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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 AGENDA OF 42ND MEETING OF THE EXPERT APPRAISAL COMM ITTEE meeting River Valley and Hydroelectric Projects held from 31/10/2025 to 31/10/2025 **Date:** 10/11/2025

MoM ID: EC/MOM/EAC/946225/10/2025

Agenda ID: EC/AGENDA/EAC/946225/10/2025

Meeting Venue: N/A

Meeting Mode: Virtual

Date & Time:

31/10/2025	10:30 AM	05:30 PM

1. Opening remarks

The 42nd 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 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 41st EAC meeting on 13th October, 2025 were confirmed.

3. Details of proposals considered by the committee

Day 1 -31/10/2025

3.1. Agenda Item No 1:

3.1.1. Details of the proposal

Adnadi Pumped Storage Scheme by **ADANI HYDRO ENERGy TEN LIMITED** located at **AMRAVATI,MAHARA**

SHTRA			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Da te**	**Activity Sub-Activity (Schedule Item)**
IA/MH/RIV/554439/20 25	J-12011/37/2025-IA.I(R)	14/10/2025	River Valley/Irrigation projects Standalone Pump Storage Projects (1(c))

3.1.2. Project Salient Features

42.1.1 The proposal is for grant of Terms of Reference (TOR) to the project Adnadi Close Loop Pumped Storage (1500 MW) in an area of 240.61Ha located at Village Adnadi, Bhandri, Jambli, etc, Sub-district Chikhaldara, District Amravati, Maharashtra by M/s Adani Hydro Energy Ten Limited.

42.1.2 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. The Adnadi Pumped Storage Project (PSP), with a proposed capacity of 1500 MW (4×300MW+ 2×150MW) and storage of 9000 MWh, is conceptualized as an off-stream closed-loop pumped storage scheme located in Chikhaldara Taluka, Amravati District, Maharashtra. The proposed scheme involves two newly constructed reservoirs: Upper Reservoir near Kamapur Village, located on a non-perennial nallah and Lower Reservoir near Adnadi Village, located on another non-perennial stream.

ii. Initial Filling and Water Source Since the natural inflows are insufficient to meet the reservoir capacity, initial filling and annual recoupment for evaporation losses will be met from external sources. The two major sources identified for this purpose are:

a) Sapan Dam Reservoir (Gross Storage : 39.26 MCM)

- Located ~4.5 km from the proposed Lower Reservoir
- Adequate gross storage available for one-time diversion
- Proposed to be used via a pipeline or canal for both initial filling and seasonal replenishment

b) Chandrabhaga Dam (Alternate Option)

- Located ~5 km away from the Lower Reservoir
- Gross storage capacity: 41.4 MCM
- Head difference: approx. 120 m
- Can be utilized via a dedicated water conductor system

iii. The geographical co-ordinate of the project are Lower Reservoir: 77° 24' 53.54" E; 21°23' 41.32" N Upper Reservoir : 77° 23' 33.87" E; 21° 24' 22.25" N.

iv. **Land requirement:**

vii. **Project Cost**: The estimated project cost is Rs 7134.07 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).

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

ix. **Environmental Sensitive area**: Melghat Tiger Reserve is about 5 km from project area. ESZ is notified dated 27.12.2016 and project is outside the ESZ. River/ water body, Water will be pumped from Sapan Reservoir.

x. MOU has been signed between Government of Maharashtra and M/s Adani Hydro Energy Ten Ltd. to build PSP with a capacity of 1500 MW on July 07, 2025.

xi. Alternative Studies:

Scheme-1 Features	**Alternate-1 (UR1+LR1)**	**Alternate-2 (UR2+LR1)**	**Alternate-3 (UR2+LR2)**	**Alternate-4 (UR3+LR2)**	**Alternate-5 (UR4+LR3)**
Type of the project	Off Stream Closed Loop	Off Stream Closed Loop	Off Stream Closed Loop	Off Stream Closed Loop	On Stream
Nearest village	U/R - Kamapur Village, L/R - Adnadi Village	U/R - Chichghat Village, L/R - Adnadi Village	U/R - Chichghat Village, L/R - Chinchati Village	U/R - Motha Village, L/R - Chinchati Village	U/R - Wavadi Village, L/R - Adnadi Village
Dam Elevations	U/R - EL 951 m L/R - EL 694 m	U/R - EL 875 m L/R - EL 694 m	U/R - EL 875 m L/R - EL 650 m	U/R - EL 1050 m L/R - EL 650 m	U/R - EL 875 m L/R - EL 675 m
Dam top length (m)	Upper dam – 900m Lower dam – 415m	Upper dam – 1800m Lower dam – 415m	Upper dam – 1800m Lower dam – 900m	Upper dam – 1450m Lower dam – 900m	Upper dam – 900m Lower dam – 500 m
Length of WCS (km)	1.6	1.4	1.25	1.6	1.5
Gross Head	257	181	225	400	200
L/H Ratio	L/H =6.2	L/H =7.7	L/H =5.6	L/H =4.0	L/H =7.5
Wild Life Sanctuary	No wild life sanctuary in the vicinity.	No wild life sanctuary in the vicinity.	No wild life sanctuary in the vicinity.	Upper Reservoir in Melghat Tiger Reserve	No wild life sanctuary in the vicinity.
Project Capacity	upto 1600 MW	upto 1100 MW	upto 1400 MW	upto 2000 MW	upto 1200 MW

Submergence Area	105 Ha (UR1+LR1)	125 Ha (UR 2+LR2)	135 Ha (UR 2+LR2)	147 Ha (UR 2+LR2)	122 Ha (UR 1+LR1)
Accessibility	Both upper and lower reservoir is approachable via MSH203 & village roads.	Both upper and lower reservoir is approachable via MSH203 & village roads.	Both upper and lower reservoir is approachable via MSH203 & village roads.	Both upper and lower reservoir is approachable via MSH 203 & village roads.	Both upper and lower reservoir is approachable via MSH203 & village roads.
Water Source	Sapan Dam Reservoir is about 4.5 km from Lower Reservoir.	Sapan Dam Reservoir is about 4.5 km from Lower Reservoir.	Chandrabhaga Dam Reservoir is about 3.0 km from Lower Reservoir.	Chandrabhaga Dam Reservoir is about 3.0 km from Lower Reservoir.	Sapan Dam Reservoir is about 4.5 km from Lower Reservoir.
Conclusion	Minimum Dam Length & Submergence Area	Low Head, High L/H	Longer Dam length & Submergence Area	Wildlife	Low Head, High L/H
	Selected	Rejected	Rejected	Rejected	Rejected

1	**EAC MEETING DETAILS**				
i	EAC meeting/s	:	42nd Meeting		
ii	Date of Meeting/s	:	31.10.2025		
iii	Date of earlier EAC meetings	:	Nil		
2	**PROJECT DETAILS**				
i	Name of the Proposal	:	Adnadi Close Loop Pumped Storage Project		
ii	Location (including coordinates)	:	Proposed upper reservoir located near Kamapur Village and lower reservoir near Adnadi Village in Chikhaldara Taluka, Amravati District of Maharashtra State		
			Reservoir	**Latitude**	**Longi**

					tude
			Lower Reservoir	21°23' 41.32" N	77° 24' 53.54" E
			Upper Reservoir	21°24'22.25" N	77° 23' 33.87" E.
iii	Interstate Issue	:	No		
iv	Seismic Zone	:	Zone-III		
3	**CATEGORY DETAILS**				
i	Category of the project	:	A		
ii	Provisions	:	-		
iii	Capacity	:	1500MW		
iv	Attracts the General Conditions (Yes/No)	:	Yes		
v	Additional Information if any	:	No		
4	**ELECTRICITY GENERATION AND CAPACITY**				
i	Powerhouse Installed Capacity	:	1500 MW		
ii	Generation of Electricity Annually	:	3121 MU		
iii	No. of Units	:	6 nos. (4 x 300 MW + 2 x 150 MW)		

iv	Additional information (if any)	:	Nil
5	**TOR/EC DETAILS**		
i	Cost of project	:	7134.07 Cr.
ii	Total area of Project	:	240.61 ha
iii	Height of Dam from Riverbed (EL)	:	Lower Dam – 77.0 m Upper Dam –73.0 m
iv	Length of Tunnel/Channel	:	1600 m
v	Details of Submergence area	:	144.340
vi	Types of Waste and quantity of generation during construction/ Operation	:	Muck from excavation, solid waste from labour colony and construction waste
vii	E-Flows for the Project	:	Not Applicable, as this is Closed Loop Pumped Storage Project (PSP)
viii	Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, the	:	No
a	E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin.	:	Not Applicable
b	If not the E-Flows maintain criteria for sustaining river ecosystem.	:	Not Applicable
ix.	No. of trees/saplings proposed in view of 'Ek Ped Maa Ke Naam' campaign		500
6	**MUCK MANAGEMENT DETAILS**		
i	No. of proposed disposal area/ (type of land-Forest/Pvt. land)	:	14.84 ha (Non-Forest Land)

ii	Muck Management Plan	:	Will be Provided in EIA/EMP report
iii	Monitoring mechanism for Muck Disposal	:	Will be Provided in EIA/EMP report
7	**LAND AREA BREAK-UP**		
i	Private Land	:	76.84 ha
ii	Government land	:	-
iii	Forest Land	:	163.77 ha
iv	Total Land	:	240.61 ha
v	Submergence area/Reservoir area	:	144.34 ha
vi	Additional information (if any)		Nil

8	**PRESENCE OF ENVIRONMENTALLY SENSITIVE AREAS IN THE STUDY AREA**		
S. no	**Forest Land/ Protected Area/ Environmental Sensitivity Zone**		**Details of Certificate/letter/Remarks**
i	Reserve Forest/PF Land		Melghat Tiger Reserve is about 5 km from project area. ESZ is notified dated 27.12.2016 and project is outside the ESZ.
ii	National Park		
iii	Wildlife Sanctuary		

9	**COURT CASE DETAILS**		
i	Court Case	:	Nil

ii	Additional Information if any	:	Nil
10	**AFFIDAVIT/UNDERTAKING DETAILS**		
i	Affidavit/Undertaking	:	Enclosed
ii	Additional information (if any)	:	Nil
11	**PREVIOUS EC COMPLIANCE AND NECESSARY APPROVALS**		
i	Certified EC compliance report (if applicable)	:	Not Applicable
ii	Status of Stage- I FC	:	Yet to Apply
iii	Additional detail (If any)	:	Nil
iv	Is FRA (2006) done for FC-I		Yet to Apply
12	**Miscellaneous**		
i.	Details of consultant		M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (NABET Accredited Consultant Organization) Certificate No
	Validity		August 15, 2028
	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
ii	Project Benefits		o Least expensive source of electri

			city, not requiring fossil fuel fo r generation o An emission-free renewable sou rce o Balancing grid for demand drive n variations o Balancing generation driven vari ations o Voltage support and grid stabilit y Apart from this, proposed PSP will also benefit the local community by creatin g employment opportunities and will re sult in upliftment of livelihood and soci o-economic conditions.
iii	Status of other statutory clearan ces		Forest Clearance - Online application s eeking forest diversion for around 163. 77 Ha after receipt of ToR Approval. Al ongside, other statutory clearances (as applicable) from State as well as Centr al government will be obtained post co mpletion of Detailed Project Report.
iv	R&R details		Details shall be evaluated during EIA/E MP Studies
v	Additional detail (If any)		Nil

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 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 Committee noted that the Upper Reservoir near Kamapur Village is proposed on a non-perennial nallah, and the Lower Reservoir near Adnadi Village is located on another non-perennial stream. Since both reservoirs are situated on natural nallahs/streams, the committee opined that the project shall be categorized as an open-loop project rather than a closed-loop PSP. Further, during the meeting, the PP informed that the water received from the catchment would be released downstream into the river. Accordingly, the EAC advised that a detailed plan for this arrangement be prepared in consultation with a reputed institution, along with a suitable monitoring mechanism to ensure compliance.

· The EAC noted that the total land requirement for the project is around 240.61 ha, out of which 76.84 ha is non-forest land and 163.77 ha is forest land. Diversion of forest land for

non-forest purpose will be involved for construction of Project components. 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 forest area falling within and around the project site comprises a very dense canopy, indicating a mature and ecologically sensitive forest ecosystem. Such dense canopy cover suggests the presence of significant biodiversity, including large trees, undergrowth, and potential habitats for wildlife species. The Committee emphasised the need for detailed survey of the study area to collect appropriate data on wild flora and fauna so that impact prediction can be done accurately considering the aspects like fragmentation of habitat, and disruption of ecological functions etc.

· The EAC observed that the Melghat Tiger Reserve is located approximately 5 km from the project site. The Eco-Sensitive Zone (ESZ) of the Reserve was notified on 27.12.2016, and the project lies outside the notified ESZ. Although the project boundary is beyond the ESZ and meets the prescribed criteria for establishment of the project, the committee expressed concern regarding the possible impact on tiger movement in the area. Accordingly, the EAC recommended that the opinion of the Chief Wildlife Warden be obtained to assess potential wildlife implications and ensure due safeguards.

· The EAC noted that the project area and surrounding villages are inhabited by a substantial tribal population, whose livelihood and cultural practices are closely linked to the local land, forest and river resources. The Committee emphasized that the EIA/EMP must include a detailed assessment of impacts on tribal communities, supported by primary socio-economic data and consultations. The EAC further advised that a Tribal Development Plan, aligned with statutory provisions and benefit-sharing measures, shall be prepared and submitted along with the EIA report.

· The Project Proponent has submitted a Memorandum of Understanding (MoU) signed between Government of Maharashtra and M/s Adani Hydro Energy Ten Ltd. to build PSP with a capacity of 1500 MW on July 07, 2025.

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.	Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly approved by CWC/CEA 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.	Detailed plan to restore wider roads and convert them into narrow up to 10m after

	construction of the project.
6.	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.
7.	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.
8.	A Sub-committee comprising members from EAC shall visit the site before considering the proposal for EC.
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.	The EIA/EMP shall include a detailed socio-economic assessment of the tribal population in the project-affected area based on primary data and community consultations. A Tribal Development Plan, prepared in consultation with the District Administration and Tribal Welfare Department, shall be submitted along with the EIA report.
4.	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.
5.	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.	The PP will submit 10 years water availability data certified by the CWC/State Water Resource Department for quantity of water that is received annually by the small stream on which upper and lower reservoir is proposed to be constructed.
2.	The PP will submit a a detailed plan and monitoring mechanism for releasing the self - catchment water of small stream draining in to reservoirs along with action plan for conservation and protection of other streams/rivulets draining in to upper and lower reservoirs.
3.	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. The monitoring mechanism to ensure the survival of saplings shall be finalised in consultation with ICFRE.
4.	Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 163.77 Ha of forest land involved in the project shall be submitted within stipulated time.
5.	Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area.
6.	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. A specific opinion on Melghat Tiger Reserve shall be obtained.
7.	Transportation Plan for transporting construction materials shall be submitted. Separate chapter for risk assessment of such transportation through/within proposed the Wildlife Sanctuary shall be included in the EIA report.
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.	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.
13.	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.
14.	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.
15.	Action plan for survival or diversion of the rivulets/stream, if any, leading to join river shall be submitted.
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.	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.
2	Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI.

1.	

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.
1	Land details including forests, private and other land.

2.	
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 f ollows:	
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, 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, 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.
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.
2	Impact on fish migration and habitat degradation due to decreased flow of water

3.	
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.	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.
2.	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.
3.	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.
4.	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.
5.	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.
6.	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.
7.	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.
8.	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.
9.	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.
10.	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.
11.	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.
12.	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.
13.	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.
14.	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.
15.	Labour Management Plan for their Health and Safety.
16.	Sanitation and Solid waste management plan for domestic waste from colonies and labour camps etc.
17.	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.
18.	Environmental safeguards during construction activities including Road Construction.
19.	A summary of Cost Estimates for all the plans, cost for implementing all the Environmental Management Plans.
20.	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

Mudghusri Pumped Storage Project by **RENEW VIDYUT TEJ PRIVATE LIMITED** located at **KABIRDHAM,CHHATTISGARH**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity Sub-Activity (Schedule Item)**
IA/CG/RIV/553919/2025	J-12011/38/2025-IA.I(R)	13/10/2025	River Valley/Irrigation projects Standalone Pump Storage Projects (1(c))

3.2.2. Project Salient Features

The proposal is for grant of Terms of References (ToR) to the project for Mudghusri Close Loop Pumped Storage (1000 MW) in an area of 307 Ha located at Village Murghusri & Reserved Forest, Sub-district Bodla, District Kabeerdham, Chhattisgarh by M/s Renew Vidyut Tej Private

Limited.

42.2.2 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:

(Source: Census 2011; Mission Antyodaya 2020)

vii. **Project Cost:** The estimated project cost is Rs 7377.44 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).

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

ix. **Environmental Sensitive area:** Bhoramdev WLS is about 9.2 km from project area. ESZ is not notified; therefore Wildlife clearance is applicable. River/ water body, Water will be pumped from Chhirpani Reservoir.

x. The MOU has been signed between Government of Chhattisgarh and M/s Renew Vidyut Tej Pvt. Ltd with a capacity of 1000 MW on March 10, 2025.

xi. Alternative Studies:

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

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

· **Project details:**

Name of the Proposal	Mudghusri Close Loop Pumped Storage Project
Location (Including coordinates)	Lower Reservoir : Latitude: 22°14' 10.21" N Longitude: 81° 12' 13.98" E Upper Reservoir : Latitude: 22° 15' 15.93" N Longitude: 81° 11' 29.90" E

Inter- state issue involved	No
Seismic zone	Zone-II

Category of the project	A
Provisions	
Capacity / Cultural command area (CCA)	1000 MW
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	Nil
Powerhouse Installed Capacity	1000 MW
Generation of Electricity Annually	2080.5 MU
No. of Units	4 nos. (4 x 250 MW)
Additional information (if any)	Nil
Cost of project	7377.44 Cr.
Total area of Project	307.0 ha
Height of Dam from River Bed (EL)	Lower Dam – 32.0 m Upper Dam – 45.0 m
Length of Tunnel/Channel	5000 m
Details of Submergence area	133.69
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

No. of trees/saplings proposed in view of 'Ek Ped M aa Ke Naam' campaign	500
No. of proposed disposal area/ (type of land- Forest/Pvt. land)	60 ha (Non-Forest Land)
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report
Private Land	112.0 ha
Government land	-
Forest Land	195.0 ha
Total Land	307.0 ha
Submergence area/Reservoir area	133.69 ha
Additional information (if any)	Nil

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate / letter/ Remarks**
Reserve Forest/Protected Forest Land	--	· Bhoramdev WLS is about 9.2 km from project area. · ESZ is not notified; therefore Wildlife clearance is applicable.
National Park	--- --	
Wildlife Sanctuary	--- --	

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	Not Applicable
Status of Stage- I FC	Yet to Apply
Additional detail (If any)	Nil
Is FRA (2006) done for FC-I	Yet to Apply

Particulars	**Details**
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (NABET Accredited Consultant Organization) Certificate No : NABET/EIA/25-28/RA0415 Validity : August 15, 2028

	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	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 195.0 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

3.2.3. 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 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 Mudghusri Close Loop Pumped Storage (1000 MW) in an area of 307 Ha located at Village Murghusri & Reserved Forest, Sub-district Bodla, District Kabeerdham, Chhattisgarh by M/s Renew Vidyut Tej 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 observed that the Mudghusri pumped storage project comprises of Upper and Lower reservoir located away from riverine system and therefore it is treated as a close loop PSP. To generate 1000 MW of pea power daily for a duration of about 6 hours by utilizing a

gross head of about 221.33 m available at project site. For the scheme about 11.58 Mm 3 of net storage is required for project. The Water required for initial reservoir filling is proposed to be met from existing Chhirpani reservoir. Chhirpani reservoir has been constructed on Phonk nallah which is a tributary of Chhirpani river which is in turn a tributary of Seonath River which is in turn a tributary of Mahanadi River. The Committee was informed that water from the Chhirpani Reservoir is currently being used by the Water Resources Department for irrigation purposes. Despite this usage, there is still adequate water available in the reservoir for the proposed project.

· The EAC noted that the total land requirement for the project is around 307.0 ha, out of which 112.0 ha is non-forest land and 195.0 ha is forest land. Diversion of forest land for non-forest purpose will be involved for construction of Project components. 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.

· It has been observed that a Memorandum of Understanding (MoU) was signed between the Government of Chhattisgarh and M/s Renew Vidyut Tej Pvt. Ltd. on March 10, 2025, for the development of a 1000 MW capacity project.

