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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 11TH MEETING OF THE EXPERT APPRAISAL COMMITTEE meeting River Valley and Hydroelectric Projects held from 27/06/2024 to 27/06/2024 **Date:** 16/07/2024

MoM ID: EC/MOM/EAC/900121/5/2024

Agenda ID: EC/AGENDA/EAC/900121/5/2024

Meeting Venue: N/A

Meeting Mode: Virtual

Date & Time:

1. Opening remarks

The 11th meeting of the EAC for River Valley & Hydroelectric Projects, Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 27th June, 2024 through virtual (online) mode, under the Chairmanship of Prof. G. J. Chakrapani. The list of Members present in the meeting is provided in **Annexure.**

2. Confirmation of the minutes of previous meeting

The Minutes of the Meeting held on 10th EAC meeting on 29th April, 2024 were confirmed. It was also decided that if the project proponent and/or consultant approaches the committee directly/indirectly for any advice, it be reported to the member-secretary for greater transparency and propriety. Also, the project proponent must ensure that the guidelines of plagiarism are meticulously followed and a duly signed self-certification be attached.

3. Details of proposals considered by the committee

Day 1 -27/06/2024

3.1. Agenda Item No 1:

3.1.1. Details of the proposal

Pedakota Pumped Storage Project (1800 MW) by **ADANI GREEN ENERGY LIMITED** located at **ALLURI SIT HARAMA RAJU,ANDHRA PRADESH**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**

IA/AP/RIV/450630/2023	J-12011/57/2023-IA.I (R)	30/10/2023	River Valley/Irrigation projects (1(c))

3.1.2. Project Salient Features

The proposal is for grant of Terms of References (ToR) to the project for Pedakota Open Loop Pumped Storage Project of capacity 1800 MW in an area of 202.11 ha located at Tehsil Anathagiri Taluka, Distrcit Alluri Seetharama Raju, (Andhra Pradesh) by M/s Adani Green Energy Limited.

ELECTRICITY GENERATION AND CAPACITY			
i	Powerhouse Installed Capacity	:	1800 MW
ii	Generation of Electricity Annuall y	:	3744.90 MU
iii	No. of Units	:	7 nos. (5 X 300 MW + 2 X 150 MW)
iv	Additional information (if any)	:	Nil
TOR DETAILS			
i	Cost of project	:	INR 10094.00crore
ii	Total area of Project	:	257.62 ha
iii	Height of Dam from Riverbed (E L)	:	Lower Dam – 73m, Upper Dam – 87m
iv	Length of Tunnel/Channel	:	2877m
v	Details of Submergence area	:	177.16ha
vi	Types of Waste and quantity of ge neration during construction/ Ope ration	:	Muck from excavation, solid waste from labour colony and construction waste
vii	E-Flows for the Project	:	Not Applicable, as this is Off-Stream closed Loo p Pumped Storage Project (PSP)
viii	Is Projects earlier studies in Cumul ative Impact assessment & Carryin g Capacity studies (CIA&CC) for River in which project located. If y es, the	:	No
a	E-flow with TOR /Recommendatio n by EAC as per CIA&CC study of River Basin.	:	Not Applicable
b	If not the E-Flows maintain criteria	:	Not Applicable

	for sustaining river ecosystem.		
MUCK MANAGEMENT DETAILS			
i	No. of proposed disposal area/ (ty pe of land-Forest/Pvt. land)	:	42.5 ha Private 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
LAND AREA BREAK-UP			
i	Private Land	:	120.72ha
ii	Government land/Forest Land	:	136.90ha
iii	Submergence area/Reservoir area	:	177.16ha
iv	Land required for project compon ents	:	80.46ha
v	Additional information (if any)	:	Nil

PRESENCE OF ENVIRONMENTALLY SENSITIVE AREAS IN THE STUDY AREA			
S. no	**Forest Land/ Protected Area/ Envir onmental Sensitivity Zone**	**Yes/ NO**	**Details of Certificate/letter/Remarks**
i	Reserve Forest/PF Land	NO	There is no Protected Area in the vicinity of the proposed project. Kambalakonda WLS is about 45.0 km from site, is the ne arest protected area.
ii	National Park	NO	
iii	Wildlife Sanctuary	NO	

COURT CASE DETAILS			
i	Court Case	:	Nil
ii	Additional Information if any	:	Nil
AFFIDAVIT/UNDERTAKING DETAILS			
i	Affidavit/Undertaking	:	Enclosed
ii	Additional information (if any)	:	Nil
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		Not Applicable

	MISCELLANEOUS		
i	**Details of Consultant**		
	Name of Consultant	:	M/s. RS Envirolink Technologies Pvt. Ltd. (RSET) (*NABET* Accredited *Consultant Organization*)

11.2.3 The EAC during deliberations noted the following:

- Earlier, the proposal was considered by the Expert Appraisal Committee (Hydro River Valley Sector) in its 3rd meeting held on 10.11.2023. The EAC deferred the proposal seeking additional information. The PP submitted the replies of observations of EAC on PARIVESH portal as under:

S. No.	EAC Query	Reply by PP
1.	The EAC noted that the lower reservoir is proposed to be located within the catchment of Bodderu river, a major tributary of Sarada River. It was noted that the project site is located in dense forest area and the lower reservoir is blocking the path of Bodderu river. Explain the criterion/ justification for selecting the project site.	For identification of the suitable PSP location in the area, 12 locations have been shortlisted for reservoirs' locations. Keeping in view of these 12 locations suitable for creating reservoirs, 11 layouts have been prepared. These layouts were compared based on technical parameters and environmental considerations and best suited layout was shortlisted for further investigation. Total land requirement is 257.62 ha, out of which 136.9 ha is forest land. Project to understand the density of the forest. Project layout has been superimposed on the classified FSI data. The Indian Forest Survey Report (ISFR) data of 2021 has been procured from Forest Survey of India, Dehradun. For the project layout, forest classification is as given below.

Forest Cover	Area (%)	Canopy density
Moderately Dense Forest	23.18	Between 40% and 70%
Open Forest	37.02	Between 10% and 40%
Scrubs	14.35	Less than 10%

		<table><tr><td>Waterbodies</td><td>0.03</td><td></td></tr><tr><td>Non Forest</td><td>25.42</td><td></td></tr><tr><td></td><td>100.00</td><td></td></tr></table> As far as the concern, of lower reservoir bloc king the path of Bodderu river, the project is re-designed as off stream closed loop project with water sourced from Konam reservoir so that all the catchment contribution from the c atchment of upper and lower reservoirs get re leased downstream.
2	The EAC was of the view that the tributarie s/rivulets have vital role in survival of major river/reservoir and its ecosystem. The comm ittee therefore suggested that the proponent t o identify a suitable site in terms of forest la nd involvement or revise the project layout keeping in view the all environmental and e cosystem related aspects of Bodderu river.	When the project was proposed for the TOR and discussed in EAC meeting of 10th Nove mber 2023, we had proposed it as an off-stre am open loop project, where the Upper dam i s located in between Dayarti village and Mad rebu village, Alluri Seetharama Raju district and Lower dam is located near Sariya villag e, Alluri Seetharama Raju district of Andhra Pradesh. Both the dams are located across mi nor nallas draining into Sarda river, which is a Minor East flowing River between Mahana di & Pennar. Upper Dam Catchment area is 2.34km^2 and Catchment area of lower dam l ocation is 81.20km^2. Water requirement fro m initial/one-time filling for reservoirs is abo ut 16.547Mm^3 and annual water requirement for recuperating of losses has been estimated to be about 0.85Mm^3. Water requirement wa s proposed to be met with from the catchmen t contribution of lower reservoir. However, keeping in view the EAC's concer n about tributaries/rivulets role in river ecosy stem, the project layout have been revised an d it has been redesigned as off stream closed loop PSP. All the water from the catchment o f upper as well as lower reservoir will be rele ased downstream and onetime water filling r equirement as well as recuperation requireme nt will be met with from Konam reservoir, w hich is about 6.8 Km away from lower reserv oir. Site of Sri Vechalapu Palavelli Konam Reser voir Project is across River Bodderu near Ko nam (V) in Cheedikada (M) of Visakhapatna m (Dist) in Andhra Pradesh. It serves the pur pose of irrigation water supply for 12638 acr e ayacut. Gross storage capacity is 48.14 MC M and live storage capacity is 23.589 MCM. Inflow-outflow data over the last decade duri ng monsoon have been studied to ensure wat er availability for the project for one time fill

