring expenditure under EMP shall be submitted.
iv. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.
v. Arial view video of project site shall be recorded and to be submitted.

Agenda Item No. 31.3

Kalu Patti Pumped Storage Project (600 MW) in an area of 267 Ha in Village Devhat, Mudel, Lain, etc, Sub District Lalganj, District Mirzapur, Uttar Pradesh by M/s Renew Hydro Power Private Limited - Terms of Reference (ToR) - reg.
[Proposal No. IA/UP/RIV/536186/2025; F. No. J-12011/18/2025-IA.I (R)]

31.3.1 The proposal is for grant of Terms of References (ToR) to the project for Kalu Patti Pumped Storage Project (600 MW) in an area of 267 Ha in Village Devhat, Mudel, Lain, etc, Sub District Lalganj, District Mirzapur, Uttar Pradesh by M/s Renew Hydro Power Private Limited.

31.3.2 The Project Proponent and the accredited Consultant M/s. R S Envirolink Technologies Pvt. Ltd., made a detailed presentation on the salient features of the project and informed that:

i. The proposed Kalu Patti Pumped Storage Project (600 MW) is envisioned as an Off-stream Closed Loop Pumped Storage Plant in Mirzapur district of Uttar Pradesh. Kalu Patti Pumped Storage Project envisages construction of two artificial reservoirs at village Devhat, Mudel, Lain, etc, Sub District Lalganj, District Mirzapur, Uttar Pradesh.

ii. The upper reservoir is located in Mahugari village (Near Drummondganj) of Mirzapur district which is about 98 km from Prayagraj airport and lower reservoir is located near Kalu Patti village in Mirzapur district which is about 96 km from Prayagraj airport.

iii. The geographical coordinates of the proposed upper reservoir are at latitude 24°51'29.91" North and longitude 82°9’27.71” East and that of lower reservoir are at 24°51'21.63" North and 82°10'33.41" East. The proposed rating of Pumped Storage Project is 600 MW.

iv. The upper reservoir is proposed to be located on nearly flat plateau having average EL 365 m, which is suitable for creating the desired gross storage capacity of 8.31 MCM by doing

excavation up to EL. 375 m. Out of 8.31 MCM, the live storage capacity is 6.78 MCM and the dead storage capacity is 1.53 MCM by keeping FRL & MDDL at EL 370.00m & EL 354.00m respectively. For creating this storage, it is proposed to construct CFRD for the weighted average height of around 22 m (with maximum height of 25m) for the length of 2892 m. Similarly, the lower reservoir is proposed to be located on a nearly flat plateau having average EL.150 m, which is suitable for creating the desired gross storage capacity of 9.18 MCM. Out of 9.18 MCM, the live storage capacity is 8.17 MCM and dead storage capacity is 1.01 MCM by keeping FRL and MDDL at EL 145.00m & EL 130.00m respectively. For creating this storage, it is proposed to construct CFRD for the weighted average height of around 18 m (with maximum height of 20m) for the length of 1955m.

v. **Land requirement:** The total land required for the construction of various components and related works for Kalu Patti PSP is estimated to be around 267.0 ha, out of which 117.0 ha is non-forest land and 150.0 ha is forest land. Diversion of forest land for non-forest purpose will be involved for construction of Kalu Patti project components. Therefore, Forest Clearance is required to be obtained under Forest Conservation Act.

vi. Demographic details in 10 km radius of project area :

- The proposed project area is located near Kalu Patti village in Lalganj tehsil of Mirzapur district. Kalu Patti is an uninhabited village.
- The surrounding region is primarily rural, with agriculture as the main livelihood. Residents primarily cultivate crops such as wheat, rice, pulses, and various seasonal vegetables, depending on soil conditions and climate.
- In addition to farming, some villagers engage in animal husbandry, rearing cattle, goats, and poultry. Small-scale businesses, artisanal crafts, and local trade also contribute to the village economy.
- Some communities in the project area rely on nearby forests for resources such as firewood, medicinal plants, and livestock fodder.

vii. **Water requirement:** Water requirement for Kalu Patti PSP is proposed to be sourced from existing Baraundha weir at Belan River, situated approximately 12.5 km northeast of the designated lower reservoir site. The Kalu Patti PSP is envisioned with a total storage capacity of 9.18 MCM in the lower reservoir and 8.31 MCM in the upper reservoir. The annual evaporation loss for the upper reservoir and lower reservoir has been calculated as 0.542 million cubic meters (MCM) and 0.697 MCM, respectively. Therefore, the Kalu Patti Pumped Storage Plant (PSP) with a capacity of 600 MW will require 10.79 MCM for the initial reservoir filling. Subsequently, an additional 1.24 MCM per year will be necessary from the Belan River to replenish the storage capacity lost to evaporation.

viii. **Project Cost**: The estimated project cost is Rs 3350 crore. Total capital cost earmarked towards environmental pollution control measures will be worked out during EIA study as well as the Recurring cost (operation and maintenance).

ix. **Project Benefit:** Total Employment will be 1000 nos during construction & 55 nos during O&M persons as direct & indirect.

x. **Environmental Sensitive area**: There is no Protected Area in the vicinity of the proposed project. Kaimur WLS is 11.80 km far from the proposed project area. River/ water body, Water will be pumped from Belan River.

xi. MOU has been signed between Government of Uttar Pradesh and M/s Renew Hydro Power Pvt. Ltd. to build PSP with a capacity of 600 MW vide MoU No. 24/REN/0000028267 dated June 25, 2024.

xii. **Alternative Studies:** Three (3) potential reservoir sites have been identified within the study area.

Alternative-1 with Surface Powerhouse:
The WCS comprises of three numbers of 5.4 m diameter, 1038.59 m long, circular steel lined Pressure Shafts connected to a common surface pit Powerhouse. The water after power generation shall be conveyed into lower reservoir through 3 nos. of 6 m diameter of length 141.64 m concrete lined Tail Race Tunnels (TRT's).

Alternative-2 with Underground Powerhouse:
The WCS comprises of three numbers of 5.7 m diameter, 562.68 m long, circular steel lined Pressure Shafts connected to a Underground Powerhouse. The water after power generation shall be conveyed
into lower reservoir through 3 nos. of 6.3 m diameter of length 830.50 m concrete lined Tail Race Tunnels (TRT's).

Alternative-3 with Surface Powerhouse:
The WCS comprises of three numbers of 5.7 m diameter, 722.52 m long, circular steel lined Pressure Shafts connected to a Surface Powerhouse. The water after power generation shall be conveyed into ower reservoir through 3 nos. of 6.3 m diameter of length 142.46 m concrete lined Tail Race Tunnels
(TRT's).

Sl. No.	Description	Alternative-1	Alternative-2	Alternative-3
1	**Type of Powerhouse**	Surface	Underground	Surface
2	**Water Source**	**Adwa Dam/ Baraundha weir**		
3	**Location Village**	**Kalu Patti**		
4	**District**	**Mirzapur**		
5	**Upper Reservoir**			
	Lattitude/Longitude	24°51'29.91"N, 82° 9'27.71"E	24°51'8.70"N, 82° 9'16.11"E	24°51'29.91"N, 82° 9'27.71"E
	Bed Level (m)	350	350	350
	Max.Dam Height (m)	25	25	25
	Length of Dam (m)	2892.00	2773.00	2912.00
	Type of Dam	CFRD	CFRD	CFRD
	Top of the Dam (m)	375	375	375
	FRL (m)	370	370	370
	MDDL (m)	354	352	352
	Area at FRL (Ha)	45.67	47.4	49.09
	Area at MDDL (Ha)	39.09	40.33	41.65
	Live Storage capacity (MCM)	6.78	7.89	8.16
6	**Lower Reservoir**			
	Lattitude/Longitude	24°51'21.63"N, 82°10'33.41"E	24°50'30.42"N, 82°10'22.74"E	24°52'15.18"N, 82° 9'9.40"E
	Bed Level (m)	128	148	153
	Max.Dam Height (m)	22	22	22
	Length of Dam (m)	1955.00	3217.00	3341.00
	Type of Dam	CFRD	CFRD	CFRD
	Top of the Dam (m)	150	170	175
	FRL (m)	145	165	170
	MDDL (m)	130	150	155

	Area at FRL (Ha)	57.78	67.89	69.39
	Area at MDDL (Ha)	51.18	61.02	62.19
	Live Storage capacity (MCM)	8.17	9.67	9.86
7	**Total Discharge(cumecs)**	**309.27**	**347.10**	**356.07**
8	Max Head (m)	240	220	215
9	Min Head (m)	209	187	182
10	Rated Net Head (m)	219.72	198.5	193.5
11	Max Min Head ratio	1.18	1.18	1.18
12	**IC (MW)**	**600**	**600**	**600**
13	Nos. of Turbine Units	3	3	3
14	Unit Capacity (MW)	3 no.s of 200 MW	3 no.s of 200 MW	3 no.s of 200 MW
15	Unit Discharge (cumecs)	**103.09**	**115.70**	**118.69**
16	**Length of The WCS**	**1180.23**	**1515.68**	**864.98**
	Main Pressure shaft			
	Nos.	3	3	3
	Diameter (m)	5.4	5.7	5.7
	Avg. Length (m)	1038.59	562.68	722.52
	Main Tail Race Tunnel			
	Nos.	3	3	3
	Diameter (m)	6	6.3	6.3
	Avg.Length (m)	141.64	830.5	142.46
17	Upstream L/H Ratio	4.7	2.8	3.7
18	Upstream Surge Tank	Not Required	Not Required	Not Required
19	Downstream Surge Gallery	Not Required	Required	Not Required
20	Max Excavation in Power House (m)	81	_	110

21	Storage Capacity (MWh)		3600.00	
22	Annual Energy (MU)	1257.90	1257.90	1257.90

Alternative 1 is technically superior and environmentally better because:

- The Forest land needed for Alternatives 2 and 3 exceeds that of Alternative 1 by roughly 7 ha and 2 ha respectively.
- In alternative 2 with underground PH, the construction time will be much more than alternative 1 & 3 (both being surface PH); hence more construction phase impacts.
- Due to presence of a few houses in lower reservoir of Alternative 2, rehabilitation and resettlement issues will be involved, therefore, not preferred
- In Alternative 3, the open excavation depth in the powerhouse pit is about 110 m which will create slope stability issues, therefore not preferred.
- *Alternative 1 with surface powerhouse* has been considered for preparation of pre-feasibility report owing to its advantages over Alternatives 2 & 3 as mentioned above.

xiii. Status of Litigation Pending against the proposal, if any. **No**

xiv. The salient features of the project are as under: -

1. Project details:

Name of the Proposal	Kalu Patti Pumped Storage Project
Location (Including coordinates)	Lower Reservoir : Latitude: 24° 51' 21.63" N Longitude: 82° 10' 33.41" E; Upper Reservoir : Latitude: 24° 51' 29.91" N Longitude: 82° 9' 27.71" E;
Inter- state issue involved	No
Seismic zone	Zone-III

2. Category details:

Category of the project	A

Provisions	
Capacity / Cultural command area (CCA)	600 MW
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	Nil

3. Electricity generation capacity:

Powerhouse Installed Capacity	600 MW
Generation of Electricity Annually	1257.9 MU
No. of Units	3 nos. (3 x 200 MW)
Additional information (if any)	Nil

4. ToR/EC Details:

Cost of project	3350 Cr.
Total area of Project	267 ha
Height of Dam from River Bed (EL)	Lower Dam – 20.0 m Upper Dam –25.0 m
Length of Tunnel/Channel	1038.59 m
Details of Submergence area	103.45
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Closed Loop Pumped Storage Project (PSP)
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	No

5. Land Area Breakup:

Private Land	117.0 ha
Government land	-
Forest Land	150.0 ha

Total Land	267.0 ha
Submergence area/Reservoir area	103.45 ha
Additional information (if any)	Nil

6. Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate / letter/ Remarks**
Reserve Forest/Protected Forest Land	--	There is no Protected Area in the vicinity of the proposed project. Kaimur WLS is approx. 11.8 km far from the proposed project area.
National Park	--	
Wildlife Sanctuary	--	

7. Court case details: Nil

8. Miscellaneous

Particulars	**Details**
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (*NABET* Accredited *Consultant Organization*) Certificate No : NABET/EIA/2225/RA0274 Validity : August 15, 2025 Contact Person : Mr. Ravinder Bhatia Name of Sector : River Valley and Hydroelectric Projects Category : A MoEF Schedule : I(C) Address : 403, Bestech Chambers, Block-B, Sushant Lok Phase I, Sector 43, Gurugram, Haryana -

	122009 E-mail : ravi@rstechnologies.co.in Land Line : (0124) 4295383 Cellular : (+91) 9810136853
Project Benefits	• Pumped storage hydropower is a modified use of conventional hydropower technology to store and manage energy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 80%, comparing favorably to other energy storage technologies and thermal technologies. This effectively shifts, stores, and reuses energy generated until there is corresponding demand for system reserves and variable energy integration. This shifting can also occur to avoid transmission congestion periods, to help more efficiently manage transmission grid, and to avoid potential interruptions to energy supply. This is important because many of the renewable energy resources being developed (e.g., wind and solar) are generated at times of low demand and off-peak energy demand periods are still being met with fossil fuel resources, often at inefficient performance levels that increase the release of greenhouse gas emissions. • Further, pumped storage projects are critical to the national economy and overall energy reliability because it's: o Least expensive source of electricity, not requiring fossil fuel for generation o An emission-free renewable source o Balancing grid for demand driven variations o Balancing generation driven variations o Voltage support and grid stability Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in

	upliftment of livelihood and socio-economic conditions.