3.2.5. Recommendation of EAC

Recommended

3.2.6. Details of Terms of Reference

3.2.6.1. Specific

Miscellaneous:	
1.	Both capital and recurring expenditure under EMP shall be submitted.
2.	Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly appraised by CWC/CEA 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 195.0 ha of forest land involved in the project shall be submitted within stipulated time.
4.	A detailed assessment shall be carried out to optimize and possibly reduce the land area earmarked for quarrying area.
5.	Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area.
6.	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.
7.	PP shall submit the detailed plan for filling the reservoir from the Chhirpani reservoir along with necessary approval form water resource department.
8.	Transportation Plan for transporting construction materials shall be submitted.
9.	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.
10.	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.
11.	Calculation and values of GHGs (CO_2, CH_4 etc.) emissions during construction and during operation till the life of the project shall be estimated and submitted.
12.	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.
13.	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.
14.	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.
15.	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.
16.	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.
17.	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.
18.	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.
19.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
20.	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.
21.	Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI.

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.
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 f ollows:	
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, 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, 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
4	Fauna study and inventorisation should be carried out for all groups of animals in the study area. Their

5.	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.
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
1	Water pollution from labour colonies/ camps and washing equipment.

1.	
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.
1	Sanitation and Solid waste management plan for domestic waste from colonies and labour camps etc.

7.	
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.

3.3. Agenda Item No 3:

3.3.1. Details of the proposal

Gond Major Irrigation Project by **EEWRD SINGRAULI** located at **SINGRAULI,MADHYA PRADESH**			
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 Sub-Activity (Schedule Item)**
IA/MP/RIV/554406/2025	J-12011/36/2023-IA.I (R)	09/10/2025	River Valley/Irrigation projects Multi purpose project with Irrigation and Hydro Power Generation Component (1(c))

3.3.2. Project Salient Features

The proposal is for grant of amendment in terms of references for Gond Major Irrigation Project (10 MW & CCA of 33,015 ha) in an area of 1088.57 Ha located at Village Siroli, Sikra, Bakwa, Bhadaili, etc, Sub-District Majhauli, Kusmi and Deosar, District Singrauli and Sidhi, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh.

42.3.1 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:

vii. It is proposed to complete the construction of project within a period of 4 years at an estimated cost of INR 745.00 crore.

viii. The proposal is for amendment in the Terms of Reference granted by the Ministry vide TOR identification No. TO23A0505MP5971902N dated 31/08/2023 for the project Gond Major Irrigation Project (20.40 MW and CCA: 41250) located at Village Jhara and Gotra, Tehsil Sarai and Kushmi, District Singrauli and Sidhi, Madhya Pradesh in favour of M/s Water Resource Department, Govt. of Madhya Pradesh.

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

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
1	**Subject**	Gond Major Irrigation Project (20.40 MW and CCA: 41250) at Village Jhara and Gotra, Tehsil Sarai and Kushmi, District Singrauli and Sidhi, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh	Gond Major Irrigation Project – Gotra Dam (10 MW and CCA: 33015 ha) in Tehsil Kusmi of District Sidhi and Tehsil Sarai of District Singrauli, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh	The earlier proposal envisages construction of 2 barrages, one each at Songarh and Gotra. Songarh Barrage is proposed at a distance of 0.34 km from the core zone and entirely inside the buffer zone of Sanjay Tiger Reserve. In order to avoid the proximity to Sanjay Tiger Reserve, Water Resource Department, Govt. of Madhya Pradesh, planned to go ahead with Gotra Barrage only with dam in Sidhi district and submergence area spreading over Sidhi and Singrauli districts. As a result, power generation capacity got reduced from 20.40 MW to 10 MW and CCA got reduced from 41250 ha to 33015 ha.
2	**Para 1**	This is in reference to your application for grant of Terms of Reference under the provision of the EIA Notification 2006, as amended in respect of project Gond Major Irrigation Project (20.40 MW and CCA: 41250)	This is in reference to your application for grant of Terms of Reference under the provision of the EIA Notification 2006, as amended in respect of project Gond Major Irrigation Project – Gotra Dam (10 MW and CCA: 33015 ha)	The decrease in power generation capacity from 20.40 MW to 10 MW and CCA from 41250 ha to 33015 ha is due to the construction of single barrage instead of 2 barrages.
3	**Para 2 (vii) Name of the project**	Gond Major Irrigation Project	Gond Major Irrigation Project – Gotra Dam	The earlier proposal envisages construction of 2 barrages, one each at Songarh and Gotra. No

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
				w, Water Resource Department, Govt. of Madhya Pradesh, planned to go ahead with Gotra Barrage only.
4	**Para 7**	The MoEF&CC has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006, as amended and after accepting the recommendations of the Expert Appraisal Committee hereby decided to grant Terms of Reference for instant proposal of Gond Major Irrigation Project (20.40 MW and CCA: 41250) at Village Jhara and Gotra, Tehsil Sarai and Kushmi, District Singrauli and Sidhi, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh, under the provisions of EIA Notification, 2006, as amended.	The MoEF&CC has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006, as amended and after accepting the recommendations of the Expert Appraisal Committee hereby decided to grant Terms of Reference for instant proposal of Gond Major Irrigation Project – Gotra Dam (10 MW and CCA: 33015 ha) in Tehsil Kusmi of District Sidhi and Tehsil Sarai of District Singrauli, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh, under the provisions of EIA Notification, 2006, as amended.	The earlier proposal envisages construction of 2 barrages, one each at Songarh and Gotra. Songarh Barrage is proposed at a distance of 0.34 km from the core zone and entirely inside the buffer zone of Sanjay Tiger Reserve. In order to avoid the proximity to Sanjay Tiger Reserve, Water Resource Department, Govt. of Madhya Pradesh, planned to go ahead with Gotra Barrage only with dam in Sidhi district and submergence area spreading over Sidhi and Singrauli districts. As a result, power generation capacity got reduced from 20.40 MW to 10 MW and CCA got reduced from 41250 ha to 33015 ha.
Annexure-II				
5	**Details of Products & By-products**	Irrigation: 41250 ha Hydro Power: 20.40 MW	Irrigation: 33015 ha Hydro Power: 10 MW	The decrease in power generation capacity from 20.40 MW to 10 MW and CCA from 4125

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
				0 ha to 33015 ha is due to the construction of single barrage instead of 2 barrages.
Annexure-III				
6	**The details of the project: Point - i**	The proposal is for ToR to the project Gond Major Irrigation Project (20.40 MW and CCA: 41250) located at Village Jhara and Gotra, Tehsil Sarai and Kushmi, District Singrauli and Sidhi, Madhya Pradesh by M/s. Water Resource Department, Govt. of Madhya Pradesh	The proposal is for ToR to Gond Major Irrigation Project – Gotra Dam (10 MW and CCA: 33015 ha) in Tehsil Kusmi of District Sidhi and Tehsil Sarai of District Singrauli, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh	The earlier proposal envisages construction of 2 barrages, one each at Songarh and Gotra. Songarh Barrage is proposed at a distance of 0.34 km from the core zone and entirely inside the buffer zone of Sanjay Tiger Reserve. In order to avoid the proximity to Sanjay Tiger Reserve, Water Resource Department, Govt. of Madhya Pradesh, planned to go ahead with Gotra Barrage only with dam in Sidhi district and submergence area spreading over Sidhi and Singrauli districts. As a result, power generation capacity got reduced from 20.40 MW to 10 MW and CCA got reduced from 41250 ha to 33015 ha.
7	**The details of the project: Point - iv**	The estimated project cost is Rs. 1316.00 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).	The estimated project cost is Rs. 745.00 Crore. Total capital cost earmarked towards environmental pollution control measures will be worked out during EIA study as well as the Recurring cost (operatio	The earlier proposal envisages construction of 2 barrages, one each at Songarh and Gotra. Now, Water Resource Department, Govt. of Madhya Pradesh, planned to go ahead with Gotra Barrage only.

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
			n and maintenance).	
	Point Number – vii **The salient features of the project are as under: -**			
	Project details:			
8	**Name of the Proposal**	Gond Major Irrigation Project	Gond Major Irrigation Project – Gotra Dam	The earlier proposal envisages construction of 2 barrages, one each at Songarh and Gotra. Now, Water Resource Department, Govt. of Madhya Pradesh, planned to go ahead with Gotra Barrage only.
9	**Location (Including coordinates)**	Songarh/ Jhara Barrage is located near Jhara village, Sarai Tehsil, Singrauli district of Madhya Pradesh with the geographical latitude of 23°59' 21.69" N and longitude of 82°6' 8.03" E. The Gotra Barrage is located near Gotra village, Kushmi Tehsil, Sidhi district of Madhya Pradesh with the geographical latitude of 24°5' 24.49" N and longitude of 81°54' 21.15" E.	The Gotra Barrage is located near Gotra village, Kusmi Tehsil, Sidhi district of Madhya Pradesh with the geographical latitude of 24°5' 9.72" N and longitude of 81°54' 25.51" E.	The earlier proposal envisages construction of 2 barrages, one each at Songarh and Gotra. Now, Water Resource Department, Govt. of Madhya Pradesh, planned to go ahead with Gotra Barrage only.
	Category details:			
10	**Capacity / Cultural command area (CCA)**	41250 ha	33015 ha	The decrease in CCA from 41250 ha to 33015 ha is due to the construction of single barrage instead of 2 barrages.
	Electricity generation capacity:			
11	**Powerhouse Installed Cap**	20.40 MW	10 MW	The decrease in power generation capacity fro

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
	acity			m 20.40 MW to 10 MW is due to the construction of single barrage instead of 2 barrages.
12	**No. of Units**	4 nos. (5.10 MW each)	2 nos. (5 MW each)	The decrease in power generation capacity from 20.40 MW to 10 MW is due to the construction of single barrage instead of 2 barrages.
	ToR Details:			
13	**Cost of project**	1316.00 Cr.	745.00 Cr.	The earlier proposal envisages construction of 2 barrages, one each at Songarh and Gotra. Now, Water Resource Department, Govt. of Madhya Pradesh, planned to go ahead with Gotra Barrage only.
14	**Total area of Project**	2380.104 ha	1088.57 ha	The land area has decreased due to the construction of single barrage instead of 2 barrages.
15	**Height of Dam from River Bed (EL)**	Songarh Barrage – 20.0 m Gotra Barrage – 16.0m	16.0m	Since it is proposed to construct Gotra Dam only and there are no changes in the features of Gotra Dam.
16	**Details of Submergence area**	2327.104 ha	1083.82 ha	The submergence area has decreased due to the construction of single barrage instead of 2 barrages.
17	**E-Flows for the Project**	Water will be stored during monsoon and diverted for irrigation. Available annual 75% dependable total yield at Son	Water will be stored during monsoon and diverted for irrigation. Available annual	Since it is proposed to construct Gotra Dam only and there are no changes in the features of Gotra Dam.

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		garh Barrage and Gotra Barrage is 678.642 MCM and 878.136 MCM respectively. There are 7 upstream projects for which water allocation (u/s commitment) is 5.76 MCM. Hence net available yield at Songarh Barrage and Gotra Barrage is 672.882 MCM and 872.376 MCM respectively. Approximately 95% of the yield is contributed by monsoon flow and only about 5% yield will be come from non-monsoon period. Therefore, to mitigate the impact of reduced flow or drying up of the river downstream of the dam; the project is designed with live storage/ proposed utilization of 75.66 MCM and 43.30 MCM at Songarh Barrage and Gotra Barrage respectively, and remaining water from monsoon contribution will be continuously discharged for downstream and upstream users. The quantum works out to be 597.222 MCM and 829.076 MCM at Songarh Barrage and Gotra Barrage respectively. Almost 89% and 95% of the water will be available at Songarh Barrage and Gotra Barrage respectively in pre-project conditions. Therefore, no additional environment flow is required to be released during monsoon period. To ensure that downstream conditions do not chan	75% dependable total yield at Gotra Barrage is 878.136 MCM. There are 7 upstream projects for which water allocation (u/s commitment) is 5.76 MCM. Hence net available yield at Gotra Barrage is 872.376 MCM. Approximately 95% of the yield is contributed by monsoon flow and only about 5% yield will be come from non-monsoon period. Therefore, to mitigate the impact of reduced flow or drying up of the river downstream of the dam; the project is designed with live storage/ proposed utilization of 43.43 MCM, and remaining water from monsoon contribution will be continuously discharged for downstream and upstream users. The quantum works out to be 829.076 MCM. Almost 95% of the water will be available at Gotra Barrage in pre-project conditions. Therefore, n	

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		ge substantially during non-monsoon period, entire discharge of non-monsoon period is recommended to be released as environmental flow.	o additional environment flow is required to be released during monsoon period. To ensure that downstream conditions do not change substantially during non-monsoon period, entire discharge of non-monsoon period is recommended to be released as environmental flow.	
	Land Area Breakup:			
18	**Private Land**	1110.824 ha	484.54 ha	The requirement of private land has decreased due to the construction of single barrage instead of 2 barrages.
19	**Government land/Forest Land**	1093.710 ha Govt. Land/ 175.570 ha Forest Land	539.78 ha Govt. Land/ 64.25 ha Forest Land	The requirement of Government land/ Forest land has decreased due to the construction of single barrage instead of 2 barrages.
20	**Submergence area/Reservoir area**	2327.104 ha	1083.82 ha	The submergence area has decreased due to the construction of single barrage instead of 2 barrages.
21	**Land required for project components**	53 ha	4.75 ha	The Land required for project components has decreased due to the construction of single barrage instead of 2 barrages.

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
22	**Additional information (if any)**	Total land required – 2380.104 ha	Total land required – 1088.57 ha	Total land required has decreased due to the construction of single barrage instead of 2 barrages.
	Presence of Environmentally Sensitive areas in the study area:			
23	**National Park**	Songarh Barrage is at a distance of 0.34 km from the core zone and its entirely inside the buffer zone of Sanjay Tiger Reserve. Distance between Gotra Barrage and core and buffer zone of Sanjay Tiger Reserve is 13 km and 2 km respectively. Letter No. मा.ची./2023/913 dated 13.02.2023 from the office of CF, Sanjay Tiger Reserve provides the above information.	Gotra Dam is at a distance of 11.8 km from the core zone of Sanjay Tiger Reserve. However, a part of the proposed submergence area along the Gopad river (which is already within water body area of existing Gopad river) is falling inside the notified Ecosensitive Zone. Letter No. तक./2025/5755 dated 09.09.2025 from the office of CCF, Sanjay Tiger Reserve provides the above information.	Since it is proposed to construct Gotra Dam only.
	Previous EC compliance and necessary approvals:			
24	**Status of Stage- I FC**	Proposal No. FP/MP/IRRIG/23033/2016. The proposal is pending with user agency as it is under revision	Online application seeking forest diversion for 167.5 Ha has been submitted vide Proposal No. FP/MP/HYD/IRRIG/480656/2024. The proposal is pending at DFO/ CF/Nodal Officer after acceptance in PSC-I. The proposal for 64.25 Ha of forest land in Singrauli division has been	The proposal was revised considering total 167.50 ha of forest land required for Gond Major Irrigation Project (comprising of Songarh and Gotra Barrages). Currently, since only Gotra barra

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
			approved by DFO on 23/07/2025 (Part II)	ge is proposed, therefore, as per FC Form-A (Part II) submitted by DFO, Singrauli Forest Division, total forest land required for the project is 64.25 ha.
	Miscellaneous:			
25	**Project Benefits**	On completion of the Project the following benefits can be derived: · Annual Rabi irrigation of 41250 Ha. · Rise in sub soil water level in the project area. · Development of fisheries in the reservoir. · Production of crops will increase Hence per capita income will increase. · Employment to local labour largely tribes during construction period.	On completion of the Project the following benefits can be derived: · Annual Rabi irrigation of 33015 Ha. · Rise in sub soil water level in the project area. · Development of fisheries in the reservoir. · Production of crops will increase Hence per capita income will increase. · Employment to local labour largely tribes during construction period.	The decrease in CCA from 41250 ha to 33015 ha is due to the construction of single barrage instead of 2 barrages.
26	**Status of other statutory clearances**	**Forest Clearance:** Online application seeking forest diversion for 383.868 was submitted on 23.10.2017 (Proposal No. FP/MP/IRRIG/23033/2016) As the location of the proposal is revised and forest land requirement has been reduced to 175.57ha, application seeking forest diversio	**Forest Clearance:** Online application seeking forest diversion for 167.5 Ha has been submitted vide Proposal No. FP/MP/HYD/IRRIG/480656/2024. The proposal is pending at DFO/CF/N	The requirement of Forest land has decreased due to the construction of single barrage instead of 2 barrages.

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		n will also be revised. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.	odal Officer after acceptance in PSC-I. The proposal for 64.25 Ha of forest land in Singrauli division has been approved by DFO on 23/07/2025 (Part II) Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.	
27	**R&R details**	522 families residing in 13 villages have been identified as project affected families. Out of the 522 families, 348 families are likely to be displaced. The process of R&R is yet to be initiated. Detailed R&R plan will be Provided in EIA/EMP Report.	Total 15 villages, 4 villages in Singrauli district and 11 villages in Sidhi district will be affected due to the submergence area. Identification of project affected families is under process. The process of R&R is yet to be initiated. Detailed R&R plan will be Provided in EIA/EMP Report.	The number of villages likely to be affected increased due to the detailed survey.

1. EAC Meeting Details:

EAC meeting/s	42nd Meeting
Date of Meeting/s	31/10/2025
Date of earlier EAC meetings	18/07/2023

2. Project details:

Name of the Proposal	Gond Major Irrigation Project – Gotra Dam
Proposal No.	IA/MP/RIV/554406/2025
Location (Including Coordinates)	Dam site is proposed on river Gopad, a tributary of So n river near village Gotra, tehsil Kusmi, district Sidhi, Madhya Pradesh at Latitude 24°05'9.72" N, Longitude 81°54'25.51" E
Company's Name	Water Resources Department, Govt. of Madhya Prade sh
CIN no. of Company/user agency	Not Applicable
Accredited Consultant, Validity an d certificate no.	R S Envirolink Technologies Pvt. Ltd. Certificate No.: NABET/EIA/25-28/RA 0415 Validity: 15-08-2028
Project location (Coordinates/ Riv er/ Reservoir)	Dam site is proposed on river Gopad, a tributary of So n river near village Gotra, tehsil Kusmi, district Sidhi, Madhya Pradesh at Latitude 24°05'9.72" N, Longitude 81°54'25.51" E. Reservoir area extends in tehsil Sarai, district Singraul i, Madhya Pradesh.
Inter- state issue involved	No

3. Category details:

Category of the project	A
Capacity / Cultural command area (CCA)	33015 ha
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	-

4. ToR Details:

Earlier EC Proposal No.	NA
Earlier EAC meeting date	24.07.2023 (for ToR)
EC Letter No.	NA
EC grant Date	NA
Cost of project	Rs. 745.00 Cr.
Total area of Project	1088.57 ha
Date of online application for amendment	09-10-2025

in ToR was	
Details of CTE/CTO	Yet to be obtained
No. of trees/saplings proposed in view of ' Ek Ped Maa Ke Naam' campaign	Will be finalized during the preparation of EIA r eport.

5. Electricity generation capacity:

Powerhouse Installed Capacity	10 MW
Generation of Electricity Annually	Captive use only
No. of Units	2 nos. (5 MW each)

6. Detail reason for amendment in ToR:

The project was proposed with two barrages, one at Songarh in Singraulii district and another at Gotra in Sidhi district both on River Gopad. The project was planned to irrigate 41250 ha of Culturable Command Area along with generation 20.40 MW of electricity. Songarh Barrage was proposed at a distance of 0.34 km from the core zone and entirely inside the buffer zone of Sanjay Tiger Reserve. Therefore, in order to avoid the proximity to Sanjay Tiger Reserve, Water Resource Department, Govt. of Madhya Pradesh has planned to go ahead with Gotra Barrage only. As a result, power generation capacity got reduced from 20.40 MW to 10 MW and CCA got reduced from 41250 ha to 33015 ha. In addition, the land area has reduced from 2380.14 ha to 1088.57 ha. Hence, amendment to scoping clearance is being requested due to revision in project parameters.