		ing during monsoon and recuperation of loss es.
3.	It was noted that alternative site analysis wa s largely based on economic variability of th e project; whereas, it should be focused on s ustainable environment and ecology. viz. lo ss of minimum forested area due to diversio n of Forest land/loss of biodiversity and its i mpacts on productivity of the ecosystem, w ater availability, water uses for generation o f hydro power and ecological flows in the s mall stream/Nallah.	Alternative site analysis has been revised and updated report covering environmental consi derations is enclosed.
4.	The EAC also suggested to submit the land record and provide details of category of Fo rest land with revised layout and make a vis ual graphic of the project site showing the a ctual status of the site.	As per the land requirement working in the P FR, project would require a total of 257.62 h a, out of which 136.9 ha is forest land and 12 0.72 ha is non forest land. Forest compartme nt map have been superimposed on the proje ct layout to identify the forest land. Further, f orest land categorization have been carried o ut using FSI data; which shows that for the st udy area – 63% is forest and 37% is non fore st. Out of 63% forest area – 22% is moderate ly dense forest, 26% is open forest and 15% i s scrub forest. Similar, exercise was also carried out for the project land i.e. 257.62 ha area required for t he project. As per FSI data 74.55% is forest l and and remaining 25.45% is non forest. Out of forest land required for the project, 23.1 8% is moderately dense forest, 37.02% is op en forest and 14.35% is scrub forest. Private land of 120.72 ha belongs to 5 village s viz. Bembi, Sariya, Tankota, Madrebu and Dayatri of Ananthagiri Mandal, Alluri Seetha rama Raju district. Khasra wise land records are not available and shall be made available after detailed survey at site. Demography and occupation pattern for these 5 villages has be en submitted. For the visual graphic of the project site, a dr one videography presented during the EAC meeting.

3.1.3. Deliberations by the committee in previous meetings

Date of EAC 1 :10/11/2023

Deliberations of EAC 1 :
3.6.3:The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of reference to the Pedakota Open Loop Pumped Storage Project of capacity 1800 MW in an area of 202.11 ha located at Tehsil Anathagiri Taluka, Distrcit Alluri Seetharama Raju, (Andhra Pradesh) by M/s Adani Green Energy Limited**.**

The project/activity is covered under Category A of item 1 (c) 'River Valley & Hydroelectric projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

The EAC noted that the lower reservoir is proposed to be located within the catchment of Bodderu river, a major tributary of Sarada River. It was noted that the project site is located in dense forest area and the lower reservoir is blocking the path of Bodderu river**.** The consultant was also not able to explain the water availability in the river. The project proponent and their consultant were unable to explain the criterion/ justification for selecting the project site. The EAC was of the view that the tributaries/rivulets have vital role in survival of major river/reservoir and its ecosystem. The committee therefore suggested that the proponent to identify a suitable site in terms of forest land involvement or revise the project layout keeping in view the all environmental and ecosystem related aspects of Bodderu river. It was noted that alternative site analysis was largely based on economic variability of the project; whereas, it should be focused on sustainable environment and ecology. viz. loss of minimum forested area due to diversion of Forest land/loss of biodiversity and its impacts on productivity of the ecosystem, water availability, water uses for generation of hydro power and ecological flows in the small stream/Nallah**.** The EAC also suggested to submit the land record and provide details of category of Forest land with revised layout and make a visual graphic of the project site showing the actual status of the site.

The EAC therefore decided to **defer** the proposal for want of above mentioned additional information.

3.1.4. Deliberations by the EAC in current meetings

- The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of references (ToR) to the project for Pedakota Open Loop Pumped Storage Project of capacity 1800 MW in an area of 202.11 ha located at Tehsil Anathagiri Taluka, Distrcit Alluri Seetharama Raju, (Andhra Pradesh) by M/s Adani Green Energy Limited.
- The project/activity is covered under Category A of item 1 (c) 'River Valley & Hydroelectric projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.
- The MoU submitted by the project proponent 1000MW, however the proposal is submitted for the 1800 MW capacity, the committee suggested that PP shall submit the revised MoU from state department during the appraisal of EC.
- The EAC noted that PP has changed its project layout as it was earlier open loop project but due to change in water source to Konam reservoir so that all the catchment contribution from the catchment of upper and lower reservoirs get released downstream. Accordingly, the project category changed to Close loop pumped storage project. It was also noted that water conducting system has been changed from the previous proposal and the location of Upper and lower reservoirs is almost same.
- The PP has informed that the proposed Upper and Lower Reservoir is on the Boderu river and a tributary. The committee suggested to shift the both the reservoirs site, in this regard the PP informed that the same is not possible and informed that the river will be diverted through spillway under dam to release water in downstream. Committee suggested at no point of time flow of the river shall be disturbed. In view of the submission by the PP, the committee opined that the project shall be considered as open loop instead of close loop project as lower reservoir is located on the river.
- The committee inquired about the applicability of Godavari and Krishna water dispute tribunal to

which PP has informed that both tribunal is not related to this project.

- The committee noted that there is no settlement in the proposed land area and no R&R issues are involved. Further, PP has informed that no approach road is available the same will made under the project, the committee suggested not to use forest land for road construction.
- The PP was unable to show the toposheet of the project site which is essential document for the preparation of feasibility report.
- The project proponent must also include information if any, on the critical mineral zone mining or potential in the projected area from Geological Survey of India /Mineral Exploration Corporation Ltd or similar such Government organizations.
- The project proponent has re-designed the project as off stream closed loop project with water sourced from Konam reservoir so that all the catchment contribution from the catchment of upper and lower reservoirs get released downstream.

3.1.5. Recommendation of EAC

Recommended

3.1.6. Details of Terms of Reference

3.1.6.1. Specific

[A] Environmental Management and Biodiversity Conservation:	
1.	Proposal of EC would be such that all the water from the catchment of upper as well as lower reservoir will be released downstream. Accordingly, DPR shall be prepared for seeking approval from CEA/CWC.
2.	Report on water availability studies/hydrological studies of Konam reservoir duly approved from CWC.
3.	Alternative sites for various components shall be identified in terms of loss of forest area and other environmental aspects with respect of change of Installed capacity.
4.	Explore the possibilities to reduce forest area for the construction of proposed project. Reduction of forest land with changing installed capacity.
5.	Conduct geological survey and find out availability of mineral in study area. Take Geological opinion from GSI regarding mineral zone in the project study area.
6.	Density of forest and its types including tentative nos of tree felled during construction of the project and details of plants species to be planted under compensatory plantation be mentioned in Compensatory Afforestation Plan under EIA/EMP.
7.	MoU for water uses for the project signed and approved by concerned State Government Authority be submitted and revised MoU to implement the project for proposed capacity of 1800 MW shall be submitted through approved authority of State Government.
8.	Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir. Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
9.	Conduct Environmental Cost Benefit Analysis in terms of loss of Forest ecosystem due to diversion of Forest land/ loss of biodiversity and its impacts on ecosystem, water availability, water uses for generation of hydro power in study area 10 km from periphery of Project components.
1	Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized.