31.3.3 The EAC during deliberations noted the following:

The Expert Appraisal Committee (EAC) deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Kalu Patti Pumped Storage Project (600 MW) in an area of 267 Ha in Village Devhat, Mudel, Lain, etc, Sub District Lalganj, District Mirzapur, Uttar Pradesh by M/s Renew Hydro Power Private Limited.

The project/activity falls under Category A of item 1(c), 'River Valley Projects,' as per the Schedule of the Environmental Impact Assessment Notification, 2006, and requires appraisal at the central level by the sectoral EAC in the Ministry.

The EAC noted that the total land required for the proposed project is about 267.0 ha, out of which 117.0 ha is non-forest land and 150.0 ha is forest land. However, it was observed that the application for Stage-I Forest Clearance (FC) has not yet been submitted, which necessitates further action from the Project Proponent. There is no Protected Area in the vicinity of the proposed project. Kaimur WLS is 11.80 km far from the proposed project area. River/ water body, Water will be pumped from Belan River.

In view of the significant forest land involvement, reliance on river water, and proximity to ecologically sensitive areas, the Committee emphasized the need for a detailed ground-level assessment.

It has been observed that Memorandum of Understanding has been signed between Government of Uttar Pradesh and M/s Renew Hydro Power Pvt. Ltd. to build PSP with a capacity of 600 MW vide MoU No. 24/REN/0000028267 dated June 25, 2024.

33.3.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Close Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Kalu Patti Pumped Storage Project (600 MW) in an area of 267 Ha in Village Devhat, Mudel, Lain, etc, Sub District Lalganj, District Mirzapur, Uttar Pradesh by M/s Renew Hydro Power Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. PP shall submit the Water Utilization Mapping within a 10 km radius of the project for examining the impacts on sustainability of ecosystem of the region after withdrawal of water for proposed project.

ii. Detailed action plan for large scale plantation of native species of plant sapling within 10 km radius of the project shall be prepared in consultation with State Forest Department.

iii. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 150.0 ha of forest land involved in the project shall be submitted within stipulated time.

iv. Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area.

v. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.

vi. PP shall submit the detailed plan for filling the reservoir from the Belan River along with necessary approval form water resource department. Necessary clearance/ approval for interstate issues/ water availability/water sharing issues shall be obtained.

vii. Transportation Plan for transporting construction materials shall be submitted.

viii. Environmental Cost Benefit Analysis shall be done in terms of loss of Forest ecosystem due to diversion of Forest land/loss of biodiversity, water availability, water uses for generation of hydro power and Ecological flows.

ix. The baseline data collection will cover the changes in biological and ecological profile of the region after monsoon with worst-case scenario study and critical mineral assessment.

x. Calculation and values of GHGs (CO2, CH4 etc.) emissions during construction and during operation till the life of the project shall be estimated and submitted.

xi. The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report. Presence of any critical mineral zone in the proposed area be clarified from GSI.

xii. Details of mineral zone, if any, in the study area, certified by Geological Survey of India

or any other concerned Government Organization shall be submitted. The project area should not come up on any critical mineral zone, the same shall to be verified by GSI/NMDC.

xiii. Quantitative values of Impact modelling of environmental parameters shall be submitted for during construction and operation. Also, mitigation measures shall be submitted in terms of construction and operation phase.

xiv. Conducting site-specific ecological study emphasizing on riverine ecology viz. fishes diversity, fish migration, habitat and aquatic biota due to construction PSP. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.

xv. Cumulative Impact of projects in the basin on carrying capacity and sustainability of Reservoir/ River /nala of catchment area due to tapping of water for filling reservoir shall be studied.

xvi. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Specific ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.

xvii. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.

xviii. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.

xix. Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Indian Council of Agriculture Research (ICAR) Institutes/ Expert Govt. institutions and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.

xx. Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI.

[B] Socio-economic Study

i. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.

ii. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. A comparative chart of issues raised by General Public during Public Hearing and commitments made by the Project Proponent will be prepared and submitted in the relevant chapter of EIA/EMP report.

iii. PP shall submit the credible documents to show the status of land acquisition w.r.t project site from/through the concerned State Government as required under Ministry's OM dated 7th October, 2014 for the project land to be acquired.

iv. Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land (if any) shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. Budget earmarked for R&R, CSR shall not be included in the cost of EMP.

[C] Muck Management

i. Details of quantity of muck generation component wise, types of muck (Excavation in tunnels, pressure shaft and powerhouse etc.) and disposal site/ transportation to be provided.

ii. Details of muck management such as dumping sites and its locations, transportation plan along with monitoring mechanism for muck transportation, detailing the road map of project construction site/ indicating the distances from HFL, river, project construction site along with types of road etc.

iii. Safety measures for avoiding spill over muck into the riverbed/streams and its flow into the river during the high discharge/ flood or monsoon period. Prepare plan for stabilization of muck disposal sites using biological and engineering measures to ensure that muck does not roll down the slopes and shall be disposed safely and that it does not pollute the natural streams and water bodies in surrounding area.

iv. Restoration plan for construction area including dumping site of excavated materials by levelling, filling up of burrow pits, landscaping etc.

[D] Disaster Management

i. Impact of Project activities (specially blasting and drilling) on the aquatic and terrestrial ecosystem, within study area to be studied and be incorporated in EIA/EMP report.

ii. The muck dumping sites shall be located with a distance of 100 mts from HFL. The PP shall submit the detailed action plan for transportation of muck along with monitoring mechanism of movement of muck carrying trucks.

[E] Miscellaneous

i. Both capital and recurring expenditure under EMP shall be submitted.

ii. Approved Layout as per pre-DPR chapter duly approved by CEA/CWC shall be submitted.

iii. The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.

iv. Drone video of project site shall be recorded and to be submitted.

v. Undertaking need to be submitted on affidavit stating that no activities has been started on the project site.

vi. Detailed plan to restore wider roads and convert them into narrow up to 10m after construction of the project.

vii. Specific Terms of Reference (ToRs) issued by the Ministry vide Office Memorandum No. F. No. IA3-22/33/2022-IA.III dated 14.08.2023 for Pumped storage projects shall be used for preparation of EIA/ EMP reports.

viii. As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.

Agenda Item No. 31.4

Damanganga (Ekdare) - Godavari intrastate link project (CCA: 12998 Ha) in an area of 257.85 Ha at Village Ekdare, Gonde, Shinde, etc., Sub District Peth and Dindori, District Nashik, Maharashtra by M/s Minor Irrigation Division – Amendment in Terms of Reference (TOR) -reg.
[Proposal No. IA/MH/RIV/535184/2025; F. No. J-12011/03/2019-IA.I (R)]

31.4.1: The proposal is for grant of amendment in Terms of Reference to the project for Damanganga (Ekdare) - Godavari intrastate link project (CCA: 12998 Ha) in an area of 257.85 Ha at Village Ekdare, Gonde, Shinde, etc., Sub District Peth and Dindori, District Nashik, Maharashtra by M/s Minor Irrigation Division.

31.4.2: The Project Proponent made a detailed presentation on the salient features of the project and informed that:

i. The proposal is for amendment in the Terms of Reference granted by the Ministry vide letter dated 13/02/2023 for the Damanganga (Ekdare) – Godavari intrastate link project located at Village Ekdare, Tehsil Peint, District Nashik (Maharashtra) in favour of M/s Minor Irrigation Division, Nashik, Maharashtra.

ii. The Project was appraised and recommended for grant of TOR in 38th meeting of EAC held on 15/12/2022. TOR was issued by MoEF&CC vide its letter dated 13/02/2023.

iii. At the stage of TOR application, the total area to be benefitted by the project was 18404 ha for irrigation out of which 687 ha command was in Damanganga basin for local use and remaining 17717 ha to be benefitted in Upper Godavari sub basin in command of existing Jayakwadi project in Marathwada region. During detailed survey and investigation, total command area has been revised as 12998 ha.

iv. There are changes in other components of salient features as well. The total land area has decreased (261.99 ha to 257.85 ha) and forest land has increased from 44.76 ha to 120.0 ha. This is due to reduction of quantum of total water available for the link project from 143 MCM to 100.569 MCM. There is an increase in the forest area, because earlier estimation was based on preliminary survey and didn't include the river area which was mentioned separately; after detailed working using forest maps and latest 7/12 extracts (a land record document maintained by the Revenue Department). Details of the revised project layout are given below.

v. The Damanganga (Ekdare) - Godavari (Waghad) link project envisages diversion of surplus flows of west flowing Damanganga basin by lift from the proposed Ekdare project to serve the water short Marathwada region in Maharashtra through Existing Jayakwadi Reservoir project. The water available for utilization is 100.569 MCM out of which 15% of the quantity of diversion (15.085 MCM) is reserved for local use as per Govt. of Maharashtra resolution and remaining 85.484 MCM will be lifted in three stages to existing Waghad reservoir in Upper Godavari sub-basin. The diversion is proposed during the months July to October (123 days).

vi. The link system comprises of the headworks viz the proposed Ekdare dam (FRL:374m), Hatti Weir (CL: 452.50 m), Nirgude weir (CL 440.0m), Circular sump (FPL 595.0m) and the existing Inambari (FPL:516.0m), Jharlipada diversion scheme (FPL 672.4m) and Waghad (FRL: 668.50m).

vii. Ekdare dam is proposed on Damanganga basin near Ekdare village, Peint taluk of Nashik district. FRL of the proposed Ekdare dam is 374.0 m and corresponding live storage capacity of 29.56 MCM. The length of the dam is 292.367 m. and the height is 77.50 m with submergence area of 231.30 ha. 13 villages (only land) are affected due to the reservoir. Protection bund (dyke) of 800m long is proposed near Ekdare village to protect from reservoir submergence at full reservoir level. The total land acquisition required for the whole project will be about 257.85 ha of which 120.0 ha is under forest.

viii. The conveyance system comprises of 14.04 km long 2 MS raising mains of 1.80 to 2.10m dia between Ekdare and existing Jharlipada diversion scheme via Nirgude weir and PH 3 near Jharlipada; the existing link cut of 1.30km from Jharlipada diversion scheme up to Kadwa river and 1.90 km long natural Kadwa river stream upto Waghad existing dam. The further conveyance will be through water flows through Kadwa river and Godavari river upto Jayakwadi reservoir.

ix. The augmentation storages of Hatti and Inambari are connected to main conveyance at Nirgude with 800m and 400 m pipelines. The distribution to Aad and Lingavane is proposed from PH-3 near Jharlipada through 12.0km long pipe with dia 0.50m. The maximum discharge in the conveyance varies between 13.06 cumec at the head and attains 14.19 cumec at Nirgude. Lifting arrangements comprises of sump, pump house and delivery cistern, at Ekdare, Nirgude and PH-3 at Jharlipada with static head of 110.13m, 158.65 m, and 82.65m respectively and the total static lift will be 351.43 m. The power requirement will be about 106 MU.

x. Out of the total utilisation, 68.786 MCM will be used for irrigation, 13.76 MCM for domestic, 9.17MCM for industrial uses and the remaining 8.853 MCM will be lost in

transmission. The link project will provide irrigation to about 12998 ha annually (2987ha in local villages) in Nashik district and 10011 ha in Aurangabad district under Jayakwadi command. The project is proposed to be constructed in 7 years. The economic parameters of the link project are furnished below.