7. The comparative statement with reference to earlier proposal and revised proposal is to be given in table format:

S. No.	Details	Original	Revised
1	**Subject**	Gond Major Irrigation Project (2 0.40 MW and CCA: 41250) at Vi llage Jhara and Gotra, Tehsil Sar ai and Kushmi, District Singrauli and Sidhi, Madhya Pradesh by M/s Water Resource Departme nt, Govt. of Madhya Pradesh	Gond Major Irrigation Project – Gotra Dam (10 MW and CC A: 33015 ha) in Tehsil Kusmi of District Sidhi and Tehsil Sar ai of District Singrauli, Madhy a Pradesh by M/s Water Reso urce Department, Govt. of Ma dhya Pradesh
2	**Para 1**	This is in reference to your appli cation for grant of Terms of Ref erence under the provision of th e EIA Notification 2006, as ame nded in respect of project Gond Major Irrigation Project (20.40 MW and CCA: 41250)	This is in reference to your ap plication for grant of Terms of Reference under the provision of the EIA Notification 2006, as amended in respect of proj ect Gond Major Irrigation Proj ect – Gotra Dam (10 MW and CCA: 33015 ha)
3	**Para 2 (vii) Name o**	Gond Major Irrigation Project	Gond Major Irrigation Project

S. No.	Details	Original	Revised
	f the project		– Gotra Dam
4	**Para 7**	The MoEF&CC has examined th e proposal in accordance with t he Environment Impact Assess ment (EIA) Notification, 2006, a s amended and after accepting t he recommendations of the Exp ert Appraisal Committee hereby decided to grant Terms of Refer ence for instant proposal of Go nd Major Irrigation Project (20.4 0 MW and CCA: 41250) at Villa ge Jhara and Gotra, Tehsil Sarai and Kushmi, District Singrauli a nd Sidhi, Madhya Pradesh by M/ s Water Resource Department, Govt. of Madhya Pradesh, under the provisions of EIA Notificatio n, 2006, as amended.	The MoEF&CC has examined the proposal in accordance wi th the Environment Impact As sessment (EIA) Notification, 2 006, as amended and after ac cepting the recommendations of the Expert Appraisal Comm ittee hereby decided to grant Terms of Reference for instan t proposal of Gond Major Irrig ation Project – Gotra Dam (10 MW and CCA: 33015 ha) in T ehsil Kusmi of District Sidhi a nd Tehsil Sarai of District Sing rauli, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh, und er the provisions of EIA Notifi cation, 2006, as amended.
Annexure-II			
5	**Details of Products & By-products**	Irrigation: 41250 ha Hydro Power: 20.40 MW	Irrigation: 33015 ha Hydro Power: 10 MW
Annexure-III			
6	**The details of the p roject: Point - i**	The proposal is for ToR to the p roject Gond Major Irrigation Pro ject (20.40 MW and CCA: 4125 0) located at Village Jhara and Gotra, Tehsil Sarai and Kushmi, District Singrauli and Sidhi, Mad hya Pradesh by M/s. Water Res ource Department, Govt. of Ma dhya Pradesh	The proposal is for ToR to Go nd Major Irrigation Project – G otra Dam (10 MW and CCA: 3 3015 ha) in Tehsil Kusmi of Di strict Sidhi and Tehsil Sarai of District Singrauli, Madhya Pra desh by M/s Water Resource Department, Govt. of Madhya Pradesh
7	**The details of the p roject: Point - iv**	The estimated project cost is R s. 1316.00 Crore. Total capital c ost earmarked towards environ mental pollution control measur es will be worked out during EI A study as well as the Recurring cost (operation and maintenanc e).	The estimated project cost is Rs. 745.00 Crore. Total capita l cost earmarked towards envi ronmental pollution control m easures will be worked out du ring EIA study as well as the R ecurring cost (operation and maintenance).

S. No.	Details	Original	Revised
	Point Number – vii **The salient features of the project are as under: -**		
	Project details:		
8	**Name of the Proposal**	Gond Major Irrigation Project	Gond Major Irrigation Project – Gotra Dam
9	**Location (Including coordinates)**	Songarh/ Jhara Barrage is located near Jhara village, Sarai Tehsil, Singrauli district of Madhya Pradesh with the geographical latitude of 23°59' 21.69" N and longitude of 82°6' 8.03" E. The Gotra Barrage is located near Gotra village, Kushmi Tehsil, Sidhi district of Madhya Pradesh with the geographical latitude of 24°5' 24.49" N and longitude of 81°54' 21.15" E.	The Gotra Barrage is located near Gotra village, Kusmi Tehsil, Sidhi district of Madhya Pradesh with the geographical latitude of 24°5' 9.72" N and longitude of 81°54' 25.51" E.
	Category details:		
10	**Capacity / Cultural command area (CCA)**	41250 ha	33015 ha
	Electricity generation capacity:		
11	**Powerhouse Installed Capacity**	20.40 MW	10 MW
12	**No. of Units**	4 nos. (5.10 MW each)	2 nos. (5 MW each)
	ToR Details:		
13	**Cost of project**	1316.00 Cr.	745.00 Cr.
14	**Total area of Project**	2380.104 ha	1088.57 ha
15	**Height of Dam from River Bed (EL)**	Songarh Barrage – 20.0 m Gotra Barrage – 16.0m	16.0m

S. No.	Details	Original	Revised
16	**Details of Submergence area**	2327.104 ha	1083.82 ha
17	**E-Flows for the Project**	Water will be stored during monsoon and diverted for irrigation. Available annual 75% dependable total yield at Songarh Barrage and Gotra Barrage is 678.642 MCM and 878.136 MCM respectively. There are 7 upstream projects for which water allocation (u/s commitment) is 5.76 MCM. Hence net available yield at Songarh Barrage and Gotra Barrage is 672.882 MCM and 872.376 MCM respectively. Approximately 95% of the yield is contributed by monsoon flow and only about 5% yield will be come from non-monsoon period. Therefore, to mitigate the impact of reduced flow or drying up of the river downstream of the dam; the project is designed with live storage/ proposed utilization of 75.66 MCM and 43.30 MCM at Songarh Barrage and Gotra Barrage respectively, and remaining water from monsoon contribution will be continuously discharged for downstream and upstream users. The quantum works out to be 597.222 MCM and 829.076 MCM at Songarh Barrage and Gotra Barrage respectively. Almost 89% and 95% of the water will be available at Songarh Barrage and Gotra Barrage respectively in pre-project conditions. Therefore, no additional environment flow is required to be released during monsoon period. To ensure that downstream conditions do not change substantially duri	Water will be stored during monsoon and diverted for irrigation. Available annual 75% dependable total yield at Gotra Barrage is 878.136 MCM. There are 7 upstream projects for which water allocation (u/s commitment) is 5.76 MCM. Hence net available yield at Gotra Barrage is 872.376 MCM. Approximately 95% of the yield is contributed by monsoon flow and only about 5% yield will be come from non-monsoon period. Therefore, to mitigate the impact of reduced flow or drying up of the river downstream of the dam; the project is designed with live storage/ proposed utilization of 43.43 MCM, and remaining water from monsoon contribution will be continuously discharged for downstream and upstream users. The quantum works out to be 829.076 MCM. Almost 95% of the water will be available at Gotra Barrage in pre-project conditions. Therefore, no additional environment flow is required to be released during monsoon period. To ensure that downstream conditions do not change substantially during nonmonsoon period, entire discharge of nonmonsoon period is recommended to be released as environmental flow.

S. No.	Details	Original	Revised
		ng nonmonsoon period, entire d ischarge of nonmonsoon period is recommended to be released as environmental flow.	
	Land Area Breakup:		
18	**Private Land**	1110.824 ha	484.54 ha
19	**Government land/F orest Land**	1093.710 ha Govt. Land/ 175.5 70 ha Forest Land	539.78 ha Govt. Land/ 64.25 ha Forest Land
20	**Submergence area/ Reservoir area**	2327.104 ha	1083.82 ha
21	**Land required for p roject components**	53 ha	4.75 ha
22	**Additional informa tion (if any)**	Total land required – 2380.104 ha	Total land required – 1088.57 ha
	Presence of Environmentally Sensitive areas in the study area:		
23	**National Park**	Songarh Barrage is at a distance of 0.34 km from the core zone and its entirely inside the buffer zone of Sanjay Tiger Reserve. Di stance between Gotra Barrage and core and buffer zone of San jay Tiger Reserve is 13 km and 2 km respectively. Letter No. मा.ची./2023/913 date d 13.02.2023 from the office of CF, Sanjay Tiger Reserve provid es the above information.	Gotra Dam is at a distance of 11.8 km from the core zone o f Sanjay Tiger Reserve. Howev er, a part of the proposed sub mergence area along the Gop ad river (which is already with in water body area of existing Gopad river) is falling inside t he notified Eco-sensitive Zone. Letter No. तक./2025/5755 da ted 09.09.2025 from the offic e of CCF, Sanjay Tiger Reserv e provides the above informat ion.
	Previous EC compliance and necessary approvals:		
24	**Status of Stage- I FC**	Proposal No. FP/MP/IRRIG/230 33/201. The proposal is pendin g with user agency as it is under revision	Proposal No. FP/MP/HYD/IRRI G/480656/2024. The proposa l is pending at DFO/CF/Nodal Officer after acceptance in PS C-I.

S. No.	Details	Original	Revised
	Miscellaneous:		
25	**Project Benefits**	On completion of the Project the following benefits can be derived: · Annual Rabi irrigation of 41250 Ha. · Rise in sub soil water level in the project area. · Development of fisheries in the reservoir. · Production of crops will increase Hence per capita income will increase. · Employment to local labour largely tribes during construction period.	On completion of the Project the following benefits can be derived: · Annual Rabi irrigation of 33015 Ha. · Rise in sub soil water level in the project area. · Development of fisheries in the reservoir. · Production of crops will increase Hence per capita income will increase. · Employment to local labour largely tribes during construction period.
26	**Status of other statutory clearances**	**Forest Clearance:** Online application seeking forest diversion for 383.868 was submitted on 23.10.2017 (Proposal No. FP/MP/IRRIG/23033/2016) As the location of the proposal is revised and forest land requirement has been reduced to 175.57ha, application seeking forest diversion will also be revised. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.	**Forest Clearance:** Online application seeking forest diversion for 167.5 Ha has been submitted vide Proposal No. FP/MP/HYD/IRRIG/480656/2024. The proposal is pending at DFO/CF/Nodal Officer after acceptance in PSC-I. The proposal for 64.25 Ha of forest land in Singrauli division has been approved by DFO on 23/07/2025 (Part II). Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
27	**R&R details**	522 families residing in 13 villages have been identified as project affected families. Out of the 522 families, 348 families are likely to be displaced. The process of R&R is yet to be initiated. Detailed R&R plan will be Provided in EIA/EMP	Total 15 villages, 4 villages in Singrauli district and 11 villages in Sidhi district will be affected due to the submergence area. Identification of project affected families is under process. The process of R&R is yet to be initiated. Detailed R&R

S. No.	Details	Original	Revised
		Report.	plan will be Provided in EIA/EMP Report.

8. Court case details: Nil

3.3.3. Deliberations by the committee in previous meetings

N/A

3.3.4. Deliberations by the EAC in current meetings

The EAC during deliberations noted the following:

The proposal is for grant of amendment in Terms of References (TOR) to the project for Gond Major Irrigation Project (10 MW & CCA of 33,015 ha) in an area of 1088.57 Ha located at Village Siroli, Sikra, Bakwa, Bhadaili, etc, Sub-District Majhauli, Kusmi and Deosar, District Singrauli and Sidhi, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh.

The project is listed at S.N.1(c) of the Schedule to the Environment Impact Assessment (EIA) Notification under category 'A' and are appraised at Central Level by Expert Appraisal Committee (EAC).

The Terms of Reference granted by the Ministry vide letter no. J-12011/36/2023-IA.I (R) dated 31/08/2023 for the Gond Major Irrigation Project (20.40 MW and CCA: 41250) at Village Jhara and Gotra, Tehsil Sarai and Kushmi, District Singrauli and Sidhi, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh.

The EAC noted that the earlier proposal comprised two barrages—one at Songarh in Singrauli district and the other at Gotra in Sidhi district—both located on the Gopad River. The project was originally planned to irrigate 41,250 ha of Culturable Command Area (CCA) and generate 20.40 MW of electricity. The Songarh Barrage was proposed at a distance of 0.34 km from the core zone, falling entirely within the buffer zone of the Sanjay Tiger Reserve. To avoid proximity to the Sanjay Tiger Reserve, the Water Resources Department, Government of Madhya Pradesh, has decided to proceed only with the Gotra Barrage. Consequently, the power generation capacity has been reduced from 20.40 MW to 10 MW, and the CCA has been reduced from 41,250 ha to 33,015 ha. In addition, the land requirement has decreased from 2,380.14 ha to 1,088.57 ha.

During the meeting, the EAC highlighted that the reduction in CCA from 41,250 ha to 33,015 ha would result in approximately 8,235 ha of land remaining unirrigated, potentially affecting the agricultural benefits envisaged under the original proposal. The Committee sought clarification on the measures proposed to address this shortfall. In response, the PP informed that they are in the process of planning another project to provide irrigation to the remaining area, and stated that the necessary statutory clearances for the proposed project would be obtained separately.

3.3.5. Recommendation of EAC

Recommended

3.3.6. Details of Terms of Reference

3.3.6.1. Specific

Additional conditions:	
1.	PP shall prepare detailed plan for Plantation of saplings under the tree plantation campaign **"Ek Ped Ma Ke Naam".**
2.	EIA/EMP, collection of baseline data, other statuary clearance and the public hearing shall be carried out as per revised layout.
3.	The PP will exercise to avoid submergence in Eco-Sensitive Zone of Sanjay Dubri Tiger Reserve.
4.	All other Terms of Reference mentioned letter no. J-12011/36/2023-IA.I (R) dated 31/08/2023 shall remain unchanged.

3.4. Agenda Item No 4:

3.4.1. Details of the proposal

Bargi Pumped Storage Hydro Project (1000 MW) at District: Mandla, Madhya Pradesh by M/s. Serentica Renewables India 21 Pvt. Ltd. by **serentica renewables india 21 private limited** located at **MANDLA,MADHYA PRADESH**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity Sub-Activity (Schedule Item)**
IA/MP/RIV/553405/2025	J-12011/36/2025-IA.I(R)	29/09/2025	River Valley/Irrigation projects Standalone Pump Storage Projects (1(c))

3.4.2. Project Salient Features

The proposal is for grant of Terms of Reference (TOR) to the project Bargi Open Pumped Storage Hydro Project (1000 MW) at Village Pindrai Mal. (Sahajpuri), Salaiya Mal.(Barangada), Jamthar, Khapa, Newari And Pondi, Sub- District Narayanganj, District Mandla, Madhya Pradesh by M/s Serentica Renewables India 21 Private Limited.

42.4.2 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. M/s. Serentica Renewables India 21 Pvt. Ltd. (SRIPL) is proposing an Off-stream Open Loop Pumped Storage Hydro Project (1000 MW) at District: Mandla (Madhya Pradesh). Pumped storage hydropower project is typically a configuration of two water reservoirs at different elevations that can generate power (discharge) as water moves down through a turbine; this project draws power as it pumps water (recharge) to the upper reservoir. Proposed Pumped Storage Hydro Project (PSHP) is Off-Stream Open Loop pumped storage development, proposed with an installed capacity of 1000 MW.

ii. The Project comprises of development of upper reservoir with a gross storage capacity of 24.44 MCM, out of which upper reservoir to be constructed with maximum dam height of 25 m (from deepest bed level) to create the desired storage capacity. The scheme of operation for the project is with 6 Hours of peak hour generation per day and 7 Hours for pumping back the water to the upper reservoir. Water will be used cyclically for energy storage and discharge. One-time water requirement for the initial filling of the upper reservoir will be 25.44 MCM. Evaporation losses have been found to be about 2.75 MCM annually which will be recouped periodically from the existing Bargi Reservoir.

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

S. No.	Latitude	Longitude
	22°51'24.29"N	79°58'51.28"E
	22°52'51.31"N	79°59'20.98"E
	22°53'26.00"N	80°0'29.22"E
	22°54'5.74"N	80°1'19.02"E
	22°53'40.44"N	80°1'37.50"E
	22°53'4.53"N	80°1'53.21"E
	22°52'27.16"N	80°1'7.57"E
	22°51'20.92"N	80°0'31.76"E
	22°51'18.86"N	79°58'59.32"E

iv. The Bargi Pumped Storage Hydro Project envisages construction of an upper reservoir, Muck Disposal Area, Lower Reservoir/ Approach Channel, WCS, Powerhouse, Pothead Yard and Adits, Colony Area, Site Offices, Labour Camps, Crushing & Batching Plant, Stacking Area & Workshop, Magazine Area etc.

v. **Land requirement:** Total area of the proposed project is 381.50 Ha. Out of the total land required for the proposed project, 271 ha is Forest Land and 110.50 ha is Non-forest Land. Out of total land area, 24.6 Ha, (~ 6.45 %) area will be developed under the greenbelt development plan for the proposed project.

vi. **Demographic details in 10 km radius of project area:** The study area comprises of 53 villages with a total population of 29980, number of Households 6901, SC Population as 971 and ST Population as 23462. Total Working population of the study area is 16123 (7570 Main workers & 8553 Marginal workers) & 13857 is non-working population. Total Literacy rate of the study area is 65.1 %. Sex Ratio (Females per 1000 Males) of the study area is 996.

vii. **Water requirement**: One-time water requirement of 25.44 MCM will be filled from the existing Bargi Reservoir & 2.75 MCM annual water required to recoup the evaporation losses will be meet from the existing Bargi Reservoir.

viii. **Project Cost:** The estimated project cost is Rs. 4689.89 Crores. Total capital cost earmarked

towards environmental management plan is Rs. 20 Crores and the Recurring cost (operation and maintenance) will be about Rs. 2 Crores per annum.

ix. **Project Benefit**:

Social Benefits: Direct & indirect employment opportunities during construction phase will significantly contribute in uplifting quality of life of people of the region. During operation phase also, local people will get employment opportunity in operation, maintenance and auxiliary activities.

Financial Benefits: The project with a proposed peaking energy installation of 1000 MW. It will contribute in reduction in gap between demand and supply of peak power in the state and country. Project activity will mobilize financial resources in the area.

Environmental Benefits: Out of total project area, 24.6 ha area will be developed under the greenbelt/ plantation. The company will carry out compensatory afforestation in consultation with the forest department. Apart from these, during operation phase of the Project, one new water body in the form of reservoir will be created.

x. **Environmental Sensitive area:** There are No National Parks, Wildlife Sanctuaries, Biosphere Reserves, Tiger/ Elephant Reserves & Wildlife Corridors present within 10 km radius of the project site. Kanha National Park is at 73.60 Km from the proposed project.

Chaurai Reserved Forest (Partly falling in the Project Site). Apart from the Chaurai Reserved Forest, there area 14 Reserved Forest and 2 Protected Forest are present within 10 km radius of the study area. Also, the study area has Dense jungle mainly teak and Dense mixed jungle.

Bargi Dam Reservoir (Rani Awanti Bai Sagar) on Narmada River (Partly falling in the Project Site as the Lower Reservoir is proposed at right bank of the existing reservoir). Apart from this, there are 3 other water bodies and few seasonal Nallahs which are active during Monsoon season present within the 10 km distance from the project site.

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

Initial Allotment Letter issued by Office of the Commissioner, New and Renewable Energy, Urja Bhawan, Bhopal vide letter no. F/NRE/PHS/2025/09/Bhopal dated 11.08.2025 for development of 1000 MW PSHP project at District Mandla, Madhya Pradesh.

xii. **Resettlement and rehabilitation:** A total of 81 PAFs of 5 villages will be affected due to the proposed project. The land value for the private land purchased will be paid to the landowners on the basis of direct negotiations and on mutually agreed terms as per the prevailing norms.