0.	Baseline data as mentioned in Standard 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.
11.	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.
12.	Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/ EMP report.
13.	A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
14.	Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located outside the Eco Sensitive Zone (ESZ) and Wildlife Sanctuary.
15.	In case any Wildlife corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.
16.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
17.	Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR)and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
18.	Environmental matrix during construction and operational phase needs to be submitted.
19.	Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.
20.	Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation and other project component.
21.	Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.
22.	The project proponent must also include information if any, on the critical mineral zone mining or potential in the projected area from Geological Survey of India /Mineral Exploration Corporation Ltd or similar such Government organizations.
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. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.
3.	Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F.No.22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.
4.	Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation &

	Resettlement plan shall be prepared. Also, details of settlement in 10 km area shall be submitted.
Muck Management/ Disaster Management	
1.	Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.
2.	Details of Muck Management plan prepared along with estimated cost incorporated in EIA/ EMP report.
3.	Techno-economic viability of the project must be recommended from CEA/ CWC
Miscellaneous	
1.	Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.
2.	Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
3.	Both capital and recurring expenditure under EMP shall be submitted.
4.	The photograph should bear the date, time, latitude & longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.
5.	Aerial view video of project site shall be recorded and to be submitted.
6.	Detailed plan to restore wider roads and convert them into narrow upto 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 Pump storage projects shall be used for preparation of EIA/ EMP reports.

3.1.6.2. Standard

1(c)	**River Valley/Irrigation projects**
Scope of EIA Study	
1.	The EIA Report should identify the relevant environmental concerns and focus on potential impacts that may change due to the construction of proposed project. Based on the baseline data collected for three (3) seasons (Pre-monsoon, Monsoon and Winter seasons), the status of the existing environment in the area and capacity to bear the impact on this should be analysed. Based on this analysis, the mitigation measures for minimizing the impact shall be suggested in the EIA/EMP study.
Details of the Project and Site	
1.	General introduction about the proposed project.
2.	Details of Project and site giving L-Sections of all U/S and D/S Projects with all relevant maps and figures. Connect such information as to establish the total length of interference of Natural River and the committed unrestricted release from the site of Dam/Barrage into the main river.
3.	A map of boundary of the project site giving details of protected areas in the vicinity of 25 km of project location.
4.	Location details on a map of the project area with contours indicating main project features. The project layout

	shall be superimposed on a contour map of ground elevation showing main project features (viz. location of dam, Head works, main canal, branch canals, quarrying etc.) shall be depicted in a scaled map.
5.	Layout details and map of the project along with contours with project components clearly marked with proper scale maps of at least 1:50,000 scale and printed at least on A3 scale for clarity.
6.	Existence of National Park, Sanctuary, Biosphere Reserve etc. in the study area, if any, should be detailed and presented on a map with distinct distances from the project components.
7.	Drainage pattern and map of the river catchment up to the proposed project site.
8.	Delineation of critically degraded areas in the directly draining catchment on the basis of Silt Yield Index as per the methodology of Soil and Land use Survey of India.
9.	Soil characteristics and map of the project area.
10.	Geological and Seismo-tectonic details and maps of the area surrounding the proposed project site showing location of dam site and canal sites.
11.	Remote Sensing studies, interpretation of satellite imagery, topographic sheets along with ground verification shall be used to develop the land use/land cover pattern of the study using overlaying mapping techniques viz. Geographic Information System (GIS), False Color Composite (FCC) generated from satellite data of project area.
12.	Land details including forests, private and other land.
13.	Demarcation of snow fed and rain fed areas for a realistic estimate of the water availability.
14.	Different riverine habitats like rapids, pools, side pools and variations in the river substratum bedrocks, rocks, boulders, sand/silt or clay etc. need to be covered under the study
Description of Environment and Baseline Data	
1.	To know the present status of environment in the area, baseline data with respect to environmental components air, water, noise, soil, land and biology & biodiversity (flora & fauna), wildlife, socioeconomic status etc. should be collected within 10 km radius of the main components of the project/site i.e. dam site and power house site. The air quality and noise are to be monitored at such locations which are environmentally & ecologically more sensitive in the study area. The baseline studies should be collected for 1 season (Preferably Monsoon season). Flora-Fauna in the catchment and command area should be documented. The study area should comprise of the following:
2.	(i) Catchment area up to the dam/barrage site.
3.	(ii) Submergence Area.
4.	(iii) Project area or the direct impact area should comprise of area within 10 km radius of the main project components like dam, canals etc.
5.	(iv) Downstream upto 10 km from the tip of the reservoir.
Details of the Methology	
1.	The methodology followed for collection of base line data along with details of number of samples and their locations in the map should be included. Study area should be demarcated properly on the appropriate scale map. Sampling sites should be depicted on map for each parameter with proper legends. For Forest Classification,

	Champion and Seth (1968) methodology should be followed.
Methodology for Collection of Biodiversity Data	
1.	The number of sampling locations should be adequate to get a reasonable idea of the diversity and other attributes of flora and fauna. The guiding principles should be the size of the study area (larger area should have larger number of sampling locations) and inherent diversity at the location, as known from secondary sources (e.g. eastern Himalayan and low altitude sites should have a larger number of sampling locations owing to higher diversity).
2.	The entire area should be divided in grids of 5kmX5km preferably on a GIS domain. There after 25% of the grids should be randomly selected for sampling of which half should be in the directly affected area (grids including project components such as reservoir, dam, powerhouse, tunnel, canal etc.) and the remaining in the rest of the area (areas of influence in 10 km radius form project components). At such chosen location, the size and number of sampling units (e.g. quadrates in case of flora/transects in case of fauna) must be decided by species area curves and the details of the same (graphs and cumulative number of species in a tabulated form) should be provided in the EIA report. Some of the grids on the edges may not be completely overlapping with the study area boundaries. However, these should be counted and considered for selecting 25% of the grids. The number of grids to be surveyed may come out as a decimal number (i.e. it has an integral and a fractional part) which should be rounded to the next whole number.
3.	The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.
4.	The R.E.T. species referred to in this point should include species listed in Schedule I and II of Wildlife (Protection) Act, 1972 and those listed in the red data books (BSI, ZSI and IUCN).
Components of the EIA Study: Various aspects to be studied and provided in the EIA/EMP report are as follow s:	
1.	null
2.	null

3.	Physical geography, Topography, Regional Geological aspects and structure of the Catchment.
4.	Tectonics, seismicity and history of past earthquakes in the area. A site specific study of the earthquake parameters will be done. The results of the site specific earthquake design shall be sent for approval of the NCSDP (National Committee of Seismic Design Parameters, Central water Commission, New Delhi for large dams.
5.	Landslide zone or area prone to landslide existing in the study area should be examined.
6.	Presence of important economic mineral deposit, if any.
7.	Justification for location & execution of the project in relation to structural components (dam /barrage height).
8.	Impact of project on geological environment.
9.	null
10.	Meteorology (viz. Temperature, Relative humidity, wind speed/direction etc.) to be collected from nearest IMD station.
11.	Ambient Air Quality with parameters viz. Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM) i.e. suspended particulate materials < 10 microns, Sulphur dioxide (SO2) and Oxides of Nitrogen (NOX) in the study area at 5-6 Locations.
12.	Existing Noise Levels and traffic density in the study area at 5-6 Locations.
13.	null
14.	Soil classification, physical parameters (viz., texture, Porosity, Bulk Density and water holding capacity) and chemical parameters (viz. pH, electrical conductivity, magnesium, calcium, total alkalinity, chlorides, sodium, potassium, organic carbon, available potassium, available phosphorus, SAR, nitrogen and salinity, etc.) at @ one sample/ha of command area.
15.	null
16.	(i) Generation of thematic maps viz, slope map, drainage map, soil map, land use and land cover map, etc. Based on these, thematic maps, an erosion intensity map should be prepared.
17.	null
18.	History of the ground water table fluctuation in the study area.
19.	Water quality for both surface water and ground water for (i) Physical parameters (pH, temperature, electrical conductivity, TSS); (ii) Chemical parameters (Alkalinity, Hardness, BOD, COD, NO2, PO4, CI, SO4, Na, K, Ca, Mg, Silica, Oil & Grease, phenolic compounds, residual sodium carbonate); (iii) Bacteriological parameter (MPN, Total coliform) and (iv) Heavy Metals (Pb, As, Hg, Cd, Cr-6, total Cr, Cu, Zn, Fe) (6 locations).
20.	Delineation of sub and micro-watersheds, their locations and extent based on the All India Soil and Land Use Survey of India (AISLUS), Department of Agriculture, Government of India. Erosion levels in each micro-watershed and prioritization of micro-watershed through silt yield index (SYI) method of AISLUS

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

	for calculating various diversity indices along with details of locations of quadrates, size of quadrates etc. to be reported within the study area in different ecosystems.
39.	Existence of National park, Sanctuary, Biosphere Reserve etc in the study area, if any, should be detailed.
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.
23.	Impact on fish migration and habitat degradation due to decreased flow of water
2	Impact on breeding and nesting grounds of animals and fish.