Estimated cost (Crore)	Annual cost	Annual benefits	BCR	IRR	GST, Labour insurance, QC and Royalty	Total project cost (Crore)
1871.12	275.01	459.64	1.67	14.48%	342.41	2213.53

xi. The total land required will be 257.85 ha out of which, 120.0 ha is of forest land. In all, 13 villages are affected partly and no population is affected.

xii. Comparison of revised layout with earlier approved layout is given below:

Sl no	Parameter		As per TOR	Actual	Deviation
1	**Purpose**	**:**	**Diversion of surplus water from Damanganga basin to Godavari basin**	**Diversion of surplus water from Damanganga basin to Godavari basin**	**No change**
2	**Quantum of utilization (MCM)**	**:**	**143.00**	**100.569**	**-42.43**
i	Local use (15%) (MCM)	:	4.40	15.09	**10.69**
ii	Diversion to Waghad (MCM)	:	138.60	85.48	**-53.12**
3	**Irrigation (Annual irrigation /CCA) (ha)**	**:**	**18404.00**	**12998.00**	**-5406.00**
i	Damanganga basin (ha)	:	687.00	2987.00	**2300.00**
ii	Upper Godavari basin (ha)	:	17717.00	10011.00	**-7706.00**
4	**Land Acquisition Details**				

	Total Area (ha)	:	261.99	257.85	**-4.14**
	Forest area (ha)	:	44.76	120.00	**75.24**
	River portion (ha)	:	53.40	0.00	**-53.40**
	Other areas (ha)	:	163.83	137.85	**-25.98**
	Total No. of Villages affected	:	13	13	**No change**
5	**Ekdare reservoir (Proposed)**				
i	State	:	Maharashtra	Maharashtra	**No change**
ii	District	:	Nasik	Nasik	**No change**
iii	Location	:	Near Ekdare village, Peint Taluk	Near Ekdare village, Peint Taluk	**No change**
iv	Name of river	:	Damanganga river	Damanganga river	**No change**
v	Basin/sub basin	:	Damanganga	Damanganga	**No change**
vi	Latitude	:	20° 11’ 17.03” N	20° 11’ 17.03” N	**No change**
vii	Longitude	:	73° 32’ 23.12” E	73° 32’ 23.12” E	**No change**
viii	Top of dam level (m)	:	375.50	375.50	**No change**
ix	Length of the dam (m)	:	302.00	293.00	**-9.00**
x	Height of the dam (m)	:	69.50	77.50	**8.00**
xi	Catchment area (sq km)	:	182.00	182.00	**No change**
xii	75% Dependability surplus yield at dam site	:	125.00 (as per CWC)	100.569	**-24.43**
xiii	Maximum water level (m)	:	374.50	375.50	**1.00**
xiv	Full reservoir level (m)	:	374.00	374.00	**No change**
xv	MDDL (m)	:	345.00	331.87	**-13.13**
xvi	Gross storage capacity (MCM)	:	36.41	32.95	**-3.46**

xvii	Live storage capacity (MCM)	:	29.37	29.56	**0.19**
xviii	Dead storage capacity (MCM)	:	7.04	3.39	**-3.65**
xix	Area of submergence at F.R.L (ha)	:	247.40	231.30	**-16.10**
xx	Forest area (ha)	:	41.91	115.45	**73.54**
xxi	River portion (ha)	:	53.40	0.00	**-53.40**
xxii	Other areas (ha)	:	152.09	115.85	**-36.24**
xxiii	No. of Villages affected in submergence (only land)	:	4	4	**No change**
6	**Hatti weir (Proposed)**				
i	Location	:	Near Hatti village, Peint taluk, Nasik district, Maharashtra	Near Hatti village, Peint taluk, Nasik district, Maharashtra	**No change**
ii	Name of river	:	Hatti Nala	Hatti Nala	**No change**
iii	Basin/sub basin	:	Damanganga upstream of Ekdare	Damanganga upstream of Ekdare	**No change**
iv	Latitude	:	20° 13’21.08”	20° 13’21.08”	**No change**
v	Longitude	:	73° 35’45.45”	73° 35’45.45”	**No change**
vi	Catchment Area up to Hatti weir (sq.km)	:	14.41	14.41	**No change**
vii	River bed level (m)	:	460.00	449.00	**-11.00**
viii	Weir Crest level (m)	:	461.50	452.50	**-9.00**
ix	Height of the weir (m)	:	1.50	3.50	**2.00**
x	Length of weir (m)	:	17.40	73.90	**56.50**
xi	75% monsoon yield (MCM)	:	11.62	11.62	**0.00**
xii	Upstream projects utilization (MCM)	:	1.17 (Shinde MIP)	1.17	**0.00**

xiii	Balance available for diversion (MCM)	:	10.45	10.45	**0.00**
xiv	Submergence area (ha)	:	Confined to river course.	Confined to river	**No change**
xv	Villages affected (No.)	:	9	9	**No change**
7	**Nirgude weir (Proposed)**				
i	Location	:	Near Nirgude village, Peint taluk, Nasik district, Maharashtra	Near Nirgude village, Peint taluk, Nasik district, Maharashtra	**No change**
ii	Name of river	:	Nirgude nala (a small right bank stream of Damanganga river)	Nirgude nala (a small right bank stream of Damanganga river)	**No change**
iii	Basin/sub basin	:	Right bank stream of Damanganga river	Right bank stream of Damanganga river	**No change**
iv	Latitude	:	20° 13’36.79”	20° 13’36.79”	**No change**
v	Longitude	:	73° 35’25.45”	73° 35’25.45”	**No change**
vi	Catchment Area up to Nirgude weir (sq.km)	:	11.48	11.48	**No change**
vii	River bed level (m)	:	443.00	430.70	**-12.30**
viii	Weir Crest level (m)	:	445.00	440.00	**-5.00**
ix	Height of the weir (m)	:	2.00	9.30	**7.30**
x	Length of weir (m)	:	34.80	63.00	**28.20**
xi	75% monsoon yield (MCM)	:	9.25	9.25	**0.00**
xii	Upstream projects utilization	:	Nil	Nil	
xiii	Balance available for diversion (MCM)	:	9.25	9.25	**No change**
xiv	Submergence area (ha)	:	Confined to river course.	Confined to river course	**No change**
xv	Villages affected (No.)	:	Nil	Nil	**No change**

8	**Waghad project (Existing)**				
i	State	:	Maharashtra	Maharashtra	**No change**
ii	District	:	Nasik	Nasik	**No change**
iii	Latitude	:	20° 14'N	20° 14'N	**No change**
iv	Longitude	:	73° 44'E	73° 44'E	**No change**
v	Name of river	:	Kadwa river (a small tributary of Godavari river)	Kadwa river (a small tributary of Godavari river)	**No change**
vi	Catchment area (sq km)	:	119.00	119.00	**No change**
vii	Top of dam level (m)	:	673.60	673.60	**No change**
viii	Maximum water level (m)	:	671.20	671.20	**No change**
ix	Full reservoir level (m)	:	668.50	668.50	**No change**
x	MDDL (m)	:	650.50	650.50	**No change**
xi	Gross storage capacity (MCM)	:	76.48	76.48	**No change**
xii	Live storage capacity (MCM)	:	70.00 (revised to 65.18)	70.00 (revised to 65.18)	**No change**
xiii	Area of submergence at F.R.L (ha)	:	1090.00	1090.00	**No change**
9	**Damanganga (Ekdare)- Godavari (Waghad) link project**				
A	**Features of link canal (pipe line)**				
i	Total length of the link canal (pipe line) (Km)	:	13.62	14.04	**0.42**
ii	Length of pipe line up to Jharlipada Diversion Scheme (km)	:	10.42	10.84	**0.42**
iii	Ridge cut link (Km)	:	1.30	1.30	**No change**

iv	Natural stream (Km)	:	1.90	1.90	**No change**
v	RCC underground pipe line between (Hatti to Nirgude) (Km)	:	0.80	0.80	**No change**
B	**Land Required for pipe line and pumphouses**				
i	Total Area (ha)	:	14.59	26.55	**11.96**
ii	Forest area (ha)	:	2.85	4.55	**1.70**
iii	Other Area (ha)	:	11.74	22.00	**10.26**
iv	Villages/Population affected	:	Nil	Nil	**No change**
C	**Lift at first stage from RD 0.00 km to 5.970 km**				
i	Maximum quantum of diversion (MCM)	:	30.51 MCM	27.88	**-2.63**
ii	Designed discharge (cumec)	:	12.84	10.41	**-2.43**
iii	Length of Pipe line (km)	:	5.97	6.10	**0.13**
iv	Nos. and Diameter of the pipe	:	4 x 1.40 m	2x1.80 m	**-2.00**
v	Velocity (m/s)	:	2.09 m/s	2.05	**-0.04**
vi	Off take level (m)	:	345.00	331.87	**-13.13**
vii	Outfall level (m)	:	445.00	442.00	**-3.00**
viii	Lift (m)	:	100.00	110.13	**10.13**
D	**Lift at 2nd stage from RD 5.97 km to 9.25 km**				
i	Maximum quantum of diversion (MCM)	:	33.92	38.00	**4.08**
ii	Designed discharge (cumec)	:	14.28	14.19	**-0.09**

iii	Length of Pipe line (km)	:	3.28	4.018	**0.738**
iv	Nos. and Diameter of the pipe	:	4 x 1.40 m	2x2.10 m	**-2.00**
v	Velocity (m/s)	:	2.32	2.05	**-0.27**
vi	Off take level (m)	:	445.00	438.33	**-6.67**
vii	Outfall level (m)	:	560.00	597.00	**37.00**
viii	Lift (m)	:	115.00	158.67	**43.67**
E	**Lift at 3rd stage from RD 9.25 km to 10.42 km**				
i	Maximum quantum of diversion (MCM)	:	33.92	38.00	**4.08**
ii	Designed discharge (cumec)	:	14.28	14.19	**-0.09**
iii	Length of Pipe line (km)	:	1.17	716.00	**714.83**
iv	Nos. and Diameter of the pipe	:	4 x 1.40 m	2x2.10 m	**-2.00**
v	Velocity (m/s)	:	2.32	2.05	**-0.27**
vi	Off take level (m)	:	560.00	593.33	**33.33**
vii	Outfall level (m)	:	672.00	676.00	**3.60**
viii	Lift (m)	:	112.40	82.65	**-29.75**
F	**Power required for lifting**				
i	At stage I (MU)	:	68.10	27.53	**-40.57**
ii	At stage II (MU)	:	76.11	51.17	**-24.94**
iii	At stage III (MU)	:	66.93	26.60	**-40.33**
iv	**Total energy required (MU)**	**:**	**211.14**	**105.70**	**-105.44**
v	Total cost for energy required (Rs.Lakh)	:	3801.00		
G	**Installed capacity**				

i	Stage I (MW)	:	23.43	16.36	**-7.07**
ii	Stage II (MW)	:	26.62	30.37	**3.75**
iii	Stage III (MW)	:	23.04	15.79	**-7.25**
iv	**Total (MW)**	:	**73.09**	**62.52**	**-10.57**
10	**Economic analysis**				
i	Net annual benefit from irrigation (Lakhs)	:	6154.00	9675.00	**3521.00**
ii	Benefit from Domestic water supply (Lakhs)	:	105.00	62.00	**-43.00**
iii	Benefit from Industrial water supply (Lakhs)	:	33600.00	30294.00	**-3306.00**
iv	Benefit from water charges(Irrigation service fee) (Lakhs)	:	276.00	0.00	**-276.00**
v	Benefit from Pisciculture and lease amount (Lakhs)	:	47.00	5582.00	**5535.00**
vi	Benefit from Animal husbandry (Lakhs)	:	1953.00	351.00	**-1602.00**
vii	**Total Annual Benefit of the project (Lakhs)**	**:**	**42135.00**	**45964.00**	**3829.00**
viii	Annual cost (Lakhs)	:	24042.00		
ix	Cost of Unit-I Head Works (Lakhs)	:	119953.00	113608.00	**-6345.00**
	Unit II: Conveyance			29020.00	**29020.00**
	Cost of Unit-III Lifting Arrangements (lakh)	:	37395.00	44484.00	**7089.00**
	Total cost of project (2019-2020 price level)(lakh)	**:**	**157348 / 2019-20**	**187112/ 2022-23**	**29764.00**
x	B.C. Ratio (considering annual	:	1.75	1.67	**-0.08**

	benefit and annual cost)				
xi	Internal Rate of Return (IRR)	:	11.11%	14.48%	**Increased**

xiii. The project proponent has requested for amendment in the ToR/EC with the details are as under:

S. N.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
1.	**TOR Letter Addressed to**	• M/s National Water Development Agency Minor Irrigation Division Sinchan Bhavan Campus Trimbak Road Nashik – 422211 Maharashtra	• Minor Irrigation Division Sinchan Bhavan Campus Trimbak Road Nashik – 422002 Maharashtra	NWDA is DPR consultant and project proponent is Minor Irrigation Division
2.	**Para 4 (ii)**	• **Damanganga (Ekadare)-Godavari (Waghad) link** project envisages diversion of about 138.6 MCM of surplus water available in the catchment of Damanganga basin up to proposed Ekdare dam site to existing Waghad reservoir in Godavari valley, by lift in three stages at Ekdare, Nirgude & at the proposed Circular sump with a total static lift of 327.40 m.	• **Damanganga (Ekadare)-Godavari (Waghad) link** project envisages diversion of about 85.484 MCM of surplus water available in the catchment of Damanganga basin up to proposed Ekdare dam site to existing Waghad reservoir in Godavari valley, by lift in three stages at Ekdare, Nirgude & intermediate sump with a total static lift of 351.43 m.	The transferable quantity reduced based on the fresh upstream reservations reported by Govt of Maharashtra and the subsequent Ekdare reservoir simulation.
3.	**Para 4 (iii)**	• The total conveyance system of 13.62 km comprises a pipe line of 10.42 km (rising main) by lift up to Jharlipada Diversion Scheme and 3.20 km by gravity (1.30 km ridge cut between Damanganga and Godavari	• The total conveyance system of 14.04 km comprises a pipe line of 10.84 km (rising main) by lift up to Jharlipada Diversion Scheme and 3.20 km by gravity (1.30 km ridge cut between Damanganga and Godavari	Pumphouse at Ekdare has been relocated and the rising main recast to minimize cutting while designing the system. Hence, there is a slight

S. N.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		basins) and 1.90 km of natural stream of Kadwa River upto Waghad Reservoir.	basins) and 1.90 km of natural stream of Kadwa River upto Waghad Reservoir.	increase in the length of rising main.
4.	**Para 4 (iv)**	• The structural component of the link system consists of one proposed Ekdare dam, ccmveyance system of 13.62 km length, two proposed weirs, i.e. Hatti & Nirgude, Intermediate Circular sump and underground RCC pipe line between the proposed Hatti & Nirgude weirs. The available water will be lifted by 3 Pump houses at Ekdare, Nirgude & Circular Pump by the rising mains to divert into the existing Jharlipada Diversion scheme.	• The structural component of the link system consists of one proposed Ekdare dam, ccmveyance system of 14.04 km length, two proposed weirs, i.e. Hatti & Nirgude, Intermediate sump and underground RCC pipe line between the proposed Hatti & Nirgude weirs. The available water will be lifted by 3 Pump houses at Ekdare, Nirgude & Intermeidate Sump by the rising mains to divert into the existing Jharlipada Diversion scheme.	Slight change in the length of rising main due to final design for minimizing cutting
5.	**Para 4 (v)**	• **Submergence area**: The submergence area at FRL is 247.4 ha. Out of which about 53.40 ha is river course, 41.91 ha is forest area and 152.09 ha Govt. land & private land. No villages are coming under submergence.	• **Submergence area**: The submergence area at FRL is 231.3 ha. Out of which about 115.45 ha is forest area and 115.85 ha is non forest land (Govt/private land). 13 villages will get affected by submergence (no displacement, only losing land)	The submergence area is recomputed at micro level based on drone output maps and hence the change in submergence area.
6.	**Para 4 (vi)**	• **Use of Water:** The proposed utilization from the Ekdare reservoir is fixed at 143 MCM out of which,4.4 MCM is kept reserved for local use and remaining 138.6 MCM is proposed for lifting to Waghad dam. The link	• **Use of Water:** The proposed utilization from the Ekdare reservoir is fixed at 100.569 MCM out of which, 15.085 MCM is kept reserved for local use and remaining 85.484 MCM is proposed for lifting to Waghad dam. The	The transferable quantity reduced based on the fresh upstream reservations reported by Govt of Maharashtra and the subsequent Ekdare reservoir

S. N.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		project will benefit a total area of 18404 ha irrigation out of which 687 ha will be benefitted in command areas within Damanganga basin for local use in Nasik district and the remaining 17717 ha will be benefitted in Upper Godavari sub-basin in the command of existing Jayakwadi project in Marathwada region.	link project will benefit a total area of 12998 ha irrigation, out of which 2987 ha will be benefitted in command areas within Damanganga basin for local use in Nasik district and the remaining 10,011 ha will be benefitted in Upper Godavari sub-basin in the command of existing Jayakwadi project in Marathwada region.	simulation. Accordingly, the water planning changed, and utilizable quantity reduced.
7.	**Para 4 (vii)**	• **Land requirement:** The total land requirement for the proposed Damaganga (Ekdare)-Godavari (Waghad) link project is **261.99 ha**, out of which **44.76 ha** is forest land, for which forest clearance to be obtained under Forest Conservation Act**.**	• **Land requirement:** The total land requirement for the proposed Damaganga (Ekdare)-Godavari (Waghad) link project is **257.85 ha**, out of which **120 ha** is forest land, for which forest clearance to be obtained under Forest Conservation Act**.**	The land requirement is recomputed at micro level based on drone output maps and hence the change in land requirement.
8.	**Para 5**	• The sectoral Expert Appraisal Committee considered the proposal in its 26th and 38th meeting held on 20th August, 2019 and 15th December, 2022 respectively. The EAC after detailed deliberation recommended the proposal for grant of applicable Standard TOR along with additional TOR for conducting EIA study to the project for Warsgaon Warangi Pumped Storage Project of capacity 1200 MW in an area of 169 ha at Village Teckpole and Warangi, Tehsil Velhe and	• Para to be deleted	The paragraph proposed for deletion pertains to a different project

S. N.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		Mahad, District Pune and Raigad (Maharashtra) by M/ s Adani Green Energy Limited, under the provisions of EIA Notification, 2006 and as amended along with the certain additional/ specific ToR.		

31.4.4 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of amendment in Terms of Reference (ToR) to the project for Damanganga (Ekdare) - Godavari intrastate link project (CCA: 12998 Ha) in an area of 257.85 Ha at Village Ekdare, Gonde, Shinde, etc., Sub District Peth and Dindori, District Nashik, Maharashtra by M/s Minor Irrigation Division..

The project/activity is covered under Category B1 of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 as CCA is 12998 Ha. However, Irrigation projects involving Inter-State issues shall be appraised at Central level without change in category therefore, it requires appraisal at Central level by the sectoral EAC in the Ministry.

The Ministry granted Terms of Reference vide letter dated 13/02/2023 for the proposed project and PP has submitted the proposal for amendment in ToR for modification in project components and change in the land area requirement.

During the meeting the EAC noted with concern that the presentation lacked sufficient detail and clarity on the proposal. PP failed comprehensively address the key aspects of the proposed amendment. Furthermore, the Project Proponent was unable to provide specific and satisfactory justifications for the proposed changes. Additionally, the EAC observed that the Project Proponent was unable to respond satisfactorily to several queries raised by the Committee members. The committed noted that PP had appeared unprepared and lacked the necessary due diligence expected at this stage of the appraisal process. This reflected a lack of preparedness and understanding of PP.

After deliberation, the project was deferred. EAC opined that the PP shall have to come prepared with a detailed presentation about the proposed amendment and ensure that all technical and

regulatory aspects are comprehensively addressed, and come prepared with clear justifications and supporting documentation in any future deliberations.

The proposal ***deferred*** on the above lines.

Additional Agenda Item

Consideration of EAC Sub-Committee Site Visit Report of Saidongar-1 Karjat Pumped Storage Project (3000 MW) (Proposal No. IA/MH/RIV/517008/2025) at village Dhak, Saidongar, Ambot, Bhaliwadi and Pali T. Kothal Khalathi, Taluka Karjat, District Raigad, Maharashtra and,

Saidongar-2 Maval Pumped Storage Project (1200 MW) (Proposal No. IA/MH/RIV/516980/2025) at village Dhak, Kusur, Pali T. Kothal Khalathi and Saidongar, Taluka Karjat, District Raigad, Maharashtra

The Member Secretary, EAC informed to the committee that the Ministry of Environment, Forest and Climate Change (MoEF&CC) granted Terms of Reference (ToR) to Saidongar-1 Karjat Pumped Storage Project (3000 MW) and Saidongar-2 Maval Pumped Storage Project (1200 MW) on 18.02.2025. At the 23rd Meeting of the River Valley and Hydroelectric Projects Sector, held on 29.01.2025 in relation to the aforementioned proposal, it was resolved that a site visit of the proposed project would be undertaken.

2. In accordance with the Ministry's directive vide letter No. J-12011/42/2023-IA.I(R) dated 15th April 2025, a sub-committee was constituted to carry out a site inspection of the Saidongar project area. The committee was tasked with assessing the environmental safeguard measures in place and recommending any additional conditions, if necessary. The sub-committee comprised Prof. G.J. Chakrapani (Chairman), Shri Ajay Kumar Lal (Member), and Dr. Krishnendu Mondal, MoEF&CC. The site visit was conducted from 21st to 23rd April 2025. During the inspection, officials from M/s Torrent Pvt. Ltd., along with their consultants, were present and facilitated the visit.

3. The EAC Sub-Committee has made following observations/recommendations:

1. The PP should re-examine the proposed width of the approach road connecting the lower and upper reservoirs, particularly in forested sections. By aligning the design with IRC guidelines and applying principles of minimal impact engineering (e.g., optimizing turning radius, slope grading, and cut/fill balance), the PP should aim to reduce forest land diversion currently proposed for this component.

2. The PP shall submit a duly approved Wildlife Conservation Plan and as well as the Biodiversity Management Plan, specifically addressing the conservation of Schedule-I species if found within or around the project area, duly approved by the Chief Wildlife Warden (CWLW) of Maharashtra. The conservation measures should be integrated with the project's overall Environmental Management Plan (EMP) and implemented in coordination with the Forest Department.

3. The PP shall ensure that the allocated water for both initial reservoir filling and annual recoupment is tapped exclusively during the monsoon season, thereby avoiding any adverse impact on the dry-season flow regime and ensuring protection of downstream water users and ecosystems. The water management strategy should include clear monitoring mechanisms and coordination with existing hydropower releases in the Pej and Ulhas rivers. Coordination with Tata Power for sustained tailrace releases and seasonal flow monitoring of the Pej and Ulhas rivers may be explored as part of a transparent, adaptive water management plan.

4. Given the significant excavation required for the deep-seated surface powerhouse, the PP revisit its comprehensive Muck Management Plan, detailing the volume, handling, reuse potential, and final disposal locations, with preference for non-forest land. Appropriate measures be taken to prevent erosion or habitat degradation and to ensure that site vegetated and stabilized.

5. All Assurances made during the site visit—especially those related to drone mapping findings, vegetation types, reservoir site conditions, and community interface—must be reflected in the final EIA/EMP. This includes precise mapping, justification of layout alternatives, compliance with ToR conditions, and risk mitigation measures.

The site visit reports are annexed at **Annexure –I** and **Annexure-II** respectively.

The EAC deliberated on the site visit reports of both PSPs and recommended that observations raised by the EAC Sub-Committee may be suitably addressed while preparing EIA/EMP report so as to assess the environmental and social concerns comprehensively.