Comparison of Alternative w.r.t Upper Reservoir and Water Conductor System

S.No.	Description	Alt. 1	Alt. 2	Alt. 3
1	Upper Reservoir	Artificial Pond		
	Type of Dam	CFRD		
	Max.Dam Height (m)	30		
	Length of Dam (Km)	5.95		

S.No.	Description	Alt. 1	Alt. 2	Alt. 3
	Excavated Bed Level (m)	525		
	FRL (m)	545		
	MDDL (m)	528		
	Live storage capacity (MCM)	22.17		
	Dead storage capacity (MCM)	2.26		
2	Lower Reservoir	Existing Reservoir		
	Type of Dam	Composite earthen & mason		
	Max.Dam Height (m)	69 (Earthen Dam) & 29 (Masonry		
	Length of Dam (Km)	2750.51(Earthen Dam) & 827 (Masc		
	FRL (m) (Actual)	422.76		
	MDDL (m) (Considered)	406		
	Live storage capacity (MCM)	2910		
	Dead storage capacity (MCM)	1010		
3	Power Potential			
	Total Generation Discharge (m^3/s)	968.02	968.02	968.02
	Unit Discharge (m^3/s)	193.25	193.25	193.25
	Dia Of Penstock/Pressure Shaft (m)	7.6	7.6	7.6
	Velocity through Pressure Shaft (m/s)	4.71	4.71	4.71
	Length of Penstock/Pressure shaft (m) (avg)	664	606	1384
	Type of Power House	Semi-UG PH	UG PH	Semi-UG PH
	Upstream L/H Ratio	6.52	6.05	13.81
	Upstream Surge Shaft	Not Required	Not Required	Required
	Dia of Main TRT (m)	8.2	8.2	8.2

S.No.	Description	Alt. 1	Alt. 2	Alt. 3
	Length of TRT (m) (avg)	264	1061	105
	Downstream Surge Gallery	Not Required	Required	Not Required
	Length of MAT/Approach Road (m)	707	401	975
	Length of Construction Adit (m)	386	1671	284
4	**Energy**			
	Peaking Hours	6	6	6
	Max Net Head (m)	135.53	134	134
	Min Net Head (m)	101.77	100.24	100.24
	Rated Net Head (m)	117.22	117.16	117.16
	Max Min Head Ratio	1.33	1.34	1.34
	IC (MW)	1000	1000	1000
	No of Units	6	6	6
	Annual Energy (MU)	2078.5	2078.5	2078.5
5	Muck Quantity/Dam Rockfill/Useable Material			
	Construction Material Required (MCM)	12.69	12.01	11.9
	Excavation Quantity (MCM)	22.14	18.12	20.14
	Useable Material (MCM)	12.7	12.11	12.42
	Muck Quantity (MCM)	12.37	8.21	10.97
	Material to be Procured from Quarry (MCM)	-	-	-
	Muck Dumping Area (Ha)	100	70	95
6	Land Requirement (Ha)	381.5	353	391
7	Construction Time (Months)	36	48	42
8	R & R Issues	Less	Less	Less

S.No.	Description	Alt. 1	Alt. 2	Alt. 3
9	Net Completion Cost Per MW (Crores)	4.69	5.36	5.1

Conclusion: In view of the geomorphological and design constraints present along and in proximity to Alternatives 2 and 3, an alternative (Alternative 1) featuring the shortest Water Conductor System and a surface powerhouse has been examined. At this location, geomorphology and topography allow for the design of the shortest water conductor system with a surface pit powerhouse/Semi-underground powerhouse in a low-head scheme, but it will require a long approach channel. Several geological cross-sections have been prepared to ascertain the geological and geotechnical setup of the approach channel. The geological assessment revealed that the approach channel will be founded on bedrock and alluvium, with a ratio of approximately 50 - 50%. This would require an appropriate construction methodology for the construction of the long approach channel with regard to floor and side wall stability and sedimentation. The water conductor system and surface pit powerhouse will be founded on a near-horizontally bedded basalt rock mass suitable for the foundation grade. Considering the geological, geomorphological, design, cost, and time factors, at this stage of the investigation, it appears that the shortest water conductor system with about 80m deep surface pit powerhouse/Semi-underground powerhouse is a techno-economic option for the Bargi Pumped Storage Scheme. The geological and geotechnical setup of the WCS for all options (Alt 1 & 2, 3) is almost similar. However, considering all design, cost, and time aspects, the shortest WCS with about 80m deep surface pit powerhouse /Semi-underground powerhouse (Alt 1) has been selected for further study.

Solid waste/ Hazardous waste generation/ Muck and its management

S.No.	Waste Generated	Source	Quantity	Unit	Mode of Disposal
1.	Muck	Quantity of muck / debris generated	22.14	MCM	Partly to be reused and rest is to be disposed of at the earmarked muck dumping site.
2.	Electronic equipment	Project and labour camp, colony	0.25	TPA	As per CPCB Guidelines
3.	Batteries	Project and labour camp, colony	2	TPA	As per CPCB Guidelines
4.	Bio-medical waste	Dispensary	1	TPA	Through CBWTF
5.	Burnt Mobil oil, Grease	Construction equipment	5.5	TPA	Through authorized dealer
6.	Plastic Waste	Labour camp and colony	22	TPA	As per CPCB Guidelines
7.	Organic Waste	Project and labour	3.5	TPA	Biodigester

S.No.	Waste Generated	Source	Quantity	Unit	Mode of Disposal
		camp, colony			
8.	Inorganic Waste	Project and labour camp, colony	5.3	TPA	Through authorized dealer

The muck generated from excavation including construction of roads is 22.14 MCM. Out of which approximately 12.7 MCM is expected to be usable muck. Balance shall be disposed of in muck disposal area.

- **Project Details**

Name of the Proposal	Bargi Pumped Storage Hydro Project (1000 MW) at District: Mandla, Madhya Pradesh by M/s. Serentica Renewables India 21 Pvt. Ltd.
Location (Including coordinates)	**Villages**: Chaurai, Jamthar, Salaiya, Pindrai Mal., Khapa Mal. and Pondi (Mooldongri) **Tehsil:** Narayanganj **District:** Mandla **State:** Madhya Pradesh **Coordinates:**
Inter- state issue involved	No
Seismic zone	The project area falls under Zone III, i.e., Moderate Risk Zone as per IS-1893 (Part 1) 2002, Seismic Zoning Map of India

S. No.	Latitude	Longitude
1.	22°51'24.29"N	79°58'51.28"E
2.	22°52'51.31"N	79°59'20.98"E
3.	22°53'26.00"N	80°0'29.22"E
4.	22°54'5.74"N	80°1'19.02"E
5.	22°53'40.44"N	80°1'37.50"E
6.	22°53'4.53"N	80°1'53.21"E
7.	22°52'27.16"N	80°1'7.57"E
8.	22°51'20.92"N	80°0'31.76"E
9.	22°51'18.86"N	79°58'59.32"E

- **Category Details:**

Category of the project	A

Provision	As per EIA Notification, 2006 as amended from time to time
Capacity/Cultural command area (CCA)	Capacity: 1000 MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	**NA**

- **Electricity Generation capacity:**

Powerhouse Installed Capacity	1000MW
Generation of Electricity Annually	2078.50 MU Energy generation
No. of Units	6 no's (4 units of 200 MW and 2 units of 100 MW)
Additional information (if any)	NA

- **ToR/EC Details**

<table>
<tr><td>Cost of project</td><td>4689.89 Crores</td></tr>
<tr><td>Total area of Project</td><td>381.50 Ha</td></tr>
<tr><td>Height of Dam from River Bed (EL)</td><td>25 m</td></tr>
<tr><td>Length of Tunnel/Channel</td><td>TRT 1-260.74m (Larger Unit)
TRT 2-260.74m (Larger Unit)
TRT 3-260.74m (Larger Unit)
TRT 4-260.74m (Larger Unit)
TRT 5-264.25 m (Smaller Unit)
TRT 6-264.25 m (Smaller Unit)</td></tr>
<tr><td>Details of Submergence area</td><td>242 Ha (Forest Land)</td></tr>
<tr><td>Types of Waste and quantity of generation during construction/ Operation</td><td>
<table>
<tr><th>S. No.</th><th>Name of the waste</th><th>Source</th><th>Quantity</th><th>Unit</th></tr>
<tr><td>1.</td><td>Muck</td><td>Quantity of muck / debris generated</td><td>22.14</td><td>MCM</td></tr>
<tr><td>2.</td><td>Electronic equipment</td><td>Project and labour camp, colony</td><td>0.25</td><td>TPA</td></tr>
<tr><td>3.</td><td>Batteries</td><td>Project and labour camp, colony</td><td>2</td><td>TPA</td></tr>
<tr><td>4.</td><td>Bio-medi</td><td>Dispensary</td><td>1</td><td>TPA</td></tr>
</table>
</td></tr>
</table>

	cal waste			
5.	Burnt Mobil oil, Grease	Construction equipment	5.5	TPA
6.	Plastic Waste	Labour camp and colony	22	TPA
7.	Organic Waste	Project and labour camp, colony	3.5	TPA
8.	Inorganic Waste	Project and labour camp, colony	5.3	TPA

E-Flows for the Project	This is an off-stream open loop project. No diversion of river flow is involved.
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
No. of trees/ saplings proposed in view of 'Ek Ped Maa ke Naam' campaign	2120

- **Muck Management Details:**

No. of proposed disposal area/ (type of land-Forest/Pvt. land)	One Muck disposal site has been earmarked of about 100 Ha area (Non-Forest land).
Muck Management Plan	The muck generated from excavation including construction of roads is 22.14 MCM, out of which approximately 12.7 MCM is expected to be usable muck. Balance shall be disposed of in muck disposal area. The area identified for Muck disposal site is about 100 Ha.
Monitoring mechanism for Muck Disposal	Monitoring mechanism for muck disposal will be submitted along with EIA/EMP Report.

- **Land Area Breakup**

Private land	110.50 ha
Government land/Forest Land	271 ha (Forest land)
Submergence area/Reservoir area	Submergence area: 242 Ha

	Upper Reservoir Area: 205 Ha
Land required for project components	381.50 Ha
Additional information (if any)	NA

- **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	· Chaurai Reserved Forest (Partly falling in the Project Site) · Jamthar RF (0.3 km in East direction) · Reserve Forest (0.8 km in NE direction) · Gumti RF (1.2 km in NNE direction) · Kathotiya RF (1.5 km in West direction) · Reserve Forest (near Newari) (2.3 km in NNE direction) · Barwakachhar RF (3.5 km in SSW direction) · Kalpi RF (3.5 km in ENE direction) · Kudna RF (4.0 km in SE direction) · Bijadandi RF (5.0 km in NNE direction) · Reserve Forest (near Jamunpani) (6.2 km in NNE direction) · Protected Forest (6.5 km in South direction) · Roto RF (7.0 km in SSW direction) · Parariya RF (8.5 km in NNW direction) · Bilaikhapa RF (8.5 km in NE direction) · Saliwara RF (8.5 km in West direction) · Pratapgarh PF (9.0 km in South direction) Apart from the above, the study area has Dense jungle mainly teak, Dense mixed jungle.
National Park	No	No National Parks, Wildlife Sanctuary present within 10 km radius of the study area.
Wildlife Sanctuary		

- **Court case details**

Court Case	No any court case pending against the project.
Additional information (if any)	NA

- **Affidavit / Undertaking details:**

Affidavit/Undertaking	Duly signed Undertaking as per Annexure VI of the Agenda for

	41st Meeting of Expert Appraisal Committee (River Valley & Hydro-Electric Projects) has been enclosed herewith with this form.
Additional information (if any)	NA

- **Previous EC compliance and necessary approvals**

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	Not Applicable, as this is the greenfield project.
Status of Stage- I FC	The Application is under preparation and yet to be submitted
Additional detail (If any)	NA
Is FRA (2006) done for FC-I	No

- **Miscellaneous**

Particulars	**Details**
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (*NABET* Accredited *Consultant Organization*) Certificate No : NABET/EIA/25-28/RA0415 Validity : August 15, 2028 Contact Person : Mr. Ravinder P S 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	Social Benefits: Direct & indirect employment opportunities during construction phase will significantly contribute in uplifting quality of life of people of the region. During operation phase also, local people will get employment opportunity in operation, maintenance and auxiliary activities. Financial Benefits: The project with a proposed peaking energy installation of 1000 MW. It will contribute in reduction in gap between demand and supply of peak power in the state and country. Project activity will mobilize financial resources in the area. Environmental Benefits: Out of total project area, 24.6 ha area will be developed under the greenbelt/ plantation. The compan

Particulars	Details
	y will carry out compensatory afforestation in consultation with the forest department. Apart from these, during operation phase of the Project, one ne w water body in the form of reservoir would be created.
R&R details	R&R for the proposed project is yet to be started. 81 (Tentativ e) number of project affected families from 5 villages have bee n identified.
Additional detail (If any)	NA

3.4.3. Deliberations by the committee in previous meetings

Date of EAC 1 :13/10/2025

Deliberations of EAC 1 :

The proposal is for grant of Environmental Clearance (EC) to the project for Bargi Open Pumped Storage Hydro Project (1000 MW) at Village Pindrai Mal. (Sahajpuri), Salaiya Mal.(Barangada), Jamthar, Khapa, Newari And Pondi, Sub- District Narayanganj, District Mandla, Madhya Pradesh by M/s Serentica Renewables India 21 Private Limited.

41.3.2 While considering the proposal, the EAC noted that the project proponent joined the meeting with considerable delay, and due to poor internet connectivity, the members were unable to clearly hear the consultant's presentation. As a result, key technical details and clarifications could not be effectively communicated. Therefore, the Committee decided to defer the proposal to the next meeting to ensure a fair and informed appraisal. The proponent and consultant were advised to ensure stable connectivity in the subsequent EAC meeting.

3.4.4. 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 Bargi Open Pumped Storage Hydro Project (1000 MW) at Village Pindrai Mal. (Sahajpuri), Salaiya Mal.(Barangada), Jamthar, Khapa, Newari And Pondi, Sub- District Narayanganj, District Mandla, Madhya Pradesh by M/s Serentica Renewables India 21 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 observed that the present proposal is for a 1000 MW open-loop pumped storage project, wherein the existing Bargi Reservoir will function as the lower reservoir and a new upper reservoir is proposed to be constructed with a gross storage capacity of 24.44 MCM and a maximum dam height of 25 m.
- The EAC noted that the total land requirement for the project is around 381.50 Ha, out of which 110.50 ha is non-forest land and 271 ha is forest land. Diversion of forest land for non-forest purpose will be involved for construction of Project components. 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 are No National Parks, Wildlife Sanctuaries, Biosphere Reserves, Tiger/ Elephant Reserves & Wildlife Corridors present within 10 km radius of the project site.

· PP informed that initial Allotment Letter issued by Office of the Commissioner, New and Renewable Energy, Urja Bhawan, Bhopal vide letter no. F/NRE/PHS/2025/09/Bhopal dated 11.08.2025 for development of 1000 MW PSHP project at District Mandla, Madhya Pradesh

3.4.5. Recommendation of EAC

Recommended

3.4.6. Details of Terms of Reference

3.4.6.1. Specific

Miscellaneous:	
1.	Both capital and recurring expenditure under EMP shall be submitted.
2.	Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly approved by CWC/CEA 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.	Detailed plan to restore wider roads and convert them into narrow up to 10m after construction of the project.
6.	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.
7.	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.	The EIA/EMP shall include a detailed socio-economic assessment of the tribal population in the project-affected area based on primary data and community consultations. A Tribal Development Plan, prepared in consultation with the District Administration and Tribal Welfare Department, shall be submitted along with the EIA report.
4.	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 O.M. dated 7th October, 2014 for the project land to be acquired.
5.	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.	The PP will submit 10 years water availability data certified by the CWC/State Water

	Resource Department for quantity of water that is received annually by the small stream on which upper and lower reservoir is proposed to be constructed.
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. The monitoring mechanism to ensure the survival of saplings shall be finalised in consultation with ICFRE.
3.	Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 271 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.	Transportation Plan for transporting construction materials shall be submitted. Separate chapter for risk assessment of such transportation through/within proposed the Wildlife Sanctuary shall be included in the EIA report.
7.	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.
8.	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.
9.	Calculation and values of GHGs (CO_2, CH_4 etc.) emissions during construction and during operation till the life of the project shall be estimated and submitted.
10.	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.
11.	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.
12.	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.
13.	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.
14.	Action plan for survival or diversion of the rivulets/stream, if any, leading to join river shall be submitted.

15.	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.
16.	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.
17.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
18.	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.
19.	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.
20.	Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI.

3.4.6.2. 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 f ollows:	
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, 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, 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.
6	Documentation of demographic, Ethnographic, Economic Structure and development profile of the area.

5.	
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.
3	Positive and negative impacts likely to be accrued due to the project are listed.

2.	
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.

2 1.	Water, Air and Noise Management Plans to be implemented during construction and post-construction periods.

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	
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	
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 42ND MEETING OF THE EXPERT APPRAISAL COMMITTEE FOR RIVER VALLEY AND HYDROELECTRIC PROJECTS HELD ON 31ST OCTOBER 2025 THROUGH VIDEO CONFERENCE

The 42nd 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 through virtual mode, under the Chairmanship of Prof. G. J. Chakrapani. The list of Members present in the meeting is at **Annexure II**.

Confirmation of the Minutes of the 41st EAC meeting:

The Minutes of the Meeting held on 41st EAC meeting on 13th October, 2025 were confirmed.

Agenda Item No. 42.1

Adnadi Close Loop Pumped Storage (1500 MW) in an area of 240.61Ha located at Village Adnadi, Bhandri, Jambli, etc, Sub-district Chikhaldara, District Amravati, Maharashtra by M/s Adani Hydro Energy Ten Limited – Terms of References (TOR) – reg.

[Proposal No. IA/MH/RIV/554439/2025; F. No. J-12011/37/2025-IA.I(R)]

42.1.1 The proposal is for grant of Terms of Reference (TOR) to the project Adnadi Close Loop Pumped Storage (1500 MW) in an area of 240.61Ha located at Village Adnadi, Bhandri, Jambli, etc, Sub-district Chikhaldara, District Amravati, Maharashtra by M/s Adani Hydro Energy Ten Limited.

42.1.2 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. The Adnadi Pumped Storage Project (PSP), with a proposed capacity of 1500 MW (4×300MW+ 2×150MW) and storage of 9000 MWh, is conceptualized as an off-stream closed-loop pumped storage scheme located in Chikhaldara Taluka, Amravati District, Maharashtra. The proposed scheme involves two newly constructed reservoirs: Upper Reservoir near Kamapur Village, located on a non-perennial nallah and Lower Reservoir near Adnadi Village, located on another non-perennial stream.

ii. Initial Filling and Water Source Since the natural inflows are insufficient to meet the reservoir capacity, initial filling and annual recoupment for evaporation losses will be met from external sources. The two major sources identified for this purpose are:

   a) Sapan Dam Reservoir (Gross Storage : 39.26 MCM)
      • Located ~4.5 km from the proposed Lower Reservoir
      • Adequate gross storage available for one-time diversion

• Proposed to be used via a pipeline or canal for both initial filling and seasonal replenishment

b) Chandrabhaga Dam (Alternate Option)
   • Located ~5 km away from the Lower Reservoir
   • Gross storage capacity: 41.4 MCM
   • Head difference: approx. 120 m
   • Can be utilized via a dedicated water conductor system

iii. The geographical co-ordinate of the project are Lower Reservoir: 77° 24' 53.54" E; 21°23' 41.32" N Upper Reservoir : 77° 23' 33.87" E; 21° 24' 22.25" N.

iv. **Land requirement:**

Forest Land : **163.77 ha**
Non-forest Land : 76.84 ha
Total Land : 240.61 ha

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

- ❑ The lower reservoir is proposed near Adnadi Village and the upper reservoir near Kamapur Village of Chikhaldara Taluka of Amravati District.
- ❑ The villages in the surrounding of project area are predominantly rural with small settlements.
- ❑ The habitation in the villages is mainly comprised of Tribal population while Scheduled Castes presence is very limited.
- ❑ The main occupations of villagers are agriculture, livestock rearing, horticulture and extraction of Minor Forest Products and cottage industry with farming being primarily rain-fed.
- ❑ Socio-economic conditions are modest, with limited infrastructure and dependency on local natural resources for livelihoods.

Parameter	Adnadi Village	Kamapur Village
Total Population	737	398
Male Population	365	198
Female Population	372	200
Households	184	79
Scheduled Caste (SC) Population	5	0
Scheduled Tribe (ST) Population	680	371

(Source: Census 2011; Mission Antyodaya 2020)

- The demographic profile of the villages around the project shows that **Adnadi** village is a relatively large village with a total population of 737, comprising 365 males and

372 females.

- The village has 184 households and a significant Scheduled Tribe (ST) population of 680 represented by ***Korku tribe***, while Scheduled Caste (SC) population is only 5.
- In contrast, **Kamapur** village is a small settlement with only 398 people and 79 households.
- The village population is equally distributed between males (198) and females (200), and there is no Scheduled Caste population but there is a significant Scheduled Tribe population of 371.

Parameters	**Jamun Nala**	**Bori**	**Jamlivan**	**Jaitadehi**	**Manbhang**	**Bhilkheda**
Total Population	293	401	319	463	485	707
Male Population	153	211	156	237	237	352
Female Population	140	190	163	226	248	355
Households	73	100	68	90	116	143
Scheduled Caste (SC) Population	4	0	132	0	0	0
Scheduled Tribe (ST) Population	289	370	180	460	474	688

(Source: Census 2011; Mission Antyodaya 2020)

- The demographic profile of the project surrounding villages shows that Bhilkheda is the largest village with a population of 707 and a significant Scheduled Tribe population of 688.
- In contrast, Jamun Nala is a very small village with total population of 293, dominated by tribal population (289).

vi. **Water requirement**: Adnadi Pumped Storage Project will require 17.51 MCM for one time filling and thereafter ~ 1.40 MCM per year will be required.

vii. **Project Cost**: The estimated project cost is Rs 7134.07 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).

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

ix. **Environmental Sensitive area**: Melghat Tiger Reserve is about 5 km from project area. ESZ is notified dated 27.12.2016 and project is outside the ESZ. River/ water body, Water will be pumped from Sapan Reservoir.

x. MOU has been signed between Government of Maharashtra and M/s Adani Hydro Energy Ten Ltd. to build PSP with a capacity of 1500 MW on July 07, 2025.

xi. Alternative Studies:

Selection of Project Area:

- 10 km radius area was defined as the study area for the initial desktop assessment.
- A comprehensive evaluation was conducted to identify suitable project locations.
- Sites falling in the Melghat Tiger Reserve and its Eco-Sensitive Zone (ESZ) boundaries were carefully excluded from consideration.
- Based on the assessment, five schemes were evaluated.