4.	
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.

3.2. Agenda Item No 2:

3.2.1. Details of the proposal

Musakhand Pumped Storage Project (600 MW) by **ACME CLEANTECH SOLUTIONS PRIVATE LIMITED** located at **CHANDAULI,UTTAR PRADESH**			
Proposal For		Amendment in ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/UP/RIV/471521/2024	J-12011/41/2023-IA.I (R)	07/05/2024	River Valley/Irrigation projects (1(c))

3.2.2. Project Salient Features

The project proponent had requested for withdrawal of the proposal due to certain reasons vide its email dated 27th May, 2024 and thereby did not attend the meeting. Accordingly, EAC agreed with the withdrawal of proposal by PP.

3.2.3. Deliberations by the committee in previous meetings

N/A

3.2.4. Deliberations by the EAC in current meetings

Requested for withdrawal.

3.2.5. Recommendation of EAC

Deferred for ADS

3.3. Agenda Item No 3:

3.3.1. Details of the proposal

Kamala Hydro Electric Project by **NHPC LIMITED** located at **KAMLE,ARUNACHAL PRADESH**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/AR/RIV/465936/2024	J-12011/11/2024-IA-I(R)	08/05/2024	River Valley/Irrigation projects (1(c))

3.3.2. Project Salient Features

The proposal is for grant of terms of references (ToR) to the project for Kamala Hydro Electric Project of capacity 1720 MW in an area of 4001.67 ha. located at Village Amperi, Baktap, Rabam and etc, Sub District Kamporijo Circle, District Kamle, Arunachal Pradesh by M/s NHPC Limited.

Dam: Type	Concrete Gravity
Average river bed level	El. 275.00 m
Deepest Foundation level	El. 259.00 m
Top of Dam	El. 475.00 m
Height above deepest foundation	216 m
Length of dam at top	628 m
Reservoir: Maximum Water Level(MWL)	El. 470.00 m
Full Reservoir Level (FRL)	El. 455.00 m
Minimum Draw Down Level (MDDL)	El. 430.00 m
Live Storage	623.60 MCM
Area under Submergence at FRL	2775 Ha
Hydrology: Catchment Area	7213 sq.km
Probable Maximum Flood (PMF)	17416 cumec
River Diversion Flood (1 in 25 NonMonsoon)	4054 cumec
Glacier lake outburst flood (GLOF)	1663 cumec
Installed Capacity	Total - 1720 MW
	8 X 210 MW (Main Unit) + 1 x 40MW (Auxiliary Unit)
Design discharge per unit	Main Unit: 160 cumec + Auxiliaryunit 30.

	47 cumec
Type of Turbines	Vertical Axis Francis
Number of Units	09 (8 x 210MW +1x 40 MW)
Design discharge per unit	Main Units 160 cumec & AuxiliaryUnits 3 0.47cumec
TRT	Horse Shoe Shape; 8 nos. + 1 no.
Tailrace Tunnels	4 + 1
Estimated Cost of Project:	Rs. 21815.00 Crores

3.3.3. Deliberations by the committee in previous meetings

N/A

3.3.4. Deliberations by the EAC in current meetings

- The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of references (ToR) to the project for Kamala Hydro Electric Project of capacity 1720 MW in an area of 4001.67 ha. located at Village Amperi, Baktap, Rabam and etc, Sub District Kamporijo Circle, District Kamle, Arunachal Pradesh by M/s NHPC Limited.
- The project/activity is covered under Category A of item 1 (c) 'River Valley & Hydroelectric projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.
- The EAC observed that initially development rights for Subansiri Middle project (which was renamed as Kamala Hydroelectric Project) was accorded to Kamala Hydro Electric Power Company Limited (KHEPCL), a joint venture between Jindal Power Ltd and Hydro Power Development Corporation of Arunachal Pradesh Ltd. Further, Ministry of Power (MOP) vide letter dated 22.12.2021 allotted the Project to NHPC for its development. The NOC for Kamala H.E. Project was issued by Government of Arunachal Pradesh (GOAP) on 28.06.2023 and has approved allotment of projects to NHPC on 21.07.2023.
- Additionally, Memorandum of Agreement (MOA) was signed on 12.08.2023 between GOAP and NHPC Limited for development, commissioning, implementation, operation and maintenance of Kamala H.E. Project on Build, Own, Operate and Transfer (BOOT) basis for a lease period of 40 (Forty) years from the commercial operation date (COD).
- Status of ToR accorded to Kamala HEP in case of Kamala Hydro Electric Power Company Limited (KHEPCL):

Sl. No.	Particulars	Date of Issue
1	Applied as Subansiri Middle HEP (1600 MW) – 04.03.2010	27.12.2010
2	Applied as Kamala HEP (1600 MW) – 23.08.2012 for extension of TOR for 1	08.02.20

	year (27.12.2012 to 27.12.2013)	13
3	Applied as Kamala HEP (1800 MW) 29.01.2014 – Fresh TOR	05.06.2014
4	Applied as Kamala HEP (1800 MW) 29.01.2014 – Validity of TOR – till 04.06.2018.	22.05.2017
5	Applied as Kamala HEP (1800 MW) – 10.07.2018 – Fresh TOR	25.09.2018

- The Committee noted that the ToR issued to M/s Jindal Power Ltd vide dated 25.09.2018 is still valid till 25.09.2024. Therefore, the committee suggested the project proponent to withdraw the said ToR first from earlier proponent and submit NOC from M/s Jindal Power Ltd in this regard.
- The committee observed that the submergence of the river is upto 65 Km and river bed at intake area 275 m and after submergence FRL will be rose upto 455m and additionally the water level in Kurung and Kumey river will also rose due to submergence.
- This project falls in Kamala river which is tributary of Subansari river. The CIA& CCS study has been completed for Subansari river basin, wherein the instant proposal has been included and recommended in said CIA&CCS.
- The committee noted that earlier the proponent submitted the DPR to CEA wherein it is mentioned that all clearance has been revoked, to which PP replied that DPR was submitted to CEA in 2013 and after observations of the CEA earlier PP didn't pursue the matter therefore CEA revoked all the clearances in 2018.

The EAC inquired about the proposed fish pass in the project, to which PP replied that there no fish pass proposed in the said HEP, therefore the committee opined that PP need to justify the reason for not proposing fish pass/fish ladder in the current proposal.

3.3.5. Recommendation of EAC

Recommended

3.3.6. Details of Terms of Reference

3.3.6.1. Specific

Environmental Management and Biodiversity Conservation	
1.	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.
2.	The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report.
3.	Environmental matrix during construction and operational phase needs to be submitted. Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used shall be mentioned in the EIA report.
4.	Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature required to be cut for barrage creation and other project component.