The meeting ended with vote of thanks to the Chair.

****

ANNEXURE

ATTENDANCE

S. No.	Name of Member	Role
1.	Prof. Govind Chakrapani	Chairman
2.	Dr. Uday Kumar R Y	Member
3.	DR. J. V. Tyagi	Member
4.	Shri Kartik Sapre	Member
5.	Shri Ajay Kumar Lal	Member
6.	Shri Rakesh Goyal	Member Representative of Central Electricity Authority (CEA)
7.	Shri Balram Kumar	Member Representative of Central Water Commission (CWC)
8.	Shri Yogendra Pal Singh	Member Secretary

APPROVAL OF THE CHAIRMAN

========== Forwarded message ==========
From: chakrapani govind <chakrapani.govind@gmail.com>
To: "Yogendra Pal Singh"<yogendra78@nic.in>
Date: Thu, 22 May 2025 12:22:52 +0530
Subject: Re: Draft MOM of the 31st EAC (RVHEP) meeting held on 14.05.2025-reg.
========== Forwarded message ==========

Approved.
Chakrapani

On Thu, 22 May, 2025, 11:56 Yogendra Pal Singh, <yogendra78@nic.in> wrote:

> Dear Sir,
>
> The draft MOM of the EAC meeting held on 14.05.2025 was circulated to all EAC members. The corrections suggested by the Goyal Sir, CEA have been duly incorporated. No other comments received so far. Accordingly, draft MOM of the EAC meeting held on 14.05.2025 are attached herewith for approval please.
>
> With Regards,
>
> **Yogendra Pal Singh**
> **Scientist 'F'**
> **Government of India**
> **M/o Environment, Forest and Climate Change**
> **Room No. 236, 2nd Floor, Vayu Wing**
> **Indira Paryavaran Bhawan**
> **Jor Bagh, New Delhi-110003**
> **Tele-fax: 011-20819364**

Annexure-I

Report of the field site visit undertaken by EAC sub-Committee from 21st to 23rd April 2025 at Saidongar-1 Karjat Pumped Storage Project (3000 MW) (Proposal No. IA/MH/RIV/517008/2025) at village Dhak, Saidongar, Ambot, Bhaliwadi and Pali T. Kothal Khalathi, Taluka Karjat, District Raigad, Maharashtra

At the 23rd Meeting of the River Valley and Hydroelectric Projects Sector, held on 29th January 2025 in relation to the aforementioned proposal, it was resolved that a site visit of the proposed project would be undertaken. Accordingly, the Ministry constituted a sub-committee, comprising the following members, to carry out the site inspection with the objective of assessing the environmental safeguard measures and recommending any additional conditions, as per letter No. J-12011/42/2023-IA.I(R) dated 15th April 2025.

Sr.No	Members of Expert Committee visiting Saidongar Sites
1	Prof. G.J. Chakrapani, Chairman
2	Shri Ajay Kumar Lal, Member
3	Dr. Krishnendu Mondal, Joint Director, MoEFCC

The aforesaid committee undertook the visit from 21st to 23rd April 2025 and during the site visit the following officers from M/s Torrent PSH3 Pvt Ltd along with their consultants were present: -

1. Shri Lachman Lalwani, Executive Director
2. Shri Kalachand Mahalik, Vice President
3. Shri R S Negi, Vice President
4. Shri Jitendra Thakur, General Manager
5. Shri Basavraj Munnoli, Assistant General Manager
6. Shri Ravinder Bhatia, RS Envirolink Technologies Pvt. Ltd. (ToR Consultant)
7. Dr. Rajdeep, Aarvee Associates (EC Consultant)
8. Shri Umesh Hegde, Tata Consulting Engineers Limited (DPR Consultant)
9. Torrent PSH3 Site team members.

Project Overview

The Project Proponent (PP) made a detailed presentation ~~to~~ before the Sub-committee. The Presentation covered technical layout of the off-river open loop system, salient features, environmental baseline data, status of ToR compliance, and findings of the EIA and EMP studies, along with Torrent initiatives taken/to be taken in the field of Environment conservation, health sector and other CSR activities. Special mention made on project geology, hydrology, catchment characteristics, water availability certification, and biodiversity conservation plans. The presentation was followed by discussions. The main features of the proposed Project as placed before the sub-committee are summarised in the following points:

- The Saidongar-1 Karjat Open Loop Pumped Storage Project is proposed as a large-scale energy storage infrastructure, strategically located in the villages of Potal, Saidongar, Ambot, Dhak, and Bhaliwadi within the Karjat Sub-District of Raigad District, Maharashtra. The project is designed to have an installed capacity of 3000 MW and an energy storage potential of 18,000 MWh, aimed at enhancing grid reliability and supporting renewable energy integration. The proposed project involves the construction of two artificial reservoirs – an upper and a lower – located at coordinates 73°24'32" E, 18°54'15" N and 73°25’34” E, 18°54’37” N respectively.
- The project entails the creation of a new upper reservoir with a gross storage capacity of 0.56 TMC (15.87 MCM) and a new lower reservoir with a gross storage capacity of 1.02 TMC (28.96 MCM). The upper reservoir will be constructed with a maximum embankment height of 27.0 meters from the natural surface level, while the lower reservoir will have a maximum dam height of 59.0 meters from the deepest riverbed. This configuration enables daily peak power generation for six hours and allows for water to be pumped back during 6.88 off-peak hours, making the project a crucial component in balancing energy supply and demand. The lower reservoir is to be constructed on a seasonal stream that is a tributary of the Ulhas River, with the upper reservoir located on a plateau to the west.
- The total land requirement for the project is estimated at 377.0 hectares, of which 144.0 hectares is non-forest land and 233.0 hectares is forest land. Consequently, diversion of forest land is required, necessitating Forest Clearance under the Forest Conservation Act. There are no protected areas

within immediate proximity; however, the Bhimashankar Wildlife Sanctuary lies approximately 15 km from the project site.

- The demographic profile of the project area reveals a predominantly tribal population, with communities such as the Thakurs, Mahadev Kolis, and Katkaris forming the majority in the surrounding villages. Agriculture, mainly subsistence-based, is the primary livelihood, supported by rainfed crops such as paddy, millets, and pulses during the monsoon season. Additionally, dependence on forest resources for firewood, fodder, and minor forest produce plays a vital role in sustaining local livelihoods.
- The project's initial water requirement for reservoir filling is estimated at 23 MCM, with an annual replenishment need of approximately 3 MCM due to evaporation. The total estimated cost of the project stands at ₹13,017.302 crore.
- The proposed dam at LR is a Concrete Gravity structure with a total length of approximately 718 meters and a height of 59 meters above NSL. The catchment area contributing to the LR is about 23.4 sq. km, yielding approximately 40 million Cubic Meters (MCM) of water annually at 75% dependability. This yield has been certified by the State Water Resources Department, Government of Maharashtra, which has also issued the Water Availability Certificate vide letter dated 13.01.2025.
- The project requires 36 MCM of water for initial one-time filling (23 MCM for S-1 and 13 MCM for S-2), which will be impounded in a phased manner over 2 to 3 years, synchronized with the staggered commissioning schedule of the Saidongar-1 and Saidongar-2 PSPs. Additionally, only 5 MCM of water will be required annually for recoupment of operational losses. Thus, the total requirement remains well within the sustainable yield of the catchment, ensuring no stress on the resource.
- Importantly, the downstream region, extending up to the confluence of the Pej and Ulhas rivers, approximately 20 km downstream—receives perennial flow contributions from the Bhivpuri Hydro Power Station (72 MW) of Tata Power. The tailrace discharge from this station, located just 5.5 km downstream of the project site, provides continuous flow to the Pej River. This ensures uninterrupted water availability for the downstream irrigation canal drawn from the left bank of Pej, which caters to the irrigation and domestic water requirements of local communities.
- The project awaits statutory clearances including Stage-I Forest Clearance (proposal number FP/MH/HYD/IRRIG/515850/2024). The project proponent has signed a Memorandum of Understanding (MoU) with the Government of Maharashtra on 03.09.2024.

Main Observations

Lower Reservoir

- The proposed site encompasses undulating but stable land surface due to rocky base–mainly consisting of basalt and other solid formation of Sahyadri range.
- The common Lower Reservoir is proposed across the Pej River, a seasonal tributary of the Ulhas River, which is one of the major west-flowing rivers in Maharashtra. During the site visit, the riverbed was observed to be dry, showing its non-perennial nature. The reservoir area consists primarily of rocky terrain with ~~negligible~~ sparse vegetation, making it a feasible location.

- Main tree species consist of Careya arborea, Terminalia alata, Terminalia arjuna, Terminalia bellerica, Euphorbia nivvulia Madhuca longifolia var. latifolia, and Diospyros melanoxylon, and Ficus hispida.
- Given this hydrological setup, the allocation of water to the Saidongar PSPs will might not compromise the competing needs of downstream users. The catchment yield is appeared at a glance adequate to support the project without affecting ecological flows or community entitlements. The integration of project scheduling with natural monsoon cycles and existing downstream contributions offers a balanced water management strategy.
- At a glance, no evidence of big mammals or cats could be found. However, available documents and certificates relating to their presence, movements or corridors will lead to drawing conclusions on this aspect.
- The proposed site for the Lower Reservoir, located across the Pej River, is non eco sensitive as such.
- There is only a single household found in the vicinity, and no displacement is anticipated as a result of the project activities.
- During the site visit, the project proponent presented core samples from boreholes extending to depths of approximately 50 to 100 meters. These samples indicate the presence of basalt rock formations, characterized by minimal fractures or joints, which is favorable from a geotechnical standpoint. The forest cover in the area is not dense, further supporting site suitability.

Other Locations

- The Representatives of the Project demonstrated drone mapping across key locations including Upper Reservoir areas of Saidongar-1 Karjat PSP and Saidongar-2 Maval PSP, Common Lower Reservoir, Escarpment zones, and alignment of the proposed water conductor system. The drone footage revealed that both the Upper Reservoirs are flat table-land area with minimal grassland vegetation and rocky outcrops indicating very shallow depth of overburden. No habitation, cultivation, or signs of wildlife were observed by the Committee members. The drone mapping provided a global view of the Project areas which were not accessible during the site visit.

I. Powerhouse

- As per the information provided by the project proponent, the project comprises of Deep-seated surface Powerhouse. The surface will be excavated to achieve the required depth for turbine placement. Excavated muck will be reused, subject to confirmation of material suitability from CSMRS, in embankment construction or disposed of scientifically in pre-identified muck disposal sites in the non-forest area.

II. Upper Reservoir

- Upper Reservoir is located apparently on open table land, free of habitation and agricultural activity. The area has sparse vegetation and visible rock outcrops, supporting limited topsoil depth. No wildlife sightings or evidence of habitat corridors were recorded. The embankment at Upper

Reservoir 1 is also proposed to be a GFRD (Geomembrane Faced Rockfill Dam) in a closed ring configuration.

- The site identified for Upper Reservoir 1 primarily comprises mainly of barren land, as also substantiated by photographic evidence. The selection of this location appears to be non-vulnerable or sensitive from environmental perspectives, and also no human habitation observed in the surrounding area.

III. Approach Road

- The approach road from Lower Reservoir to Upper Reservoir is proposed through forest land with a maximum width of 17 meters (average ~12 meters). The PP has been advised to explore scope for optimization of this width as per IRC guidelines, considering turning radius, slope gradient, and type of vehicular movement required during construction. This effort will help minimize forest land diversion (17 Ha out of 233 Ha proposed forest land) and should be reflected in the final layout.