Scheme-1	Alternate-1	Alternate-2	Alternate-3	Alternate-4	Alternate-5
Type of the project	Off Stream Closed Loop	Off Stream Closed Loop	Off Stream Closed Loop	Off Stream Closed Loop	On Stream
Nearest village	U/R - Kamapur Village, L/R -	U/R - Chichghat	U/R - Chichghat	U/R - Motha Village, L/R -	U/R - Wavadi Village, L/R -
Dam Elevations	U/R - EL 951 m L/R - EL 694 m	U/R - EL 875 m L/R - EL	U/R - EL 875 m L/R - EL	U/R - EL 1050 m L/R - EL	U/R - EL 875 m L/R - EL
Dam top length (m)	Upper dam – 900m Lower dam – 415m	Upper dam – 1800m Lower dam – 415m	Upper dam – 1800m Lower dam – 900m	Upper dam – 1450m Lower dam – 900m	Upper dam – 900m Lower dam – 500m
Length of	1.6	1.4	1.25	1.6	1.5
Gross Head	257	181	225	400	200
L/H Ratio	L/H =6.2	L/H =7.7	L/H =5.6	L/H =4.0	L/H =7.5
Wild Life Sanctuary	No wild life sanctuary in the vicinity.	No wild life sanctuary in the vicinity.	No wild life sanctuary in the vicinity.	Upper Reservoir in Melghat	No wild life sanctuary in the vicinity.
Project Capacity	upto 1600 MW	upto 1100 MW	upto 1400 MW	upto 2000 MW	upto 1200 MW
Submergence Area	105 Ha (UR1+LR1)	125 Ha (UR2+LR2)	135 Ha (UR2+LR2)	147 Ha (UR2+LR2)	122 Ha (UR1+LR1)

Accessibility	Both upper and lower reservoir is approachable via MSH203 & village roads.	Both upper and lower reservoir is approachable via MSH203 & village roads.	Both upper and lower reservoir is approachable via MSH203 & village roads.	Both upper and lower reservoir is approachable via MSH203 & village roads.	Both upper and lower reservoir is approachable via MSH203 & village roads.
Water Source	Sapan Dam Reservoir is about 4.5 km from Lower Reservoir.	Sapan Dam Reservoir is about 4.5 km from Lower Reservoir.	Chandrabhaga Dam Reservoir is about 3.0 km from Lower Reservoir.	Chandrabhaga Dam Reservoir is about 3.0 km from Lower Reservoir.	Sapan Dam Reservoir is about 4.5 km from Lower Reservoir.
Conclusion	Minimum Dam Length & Submergence	Low Head, High L/H	Longer Dam length & Submergence	Wildlife	Low Head, High L/H
	Selected	Rejected	Rejected	Rejected	Rejected

Scheme 1 has been selected for further studies:

- It has the lowest submergence area at 105 hectares, minimizing environmental and social impacts.
- The scheme avoids any wildlife sanctuary, simplifying the statutory requirements.
- Dam lengths are the shortest, reducing construction time and cost.
- The water conductor system is only 1.6 km long, which is efficient compared to other schemes.
- The L/H ratio of 6.21 indicates a well-balanced design, avoiding inefficiencies seen in other options.
- Both reservoirs are easily accessible via existing roads.

To further optimize the layout, three alternative WCS were explored within the finalized scheme to arrive at the most techno-economically viable layout.

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

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

1	**EAC MEETING DETAILS**		
i	EAC meeting/s	:	42nd Meeting
ii	Date of Meeting/s	:	31.10.2025

iii	Date of earlier EAC meetings	:	Nil
2	**PROJECT DETAILS**		
i	Name of the Proposal	:	Adnadi Close Loop Pumped Storage Project
ii	Location (including coordinates)	:	Proposed upper reservoir located near Kamapur Village and lower reservoir near Adnadi Village in Chikhaldara Taluka, Amravati District of Maharashtra State

Reservoir	**Latitude**	**Longitude**
Lower Reservoir	21°23' 41.32" N	77° 24' 53.54" E
Upper Reservoir	21°24'22.25" N	77° 23' 33.87" E.

iii	Interstate Issue	:	No
iv	Seismic Zone	:	Zone-III
3	**CATEGORY DETAILS**		
i	Category of the project	:	A
ii	Provisions	:	-
iii	Capacity	:	1500MW
iv	Attracts the General Conditions (Yes/No)	:	Yes
v	Additional Information if any	:	No
4	**ELECTRICITY GENERATION AND CAPACITY**		
i	Powerhouse Installed Capacity	:	1500 MW
ii	Generation of Electricity Annually	:	3121 MU
iii	No. of Units	:	6 nos. (4 x 300 MW + 2 x 150 MW)
iv	Additional information (if any)	:	Nil
5	**TOR/EC DETAILS**		
i	Cost of project	:	7134.07 Cr.
ii	Total area of Project	:	240.61 ha

iii	Height of Dam from Riverbed (EL)	:	Lower Dam – 77.0 m Upper Dam –73.0 m
iv	Length of Tunnel/Channel	:	1600 m
v	Details of Submergence area	:	144.340
vi	Types of Waste and quantity of generation during construction/ Operation	:	Muck from excavation, solid waste from labour colony and construction waste
vii	E-Flows for the Project	:	Not Applicable, as this is Closed Loop Pumped Storage Project (PSP)
viii	Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, the	:	No
a	E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin.	:	Not Applicable
b	If not the E-Flows maintain criteria for sustaining river ecosystem.	:	Not Applicable
ix.	No. of trees/saplings proposed in view of 'Ek Ped Maa Ke Naam' campaign		500
6	**MUCK MANAGEMENT DETAILS**		
i	No. of proposed disposal area/ (type of land- Forest/Pvt. land)	:	14.84 ha (Non-Forest Land)
ii	Muck Management Plan	:	Will be Provided in EIA/EMP report
iii	Monitoring mechanism for Muck Disposal	:	Will be Provided in EIA/EMP report
7	**LAND AREA BREAK-UP**		
i	Private Land	:	76.84 ha
ii	Government land	:	-

iii	Forest Land	:	163.77 ha
iv	Total Land	:	240.61 ha
v	Submergence area/Reservoir area	:	144.34 ha
vi	Additional information (if any)		Nil
8	**PRESENCE OF ENVIRONMENTALLY SENSITIVE AREAS IN THE STUDY AREA**		
S.no	**Forest Land/ Protected Area/ Environmental Sensitivity Zone**		**Details of Certificate/letter/Remarks**
i	Reserve Forest/PF Land		Melghat Tiger Reserve is about 5 km from project area. ESZ is notified dated 27.12.2016 and project is outside the ESZ.
ii	National Park		
iii	Wildlife Sanctuary		
9	**COURT CASE DETAILS**		
i	Court Case	:	Nil
ii	Additional Information if any	:	Nil
10	**AFFIDAVIT/UNDERTAKING DETAILS**		
i	Affidavit/Undertaking	:	Enclosed
ii	Additional information (if any)	:	Nil
11	**PREVIOUS EC COMPLIANCE AND NECESSARY APPROVALS**		
i	Certified EC compliance report (if applicable)	:	Not Applicable
ii	Status of Stage- I FC	:	Yet to Apply
iii	Additional detail (If any)	:	Nil
iv	Is FRA (2006) done for FC-I		Yet to Apply
12	**Miscellaneous**		
i.	Details of consultant		M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (NABET Accredited Consultant Organization)

			Certificate No
	Validity		August 15, 2028
	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
ii	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.
iii	Status of other statutory clearances		Forest Clearance - Online application seeking forest diversion for around 163.77 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.
iv	R&R details		Details shall be evaluated during EIA/EMP Studies
v	Additional detail (If any)		Nil

42.1.3 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 Adnadi Close Loop Pumped Storage (1500 MW) in an area of 240.61Ha located at Village Adnadi, Bhandri, Jambli, etc, Sub-district Chikhaldara, District Amravati, Maharashtra by M/s Adani Hydro Energy Ten 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 Committee noted that the Upper Reservoir near Kamapur Village is proposed on a non-perennial nallah, and the Lower Reservoir near Adnadi Village is located on another non-perennial stream. Since both reservoirs are situated on natural nallahs/streams, the

committee opined that the project shall be categorized as an open-loop project rather than a closed-loop PSP. Further, during the meeting, the PP informed that the water received from the catchment would be released downstream into the river. Accordingly, the EAC advised that a detailed plan for this arrangement be prepared in consultation with a reputed institution, along with a suitable monitoring mechanism to ensure compliance.

- The EAC noted that the total land requirement for the project is around 240.61 ha, out of which 76.84 ha is non-forest land and 163.77 ha is forest land. Diversion of forest land for non-forest purpose will be involved for construction of Project components. 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 forest area falling within and around the project site comprises a very dense canopy, indicating a mature and ecologically sensitive forest ecosystem. Such dense canopy cover suggests the presence of significant biodiversity, including large trees, undergrowth, and potential habitats for wildlife species. The Committee emphasised the need for detailed survey of the study area to collect appropriate data on wild flora and fauna so that impact prediction can be done accurately considering the aspects like fragmentation of habitat, and disruption of ecological functions etc.

- The EAC observed that the Melghat Tiger Reserve is located approximately 5 km from the project site. The Eco-Sensitive Zone (ESZ) of the Reserve was notified on 27.12.2016, and the project lies outside the notified ESZ. Although the project boundary is beyond the ESZ and meets the prescribed criteria for establishment of the project, the committee expressed concern regarding the possible impact on tiger movement in the area. Accordingly, the EAC recommended that the opinion of the Chief Wildlife Warden be obtained to assess potential wildlife implications and ensure due safeguards.

- The EAC noted that the project area and surrounding villages are inhabited by a substantial tribal population, whose livelihood and cultural practices are closely linked to the local land, forest and river resources. The Committee emphasized that the EIA/EMP must include a detailed assessment of impacts on tribal communities, supported by primary socio-economic data and consultations. The EAC further advised that a Tribal Development Plan, aligned with statutory provisions and benefit-sharing measures, shall be prepared and submitted along with the EIA report.

- The Project Proponent has submitted a Memorandum of Understanding (MoU) signed between Government of Maharashtra and M/s Adani Hydro Energy Ten Ltd. to build PSP with a capacity of 1500 MW on July 07, 2025.

42.1.4 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 Open Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Adnadi Close Loop Pumped Storage (1500 MW) in an area of

240.61Ha located at Village Adnadi, Bhandri, Jambli, etc, Sub-district Chikhaldara, District Amravati, Maharashtra by M/s Adani Hydro Energy Ten Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR

[A] Environmental Management and Biodiversity Conservation:

i. The PP will submit 10 years water availability data certified by the CWC/State Water Resource Department for quantity of water that is received annually by the small stream on which upper and lower reservoir is proposed to be constructed.

ii. The PP will submit a a detailed plan and monitoring mechanism for releasing the self - catchment water of small stream draining in to reservoirs along with action plan for conservation and protection of other streams/rivulets draining in to upper and lower reservoirs.

iii. 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. The monitoring mechanism to ensure the survival of saplings shall be finalised in consultation with ICFRE.

iv. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 163.77 Ha of forest land involved in the project shall be submitted within stipulated time.

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

vi. 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. A specific opinion on Melghat Tiger Reserve shall be obtained.

vii. Transportation Plan for transporting construction materials shall be submitted. Separate chapter for risk assessment of such transportation through/within proposed the Wildlife Sanctuary shall be included in the EIA report.

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. 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.

xiii. 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.

xiv. 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.

xv. Action plan for survival or diversion of the rivulets/stream, if any, leading to join river shall be submitted.

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. 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.

xxi. 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. The EIA/EMP shall include a detailed socio-economic assessment of the tribal population in the project-affected area based on primary data and community consultations. A Tribal Development Plan, prepared in consultation with the District Administration and Tribal Welfare Department, shall be submitted along with the EIA report.

iv. 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.

v. 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. Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly approved by CWC/CEA 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. Detailed plan to restore wider roads and convert them into narrow up to 10m after construction of the project.

vi. 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.

vii. 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.

viii. A Sub-committee comprising members from EAC shall visit the site before considering the proposal for EC.

Agenda Item No. 42.2

Mudghusri Close Loop Pumped Storage (1000 MW) in an area of 307 Ha located at Village Murghusri & Reserved Forest, Sub-district Bodla, District Kabeerdham, Chhattisgarh by M/s Renew Vidyut Tej Private Limited – Terms of References (TOR) – reg.

[Proposal No. IA/CG/RIV/553919/2025; F. No. J-12011/38/2025-IA.I(R)]]

42.2.1 The proposal is for grant of Terms of References (ToR) to the project for Mudghusri Close Loop Pumped Storage (1000 MW) in an area of 307 Ha located at Village Murghusri & Reserved Forest, Sub-district Bodla, District Kabeerdham, Chhattisgarh by M/s Renew Vidyut Tej Private Limited.

42.2.2 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. Mudghusri PSP is an Off stream Closed Loop pumped storage scheme with an installed capacity of 1000 MW. The scheme of operation considered for the project is daily regulation to meet the demand of about 6 hours of peak power daily. Offpeak pumping hours are considered as 6.93 hours daily. The proposed project involves construction of upper and lower reservoirs required for daily regulation of the Mudghusri PSP.

ii. Mudghusri PSP envisages a scheme to generate 1000 MW of peak power daily for a duration of about 6 hours by drawing water from the upper reservoir into the reversible PTG units by utilizing a gross head of about 221.33 m available at project site. Water will be pumped up to the upper reservoir in pumping mode during offpeak periods. A daily cycle of operation has been proposed for the scheme, and it is found that about 11.58 Mm3 of net storage is required for project.

iii. The upper reservoir is located within Daldali reserve forest, in Kabirdham district of Chhattisgarh with the geographical latitude of 22°15'15.93" N and longitude of 81°11'29.90" E. The lower dam is located near Mudghusri village of Kabirdham district

of Chhattisgarh having a geographical latitude 22°14'10.21" N& longitude 81°12'13.98"E.

iv. **Land requirement:**

Forest Land :195.0 ha

Non-forest Land : 112.0 ha

Total Land : 307.0 ha

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

- ❑ The lower reservoir is proposed near Mudghusri village of, and the upper reservoir near Mudghusri Plot of Bodla Tehsil in Kabirdham District in Chhattisgarh State.
- ❑ The villages in the surrounding area are predominantly rural with small and scattered settlements.
- ❑ Habitation in the area is mainly comprised of Schedule Tribe population represent by ***Baiga tribe***.
- ❑ The main occupations of villagers are agriculture, livestock rearing, and extraction of Minor Forest Products.
- ❑ Socio-economic conditions are modest, with limited infrastructure and dependency on local natural resources for livelihoods.

Parameter	**Mudghusri Village**	**Mudghusri Plot**
Households	158	14
Total Population	793	65
Male Population	384	31
Female Population	409	34
Scheduled Cast (SC) Population	13	0
Scheduled Tribe (ST) Population	537	65

(Source: Census 2011; Mission Antyodaya 2020)

- The demographic profile of the villages around the project shows that Mudghusri is a relatively large village with a total population of 793, comprising 384 males and 409 females.
- The village has 158 households and a significant Scheduled Tribe (ST) population of 537 while Scheduled Caste (SC) represent by very small proportion of the total population.
- In contrast, Mudghusri Plot is a very small settlement with only 65 people and

14 households represent by schedule tribe. The village population is equally distributed between males and female.

Parameters	Barhapani	Amapani	Dholbajja	Chhirpani
Households	49	74	148	27
Total Population	231	387	656	128
Male Population	111	203	313	79
Female Population	120	184	343	49
Scheduled Caste (SC) Pop.	0	0	0	0
Scheduled Tribe (ST) Pop.	227	386	632	122

(Source: Census 2011; Mission Antyodaya 2020)

- The demographic profile of the project surrounding villages shows that Dholbajja village is the largest village with a population of 656 and a significant Scheduled Tribe population of 632, while Amapani village is a tribal village with total population of 387 people.
- In contrast, Chhirpani village is a very small village with only 128 people of which 122 belongs to Scheduled Tribe.

vi. **Water requirement:** Mudghusri Pumped Storage Project will require 16.24 MCM for one time filling and thereafter ~ 3.06 MCM per year will be required. Water required for initial reservoir filling is proposed to be met from existing Chhirpani reservoir. Chhirpani reservoir has been constructed on Phonk nallah which is a tributary of Chhirpani river which is in turn a tributary of Seonath River which is in turn a tributary of Mahanadi River.

vii. **Project Cost:** The estimated project cost is Rs 7377.44 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).

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

ix. **Environmental Sensitive area:** Bhoramdev WLS is about 9.2 km from project area. ESZ is not notified; therefore Wildlife clearance is applicable. River/ water body, Water will be pumped from Chhirpani Reservoir.

x. The MOU has been signed between Government of Chhattisgarh and M/s Renew Vidyut Tej Pvt. Ltd with a capacity of 1000 MW on March 10, 2025.

xi. Alternative Studies:

Three different alternatives have been studied for choosing the final layout of the project. The following aspects have been considered for formulation of alternative layouts :

- Maximum utilization of available head at the project site.
- Minimal area of Private land acquisition to accommodate project components
- Topography and Geological considerations
- Development of economical and optimized layout
- Ease of construction.
- Operational consideration during the operations of the plant over its service life

The alternative location of reservoir sites has been fixed duly considering the aspects of utilization of maximum available head, topography, geological aspects, availability of adequate storage capacity, availability of source of water for initial filling and minimal or no R&R issues. Based on the assessment, three schemes were evaluated.

Upper Reservoir	Lower Reservoir	Gross Head (m)	L / H Ratio	Gross Storage (Mm3)	Plant Capacity (MW)	Initial Filling Arrangement	Total Submergence Area (Ha)	Forest Area (Ha)	Non-Forest Area (Ha)	Habitations Affected	Scheme No.
R-1	R-4	230	9.48	27.28	2800	22°12'50.83"N 81°12'30.02"E	326	318	8	Significant number of houses (>35)	1
R-2	R-5	220	8.02	11.57	1000	22°12'50.83"N 81°12'30.02"E	171	123	48	10-12 houses	2
R-3	R-6	200	7.04	5.73	500	22°12'50.83"N 81°12'30.02"E	116	91	25	Few houses (3-5)	3

A total of 6 reservoirs and three schemes has been explored for viability. The desk study was conducted by keeping the reference point of Chhirpani Dam.

Scheme 2 has been selected for further studies:

Scheme I has the highest capacity. However, it has a significant number of disadvantages viz. significant destruction and submergence of forest area and habitat. The Upper embankment design is not feasible in this topography. Concrete dam of more than 3 km will incur significant loss.

Scheme 2 has a capacity of 1000 MW with embankment dam. Less number of locals will have to be rehabilitated. Moreover. The lower reservoir is in non-forest area. This alternative will involve minimum number of trees cutting as both upper and lower reservoir is in forest area.

Scheme 3 has the minimum L/H ratio. However, the upper reservoir is mostly in the forest area. The Upper embankment is not feasible and concrete dan will have to be constructed which will render the project unviable.

To further optimize the layout, three alternative WCS were explored within the finalized scheme to arrive at the most techno-economically viable layout.

Alternative 2 has been placed over a major nallah in the area. A pit type powerhouse will have significant risk of flooding and hence has been discarded.

Alternative 3 has a backslope of more than 90m which will pose sever excavation challenges along with increased support systems. The eastern slope of the powerhouse is more than 100m. Hence, it is not the preferred alternative. Should there be any geological problems encountered during subsurface investigations, which might rule out Alternative 1, this Alternative will have preference.

In **Alternative 1**, Powerhouse complex has been placed underground with competent Meta-Volcanic rock and has been chosen as the preferred alternative.

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

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

- **Project details:**

Name of the Proposal	Mudghusri Close Loop Pumped Storage Project
Location (Including coordinates)	Lower Reservoir : Latitude: 22°14' 10.21" N Longitude: 81° 12' 13.98" E Upper Reservoir : Latitude: 22° 15' 15.93" N Longitude: 81° 11' 29.90" E
Inter- state issue involved	No
Seismic zone	Zone-II

- **Category details:**

Category of the project	A
Provisions	
Capacity / Cultural command area (CCA)	1000 MW
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	Nil

- **Electricity generation capacity:**

Powerhouse Installed Capacity	1000 MW
Generation of Electricity Annually	2080.5 MU
No. of Units	4 nos. (4 x 250 MW)
Additional information (if any)	Nil

- **ToR/EC Details:**

Cost of project	7377.44 Cr.
Total area of Project	307.0 ha
Height of Dam from River Bed (EL)	Lower Dam – 32.0 m Upper Dam – 45.0 m
Length of Tunnel/Channel	5000 m
Details of Submergence area	133.69
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
No. of trees/saplings proposed in view of 'Ek Ped Maa Ke Naam' campaign	500

- **Muck Management Details:**

No. of proposed disposal area/ (type of land- Forest/Pvt. land)	60 ha (Non-Forest Land)
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

- **Land Area Breakup:**

Private Land	112.0 ha
Government land	-
Forest Land	195.0 ha
Total Land	307.0 ha
Submergence area/Reservoir area	133.69 ha
Additional information (if any)	Nil

- **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	--	• Bhoramdev WLS is about 9.2 km from project area. • ESZ is not notified; therefore Wildlife clearance is applicable.
National Park	--	
Wildlife Sanctuary	--	

- **Court case details: NIL**

- **Previous EC compliance and necessary approvals:**

Particulars	Letter no. and date
Certified EC compliance report (if applicable)	Not Applicable
Status of Stage- I FC	Yet to Apply
Additional detail (If any)	Nil
Is FRA (2006) done for FC-I	Yet to Apply

- **Miscellaneous**

Particulars	Details
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (NABET Accredited Consultant Organization) Certificate No : NABET/EIA/25-28/RA0415 Validity : August 15, 2028 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.