5.	Three season (Pre-monsoon, Monsoon and winter season) baseline data of all the environmental attributes including biological environment as mentioned in the Standard ToR shall be collected for preparation of EIA/EMP report.
6.	Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
7.	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.
8.	A detailed wildlife conservation plan for Schedule –I species be prepared duly approved by the Chief Wild Life Warden be submitted.
9.	Explore the possibilities to reduce forest area for the construction of proposed project. Reduction of forest land with changing installed capacity.
10.	Conduct geological survey and find out availability of mineral in study area. Take Geological opinion from GSI regarding mineral zone in the project study area.
11.	Density of forest and its types including tentative nos of tree felled during construction of the project and details of plants species to be planted under compensatory plantation be mentioned in Compensatory Afforestation Plan under EIA/EMP.
12.	Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir. Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
13.	A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
14.	Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located outside the Eco Sensitive Zone (ESZ) and Wildlife Sanctuary.
15.	In case any Wildlife corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.
16.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
17.	Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR)and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
18.	Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.
19.	Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation and other project component.

20.	Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.
21.	The project proponent must also include information if any, on the critical mineral zone mining or potential in the projected area from Geological Survey of India /Mineral Exploration Corporation Ltd or similar such Government organizations.
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. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.
3.	Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F.No.22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.
4.	Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared. Details of settlement in 10 km area shall be submitted.
5.	Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013
Muck Management/ Disaster 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.	Details of water sprinkling arrangements for arresting the fugitive / dust, emission from transportation and other project activities in project construction area.
4.	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.
5.	Restoration plan for construction area including dumping site of excavated materials by levelling, filling up of burrow pits, landscaping etc.
Disaster Management	
1.	CAT plan, Dam break analysis, Disaster Management Plan and Fisheries Management Plan be

	prepared along with other EMPs and incorporated in the EIA/EMP report.
2.	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.
3.	Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly approved by CWC /CEA shall be submitted.
Miscellaneous	
1.	Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.
2.	Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
3.	Both capital and recurring expenditure under EMP shall be submitted.
4.	The photograph should bear the date, time, latitude & longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.
5.	Aerial view video of project site shall be recorded and to be submitted.
6.	Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project.

3.3.6.2. Standard

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

5.	Layout details and map of the project along with contours with project components clearly marked with proper scale maps of at least 1:50,000 scale and printed at least on A3 scale for clarity.
6.	Existence of National Park, Sanctuary, Biosphere Reserve etc. in the study area, if any, should be detailed and presented on a map with distinct distances from the project components.
7.	Drainage pattern and map of the river catchment up to the proposed project site.
8.	Delineation of critically degraded areas in the directly draining catchment on the basis of Silt Yield Index as per the methodology of Soil and Land use Survey of India.
9.	Soil characteristics and map of the project area.
10.	Geological and Seismo-tectonic details and maps of the area surrounding the proposed project site showing location of dam site and canal sites.
11.	Remote Sensing studies, interpretation of satellite imagery, topographic sheets along with ground verification shall be used to develop the land use/land cover pattern of the study using overlaying mapping techniques viz. Geographic Information System (GIS), False Color Composite (FCC) generated from satellite data of project area.
12.	Land details including forests, private and other land.
13.	Demarcation of snow fed and rain fed areas for a realistic estimate of the water availability.
14.	Different riverine habitats like rapids, pools, side pools and variations in the river substratum bedrocks, rocks, boulders, sand/silt or clay etc. need to be covered under the study
Description of Environment and Baseline Data	
1.	To know the present status of environment in the area, baseline data with respect to environmental components air, water, noise, soil, land and biology & biodiversity (flora & fauna), wildlife, socioeconomic status etc. should be collected within 10 km radius of the main components of the project/site i.e. dam site and power house site. The air quality and noise are to be monitored at such locations which are environmentally & ecologically more sensitive in the study area. The baseline studies should be collected for 1 season (Preferably Monsoon season). Flora-Fauna in the catchment and command area should be documented. The study area should comprise of the following:
2.	(i) Catchment area up to the dam/barrage site.
3.	(ii) Submergence Area.
4.	(iii) Project area or the direct impact area should comprise of area within 10 km radius of the main project components like dam, canals etc.
5.	(iv) Downstream upto 10 km from the tip of the reservoir.
Details of the Methology	
1.	The methodology followed for collection of base line data along with details of number of samples and their locations in the map should be included. Study area should be demarcated properly on the appropriate scale map. Sampling sites should be depicted on map for each parameter with proper legends. For Forest Classification, Champion and Seth (1968) methodology should be followed.
Methodology for Collection of Biodiversity Data	

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

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

2.	
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.
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.
2	Impact on socio-economic status

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

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

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

3.4. Agenda Item No 4:

3.4.1. Details of the proposal

Khadakwasala Fursungi Tunnel Project Substitute to New Mutha Right Bank Canal KM 1 to Km 34 by **EXECUTIVE ENGINEER IPI DIVISION BSB PUNE** located at **PUNE,MAHARASHTRA**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/MH/RIV/459818/2024	J-12011/16/2024-IA-I(R)	27/05/2024	River Valley/Irrigation projects (1(c))

3.4.2. Project Salient Features

The proposal is for grant of Terms of References (ToR) to the project for Khadakwasala Fursungi Tunnel Project Substitute to New Mutha Right Bank Canal KM 1 to Km 34 in an area of 23.8364 Ha located at Village Akole, Rui etc, Sub-district Indapur, Haveli, Pune City, etc, District Pune, MAHARASHTRA by M/s Executive Engineer Ipi Division Bsb Pune.

11.5.2 The Project Proponent and the accredited Consultant M/s. MITCON Consultancy & Engineering Services Ltd, made a detailed presentation on the salient features of the project and informed that:

i. The Khadakwasla Irrigation Project comprises 4 Dams the Panset dam (10.65 TMC) (Ambi River), the Varasgaon Dam (12.82TMC) (Mose River), & Temghar Dam (3.71 TMC) (Mutha River) the Khadakwasla Dam (1.97 TMC) (Mutha river).

ii. The main canal - New Mutha Right Bank Canal (NMRBC) is a 202 km long contour canal, serving a projected irrigation area of about 62150 Hectares. Storage capacity of four reservoirs is 29.15 TMC

iii. The Tunnel is substitute to New Mutha Right Bank Canal Km. 1 to 34 and proposed in upstream of Khadakwasla dam in Pune district of Maharashtra. The proposed Intake site is in upstream of Kadakwasla Dam and outlet at in Canal CH-34/00. The outlet site is located at Fursungi village, which is about 20 km from Pune city.

iv. Khadakwasla dam on the Mutha River situated 21 km from the City of Pune. This dam is one of the main sources of water for Pune city as well as for irrigation in Daund, Indapur, Haveli, Baramati Taluka.

v. New Mutha Right Bank Canal: - Khadakwasla Project having canal namely New Mutha Right Bank Canal (NMRBC) is 202 KM. along counter with proper distribution system and Old Mutha Right Bank Canal is 109 KM. At the head of canal is designed for flowing 2050 Cusecs of water.

vi. The first 30 Km. length of canal is flowing through densely populated area of Pune City. Due to numerous difficulties faced during operation of the canal, a tunnel is proposed in upstream of Khadakwasla dam and outlet at Mutha Right Bank Canal Km. 1 to 34 in Pune district of Maharashtra.

vii. The original Khadakwasla Dam Construction work was started in 1860 and completed in 1878. Hence Environmental Clearance was not applicable to existing project. As per the Gazette Notification dated 14th Sep, 2006 and its subsequent amendments, a tunnel between Khadakwasala-

Dam to Fursungi is proposed substitutes for New Mutha Right Bank Canal Km 1 to 34 is applied for Environmental Clearance.

viii. Total area of forest affected due to project is 0.8064 ha. Actual acquisition of this area is not required. The proposal for forest land is submitted on parivesh with application no. FP/MH/MinorCanal/460637/2024.

ix. Benefits of Project:

- 2.18 TMC water will be saved and can be used for Irrigation and Non-Irrigation purpose.
- Increasing demand for drinking and industrial purposes in Pune city and surroundings, leakage in canals etc. Due to these reasons, the stress on the irrigation sector can be reduced through this saving. Also, additional water may be available for drinking.
- Total 3471 Ha command area has been restored due to saved water.
- Land acquisition will not require except for tunnel shafts, approach road, open channel and cut & cover portion (11.71 Ha). So, as there will be no question of rehabilitation.
- No requirement of approval from Krishna Water Dispute Tribunal-2 (KWDT-2).