Recommendations

1. The PP should re-examine the proposed width of the approach road connecting the lower and upper reservoirs, particularly in forested sections. By aligning the design with IRC guidelines and applying principles of minimal impact engineering (e.g., optimizing turning radius, slope grading, and cut/fill balance), the PP should aim to reduce forest land diversion currently proposed for this component.
2. The PP shall submit a duly approved Wildlife Conservation Plan ~~and~~ as well as the Biodiversity Management Plan, specifically addressing the conservation of Schedule-I species if found within or around the project area, duly approved by the Chief Wildlife Warden (CWLW) of Maharashtra. The conservation measures should be integrated with the project's overall Environmental Management Plan (EMP) and implemented in coordination with the Forest Department.
3. The PP shall ensure that the allocated water for both initial reservoir filling and annual recoupment is tapped exclusively during the monsoon season, thereby avoiding any adverse impact on the dry-season flow regime and ensuring protection of downstream water users and ecosystems. The water management strategy should include clear monitoring mechanisms and coordination with existing hydropower releases in the Pej and Ulhas rivers. Coordination with Tata Power for sustained tailrace releases and seasonal flow monitoring of the Pej and Ulhas rivers may be explored as part of a transparent, adaptive water management plan.
4. Given the significant excavation required for the deep-seated surface powerhouse, the PP revisit its comprehensive Muck Management Plan, detailing the volume, handling, reuse potential, and final disposal locations, with preference for non-forest land. Appropriate measures be taken to prevent erosion or habitat degradation and to ensure that site vegetated and stabilized
5. All Assurances made during the site visit—especially those related to drone mapping findings, vegetation types, reservoir site conditions, and community interface—must be reflected in the final EIA/EMP. This includes precise mapping, justification of layout alternatives, compliance with ToR conditions, and risk mitigation measures.

Endorsed by EAC site visit team:

1. Krishnendu Mondal
2. A.K. Lal
3. G. J.Chakrapani

Photo 1. The project proponent (PP) delivered a comprehensive presentation followed by an interactive Q&A session, during which all committee queries were addressed. The PP highlighted Torrent Group's environmental initiatives and ongoing CSR activities focused on children's health and nearby villages.

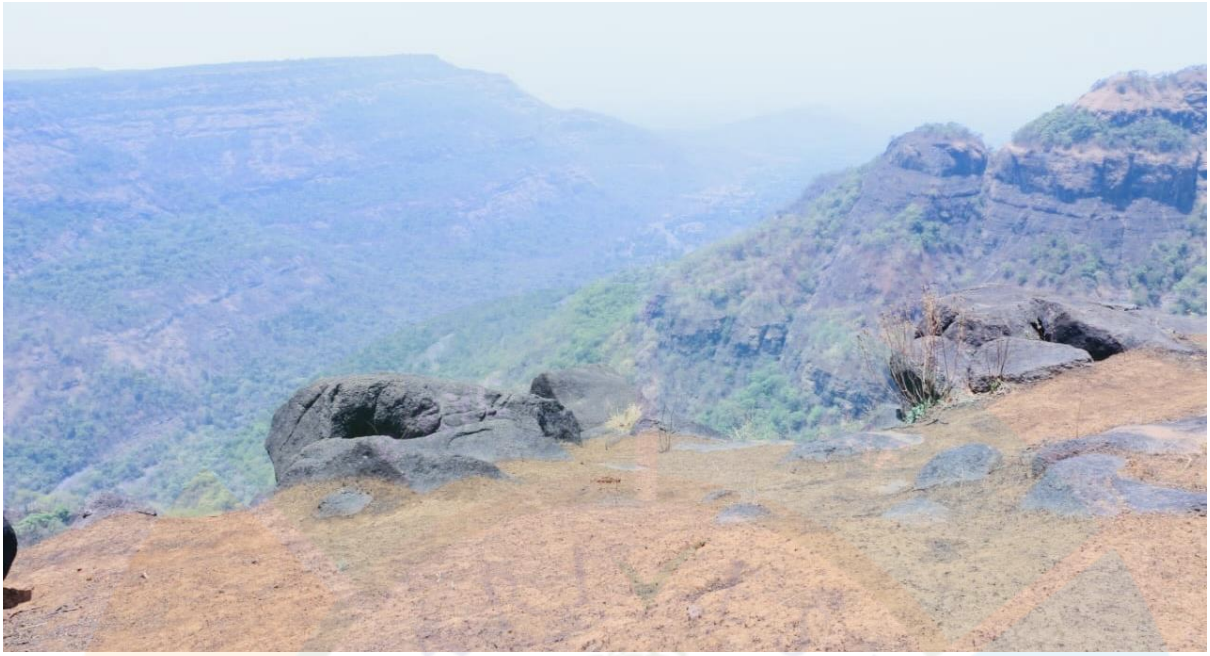

Photo 2. The Saidongar-1 Karjat Pumped Storage Project (PSP) Upper Reservoir is situated on an open tableland with minimal soil cover and sparse vegetation, as evidenced by visible rock surfaces, and is free from habitation and agricultural use. No wildlife sightings or indications of habitat corridors were observed during the site assessment.

Photo 3. Committee members inspected the site along the Lower Dam Axis, where the proposed Lower Reservoir Dam is planned as a 57 m high Concrete Gravity Dam above NSL. It was observed that the Pej River was completely dry during the visit, and the project proponent informed that it is a seasonal stream with negligible flow for most of the year, except during the monsoon. A detailed discussion was also held on the initial water requirement and the staggered plan to fill the reservoir over a 3 to 5-year period.

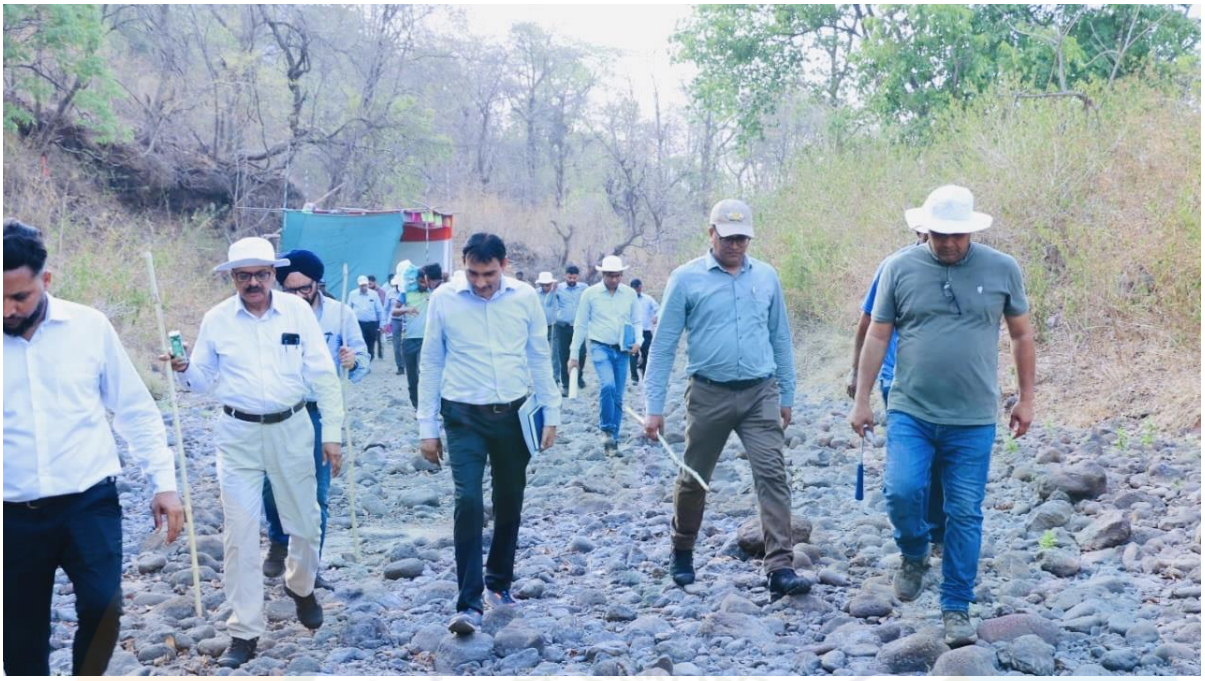

Photo 4. Project proponent walking the expert team through the proposed alignment of powerhouse, tail race tunnel (TRT) and Lower Reservoir (LR) Dam axis as part of the on-site assessment of the S1 project. The walk-through highlights the key geographical and technical aspects of each component.

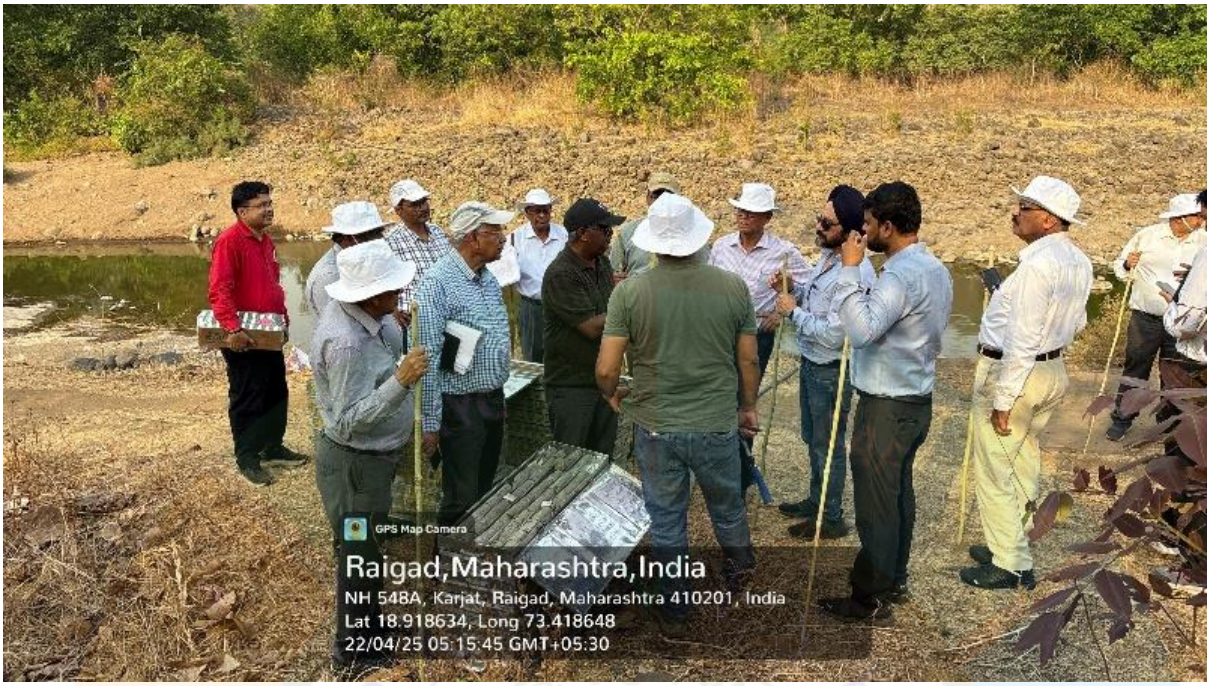

Photo 5. Discussions covered core samples inspection and the potential reuse of excavated material in embankment construction, subjected to the suitability confirmation from CSMRS, rest of the material will be disposed of scientifically at designated muck disposal sites in non-forest areas.

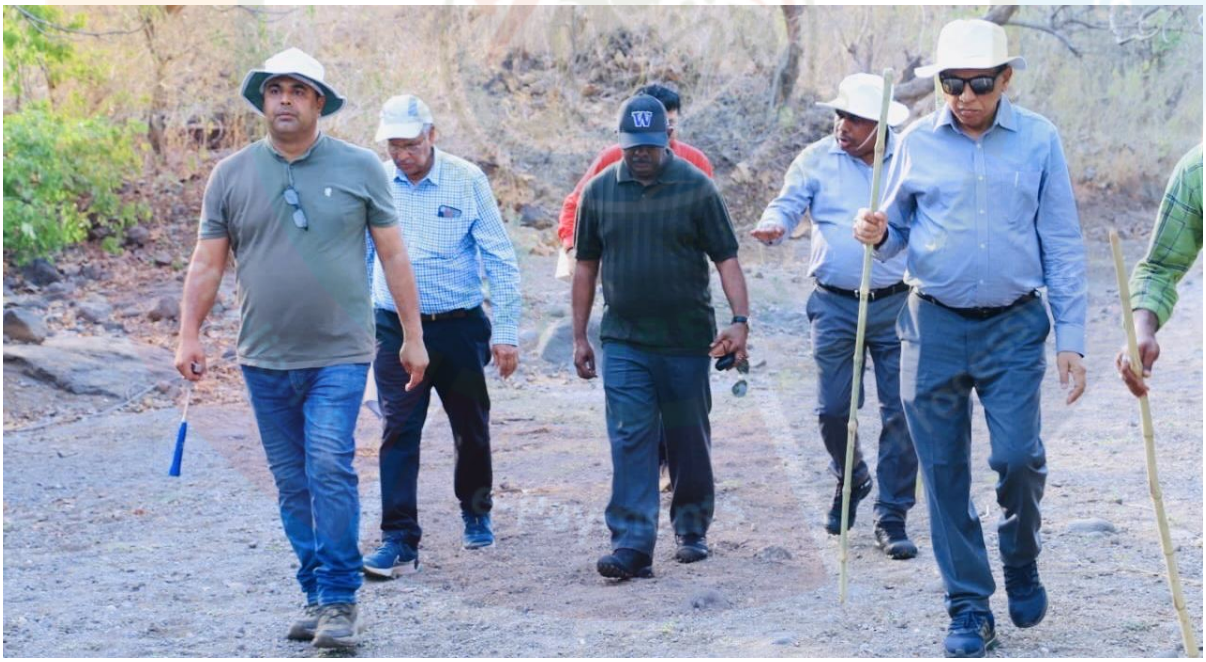

Photo 6. The EAC team conducted an on-site assessment of the local geomorphology and vegetation within the project area. The Torrent team provided a detailed explanation of the regional geology, highlighting the presence of basalt formations—massive, amygdaloidal, and vesicular types—typical of extrusive igneous rock. Geomorphologically, the area comprises of dissected hills and plateau features with three major sets of discontinuities. The EAC team also discussed the planned initiation of sub-surface geological investigations.