Status of other statutory clearances	Forest Clearance - Online application seeking forest diversion for around 195.0 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

42.2.3 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 Mudghusri Close Loop Pumped Storage (1000 MW) in an area of 307 Ha located at Village Murghusri & Reserved Forest, Sub-district Bodla, District Kabeerdham, Chhattisgarh by M/s Renew Vidyut Tej 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 observed that the Mudghusri pumped storage project comprises of Upper and Lower reservoir located away from riverine system and therefore it is treated as a close loop PSP. To generate 1000 MW of pea power daily for a duration of about 6 hours by utilizing a gross head of about 221.33 m available at project site. For the scheme about 11.58 Mm 3 of net storage is required for project. The Water required for initial reservoir filling is proposed to be met from existing Chhirpani reservoir. Chhirpani reservoir has been constructed on Phonk nallah which is a tributary of Chhirpani river which is in turn a tributary of Seonath River which is in turn a tributary of Mahanadi River. The Committee was informed that water from the Chhirpani Reservoir is currently being used by the Water Resources Department for irrigation purposes. Despite this usage, there is still adequate water available in the reservoir for the proposed project.

- The EAC noted that the total land requirement for the project is around 307.0 ha, out of which 112.0 ha is non-forest land and 195.0 ha is forest land. Diversion of forest land for non-forest purpose will be involved for construction of Project components. 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.

- It has been observed that a Memorandum of Understanding (MoU) was signed between the Government of Chhattisgarh and M/s Renew Vidyut Tej Pvt. Ltd. on March 10, 2025, for the development of a 1000 MW capacity project.

42.2.4 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 Mudghusri Close Loop Pumped Storage (1000 MW) in an area of 307 Ha located at Village Murghusri & Reserved Forest, Sub-district Bodla, District Kabeerdham, Chhattisgarh by M/s Renew Vidyut Tej 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 195.0 ha of forest land involved in the project shall be submitted within stipulated time.

iv. A detailed assessment shall be carried out to optimize and possibly reduce the land area earmarked for quarrying area.

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

vi. 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.

vii. PP shall submit the detailed plan for filling the reservoir from the Chhirpani reservoir along with necessary approval form water resource department.

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

ix. 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.

x. 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.

xi. Calculation and values of GHGs (CO_2, CH_4 etc.) emissions during construction and during operation till the life of the project shall be estimated and submitted.

xii. 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.

xiii. 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.

xiv. 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.

xv. 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.

xvi. 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.

xvii. 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.

xviii. 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.

xix. Reservoir/ River banks protection plan all along the submergence need to be prepared

and incorporated in EIA/ EMP.

xx. 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.

xxi. 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. Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly appraised by CWC/CEA 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. 42.3

Gond Major Irrigation Project (10 MW & CCA of 33,015 ha) in an area of 1088.57 Ha located at Village Siroli, Sikra, Bakwa, Bhadaili, etc, Sub-District Majhauli, Kusmi and Deosar, District Singrauli and Sidhi, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh – Amendment in Terms of References (TOR) – reg.

[Proposal No. IA/MP/RIV/554406/2025; F. No. J-12011/36/2023-IA.I (R)

42.3.1 The proposal is for grant of amendment in terms of references for Gond Major Irrigation Project (10 MW & CCA of 33,015 ha) in an area of 1088.57 Ha located at Village Siroli, Sikra, Bakwa, Bhadaili, etc, Sub-District Majhauli, Kusmi and Deosar, District Singrauli and Sidhi, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh.

42.3.1 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. Gond Major Project – Gotra Dam is aimed to irrigate land in Rabi season in Singrauli and Sidhi Districts of Madhya Pradesh. Under this project, the dam is proposed to be constructed across Gopad River to store 43.43 MCM of water and irrigate 33015 Ha of Culturable Command Area in Singrauli and Sidhi Districts in Madhya Pradesh. This project is proposed on the basis of availability of water, low irrigation facility in the area, demand and other socio-economic factors.

ii. The dam is proposed to be constructed near Gotra village, Kusmi Tehsil of Sidhi district located around 40 KM from Sidhi city. The proposed dam is of gross capacity of 43.43 MCM with total submergence area of approx. 1083.82 ha. The river bed level is RL 332m and FRL is 345.0m. The water to be pumped from the dam for irrigating 33015 Ha CCA by constructing two pump houses from dam to command area with lifting level from RL 332m to RL 450.66m. It is proposed to lift 11.56 cumec of water from dam to command area.

iii. Constructing two pumps houses for lifting water to command area, pump houses will consume approximately 17.45 MW power for running pumps, lifting 11.56 cumec of water from the dam and carrying water to command area through pipe line for irrigating 33015 ha; covering 97 villages (5 villages in Kusmi tehsil, 7 villages in

Madwas tehsil, 69 villages in Majhauli tehsil, Sidhi district and 16 villages in Sarai tehsil, Singrauli district).

iv. It is proposed to install necessary transmission line for drawing power for running pumps during irrigation period and exporting power produced through power generation. 10 MW of Power is expected to be generated through this project.

v. The total land required for submergence area & permanent structures is 1088.57 ha. Out of the total land required 64.25 ha is Forest land, 539.78 ha is Government land and the rest 484.54 is Private land.

vi. The proposed project is located in the close vicinity of Sanjay Dubri Tiger Reserve. According to the Chief Conservator of Forests, Sanjay Tiger Reserve, the distance of Gotra Dam is at a distance of 11.8 km from the core zone of Sanjay Tiger Reserve. However, a part of the proposed submergence area along the Gopad river (which is already within water body area of existing Gopad river) is falling inside the notified Eco-sensitive Zone.

vii. It is proposed to complete the construction of project within a period of 4 years at an estimated cost of INR 745.00 crore.

viii. The proposal is for amendment in the Terms of Reference granted by the Ministry vide TOR identification No. TO23A0505MP5971902N dated 31/08/2023 for the project Gond Major Irrigation Project (20.40 MW and CCA: 41250) located at Village Jhara and Gotra, Tehsil Sarai and Kushmi, District Singrauli and Sidhi, Madhya Pradesh in favour of M/s Water Resource Department, Govt. of Madhya Pradesh.

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

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
1	**Subject**	Gond Major Irrigation Project (20.40 MW and CCA: 41250) at Village Jhara and Gotra, Tehsil Sarai and Kushmi, District Singrauli and Sidhi, Madhya Pradesh by M/s Water Resource	Gond Major Irrigation Project – Gotra Dam (10 MW and CCA: 33015 ha) in Tehsil Kusmi of District Sidhi and Tehsil Sarai of District	The earlier proposal envisages construction of 2 barrages, one each at Songarh and Gotra. Songarh Barrage is proposed at a distance of 0.34 km

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		Department, Govt. of Madhya Pradesh	Singrauli, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh	from the core zone and entirely inside the buffer zone of Sanjay Tiger Reserve. In order to avoid the proximity to Sanjay Tiger Reserve, Water Resource Department, Govt. of Madhya Pradesh, planned to go ahead with Gotra Barrage only with dam in Sidhi district and submergence area spreading over Sidhi and Singrauli districts. As a result, power generation capacity got reduced from 20.40 MW to 10 MW and CCA got reduced from 41250 ha to 33015 ha.
2	**Para 1**	This is in reference to your application for grant of Terms of Reference under the provision of the EIA Notification 2006, as amended in respect of project Gond Major Irrigation Project (20.40 MW and CCA: 41250)	This is in reference to your application for grant of Terms of Reference under the provision of the EIA Notification 2006, as amended in respect of project Gond Major Irrigation Project – Gotra	The decrease in power generation capacity from 20.40 MW to 10 MW and CCA from 41250 ha to 33015 ha is due to the construction of single barrage instead of 2 barrages.

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
			Dam (10 MW and CCA: 33015 ha)	
3	**Para 2 (vii) Name of the project**	Gond Major Irrigation Project	Gond Major Irrigation Project – Gotra Dam	The earlier proposal envisages construction of 2 barrages, one each at Songarh and Gotra. Now, Water Resource Department, Govt. of Madhya Pradesh, planned to go ahead with Gotra Barrage only.
4	**Para 7**	The MoEF&CC has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006, as amended and after accepting the recommendations of the Expert Appraisal Committee hereby decided to grant Terms of Reference for instant proposal of Gond Major Irrigation Project (20.40 MW and CCA: 41250) at Village Jhara and Gotra, Tehsil Sarai and Kushmi, District Singrauli and Sidhi, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh, under the provisions of EIA	The MoEF&CC has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006, as amended and after accepting the recommendations of the Expert Appraisal Committee hereby decided to grant Terms of Reference for instant proposal of Gond Major Irrigation Project – Gotra Dam (10 MW and CCA: 33015 ha) in Tehsil Kusmi of District	The earlier proposal envisages construction of 2 barrages, one each at Songarh and Gotra. Songarh Barrage is proposed at a distance of 0.34 km from the core zone and entirely inside the buffer zone of Sanjay Tiger Reserve. In order to avoid the proximity to Sanjay Tiger Reserve, Water Resource Department, Govt. of Madhya Pradesh, planned to go ahead with Gotra Barrage only with dam in Sidhi district and submergence area

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		Notification, 2006, as amended.	Sidhi and Tehsil Sarai of District Singrauli, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh, under the provisions of EIA Notification, 2006, as amended.	spreading over Sidhi and Singrauli districts. As a result, power generation capacity got reduced from 20.40 MW to 10 MW and CCA got reduced from 41250 ha to 33015 ha.
Annexure-II				
5	**Details of Products & By-products**	Irrigation: 41250 ha Hydro Power: 20.40 MW	Irrigation: 33015 ha Hydro Power: 10 MW	The decrease in power generation capacity from 20.40 MW to 10 MW and CCA from 41250 ha to 33015 ha is due to the construction of single barrage instead of 2 barrages.
Annexure-III				
6	**The details of the project:** **Point - i**	The proposal is for ToR to the project Gond Major Irrigation Project (20.40 MW and CCA: 41250) located at Village Jhara and Gotra, Tehsil Sarai and Kushmi, District Singrauli and Sidhi, Madhya Pradesh by M/s. Water Resource Department, Govt. of Madhya Pradesh	The proposal is for ToR to Gond Major Irrigation Project – Gotra Dam (10 MW and CCA: 33015 ha) in Tehsil Kusmi of District Sidhi and Tehsil Sarai of District Singrauli, Madhya Pradesh by M/s Water Resource	The earlier proposal envisages construction of 2 barrages, one each at Songarh and Gotra. Songarh Barrage is proposed at a distance of 0.34 km from the core zone and entirely inside the buffer zone of Sanjay Tiger Reserve. In order to avoid the proximity

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
			Department, Govt. of Madhya Pradesh	to Sanjay Tiger Reserve, Water Resource Department, Govt. of Madhya Pradesh, planned to go ahead with Gotra Barrage only with dam in Sidhi district and submergence area spreading over Sidhi and Singrauli districts. As a result, power generation capacity got reduced from 20.40 MW to 10 MW and CCA got reduced from 41250 ha to 33015 ha.
7	**The details of the project:** **Point - iv**	The estimated project cost is Rs. 1316.00 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).	The estimated project cost is Rs. 745.00 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).	The earlier proposal envisages construction of 2 barrages, one each at Songarh and Gotra. Now, Water Resource Department, Govt. of Madhya Pradesh, planned to go ahead with Gotra Barrage only.
	Point Number – vii **The salient features of the project are as under: -**			
	Project details:			

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
8	**Name of the Proposal**	Gond Major Irrigation Project	Gond Major Irrigation Project – Gotra Dam	The earlier proposal envisages construction of 2 barrages, one each at Songarh and Gotra. Now, Water Resource Department, Govt. of Madhya Pradesh, planned to go ahead with Gotra Barrage only.
9	**Location (Including coordinates)**	Songarh/ Jhara Barrage is located near Jhara village, Sarai Tehsil, Singrauli district of Madhya Pradesh with the geographical latitude of 23°59' 21.69" N and longitude of 82°6' 8.03" E. The Gotra Barrage is located near Gotra village, Kushmi Tehsil, Sidhi district of Madhya Pradesh with the geographical latitude of 24°5' 24.49" N and longitude of 81°54' 21.15" E.	The Gotra Barrage is located near Gotra village, Kusmi Tehsil, Sidhi district of Madhya Pradesh with the geographical latitude of 24°5' 9.72" N and longitude of 81°54' 25.51" E.	The earlier proposal envisages construction of 2 barrages, one each at Songarh and Gotra. Now, Water Resource Department, Govt. of Madhya Pradesh, planned to go ahead with Gotra Barrage only.
	Category details:			
10	**Capacity / Cultural command area (CCA)**	41250 ha	33015 ha	The decrease in CCA from 41250 ha to 33015 ha is due to the construction of single barrage instead of 2 barrages.

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
	Electricity generation capacity:			
11	**Powerhouse Installed Capacity**	20.40 MW	10 MW	The decrease in power generation capacity from 20.40 MW to 10 MW is due to the construction of single barrage instead of 2 barrages.
12	**No. of Units**	4 nos. (5.10 MW each)	2 nos. (5 MW each)	The decrease in power generation capacity from 20.40 MW to 10 MW is due to the construction of single barrage instead of 2 barrages.
	ToR Details:			
13	**Cost of project**	1316.00 Cr.	745.00 Cr.	The earlier proposal envisages construction of 2 barrages, one each at Songarh and Gotra. Now, Water Resource Department, Govt. of Madhya Pradesh, planned to go ahead with Gotra Barrage only.
14	**Total area of Project**	2380.104 ha	1088.57 ha	The land area has decreased due to the construction of single barrage

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
				instead of 2 barrages.
15	**Height of Dam from River Bed (EL)**	Songarh Barrage – 20.0 m Gotra Barrage – 16.0m	16.0m	Since it is proposed to construct Gotra Dam only and there are no changes in the features of Gotra Dam.
16	**Details of Submergence area**	2327.104 ha	1083.82 ha	The submergence area has decreased due to the construction of single barrage instead of 2 barrages.
17	**E-Flows for the Project**	Water will be stored during monsoon and diverted for irrigation. Available annual 75% dependable total yield at Songarh Barrage and Gotra Barrage is 678.642 MCM and 878.136 MCM respectively. There are 7 upstream projects for which water allocation (u/s commitment) is 5.76 MCM. Hence net available yield at Songarh Barrage and Gotra Barrage is 672.882 MCM and 872.376 MCM respectively. Approximately 95% of the yield is contributed by monsoon flow and only	Water will be stored during monsoon and diverted for irrigation. Available annual 75% dependable total yield at Gotra Barrage is 878.136 MCM. There are 7 upstream projects for which water allocation (u/s commitment) is 5.76 MCM. Hence net available yield at Gotra Barrage is 872.376 MCM. Approximately 95% of the yield is contributed by monsoon flow and	Since it is proposed to construct Gotra Dam only and there are no changes in the features of Gotra Dam.

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		about 5% yield will be come from non-monsoon period. Therefore, to mitigate the impact of reduced flow or drying up of the river downstream of the dam; the project is designed with live storage/ proposed utilization of 75.66 MCM and 43.30 MCM at Songarh Barrage and Gotra Barrage respectively, and remaining water from monsoon contribution will be continuously discharged for downstream and upstream users. The quantum works out to be 597.222 MCM and 829.076 MCM at Songarh Barrage and Gotra Barrage respectively. Almost 89% and 95% of the water will be available at Songarh Barrage and Gotra Barrage respectively in pre-project conditions. Therefore, no additional environment flow is required to be released during monsoon period.	only about 5% yield will be come from non-monsoon period. Therefore, to mitigate the impact of reduced flow or drying up of the river downstream of the dam; the project is designed with live storage/ proposed utilization of 43.43 MCM, and remaining water from monsoon contribution will be continuously discharged for downstream and upstream users. The quantum works out to be 829.076 MCM. Almost 95% of the water will be available at Gotra Barrage in pre-project conditions. Therefore, no additional environment flow is required to be released during monsoon period.	

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		To ensure that downstream conditions do not change substantially during non-monsoon period, entire discharge of non-monsoon period is recommended to be released as environmental flow.	To ensure that downstream conditions do not change substantially during non-monsoon period, entire discharge of non-monsoon period is recommended to be released as environmental flow.	
	Land Area Breakup:			
18	**Private Land**	1110.824 ha	484.54 ha	The requirement of private land has decreased due to the construction of single barrage instead of 2 barrages.
19	**Government land/Forest Land**	1093.710 ha Govt. Land/ 175.570 ha Forest Land	539.78 ha Govt. Land/ 64.25 ha Forest Land	The requirement of Government land/ Forest land has decreased due to the construction of single barrage instead of 2 barrages.
20	**Submergence area/Reservoir area**	2327.104 ha	1083.82 ha	The submergence area has decreased due to the construction of single barrage

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
				instead of 2 barrages.
21	**Land required for project components**	53 ha	4.75 ha	The Land required for project components has decreased due to the construction of single barrage instead of 2 barrages.
22	**Additional information (if any)**	Total land required – 2380.104 ha	Total land required – 1088.57 ha	Total land required has decreased due to the construction of single barrage instead of 2 barrages.
	Presence of Environmentally Sensitive areas in the study area:			
23	**National Park**	Songarh Barrage is at a distance of 0.34 km from the core zone and its entirely inside the buffer zone of Sanjay Tiger Reserve. Distance between Gotra Barrage and core and buffer zone of Sanjay Tiger Reserve is 13 km and 2 km respectively. Letter No. मा.ची./2023/913 dated 13.02.2023 from the office of CF, Sanjay Tiger Reserve provides the above information.	Gotra Dam is at a distance of 11.8 km from the core zone of Sanjay Tiger Reserve. However, a part of the proposed submergence area along the Gopad river (which is already within water body area of existing Gopad river) is falling inside the notified Ecosensitive Zone. Letter No. तक./2025/5755	Since it is proposed to construct Gotra Dam only.

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
			dated 09.09.2025 from the office of CCF, Sanjay Tiger Reserve provides the above information.	
	Previous EC compliance and necessary approvals:			
24	**Status of Stage- I FC**	Proposal No. FP/MP/IRRIG/23033/2016. The proposal is pending with user agency as it is under revision	Online application seeking forest diversion for 167.5 Ha has been submitted vide Proposal No. FP/MP/HYD/IRRIG/480656/2024. The proposal is pending at DFO/CF/Nodal Officer after acceptance in PSC-I. The proposal for 64.25 Ha of forest land in Singrauli division has been approved by DFO on 23/07/2025 (Part II)	The proposal was revised considering total 167.50 ha of forest land required for Gond Major Irrigation Project (comprising of Songarh and Gotra Barrages). Currently, since only Gotra barrage is proposed, therefore, as per FC Form-A (Part II) submitted by DFO, Singrauli Forest Division, total forest land required for the project is 64.25 ha.
	Miscellaneous:			
25	**Project Benefits**	On completion of the Project the following benefits can be derived: • Annual Rabi irrigation of 41250 Ha.	On completion of the Project the following benefits can be derived:	The decrease in CCA from 41250 ha to 33015 ha is due to the construction of single barrage

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		• Rise in sub soil water level in the project area. • Development of fisheries in the reservoir. • Production of crops will increase Hence per capita income will increase. • Employment to local labour largely tribes during construction period.	• Annual Rabi irrigation of 33015 Ha. • Rise in sub soil water level in the project area. • Development of fisheries in the reservoir. • Production of crops will increase Hence per capita income will increase. • Employment to local labour largely tribes during construction period.	instead of 2 barrages.
26	**Status of other statutory clearances**	**Forest Clearance:** Online application seeking forest diversion for 383.868 was submitted on 23.10.2017 (Proposal No. FP/MP/IRRIG/23033/2016) As the location of the proposal is revised and forest land requirement has been reduced to 175.57ha, application seeking forest diversion will also be revised. Alongside, other statutory clearances (as applicable) from State as well as Central government will be	**Forest Clearance:** Online application seeking forest diversion for 167.5 Ha has been submitted vide Proposal No. FP/MP/HYD/IRRIG/480656/2024. The proposal is pending at DFO/CF/Nodal Officer after acceptance in PSC-I. The proposal for 64.25 Ha of forest land in Singrauli division has been approved by DFO	The requirement of Forest land has decreased due to the construction of single barrage instead of 2 barrages.