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

Name of the Proposal	Proposed Khadakwasala-Fursungi Tunnel Project Substitute to New Mutha Right Bank Canal KM 1 to KM 34, Dist. Pune
Location (Including coordinates)	Latitude (N): 18o 26’ 02” N and 18o 27’ 43” N Longitude(E): 73o 46’ 15” E and 74o 01’ 02” E
Inter- state issue involved	No
Seismic zone	III
Category of the project	A
Provisions	Irrigation to draught prone area of Dist. Satara, Sangli and Solapur Maharashtra
Capacity / C	Irrigation facilities in the project command area

New	Talu	GCA	CCA	ICA

ultural command area (CCA)	Mutha Right Branch Canal	ka	(Ha)	(Ha)	(Ha)
		Haveli	109668	94665	57855
		Baramati	18559	16044	9800
		Daund	530900	458144	279999
		Indapur	519200	448005	273882
		Total	1178837	1016868	621446
Attracts the G	Yes, Western Ghat ESA boundary near Ghera Sinhagad Village at 3.65 km towards south west				

eneral Conditions (Yes/~~No~~)	

Powerhouse Installed Capacity	NA
Generation of Electricity Annually	NA
No. of Units	0
Additional information (if any)	Total electricity requirement will be 10 MW

Cost of project	Proposed Project (In Crore): Rs. 2277 Total Cost (In Crore) : Rs. 2277
Total area of Project	<table><tr><th>Nature of Land involved in (Ha)</th><th>Private Land in Ha</th><th>Govt. land in Ha</th><th>Total Area required in Ha</th></tr><tr><td></td><td>23.03</td><td>0.8064</td><td>23.8364 Ha</td></tr><tr><td></td><td>23.03</td><td>0.8064 Ha</td><td>23.8364 Ha</td></tr></table>
Height of Dam from River Bed (EL)	Existing: 36.09 m
Length of Tunnel/Channel	Length of Proposed Tunnel: 23450 m Cut & Cover Section: 2350 m Open Channel Section: 867 m
Details of Submergence area	Existing area: 1480 Ha
Types of Waste and quantity of generation during construction/ Operation	**Domestic Waste:** <table><tr><th>Name of Waste</th><th>Source</th><th>Qty (TPA)</th></tr><tr><td>Dry Waste</td><td>Labour Colony</td><td>147.6</td></tr><tr><td>Wet Waste</td><td>Labour Colony</td><td>98.4</td></tr></table>**Excavation Waste** <table><tr><th>Name of Waste</th><th>Source</th><th>Qty (cu.m)</th></tr><tr><td>Muck</td><td>Excavation & Tunnel Work</td><td>1670000</td></tr></table>

E-Flows for the Project	NA
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	NA

Muck Management Details:

No. of proposed disposal area/(type of land/ Forest/ Pvt. land) Muc	v 3750000 cu.m shall be used for back filling of open ch

k Management Plan	annel portion v 6000 0 0 0 cu. m stone & aggregates shall be utilised for construction v Bal

	ance 69500 0 0 cu. m material shall be utilised for lolying area and adjoining Quarry

	area
Monitoring mechanism for Muck Disposal	Environmental Management Cell (EMC) shall monitor mechanism of muck disposal

Land Area Breakup:

	23.03 Ha
	0.8064 Ha
	Existing area: 1480 Ha
Land required for project components	Nature of Land involved in (Ha) / Private Land in Ha / Govt. land in Ha / Total Area required in Ha 23.03 / 0.8064 / 23.8364 23.03 / 0.8064 / 23.8364
Additional information (if any)	NA

Forest Lan	Yes/No	Details of Certificate/letter/Remarks

<table>
<tr><td>d/ Protected Area/ Environmental Sensitivity Zone</td><td></td><td></td></tr>
<tr><td>Reserve Forest/ Protected Forest Land</td><td>Yes</td><td>
<table>
<tr><th>Nature of Land involved in (Ha)</th><th>Area Existing in Ha</th><th>Area Proposed in Ha</th><th>Total Area required in Ha</th></tr>
<tr><td>F</td><td>0</td><td>0.</td><td>0.</td></tr>
</table>
</td></tr>
</table>

		forest Land 8064 8064
National Park	No	Not within 10 km radius from proposed command area boundary
Wildlife Sanctuary	No	Western Ghat ESA boundary near Ghera Sinhagad Village at 3.65 km towards south

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	Not Applicable
Status of Stage- I FC	Application Submitted FP/MH/MinorCanal/460637/2024
Additional detail (If any)	The original Khadakwasla Dam Construction work was started in 1860 and completed in 1878. Hence Environmental Clearance was not applicable to existing project. As per the Gazette Notification dated 14th Sep, 2006 and its subsequent amendments, a tunnel between Khadakwasala- Dam to Fursungi is proposed substitutes for New Mutha Right Bank Canal Km 1 to 34 is applied for Environmental Clearance.
Is FRA (2006) done for FC-I	NA

Particulars	**Details**
Details of consultant	MITCON Consultancy & Engineering Services Ltd. Pune **Certificate No.** Certificate No. NABET/EIA/2124/RA 229_Rev 03 **Extension** dated 9th Feb 24: Valid Up to 8th May 2024 **Extension** dated 13th May 24: Valid Up to 12th August 2024

<table>
<tr><td>Project Benefits</td><td>v 2.18 TMC water will be saved and can be used for Irrigation and Non-Irrigation purpose.
v Increasing demand for drinking and industrial purposes in Pune city and surroundings, leakage in canals etc. Due to these reasons, the stress on the irrigation sector can be reduced through this saving. Also, additional water may be available for drinking.
v Total 3471 Ha command area has been restored due to saved water.
v Land acquisition will not require except for tunnel shafts, approach road, open channel and cut & cover portion (11.71 Ha). So, as there will be no question of rehabilitation.
v During construction phase
Permanent employment
No. of permanent employment: 75
Period of employment (days): 7461
Temporary employment
Temporary employment: 1350
Temporary / Contractual employment
(No. of Man days): 1972350
During operational phase
Permanent employment proposed: 58
Temporary employment: 20</td></tr>
<tr><td>Status of other statutory clearances</td><td>Forest Clearance Application Submitted
Proposal No. FP/MH/Minor Canal/460637/2024</td></tr>
<tr><td>R&R details</td><td>Total private land of around 23.03 Ha is proposed for acquisition. The land acquisition will be done and compensation shall be paid to land owners as per the “The Right to Fair Compensation & Transparency in Land acquisition, Rehabilitation and Resettlement Act 2013” or as per Government of Maharashtra GR dated 12 May, 2015 for purchase of land for irrigation projects through private negotiation.
As there are no households in the land to be acquired, there is no issue of rehabilitation & resettlement of the land owners.
<table>
<tr><th>Sr. No</th><th>District Taluka</th><th>Particular</th><th>Village name</th><th>Gut No.</th></tr>
<tr><td>1</td><td rowspan="8">Dist: Pune Tal: Haveli</td><td>Shaft no. 1</td><td>Kirkatwadi</td><td>356, 358, 359, 360</td></tr>
<tr><td>2</td><td>Shaft no. 2</td><td>Dhayari</td><td>35, 36</td></tr>
<tr><td>3</td><td>Shaft no. 3</td><td>Mangadewadi</td><td>6, 9, 10</td></tr>
<tr><td>4</td><td>Shaft no. 4</td><td>Yevalewadi</td><td>29, 30, 35, 36</td></tr>
<tr><td>5</td><td>Shaft no. 5</td><td>Vadachiwadi</td><td>33, 34</td></tr>
<tr><td>6</td><td>Shaft no. 6</td><td>Holkarwadi</td><td>111, 116</td></tr>
<tr><td>7</td><td>Cut & Cover</td><td>Vadaki</td><td>128, 129, 130, 183, 187</td></tr>
<tr><td>8</td><td>Open Channel</td><td>Loni Kalbhor</td><td>1995, 1997, 1996, 1998, 1971, 2010, 2009, 2008, 2007, 2006, 2005, 2013, 2014, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2137, 2138, 2140, 2141, 2152, 2153, 2151, 2168, 2167,</td></tr>
</table></td></tr>
</table>