Annexure-II

Field site Visit Report undertaken by EAC sub-Committee from 21st to 23rd April 2025 at Saidongar-2 Maval Pumped Storage Project (1200 MW) (Proposal No. IA/MH/RIV/516980/2025) at village Dhak, Kusur, Pali T. Kothal Khalathi and Saidongar, Taluka Karjat, District Raigad, Maharashtra

At the 23rd Meeting of the River Valley and Hydroelectric Projects Sector, held on 29th January 2025 in relation to the aforementioned proposal, it was resolved that a site visit of the proposed project would be undertaken. Accordingly, the Ministry constituted a sub-committee, comprising the following members, to carry out the site inspection with the objective of assessing the environmental safeguard measures and recommending any additional conditions, as per letter No. J-12011/42/2023-IA.I(R) dated 15th April 2025.

Sr.No	Members of Expert Committee visiting Saidongar Sites
1	Prof. G.J. Chakrapani, Chairman
2	Shri Ajay Kumar Lal, Member
3	Dr. Krishnendu Mondal, Joint Director, MoEFCC

The aforesaid committee undertook the visit from 21st to 23rd April 2025 and during the site visit the following officers from M/s Torrent PSH3 Pvt Ltd along with their consultants were present.

10. Shri Lachman Lalwani, Executive Director
11. Shri Kalachand Mahalik, Vice President
12. Shri R S Negi, Vice President
13. Shri Jitendra Thakur, General Manager
14. Shri Basavraj Munnoli, Assistant General Manager
15. Shri Ravinder Bhatia, RS Envirolink Technologies Pvt. Ltd. (ToR Consultant)
16. Dr. Rajdeep, Aarvee Associates (EC Consultant)
17. Shri Umesh Hegde, Tata Consulting Engineers Limited (DPR Consultant)
18. Torrent PSH3 Site team members.

Project Overview

The Project Proponent (PP) commenced the site visit with a comprehensive presentation to the EAC sub-committee. The presentation covered the technical layout of the off-river open loop projects, salient features, environmental baseline data, status of ToR compliance, and findings of the EIA and EMP studies, along with Torrent initiatives in the field of Environment friendliness, health sector and other CSR activities presently in progress. Special emphasis was given to project geology, hydrology, catchment characteristics, water availability certification, and biodiversity conservation plans. The session was followed by an interactive Q&A session, where the PP responded to all queries raised by the committee related to CSR activities, project features, timelines etc. The following details of the project were deliberated before the EAC.

- The Saidongar 2 - Maval Open Loop Pumped Storage Project (PSP) is a 1200 MW (7200 MWH) hydroelectric project proposed by M/s Torrent PSH 4 Private Limited in Raigad district, Maharashtra. The project spans an area of approximately 141.44 hectares, involving five villages—Dhak, Kusur, Pali T. Kothal Khalathi, and Saidongar. The scheme involves the construction of a new upper reservoir (0.26 TMC or 7.22 MCM) and a new lower reservoir (1.02 TMC or 28.96 MCM) as part of an off-stream, open-loop system. The plant is designed to operate with six hours of daily peak power generation and approximately 6.87 hours of water pumping back to the upper reservoir. The initial water requirement will be met from the catchment yield, which will also compensate for evaporation and seepage losses.

- Major civil components include a 29 m high Rockfill Upper Dam, a 59 m high Concrete Gravity Lower Dam with gated spillway, and several associated hydraulic and underground structures such as a powerhouse, transformer hall, intake/outlet tunnels, pressure shafts, tailrace tunnels, and multiple construction adits. The underground powerhouse will house generating units of 3 x 300 MW and 2 x 150 MW, while a detailed layout including main access tunnels and pothead yard is planned.
- The total land requirement includes 105.84 ha of non-forest land and 35.6 ha of forest land, necessitating forest clearance under the Forest (Conservation) Act. There are no protected areas in the immediate vicinity, with the nearest being Bhimashankar Wildlife Sanctuary located about 15

km away. The total estimated cost of the project is approximately Rs. 6088.67 crore, and the anticipated construction period is five years from the commencement of civil works.

Main Observations

IV. Lower Reservoir

- The Subcommittee visited the proposed site and observed that the undulating land surface with considerable stability due to rocky surface mainly consisting of basalt and other solid formation of Sahyadri range.
- The common Lower Reservoir is proposed across the Pej River, a seasonal tributary of the Ulhas River, which is one of the major west-flowing rivers in Maharashtra. During the site visit, the riverbed was observed to be completely dry, reaffirming its non-perennial nature. The reservoir area consists primarily of rocky terrain with negligible vegetation, making it a technically and environmentally feasible location.
- The tree canopy majorly consists of Careya arborea, Terminalia alata, Terminalia arjuna, Terminalia bellerica, Euphorbia nivvulia Madhuca longifolia var. latifolia, and Diospyros melanoxylon, and Ficus hispida.
- The proposed dam at LR is a Concrete Gravity structure with a total length of approximately 718 meters and a height of 59 meters above NSL. The catchment area contributing to the LR is about 23.4 sq. km, yielding approximately 40 million Cubic Meters (MCM) of water annually at 75% dependability. This yield has been certified by the State Water Resources Department, Government of Maharashtra, which has also issued the Water Availability Certificate vide letter dated 13.01.2025.
- The project requires 36 MCM of water for initial one-time filling (23 MCM for S-1 and 13 MCM for S-2), which will be impounded in a phased manner over 2 to 3 years, synchronized with the staggered commissioning schedule of the Saidongar-1 and Saidongar-2 PSPs. Additionally, only 5 MCM of water will be required annually for recoupment of operational losses. Thus, the total requirement remains well within the sustainable yield of the catchment, ensuring no stress on the resource.
- Importantly, the downstream region, extending up to the confluence of the Pej and Ulhas rivers, approximately 20 km downstream—receives perennial flow contributions from the Bhivpuri Hydro Power Station (72 MW) of Tata Power. The tailrace discharge from this station, located just 5.5 km downstream of the project site, provides continuous flow to the Pej River. This ensures uninterrupted water availability for the downstream irrigation canal drawn from the left bank of Pej, which caters to the irrigation and domestic water requirements of local communities.
- Given this hydrological setup, the allocation of water to the Saidongar PSPs will not compromise the competing needs of downstream users. The catchment yield is adequate to support the project without affecting ecological flows or community entitlements. The integration of project scheduling with natural monsoon cycles and existing downstream contributions offers a balanced water management strategy.
- At a glance, no evidence of big mammals or cats could be traced or found. Available documents and certificates relating to their presence, movements or corridors will lead to drawing conclusions on this aspect.

- The proposed site for the Lower Reservoir, located across the Pej River, is assessed to be suitable. There is only a single household in the vicinity, and no displacement is anticipated as a result of the project activities.
- During the site visit, the project proponent presented core samples from boreholes extending to depths of approximately 50 to 100 meters (to be cross-verified with the project proponent and photographic documentation). These samples indicate the presence of basalt rock formations, characterized by minimal fractures or joints, which is favorable from a geotechnical standpoint. The forest cover in the area is not dense, further supporting site suitability.

V. Other locations

- The site team demonstrated drone mapping across key locations including Upper Reservoir areas of Saidongar-1 Karjat PSP and Saidongar-2 Maval PSP, Common Lower Reservoir, Escarpment zones, and alignment of the proposed water conductor system. The drone footage revealed that both the Upper Reservoirs are flat table-land area with minimal grassland vegetation and rocky outcrops indicating very shallow depth of overburden. No habitation, cultivation, or signs of wildlife were observed by the Committee members. The drone mapping provided a global view of the Project areas which were not accessible during the site visit.

VI. Powerhouse

- As per the information provided by the project proponent the Main Access Tunnel & adits will be excavated to reach the required elevation of turbine level. Excavated muck will be reused, subject to confirmation of material suitability from CSMRS, in embankment construction or disposed of scientifically in pre-identified muck disposal sites in the non-forest area.

VII. Upper Reservoir

- With regard to Upper Reservoir 2, the site is currently not accessible by road or foot. However, its location was presented through real-time drone (UAV) footage and photographic images. The selection of this site also appears appropriate. It is noted that the construction of Upper Reservoirs 1 and 2 is planned in a phased manner. Reservoir 2 will be taken up for development following the completion of Reservoir 1. This phased approach allows for any necessary course corrections based on observations and outcomes from the first phase of development.
- The area has sparse vegetation and visible rock outcrops, confirming limited topsoil depth. No wildlife sightings or evidence of habitat corridors were recorded.

VIII. Approach Road

- The approach road from Lower Reservoir to Upper Reservoir 2 is proposed through forest land with a maximum width of 17 meters (average ~12 meters). The PP has been advised to explore scope for optimization of this width as per IRC guidelines, considering turning radius, slope gradient, and type of vehicular movement required during construction. This effort will help minimize forest land diversion (15.09 Ha out of 35.60 Ha proposed forest land) and should be reflected in the final layout.

Recommendations

6. The PP should re-examine the proposed width of the approach road connecting the lower and upper reservoirs, particularly in forested sections. By aligning the design with IRC guidelines and applying principles of minimal impact engineering (e.g., optimizing turning radius, slope grading, and cut/fill balance), the PP should aim to reduce forest land diversion currently proposed for this component.

7. The PP shall prepare and submit a duly approved Wildlife Conservation Plan and Biodiversity Management Plan, specifically addressing the conservation of Schedule-I species if found within or around the project area. These plans must be submitted to and approved by the Chief Wildlife Warden (CWLW) of Maharashtra. The conservation measures should be integrated with the project's overall Environmental Management Plan (EMP) and implemented in coordination with the Forest Department.

8. The PP shall ensure that the allocated water for both initial reservoir filling and annual recoupment is tapped exclusively during the monsoon season, thereby avoiding any adverse impact on the dry-season flow regime and ensuring protection of downstream water users and ecosystems. The water management strategy should include clear monitoring mechanisms and coordination with existing hydropower releases in the Pej and Ulhas rivers. Coordination with Tata Power for sustained tailrace releases and seasonal flow monitoring of the Pej and Ulhas rivers should be part of a transparent, adaptive water management plan.

9. Given the significant excavation required for the deep-seated surface powerhouse, the PP shall develop a comprehensive Muck Management Plan, detailing the volume, handling, reuse potential, and final disposal locations, with preference for non-forest land. Disposal sites must be scientifically stabilized and rehabilitated with appropriate vegetation cover to prevent erosion or habitat degradation.

10. All observations and commitments made during the site visit—especially those related to drone mapping findings, vegetation types, reservoir site conditions, and community interface—must be reflected in the final EIA/EMP. This includes precise mapping, justification of layout alternatives, compliance with ToR conditions, and risk mitigation measures.