S. No.	Para of ToR issued by MoEF&CC	Details as per the ToR	To be revised/ read as	Justification/ reasons
		obtained post completion of Detailed Project Report.	on 23/07/2025 (Part II) Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.	
27	**R&R details**	522 families residing in 13 villages have been identified as project affected families. Out of the 522 families, 348 families are likely to be displaced. The process of R&R is yet to be initiated. Detailed R&R plan will be Provided in EIA/EMP Report.	Total 15 villages, 4 villages in Singrauli district and 11 villages in Sidhi district will be affected due to the submergence area. Identification of project affected families is under process. The process of R&R is yet to be initiated. Detailed R&R plan will be Provided in EIA/EMP Report.	The number of villages likely to be affected increased due to the detailed survey.

x. The salient features of the project:

1. EAC Meeting Details:

EAC meeting/s	42nd Meeting
Date of Meeting/s	31/10/2025
Date of earlier EAC meetings	18/07/2023

2. Project details:

Name of the Proposal	Gond Major Irrigation Project – Gotra Dam
Proposal No.	IA/MP/RIV/554406/2025
Location (Including Coordinates)	Dam site is proposed on river Gopad, a tributary of Son river near village Gotra, tehsil Kusmi, district Sidhi, Madhya Pradesh at Latitude 24°05'9.72" N, Longitude 81°54'25.51" E
Company's Name	Water Resources Department, Govt. of Madhya Pradesh
CIN no. of Company/user agency	Not Applicable
Accredited Consultant, Validity and certificate no.	R S Envirolink Technologies Pvt. Ltd. Certificate No.: NABET/EIA/25-28/RA 0415 Validity: 15-08-2028
Project location (Coordinates/ River/ Reservoir)	Dam site is proposed on river Gopad, a tributary of Son river near village Gotra, tehsil Kusmi, district Sidhi, Madhya Pradesh at Latitude 24°05'9.72" N, Longitude 81°54'25.51" E. Reservoir area extends in tehsil Sarai, district Singrauli, Madhya Pradesh.
Inter- state issue involved	No

3. Category details:

Category of the project	A
Capacity / Cultural command area (CCA)	33015 ha
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	-

4. ToR Details:

Earlier EC Proposal No.	NA
Earlier EAC meeting date	24.07.2023 (for ToR)
EC Letter No.	NA
EC grant Date	NA
Cost of project	Rs. 745.00 Cr.
Total area of Project	1088.57 ha
Date of online application for amendment in ToR was	09-10-2025
Details of CTE/CTO	Yet to be obtained
No. of trees/saplings proposed in view of	Will be finalized during the preparation of EIA

'Ek Ped Maa Ke Naam' campaign	report.

5. Electricity generation capacity:

Powerhouse Installed Capacity	10 MW
Generation of Electricity Annually	Captive use only
No. of Units	2 nos. (5 MW each)

6. Detail reason for amendment in ToR:

The project was proposed with two barrages, one at Songarh in Singraulii district and another at Gotra in Sidhi district both on River Gopad. The project was planned to irrigate 41250 ha of Culturable Command Area along with generation 20.40 MW of electricity. Songarh Barrage was proposed at a distance of 0.34 km from the core zone and entirely inside the buffer zone of Sanjay Tiger Reserve. Therefore, in order to avoid the proximity to Sanjay Tiger Reserve, Water Resource Department, Govt. of Madhya Pradesh has planned to go ahead with Gotra Barrage only. As a result, power generation capacity got reduced from 20.40 MW to 10 MW and CCA got reduced from 41250 ha to 33015 ha. In addition, the land area has reduced from 2380.14 ha to 1088.57 ha. Hence, amendment to scoping clearance is being requested due to revision in project parameters.

7. The comparative statement with reference to earlier proposal and revised proposal is to be given in table format:

S. No.	Details	Original	Revised
1	**Subject**	Gond Major Irrigation Project (20.40 MW and CCA: 41250) at Village Jhara and Gotra, Tehsil Sarai and Kushmi, District Singrauli and Sidhi, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh	Gond Major Irrigation Project – Gotra Dam (10 MW and CCA: 33015 ha) in Tehsil Kusmi of District Sidhi and Tehsil Sarai of District Singrauli, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh
2	**Para 1**	This is in reference to your application for grant of Terms of Reference under the provision of the EIA Notification 2006, as amended in respect of project Gond Major	This is in reference to your application for grant of Terms of Reference under the provision of the EIA Notification 2006, as amended in respect of project Gond Major Irrigation Project – Gotra Dam (10 MW and CCA:

S. No.	Details	Original	Revised
		Irrigation Project (20.40 MW and CCA: 41250)	33015 ha)
3	**Para 2 (vii) Name of the project**	Gond Major Irrigation Project	Gond Major Irrigation Project – Gotra Dam
4	**Para 7**	The MoEF&CC has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006, as amended and after accepting the recommendations of the Expert Appraisal Committee hereby decided to grant Terms of Reference for instant proposal of Gond Major Irrigation Project (20.40 MW and CCA: 41250) at Village Jhara and Gotra, Tehsil Sarai and Kushmi, District Singrauli and Sidhi, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh, under the provisions of EIA Notification, 2006, as amended.	The MoEF&CC has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006, as amended and after accepting the recommendations of the Expert Appraisal Committee hereby decided to grant Terms of Reference for instant proposal of Gond Major Irrigation Project – Gotra Dam (10 MW and CCA: 33015 ha) in Tehsil Kusmi of District Sidhi and Tehsil Sarai of District Singrauli, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh, under the provisions of EIA Notification, 2006, as amended.
Annexure-II			
5	**Details of Products & By-products**	Irrigation: 41250 ha Hydro Power: 20.40 MW	Irrigation: 33015 ha Hydro Power: 10 MW
Annexure-III			
6	**The details of the project: Point - i**	The proposal is for ToR to the project Gond Major Irrigation Project (20.40 MW and CCA: 41250) located at Village Jhara and	The proposal is for ToR to Gond Major Irrigation Project – Gotra Dam (10 MW and CCA: 33015 ha) in Tehsil Kusmi of District Sidhi and Tehsil Sarai of District

S. No.	Details	Original	Revised
		Gotra, Tehsil Sarai and Kushmi, District Singrauli and Sidhi, Madhya Pradesh by M/s. Water Resource Department, Govt. of Madhya Pradesh	Singrauli, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh
7	**The details of the project: Point - iv**	The estimated project cost is Rs. 1316.00 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).	The estimated project cost is Rs. 745.00 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).
	Point Number – vii **The salient features of the project are as under: -**		
	Project details:		
8	**Name of the Proposal**	Gond Major Irrigation Project	Gond Major Irrigation Project – Gotra Dam
9	**Location (Including coordinates)**	Songarh/ Jhara Barrage is located near Jhara village, Sarai Tehsil, Singrauli district of Madhya Pradesh with the geographical latitude of 23°59’ 21.69” N and longitude of 82°6’ 8.03” E. The Gotra Barrage is located near Gotra village, Kushmi Tehsil, Sidhi district of Madhya Pradesh with the geographical latitude of 24°5’ 24.49” N and longitude of 81°54’ 21.15” E.	The Gotra Barrage is located near Gotra village, Kusmi Tehsil, Sidhi district of Madhya Pradesh with the geographical latitude of 24°5’ 9.72” N and longitude of 81°54’ 25.51” E.
	Category details:		
10	**Capacity / Cultural command area (CCA)**	41250 ha	33015 ha

S. No.	Details	Original	Revised
	Electricity generation capacity:		
11	**Powerhouse Installed Capacity**	20.40 MW	10 MW
12	**No. of Units**	4 nos. (5.10 MW each)	2 nos. (5 MW each)
	ToR Details:		
13	**Cost of project**	1316.00 Cr.	745.00 Cr.
14	**Total area of Project**	2380.104 ha	1088.57 ha
15	**Height of Dam from River Bed (EL)**	Songarh Barrage – 20.0 m Gotra Barrage – 16.0m	16.0m
16	**Details of Submergence area**	2327.104 ha	1083.82 ha
17	**E-Flows for the Project**	Water will be stored during monsoon and diverted for irrigation. Available annual 75% dependable total yield at Songarh Barrage and Gotra Barrage is 678.642 MCM and 878.136 MCM respectively. There are 7 upstream projects for which water allocation (u/s commitment) is 5.76 MCM. Hence net available yield at Songarh Barrage and Gotra Barrage is 672.882 MCM and 872.376 MCM respectively. Approximately 95% of the yield is contributed by monsoon flow and only about 5% yield will be come from non-monsoon period. Therefore, to mitigate the impact of reduced flow or	Water will be stored during monsoon and diverted for irrigation. Available annual 75% dependable total yield at Gotra Barrage is 878.136 MCM. There are 7 upstream projects for which water allocation (u/s commitment) is 5.76 MCM. Hence net available yield at Gotra Barrage is 872.376 MCM. Approximately 95% of the yield is contributed by monsoon flow and only about 5% yield will be come from non-monsoon period. Therefore, to mitigate the impact of reduced flow or drying up of the river downstream of the dam; the project is designed with live storage/ proposed utilization of 43.43 MCM, and remaining water from monsoon contribution will be continuously discharged for downstream and upstream users. The quantum works out to be

S. No.	Details	Original	Revised
		drying up of the river downstream of the dam; the project is designed with live storage/ proposed utilization of 75.66 MCM and 43.30 MCM at Songarh Barrage and Gotra Barrage respectively, and remaining water from monsoon contribution will be continuously discharged for downstream and upstream users. The quantum works out to be 597.222 MCM and 829.076 MCM at Songarh Barrage and Gotra Barrage respectively. Almost 89% and 95% of the water will be available at Songarh Barrage and Gotra Barrage respectively in pre-project conditions. Therefore, no additional environment flow is required to be released during monsoon period. To ensure that downstream conditions do not change substantially during nonmonsoon period, entire discharge of nonmonsoon period is recommended to be released as environmental flow.	829.076 MCM. Almost 95% of the water will be available at Gotra Barrage in pre-project conditions. Therefore, no additional environment flow is required to be released during monsoon period. To ensure that downstream conditions do not change substantially during nonmonsoon period, entire discharge of nonmonsoon period is recommended to be released as environmental flow.
	Land Area Breakup:		
18	**Private Land**	1110.824 ha	484.54 ha
19	**Government land/Forest Land**	1093.710 ha Govt. Land/ 175.570 ha Forest Land	539.78 ha Govt. Land/ 64.25 ha Forest Land
20	**Submergence**	2327.104 ha	1083.82 ha

S. No.	Details	Original	Revised
	area/Reservoir area		
21	**Land required for project components**	53 ha	4.75 ha
22	**Additional information (if any)**	Total land required – 2380.104 ha	Total land required – 1088.57 ha
	Presence of Environmentally Sensitive areas in the study area:		
23	**National Park**	Songarh Barrage is at a distance of 0.34 km from the core zone and its entirely inside the buffer zone of Sanjay Tiger Reserve. Distance between Gotra Barrage and core and buffer zone of Sanjay Tiger Reserve is 13 km and 2 km respectively. Letter No. मा.ची./2023/913 dated 13.02.2023 from the office of CF, Sanjay Tiger Reserve provides the above information.	Gotra Dam is at a distance of 11.8 km from the core zone of Sanjay Tiger Reserve. However, a part of the proposed submergence area along the Gopad river (which is already within water body area of existing Gopad river) is falling inside the notified Eco-sensitive Zone. Letter No. तक./2025/5755 dated 09.09.2025 from the office of CCF, Sanjay Tiger Reserve provides the above information.
	Previous EC compliance and necessary approvals:		
24	**Status of Stage- I FC**	Proposal No. FP/MP/IRRIG/23033/201. The proposal is pending with user agency as it is under revision	Proposal No. FP/MP/HYD/IRRIG/480656/2024. The proposal is pending at DFO/CF/Nodal Officer after acceptance in PSC-I.
	Miscellaneous:		
25	**Project Benefits**	On completion of the Project the following benefits can be derived: • Annual Rabi irrigation of 41250 Ha. • Rise in sub soil water level in the project area. • Development of fisheries in the reservoir.	On completion of the Project the following benefits can be derived: • Annual Rabi irrigation of 33015 Ha. • Rise in sub soil water level in the project area. • Development of fisheries in the reservoir. • Production of crops will increase

S. No.	Details	Original	Revised
		• Production of crops will increase Hence per capita income will increase. • Employment to local labour largely tribes during construction period.	Hence per capita income will increase. • Employment to local labour largely tribes during construction period.
26	**Status of other statutory clearances**	**Forest Clearance:** Online application seeking forest diversion for 383.868 was submitted on 23.10.2017 (Proposal No. FP/MP/IRRIG/23033/2016) As the location of the proposal is revised and forest land requirement has been reduced to 175.57ha, application seeking forest diversion will also be revised. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.	**Forest Clearance:** Online application seeking forest diversion for 167.5 Ha has been submitted vide Proposal No. FP/MP/HYD/IRRIG/480656/2024. The proposal is pending at DFO/CF/Nodal Officer after acceptance in PSC-I. The proposal for 64.25 Ha of forest land in Singrauli division has been approved by DFO on 23/07/2025 (Part II). Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
27	**R&R details**	522 families residing in 13 villages have been identified as project affected families. Out of the 522 families, 348 families are likely to be displaced. The process of R&R is yet to be initiated. Detailed R&R plan will be Provided in EIA/EMP Report.	Total 15 villages, 4 villages in Singrauli district and 11 villages in Sidhi district will be affected due to the submergence area. Identification of project affected families is under process. The process of R&R is yet to be initiated. Detailed R&R plan will be Provided in EIA/EMP Report.

8. Court case details: Nil

42.3.3 The EAC during deliberations noted the following:

The proposal is for grant of amendment in Terms of References (TOR) to the project for Gond Major Irrigation Project (10 MW & CCA of 33,015 ha) in an area of 1088.57 Ha located at Village Siroli, Sikra, Bakwa, Bhadaili, etc, Sub-District Majhauli, Kusmi and Deosar, District Singrauli and Sidhi, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh.

The project is listed at S.N.1(c) of the Schedule to the Environment Impact Assessment (EIA) Notification under category 'A' and are appraised at Central Level by Expert Appraisal Committee (EAC).

The Terms of Reference granted by the Ministry vide letter no. J-12011/36/2023-IA.I (R) dated 31/08/2023 for the Gond Major Irrigation Project (20.40 MW and CCA: 41250) at Village Jhara and Gotra, Tehsil Sarai and Kushmi, District Singrauli and Sidhi, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh.

The EAC noted that the earlier proposal comprised two barrages—one at Songarh in Singrauli district and the other at Gotra in Sidhi district—both located on the Gopad River. The project was originally planned to irrigate 41,250 ha of Culturable Command Area (CCA) and generate 20.40 MW of electricity. The Songarh Barrage was proposed at a distance of 0.34 km from the core zone, falling entirely within the buffer zone of the Sanjay Tiger Reserve. To avoid proximity to the Sanjay Tiger Reserve, the Water Resources Department, Government of Madhya Pradesh, has decided to proceed only with the Gotra Barrage. Consequently, the power generation capacity has been reduced from 20.40 MW to 10 MW, and the CCA has been reduced from 41,250 ha to 33,015 ha. In addition, the land requirement has decreased from 2,380.14 ha to 1,088.57 ha.

During the meeting, the EAC highlighted that the reduction in CCA from 41,250 ha to 33,015 ha would result in approximately 8,235 ha of land remaining unirrigated, potentially affecting the agricultural benefits envisaged under the original proposal. The Committee sought clarification on the measures proposed to address this shortfall. In response, the PP informed that they are in the process of planning another project to provide irrigation to the remaining area, and stated that the necessary statutory clearances for the proposed project would be obtained separately.

42.3.4 The EAC after examining the information submitted and detailed deliberations recommended the proposal grant of amendment in Terms of References as proposed by the PP to Gond Major Irrigation Project (10 MW & CCA of 33,015 ha) in an area of 1088.57 Ha located at Village Siroli, Sikra, Bakwa, Bhadaili, etc, Sub-District Majhauli, Kusmi and Deosar, District Singrauli and Sidhi, Madhya Pradesh by M/s Water Resource Department, Govt. of Madhya Pradesh, under the provisions of EIA Notification, 2006 and as amended with subject to the following additional conditions:

i. PP shall prepare detailed plan for Plantation of saplings under the tree plantation campaign **"Ek Ped Ma Ke Naam"**.
ii. EIA/EMP, collection of baseline data, other statuary clearance and the public hearing shall be carried out as per revised layout.
iii. The PP will exercise to avoid submergence in Eco-Sensitive Zone of Sanjay Dubri Tiger Reserve.
iv. All other Terms of Reference mentioned letter no. J-12011/36/2023-IA.I (R) dated 31/08/2023 shall remain unchanged.

Agenda Item No. 42.4

Bargi Open Pumped Storage Hydro Project (1000 MW) at Village Pindrai Mal. (Sahajpuri), Salaiya Mal.(Barangada), Jamthar, Khapa, Newari and Pondi, Sub- District Narayanganj, District Mandla, Madhya Pradesh by M/s Serentica Renewables India 21 Private Limited - Terms of Reference – reg.

[Proposal No. IA/MP/RIV/553405/2025; F. No. J-12011/36/2025-IA.I(R)]

42.4.1 The proposal is for grant of Terms of Reference (TOR) to the project Bargi Open Pumped Storage Hydro Project (1000 MW) at Village Pindrai Mal. (Sahajpuri), Salaiya Mal.(Barangada), Jamthar, Khapa, Newari And Pondi, Sub- District Narayanganj, District Mandla, Madhya Pradesh by M/s Serentica Renewables India 21 Private Limited.

42.4.2 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. M/s. Serentica Renewables India 21 Pvt. Ltd. (SRIPL) is proposing an Off-stream Open Loop Pumped Storage Hydro Project (1000 MW) at District: Mandla (Madhya Pradesh). Pumped storage hydropower project is typically a configuration of two water reservoirs at different elevations that can generate power (discharge) as water moves down through a turbine; this project draws power as it pumps water (recharge) to the upper reservoir. Proposed Pumped Storage Hydro Project (PSHP) is Off-Stream Open Loop pumped storage development, proposed with an installed capacity of 1000 MW.

ii. The Project comprises of development of upper reservoir with a gross storage capacity of 24.44 MCM, out of which upper reservoir to be constructed with maximum dam height of 25 m (from deepest bed level) to create the desired storage capacity. The scheme of operation for the project is with 6 Hours of peak hour generation per day and 7 Hours for pumping back the water to the upper reservoir. Water will be used cyclically for energy storage and discharge. One-time water requirement for the initial filling of the upper

reservoir will be 25.44 MCM. Evaporation losses have been found to be about 2.75 MCM annually which will be recouped periodically from the existing Bargi Reservoir.

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

S. No.	Latitude	Longitude
1.	22°51'24.29"N	79°58'51.28"E
2.	22°52'51.31"N	79°59'20.98"E
3.	22°53'26.00"N	80°0'29.22"E
4.	22°54'5.74"N	80°1'19.02"E
5.	22°53'40.44"N	80°1'37.50"E
6.	22°53'4.53"N	80°1'53.21"E
7.	22°52'27.16"N	80°1'7.57"E
8.	22°51'20.92"N	80°0'31.76"E
9.	22°51'18.86"N	79°58'59.32"E

iv. The Bargi Pumped Storage Hydro Project envisages construction of an upper reservoir, Muck Disposal Area, Lower Reservoir/ Approach Channel, WCS, Powerhouse, Pothead Yard and Adits, Colony Area, Site Offices, Labour Camps, Crushing & Batching Plant, Stacking Area & Workshop, Magazine Area etc.

v. **Land requirement:** Total area of the proposed project is 381.50 Ha. Out of the total land required for the proposed project, 271 ha is Forest Land and 110.50 ha is Non-forest Land. Out of total land area, 24.6 Ha, (~ 6.45 %) area will be developed under the greenbelt development plan for the proposed project.

vi. **Demographic details in 10 km radius of project area:** The study area comprises of 53 villages with a total population of 29980, number of Households 6901, SC Population as 971 and ST Population as 23462. Total Working population of the study area is 16123 (7570 Main workers & 8553 Marginal workers) & 13857 is non-working population. Total Literacy rate of the study area is 65.1 %. Sex Ratio (Females per 1000 Males) of the study area is 996.

vii. **Water requirement**: One-time water requirement of 25.44 MCM will be filled from the existing Bargi Reservoir & 2.75 MCM annual water required to recoup the evaporation losses will be meet from the existing Bargi Reservoir.

viii. **Project Cost:** The estimated project cost is Rs. 4689.89 Crores. Total capital cost earmarked towards environmental management plan is Rs. 20 Crores and the Recurring cost (operation and maintenance) will be about Rs. 2 Crores per annum**.**

ix. **Project Benefit**:

Social Benefits: Direct & indirect employment opportunities during construction phase will significantly contribute in uplifting quality of life of people of the region. During operation phase also, local people will get employment opportunity in operation, maintenance and auxiliary activities.