					1894, 1893, 1892, 1891, 1890, 1889, 1888, 1887, 1886, 1885

SI	Particular	Qty	Unit
1	Acquisition of Land required for stacking excavat		

	edstuffandforshaftsetc.		
		0.94	Ha.
		7.10	Ha.
		1.67	Ha.
		2.000	Ha.
		111.32	Ha.
	Total	**23.03**	**Ha.**

3.4.3. Deliberations by the committee in previous meetings

N/A

3.4.4. Deliberations by the EAC in current meetings

11.5.3 The EAC during deliberations noted the following:

- The project/activity is covered under Category B of item 1 (c) 'River Valley & Hydroelectric projects' but due to applicability of general condition (3.6 km from ESA boundary of Western Ghats) the project appraised at Central level by the sectoral EAC in the Ministry.
- The EAC noted that the proposed project is to construct a Tunnel which is substitute to New Mutha Right Bank Canal Km. 1 to 34 which is more than 60 years old and proposed in upstream of Khadakwasla dam in Pune district of Maharashtra.
- During the presentation, the EAC inquired about the constraints due to which new canal is proposed and why the existing canal cannot be repaired or restructured, accordingly, PP replied that the 35km of pipeline passes through city which has been encroached form both side of the canal and people around the canal are dumping garbage into it. Also it was noted that due to large amount of seepage lossesit affects the water availability in the downstream. Additionally, the committee inquired about the decommissioned plan of the canal to which PP replies that it will be handed over to Pune municipal cooperation for the development of the city.
- The EAC inquired that people residing near to the canal, they must be dependent on the water from the canal to which PP replied that all the people in Pune city receives water from Municipal Corporation limited.
- The EAC insisted PP to restructure or modification can be done in the canal so as to avoid construction of new tunnel which seems to be more environmental friendly, also it was suggested that lining of the canal can be done which can further reduce the seepage losses, afterwards PP defended their proposal and submitted that if they opt for modifying the existing they need to shutdown canal for at least 2-3 years due to which irrigation facilities will get disrupted and it will not become economical viable.

The committee observed that the total muck generation will be generated 1670000 cu.m out of which 375000 cum shall be used for backfilling of open channel portion, 600000 cum stone & aggregates shall be utilised for construction and Balance 695000 cum material shall be utilised for lo lying area and adjoining Quarry area.

11.5.4 The EAC after detailed deliberation on the information submitted and as presented **deferred** the proposal for want of following additional information:

i. PP shall submit technical analysis along with cost of new tunnel and old tunnel modification shall be submitted.
ii. Detailed plan along with time bound, budget wise shall be summited for green plantation or park development in the old channel.
iii. Ground water level studies analysis shall be carried out to quantify the changes will occur after underground pipelines installation.
iv. Necessary permission from government shall be taken for change in land use pattern.
v. Approved DPR of the project to be submitted.
vi. Option analysis to be carried out.

3.4.5. Recommendation of EAC

Deferred for ADS

3.5. Agenda Item No 5:

3.5.1. Details of the proposal

NAYING HYDRO ELECTRIC PROJECT (1000 MW) - NEAR VILLAGE- YAPIK, DISTRICTS- SHI YOMI & SIANG, STATE- ARUNACHAL PRADESH by **NORTH EASTERN ELECTRIC POWER CORPORATION LT D** located at **SHI YOMI,ARUNACHAL PRADESH**	
Proposal For	Fresh ToR

Proposal No	File No	Submission Date	Activity (Schedule Item)
IA/AR/RIV/470969/2024	J-12011/37/2007-IA-I (R)	11/05/2024	River Valley/Irrigation projects (1(c))

3.5.2. Project Salient Features

The proposal is for grant of Terms of Reference to the project Naying Hydro Electric Project of capacity 1000 MW (4x250 MW) run-of-river project on river Siyom, in an area of 470.8 ha. located at Village Yapik, Hone, Lipo, Row and etc, Sub District Payum Circle and tato, Distrcit Shi Yomi & Siang, Arunachal Pradesh by M/s North Eastern Electric Power Corporation Ltd.

11.6.2 The Project Proponent along with consultant M/s P and M Solution, made a detailed presentation on the salient features of the project and informed that:

i. Naying HEP is proposed to be developed as a run-of-river type development on river Siyom, a tributary of Siang river, with proposed dam site located at 28°31'10"N, 94°30'25"E. The project dam site is located 4 km downstream of village Yapik, 40 km upstream of Middle Siyom HEP dam site and 100 km upstream of Aalo (Along) Town (nearest major town and the District HQ of West Siang District).

ii. The project envisages to harness a gross head of about 285 m in a stretch of about 15 km (from FRL to TWL). The project with a proposed installation of 1000 MW (4x250 MW) will generate annual energy of 3809.60 MU in 90% dependable year with 95% machine availability giving 43.71% load factor.

iii. Naying Hydro Electric Project (1000 MW) is currently allotted to North Eastern Electric Power Corporation Limited (NEEPCO), a Govt of India Enterprise. Memorandum of Agreement has been executed between Government of Arunachal Pradesh & NEEPCO for development of the Project on 12th August 2023.

iv. Appraisal of the DPR of Naying HEP (1000 MW) was carried out by CEA and accorded Concurrence vide Office Memorandum No. 2/ARP/17/CEA/09-PAC/5387-5419 dated 11-09-2013 which was subsequently transferred to NEEPCO vide CEA's letter No. CEA-HY-12-12/14/2023-HPA Division dated 20-10-2023 having validity upto 30-09-2025.

v. Earlier, the Environmental Clearance process also progressed substantially with holding of Public Hearing meeting on 11-05-2012 followed by appraisal of the project in the 66th EAC meeting held on 04-05-2013. The committee advised the PP to include some more information/ test result in the EIA/EMP reports including outcome of Siang River basin study which was in advanced stage of completion at the time.

vi. As regards to the outcome of the Cumulative Environmental Impact Assessment Study (River Basin study) of Siang River Basin, it may be mentioned that the MOEF&CC, GOI vide F. No. J-12011/22/2015- IA-1(T)(Pt.) dated 14-10-2016 has decided for development of Naying HEP and Tato-II HEP (immediate upstream project) in the present form without any reduction of FRL. The FRL of Siyom Middle HEP (immediate downstream project) to be reduced by 10 m to create free flow river stretch between the FRL of Siyom Middle and the TWL of Naying HEP. The Ministry vide the above communication has also directed Naying, Tato-II and Hirong HEP for implementation of the Environment flow release as mentioned in the Siang Basin Study report without any relaxation.

vii. NEEPCO carried out Power Potential Studies (PPS) based on recommendations of Basin Study report for introduction of e-flow for development of Naying, HEP. The CEA vide letter dated 29.03.2022 cleared the PPS for Naying H.E. Project (1000MW) as submitted by NEEPCO.