    Endorsed by EAC site visit team:

    1. Krishnendu Mondal
    2. A.K. Lal
    3. G. J.Chakrapani

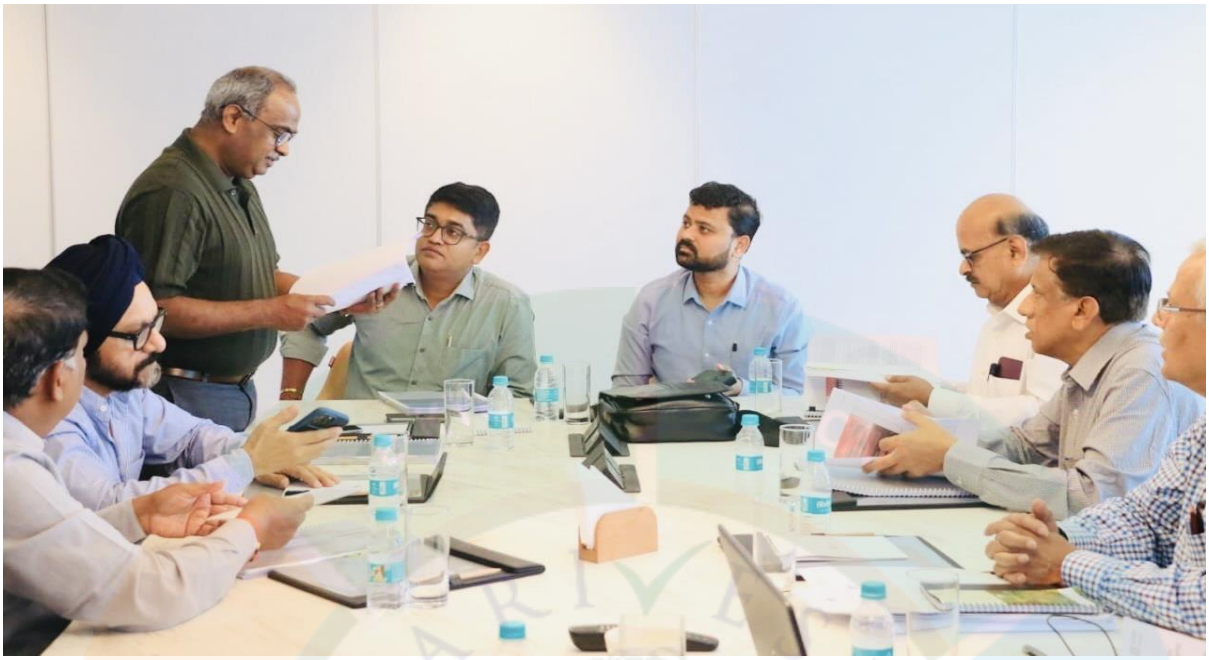

Photo 1. The project proponent (PP) delivered a comprehensive presentation followed by an interactive Q&A session, during which all committee queries were addressed. The PP highlighted Torrent Group's environmental initiatives and ongoing CSR activities focused on children's health and nearby villages.

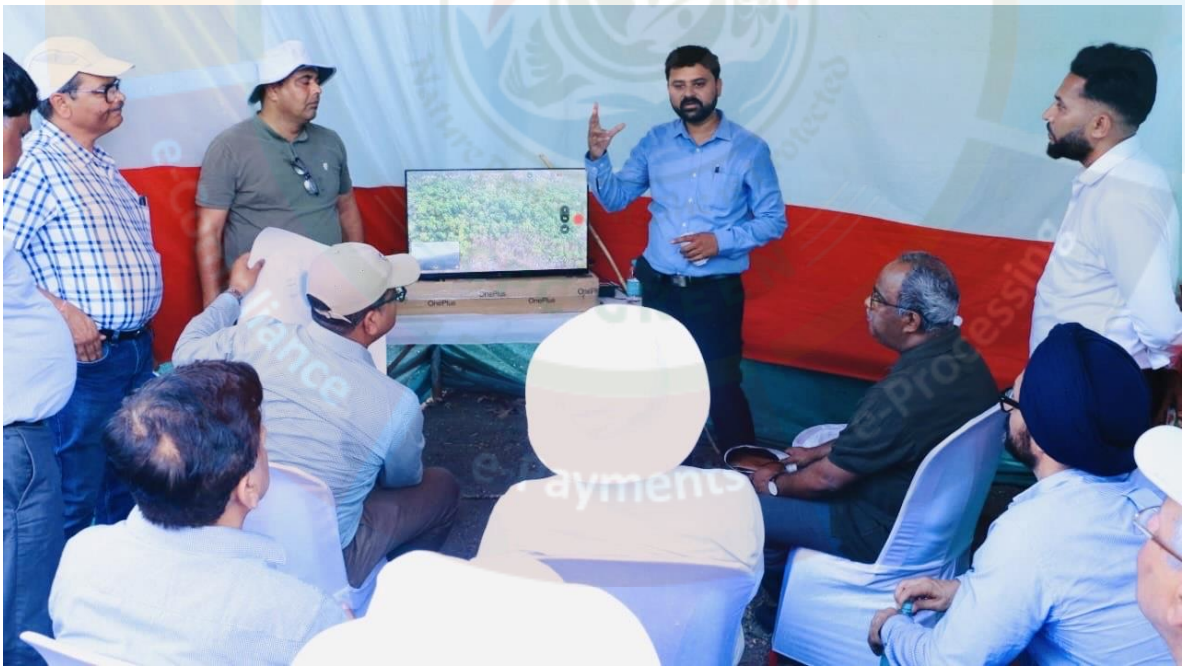

Photo 2. With regard to Upper Reservoir 2, the site is currently not accessible by road or foot. However, its location was presented through real-time drone (UAV) footage and photographic images.

Photo 3. Committee members inspected the site along the Lower Dam Axis, where the proposed Lower Reservoir Dam is planned as a 57 m high Concrete Gravity Dam above NSL. It was observed that the Pej River was completely dry during the visit, and the project proponent informed that it is a seasonal stream with negligible flow for most of the year, except during the monsoon. A detailed discussion was also held on the initial water requirement and the staggered plan to fill the reservoir over a 3 to 5-year period.

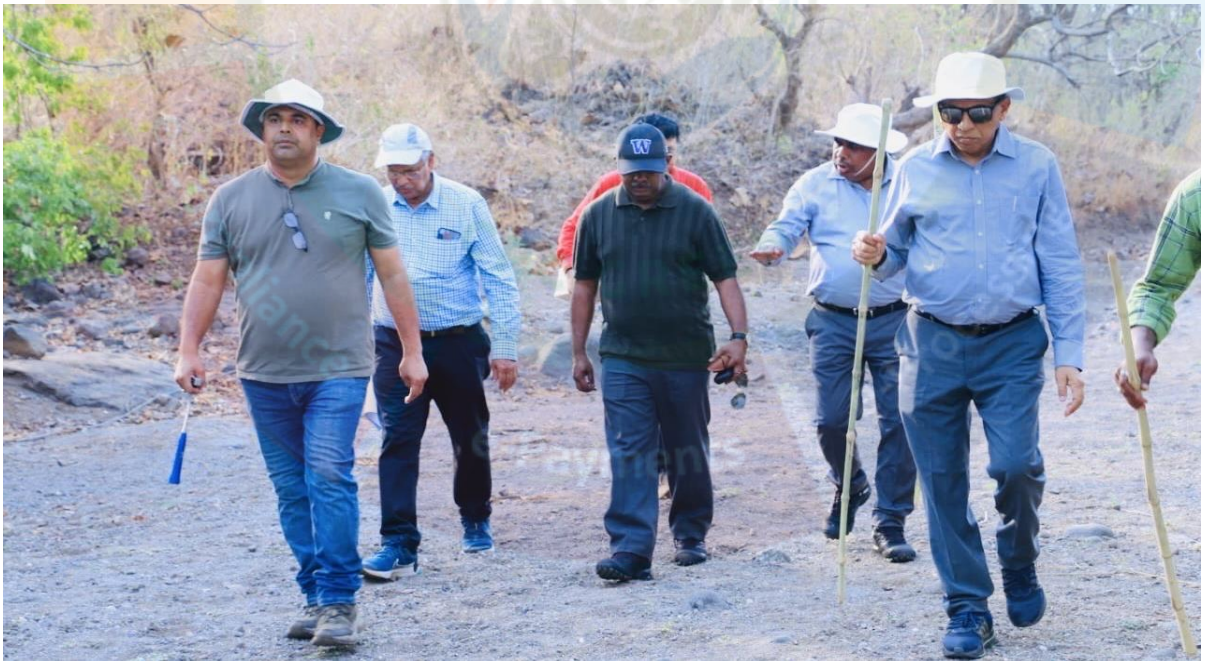

Photo 4. Project proponent walking the expert team through the proposed alignment of powerhouse, tail race tunnel (TRT) and Lower Reservoir (LR) Dam axis as part of the on-site assessment of the S1 project. The walk-through highlights the key geographical and technical aspects of each component.

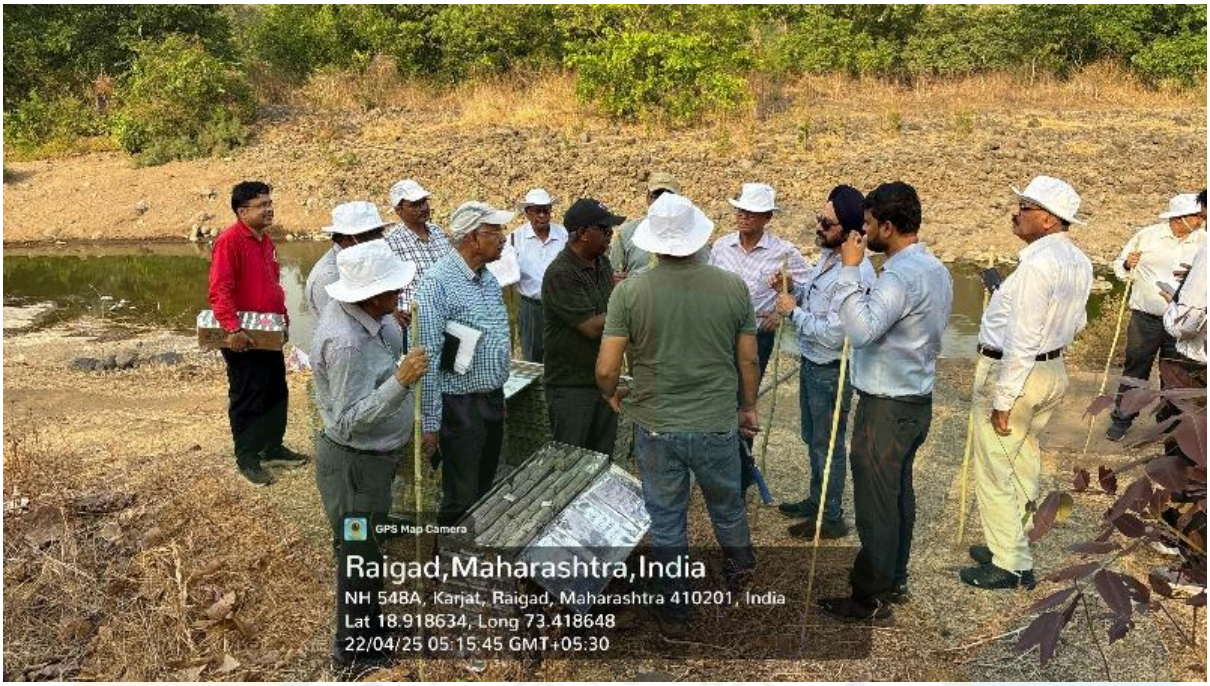

Photo 5. Discussions covered core samples inspection and the potential reuse of excavated material in embankment construction, subjected to the suitability confirmation from CSMRS, rest of the material will be disposed of scientifically at designated muck disposal sites in non-forest areas.

Photo 6. The EAC team conducted an on-site assessment of the local geomorphology and vegetation within the project area. The Torrent team provided a detailed explanation of the regional geology, highlighting the presence of basalt formations—massive, amygdaloidal, and vesicular types—typical of extrusive igneous rock. Geomorphologically, the area comprises dissected hills and plateau features with three major sets of discontinuities. The EAC team also discussed the planned initiation of sub-surface geological investigations.

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