Financial Benefits: The project with a proposed peaking energy installation of 1000 MW. It will contribute in reduction in gap between demand and supply of peak power in the state and country. Project activity will mobilize financial resources in the area.

Environmental Benefits: Out of total project area, 24.6 ha area will be developed under the greenbelt/ plantation. The company will carry out compensatory afforestation in consultation with the forest department. Apart from these, during operation phase of the Project, one new water body in the form of reservoir will be created.

x. **Environmental Sensitive area:** There are No National Parks, Wildlife Sanctuaries, Biosphere Reserves, Tiger/ Elephant Reserves & Wildlife Corridors present within 10 km radius of the project site. Kanha National Park is at 73.60 Km from the proposed project.

Chaurai Reserved Forest (Partly falling in the Project Site). Apart from the Chaurai Reserved Forest, there area 14 Reserved Forest and 2 Protected Forest are present within 10 km radius of the study area. Also, the study area has Dense jungle mainly teak and Dense mixed jungle.

Bargi Dam Reservoir (Rani Awanti Bai Sagar) on Narmada River (Partly falling in the Project Site as the Lower Reservoir is proposed at right bank of the existing reservoir). Apart from this, there are 3 other water bodies and few seasonal Nallahs which are active during Monsoon season present within the 10 km distance from the project site.

xi. **MoU / any other clearance/ permission signed with State government**:
Initial Allotment Letter issued by Office of the Commissioner, New and Renewable Energy, Urja Bhawan, Bhopal vide letter no. F/NRE/PHS/2025/09/Bhopal dated 11.08.2025 for development of 1000 MW PSHP project at District Mandla, Madhya Pradesh.

xii. **Resettlement and rehabilitation:** A total of 81 PAFs of 5 villages will be affected due to the proposed project. The land value for the private land purchased will be paid to the landowners on the basis of direct negotiations and on mutually agreed terms as per the prevailing norms.

xiii. **Scheduled –I species:** Will be assessed during preparation of EIA/EMP Report.

xiv. **Alternative Studies:** During the preparation of Feasibility Study Report, three alternatives w.r.t Upper Reservoir have been selected and 5 alternatives w.r.t Water Conductor System. Alternative -1 was found to be more feasible in techno-economical aspects. The existing Bargi Reservoir, also known as Rani Awanti Bai Sagar, will act as the lower reservoir. The details are as follows:

Comparison of Alternative w.r.t Upper Reservoir and Water Conductor System

S.No.	Description	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
1	Upper Reservoir	Artificial Pond			Artificial Pond	Artificial Pond
	Type of Dam	CFRD			CFRD	CFRD
	Max.Dam Height (m)	30			22	30
	Length of Dam (Km)	5.95			5.625	5.73
	Excavated Bed Level (m)	525			520	510
	FRL (m)	545			537	525
	MDDL (m)	528			522	512.25
	Live storage capacity (MCM)	22.17			23.50	25.04
	Dead storage capacity (MCM)	2.26			3.02	5.43
2	Lower Reservoir	Existing Reservoir				
	Type of Dam	Composite earthen & masonry				
	Max.Dam Height (m)	69 (Earthen Dam) & 29 (Masonry Dam)				
	Length of Dam (Km)	2750.51(Earthen Dam) & 827 (Masonry Dam)				
	FRL (m) (Actual)	422.76				
	MDDL (m) (Considered)	406				
	Live storage capacity (MCM)	2910				
	Dead storage capacity (MCM)	1010				
3	Power Potential					
	Total Generation Discharge (m^3/s)	968.02	968.02	968.02	1031.29	1148.98
	Unit Discharge (m^3/s)	193.25	193.25	193.25	206.26	229.80
	Dia Of	7.6	7.6	7.6	7.6	8

S.No.	Description	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
	Penstock/Pressure Shaft (m)					
	Velocity through Pressure Shaft (m/s)	4.71	4.71	4.71	4.55	4.57
	Length of Penstock/Pressure shaft (m) (avg)	664	606	1384	412	378
	Type of Power House	Semi-UG PH	UG PH	Semi-UG PH	UG PH	UG PH
	Upstream L/H Ratio	6.52	6.05	13.81	4.38	4.47
	Upstream Surge Shaft	Not Required	Not Required	Required	Not Required	Not Required
	Dia of Main TRT (m)	8.2	8.2	8.2	8.25	8.75
	Length of TRT (m) (avg)	264	1061	105	972.15	1152.03
	Downstream Surge Gallery	Not Required	Required	Not Required	Required	Required
	Length of MAT/Approach Road (m)	707	401	975	647	857
	Length of Construction Adit (m)	386	1671	284	3550	3625
4	**Energy**					
	Peaking Hours	6	6	6	6	6
	Max Net Head (m)	135.53	134	134	126	114
	Min Net Head (m)	101.77	100.24	100.24	94.24	84.49
	Rated Net Head (m)	117.22	117.16	117.16	109.83	98.58
	Max Min Head Ratio	1.33	1.34	1.34	1.34	1.35
	IC (MW)	1000	1000	1000	1000	1000
	No of Units	6	6	6	6	6
	Annual Energy (MU)	2078.5	2078.5	2078.5	2078.5	2078.5
5	Muck Quantity/Dam Rockfill/Useable Material					

S.No.	Description	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
	Construction Material Required (MCM)	12.69	12.01	11.9	15.48	15.57
	Excavation Quantity (MCM)	22.14	18.12	20.14	16.63	35.72
	Useable Material (MCM)	12.7	12.11	12.42	7.1	19.97
	Muck Quantity (MCM)	12.37	8.21	10.97	11.97	24.81
	Material to be Procured from Quarry (MCM)	-	-	-	8.39	-
	Muck Dumping Area (Ha)	100	70	95	100	200
6	Land Requirement (Ha)	381.5	353	391	443	618
7	Construction Time (Months)	36	48	42	48	48
8	R & R Issues	Less	Less	Less	High	Medium
9	Net Completion Cost Per MW (Crores)	4.69	5.36	5.1	5.7	5.49

Conclusion: In view of the geomorphological and design constraints present along and in proximity to Alternatives 2 and 3, an alternative (Alternative 1) featuring the shortest Water Conductor System and a surface powerhouse has been examined. At this location, geomorphology and topography allow for the design of the shortest water conductor system with a surface pit powerhouse/Semi-underground powerhouse in a low-head scheme, but it will require a long approach channel. Several geological cross-sections have been prepared to ascertain the geological and geotechnical setup of the approach channel. The geological assessment revealed that the approach channel will be founded on bedrock and alluvium, with a ratio of approximately 50 - 50%. This would require an appropriate construction methodology for the construction of the long approach channel with regard to floor and side wall stability and sedimentation. The water conductor system and surface pit powerhouse will be founded on a near-horizontally bedded basalt rock mass suitable for the foundation grade. Considering the geological, geomorphological, design, cost, and time factors, at this stage of the investigation, it appears that the shortest water conductor system with about 80m deep surface pit powerhouse/Semi-underground powerhouse is a techno-economic option for the Bargi Pumped Storage Scheme. The geological and geotechnical setup of the WCS for all options (Alt 1 & 2, 3) is almost similar. However, considering all design, cost, and time aspects, the

shortest WCS with about 80m deep surface pit powerhouse /Semi-underground powerhouse (Alt 1) has been selected for further study.

xv. Details of Solid waste/ Hazardous waste generation/ Muck and its management

Solid waste/ Hazardous waste generation/ Muck and its management

S.No.	Waste Generated	Source	Quantity	Unit	Mode of Disposal
1.	Muck	Quantity of muck / debris generated	22.14	MCM	Partly to be reused and rest is to be disposed of at the earmarked muck dumping site.
2.	Electronic equipment	Project and labour camp, colony	0.25	TPA	As per CPCB Guidelines
3.	Batteries	Project and labour camp, colony	2	TPA	As per CPCB Guidelines
4.	Bio-medical waste	Dispensary	1	TPA	Through CBWTF
5.	Burnt Mobil oil, Grease	Construction equipment	5.5	TPA	Through authorized dealer
6.	Plastic Waste	Labour camp and colony	22	TPA	As per CPCB Guidelines
7.	Organic Waste	Project and labour camp, colony	3.5	TPA	Biodigester
8.	Inorganic Waste	Project and labour camp, colony	5.3	TPA	Through authorized dealer

The muck generated from excavation including construction of roads is 22.14 MCM. Out of which approximately 12.7 MCM is expected to be usable muck. Balance shall be disposed of in muck disposal area.

xvi. Status of Litigation Pending against the proposal, if any. NIL

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

- **Project Details**

Name of the Proposal	Bargi Pumped Storage Hydro Project (1000 MW) at District: Mandla, Madhya Pradesh by M/s. Serentica Renewables India 21 Pvt. Ltd.

<table>
<tr><td>Location (Including coordinates)</td><td>Villages: Chaurai, Jamthar, Salaiya, Pindrai Mal., Khapa Mal. and Pondi (Mooldongri)
Tehsil: Narayanganj
District: Mandla
State: Madhya Pradesh
Coordinates:
<table>
<tr><th>S. No.</th><th>Latitude</th><th>Longitude</th></tr>
<tr><td>1.</td><td>22°51'24.29"N</td><td>79°58'51.28"E</td></tr>
<tr><td>2.</td><td>22°52'51.31"N</td><td>79°59'20.98"E</td></tr>
<tr><td>3.</td><td>22°53'26.00"N</td><td>80°0'29.22"E</td></tr>
<tr><td>4.</td><td>22°54'5.74"N</td><td>80°1'19.02"E</td></tr>
<tr><td>5.</td><td>22°53'40.44"N</td><td>80°1'37.50"E</td></tr>
<tr><td>6.</td><td>22°53'4.53"N</td><td>80°1'53.21"E</td></tr>
<tr><td>7.</td><td>22°52'27.16"N</td><td>80°1'7.57"E</td></tr>
<tr><td>8.</td><td>22°51'20.92"N</td><td>80°0'31.76"E</td></tr>
<tr><td>9.</td><td>22°51'18.86"N</td><td>79°58'59.32"E</td></tr>
</table></td></tr>
<tr><td>Inter- state issue involved</td><td>No</td></tr>
<tr><td>Seismic zone</td><td>The project area falls under Zone III, i.e., Moderate Risk Zone as per IS-1893 (Part 1) 2002, Seismic Zoning Map of India</td></tr>
</table>

- **Category Details:**

Category of the project	A
Provision	As per EIA Notification, 2006 as amended from time to time
Capacity/Cultural command area (CCA)	Capacity: 1000 MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	**NA**

- **Electricity Generation capacity:**

Powerhouse Installed Capacity	1000MW
Generation of Electricity Annually	2078.50 MU Energy generation
No. of Units	6 no's (4 units of 200 MW and 2 units of 100 MW)
Additional information (if any)	NA

- **ToR/EC Details**

Cost of project	4689.89 Crores
Total area of Project	381.50 Ha
Height of Dam from River Bed (EL)	25 m
Length of Tunnel/Channel	TRT 1-260.74m (Larger Unit) TRT 2-260.74m (Larger Unit)

<table>
<tr><td></td><td>TRT 3-260.74m (Larger Unit)
TRT 4-260.74m (Larger Unit)
TRT 5-264.25 m (Smaller Unit)
TRT 6-264.25 m (Smaller Unit)</td></tr>
<tr><td>Details of Submergence area</td><td>242 Ha (Forest Land)</td></tr>
<tr><td>Types of Waste and quantity of generation during construction/ Operation</td><td>
<table>
<tr><th>S. No.</th><th>Name of the waste</th><th>Source</th><th>Quantity</th><th>Unit</th></tr>
<tr><td>1.</td><td>Muck</td><td>Quantity of muck / debris generated</td><td>22.14</td><td>MCM</td></tr>
<tr><td>2.</td><td>Electronic equipment</td><td>Project and labour camp, colony</td><td>0.25</td><td>TPA</td></tr>
<tr><td>3.</td><td>Batteries</td><td>Project and labour camp, colony</td><td>2</td><td>TPA</td></tr>
<tr><td>4.</td><td>Bio-medical waste</td><td>Dispensary</td><td>1</td><td>TPA</td></tr>
<tr><td>5.</td><td>Burnt Mobil oil, Grease</td><td>Construction equipment</td><td>5.5</td><td>TPA</td></tr>
<tr><td>6.</td><td>Plastic Waste</td><td>Labour camp and colony</td><td>22</td><td>TPA</td></tr>
<tr><td>7.</td><td>Organic Waste</td><td>Project and labour camp, colony</td><td>3.5</td><td>TPA</td></tr>
<tr><td>8.</td><td>Inorganic Waste</td><td>Project and labour camp, colony</td><td>5.3</td><td>TPA</td></tr>
</table>
</td></tr>
<tr><td>E-Flows for the Project</td><td>This is an off-stream open loop project. No diversion of river flow is involved.</td></tr>
<tr><td>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.</td><td>No</td></tr>
</table>

b) If not the E-Flows maintain criteria for sustaining river ecosystem.	
No. of trees/ saplings proposed in view of 'Ek Ped Maa ke Naam' campaign	2120

- **Muck Management Details:**

No. of proposed disposal area/ (type of land-Forest/Pvt. land)	One Muck disposal site has been earmarked of about 100 Ha area (Non-Forest land).
Muck Management Plan	The muck generated from excavation including construction of roads is 22.14 MCM, out of which approximately 12.7 MCM is expected to be usable muck. Balance shall be disposed of in muck disposal area. The area identified for Muck disposal site is about 100 Ha.
Monitoring mechanism for Muck Disposal	Monitoring mechanism for muck disposal will be submitted along with EIA/EMP Report.

- **Land Area Breakup**

Private land	110.50 ha
Government land/Forest Land	271 ha (Forest land)
Submergence area/Reservoir area	Submergence area: 242 Ha Upper Reservoir Area: 205 Ha
Land required for project components	381.50 Ha
Additional information (if any)	NA

- **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	• Chaurai Reserved Forest (Partly falling in the Project Site) • Jamthar RF (0.3 km in East direction) • Reserve Forest (0.8 km in NE direction) • Gumti RF (1.2 km in NNE direction) • Kathotiya RF (1.5 km in West direction) • Reserve Forest (near Newari) (2.3 km in NNE direction) • Barwakachhar RF (3.5 km in SSW direction)

		• Kalpi RF (3.5 km in ENE direction) • Kudna RF (4.0 km in SE direction) • Bijadandi RF (5.0 km in NNE direction) • Reserve Forest (near Jamunpani) (6.2 km in NNE direction) • Protected Forest (6.5 km in South direction) • Roto RF (7.0 km in SSW direction) • Parariya RF (8.5 km in NNW direction) • Bilaikhapa RF (8.5 km in NE direction) • Saliwara RF (8.5 km in West direction) • Pratapgarh PF (9.0 km in South direction) Apart from the above, the study area has Dense jungle mainly teak, Dense mixed jungle.
National Park Wildlife Sanctuary	No	No National Parks, Wildlife Sanctuary present within 10 km radius of the study area.

- **Court case details**

Court Case	No any court case pending against the project.
Additional information (if any)	NA

- **Affidavit / Undertaking details:**

Affidavit/Undertaking	Duly signed Undertaking as per Annexure VI of the Agenda for 41st Meeting of Expert Appraisal Committee (River Valley & Hydro-Electric Projects) has been enclosed herewith with this form.
Additional information (if any)	NA

- **Previous EC compliance and necessary approvals**

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	Not Applicable, as this is the greenfield project.
Status of Stage- I FC	The Application is under preparation and yet to be submitted
Additional detail (If any)	NA
Is FRA (2006) done for FC-I	No

- **Miscellaneous**

Particulars	Details
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (*NABET* Accredited *Consultant Organization*) Certificate No : NABET/EIA/25-28/RA0415 Validity : August 15, 2028 Contact Person : Mr. Ravinder P S Bhatia Name of Sector Projects : River Valley and Hydroelectric 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	Social Benefits: Direct & indirect employment opportunities during construction phase will significantly contribute in uplifting quality of life of people of the region. During operation phase also, local people will get employment opportunity in operation, maintenance and auxiliary activities. Financial Benefits: The project with a proposed peaking energy installation of 1000 MW. It will contribute in reduction in gap between demand and supply of peak power in the state and country. Project activity will mobilize financial resources in the area. Environmental Benefits: Out of total project area, 24.6 ha area will be developed under the greenbelt/ plantation. The company will carry out compensatory afforestation in consultation with the forest department. Apart from these, during operation phase of the Project, one new water body in the form of reservoir would be created.
R&R details	R&R for the proposed project is yet to be started. 81 (Tentative) number of project affected families from 5 villages have been identified.
Additional detail (If any)	NA

42.4.3 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 Bargi Open Pumped Storage Hydro Project (1000 MW) at Village Pindrai Mal. (Sahajpuri), Salaiya Mal.(Barangada), Jamthar, Khapa, Newari And Pondi, Sub- District Narayanganj, District Mandla, Madhya Pradesh by M/s Serentica Renewables India 21 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 observed that the present proposal is for a 1000 MW open-loop pumped storage project, wherein the existing Bargi Reservoir will function as the lower reservoir and a new upper reservoir is proposed to be constructed with a gross storage capacity of 24.44 MCM and a maximum dam height of 25 m.

- The EAC noted that the total land requirement for the project is around 381.50 Ha, out of which 110.50 ha is non-forest land and 271 ha is forest land. Diversion of forest land for non-forest purpose will be involved for construction of Project components. 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 are No National Parks, Wildlife Sanctuaries, Biosphere Reserves, Tiger/ Elephant Reserves & Wildlife Corridors present within 10 km radius of the project site.

- PP informed that initial Allotment Letter issued by Office of the Commissioner, New and Renewable Energy, Urja Bhawan, Bhopal vide letter no. F/NRE/PHS/2025/09/Bhopal dated 11.08.2025 for development of 1000 MW PSHP project at District Mandla, Madhya Pradesh

42.4.4 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 Open Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Mudghusri Close Loop Pumped Storage (1000 MW) in an area of 307 Ha located at Village Murghusri & Reserved Forest, Sub-district Bodla, District Kabeerdham, Chhattisgarh by M/s Renew Vidyut Tej 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. The PP will submit 10 years water availability data certified by the CWC/State Water Resource Department for quantity of water that is received annually by the small stream on which upper and lower reservoir is proposed to be constructed.

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. The monitoring mechanism to ensure the survival of saplings shall be finalised in consultation with ICFRE.

iii. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 271 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. Transportation Plan for transporting construction materials shall be submitted. Separate chapter for risk assessment of such transportation through/within proposed the Wildlife Sanctuary shall be included in the EIA report.

vii. 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.

viii. 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.

ix. 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.

x. 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.

xi. 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.

xii. 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.

xiii. 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.

xiv. Action plan for survival or diversion of the rivulets/stream, if any, leading to join river shall be submitted.

xv. 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.

xvi. 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.

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

xviii. 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.

xix. 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.

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. The EIA/EMP shall include a detailed socio-economic assessment of the tribal population in the project-affected area based on primary data and community consultations. A Tribal Development Plan, prepared in consultation with the District Administration and Tribal Welfare Department, shall be submitted along with the EIA report.

iv. 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 O.M. dated 7th October, 2014 for the project land to be acquired.

v. 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. Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly approved by CWC/CEA 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. Detailed plan to restore wider roads and convert them into narrow up to 10m after construction of the project.

vi. 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.

vii. 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.

ANNEXURE I

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.	Dr. J. A. Johnson	Member Representative of Wildlife Institute of India (WII)
9.	Dr. A.K. Sahoo	Member Representative of CIFRI
10.	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>
Cc: "goyalrakesh"<goyal.rakesh@nic.in>
Date: Mon, 10 Nov 2025 11:38:19 +0530
Subject: Re: Draft MOM of the 42ND EAC (RVHEP) meeting held on 31.10.2025-reg.
========== Forwarded message ==========

Approved.
Chakrapani

On Mon, 10 Nov, 2025, 10:52 am Yogendra Pal Singh, <yogendra78@nic.in> wrote:

> Dear Sir,
>
> The draft MOM were circulated to all members. Observations made by Goyal Sir have been addressed.
> The Mudghusri Pumped Storage (1000 MW) Project is Closed loop PSP and accordingly the TOR has been revised (highlighted in yellow) as given below:
>
> **"..Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly appraised by CWC/CEA shall be submitted...."**
>
> I have discussed the issue with Goyal Sir.
>
> The modified draft MOM are attached for your 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**