viii. In the meantime, NEEPCO has also reassessed the total land requirement of 644 Ha projected earlier and after optimization, the total land quantity now stands at about 470.80 Ha (a reduction of 173.20 Ha). Since the entire project area may be categorized as Unclassed State Forest (USF), above exercise has considerably reduced the requirement of Forest diversion, thus reducing the extent of adverse environmental impacts due to the project.

ix. Project Cost: The estimated project cost is Rs. 9558.52 Crores.Total capital cost earmarked towards

environmental pollution control measures is Rs 82.03 Crores (includes Recurring cost of operation and maintenance – detail breakup shall be provided in the EIA and EMP reports).

x. Project Benefit: Total Employment will be 150 and 100 persons as direct benefits during construction & operational phase respectively besides labour force & (this project does not envisage any expansion) persons indirect after expansion. Industry proposes to allocate, Local Area Development Fund @2% of power generation (1% by the State Govt and 1 % by NEEPCO) per year will be a recurring source of fund available for development/ improvement of the local infrastructures and for overall benefit of the local community.

xi. Environmental Sensitive area: There are no National Parks, Wildlife Sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site. The project lies on the River Siyom.

xii. MoU / any other clearance/ permission signed with State government: Memorandum of Agreement has been executed between Government of Arunachal Pradesh & NEEPCO for development of the Project on 12th August 2023.

xiii. Resettlement and rehabilitation: One circle comprising 9 villages, with 120 Project affected families, is likely to be affected due to land acquisition for various components of the proposed HEP. The Resettlement & rehabilitation plan for the PAF of the proposed project shall be formulated within the provisions and/or guidelines as given in the NRRP, 2007 & State R&R Policy, 2008. Also "Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013" to provide rehabilitation to the affected families including services like job opportunities, training, skill development opportunities and financial assistance to the people shall be done.

xiv. Alternative Studies: Several alternative studies have been carried out for arriving at the most suitable scheme for the project. These broadly included:

(i) Study of left bank vs. right bank development
(ii) Identification and assessment of several dam axis
(iii) Identification and assessment of different locations of the intake and
(iv) Identification and assessment of different locations of the powerhouse.

Based on the initial reconnaissance and study of the maps, it was concluded that the project should be developed on the right bank. Also for the dam Site, five potential alternative schemes were considered in the allotted river reach with FRL and TWL taken as El 805 m and El 520 m, respectively (as allotted for the project by the Government of Arunachal Pradesh). Correspondingly, the dam top is considered at El 808 m. Moreover, in all the alternative schemes, the powerhouse complex is located underground in the same general area and the water conductor system is located on the right bank of the river. Considering and studying various factors, the location of diversion has been finalized with the concrete dam (4 km downstream of village Yapik), at 138m high from the deepest foundation level to top of dam at El 808 m where the river bed level is El 700 m. Using the long term flow data and the allotted head, power potential studies have been carried out and Project's installed capacity has been assessed to be 1000 MW.

xv. Details of Solid waste/ Hazardous waste generation/ Muck and its Management: The project would generate substantial quantity i.e. around 2310000 TPA of muck from excavation of various structures. About 30% of the muck generated is proposed to be carried to the aggregate processing plants for production of coarse and fine aggregates. The balance quantity and material found unsuitable for processing would be directed to the designated disposal sites. Municipal Solid waste shall be disposed off by landfilling which shall be transported by road. The detailed Management plan shall be given in the EIA and EMP Reports.

xvi. The Salient features of the project are as follows:

Name of the Proposal	Kalai II Hydro Electric Project (Run-of-the-River) of 1200 MW located in Tehsil Hawai Town, District Anjaw, Arunachal Pradesh by M/s THDC India Limited
Location	Anjaw District, Arunachal Pradesh

(Including coordinates)	Lat: $27^0$54’ 20” Long $96^0$48’16”
Inter- state issue involved	No
Seismic zone	Zone V

Category of the project	1 (c)
Provisions	As per Schedule of EIA Notification 2006
Capacity / Cultural Command Area (CCA)	1200 MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	NIL

Powerhouse Installed Capacity	1200 MW
Generation of Electricity Annually	4852.95 GWh
No. of Units	6*190 MW + 1*60 MW (07 units)
Additional information (if any)	No

Cost of project	12801.54 Cr (Submitted to CEA for approval)
Total area of Project	1100 Ha
Height of Dam from River Bed (EL)	128.5 m
Length of Tunnel/Channel	The total length of five Nos of 7.5 m dia HRTs is 534.7 m and for 8.5 m dia HRT is 63.3 m . Total length of 3 nos. TRT is 3939 m plus Leng th of 01 Auxiliary TRT is 333 m.
Details of the Submergence area	638.456 Ha
Types of Waste and quantity of generation during construction/ Operation	Domestic Solid Waste, Hazardous Waste, and Muck.
E-Flows for the Project	As per the table given below.
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CI A&CC) for River in which project located. If yes, then	Yes, Cumulative Impact assessment and carryin g capacity study of Lohit Basin, 2016.
a) E-flow with TOR /Recommendation by E AC as per CIA&CC study of River Basi n.	a) Listed As per the table given below.

b) If not the E-Flows maintain criteria for su staining river ecosystem.	

No. of proposed disposal area/(type of land-Forest/Pvt. land)	05 sites, Forest land
Muck Management Plan	Shall be covered as apart of EIA Study
Monitoring mechanism for Muck Disposal	Shall be covered as apart of EIA Study

Private land	Nil
Government land/Forest Land	963.764 Forest Land
Submergence area/Reservoir area	638.456 ha
Land required for project components	1100 Ha
Additional information (if any)	A proposal for 963.764 Ha of forest land has bee n submitted and is under process of approval. Additional 136.236 ha of land in the under-identi fication stage for base camp township, store, offi ce, weigh bridge, EM & HM store, cement & ste el stockyard. The remaining land shall be acquired as per prev ailing norms for Pvt land, Govt land or Forest la nd, as applicable.

Forest Land/ Protected Area/ Envi ronmental Sensitivity Zone	**Yes/No**	**Details of Certificate/letter/Remarks**
Reserve Forest (RF) Protected Forest Land	295.986 Ha R.F. Nil	Application for Stage-I FC was submitted on 23.01.20 24 for 295.986 ha of reserv e forest along with 667.778 ha of unclassed Forest.
National Park	Nil	
Wildlife Sanctuary	Nil	

Court Case	NIL
Additional information (if any)	
Affidavit/Undertaking	Attached
Additional information (if any)	

Particulars	**Letter no. and date**

Certified EC compliance report (if applicable)	NA
Status of Stage- I FC	Proposal No FP/AR/HYD/IRRIG/459593/2024 was submitted on 23.01.2024.
Additional detail (If any)	The Project was initially allotted to Kalai Power Private Limited (a subsidiary of Reliance Power Limited). EAC recommended the issuance of EC vide its 81st meeting held on 28.01.2015 based on the EIA/EMP study and PH conducted 2014. After that MoEF&CC vide its letter No. J-12011/40/2009-IA.I dtd 20.05.2015 conveyed that Environment Clearance (EC) for Kalai-II HEP has been approved by the competent authority and EC letter shall be issued on production of Stage-1 Forest Clearance (FC). The proposal case for seeking Stage-1 Forest Clearance was initiated in February 2013 and the same could not take off. Meanwhile, THDCIL has entered into a Memorandum of Agreement (MoA), executed between the Hon'ble Governor of Arunachal Pradesh and THDC India Ltd on dtd 30.12.2023 for the execution of 1200 MW Kalai-II Hydroelectric Project. A fresh application for Forest Clearance has been submitted on 23.01.2024. Since EC was approved only, and was not issued, hence, the same could not be transferred in the name of THDCIL. Accordingly, the present proposal for the issuance of ToR has been submitted on 23.03.2024.
Is FRA (2006) done for FC-I	FRA certificate issued vide Letter dated 14.11.2014 and 22.02.2024.

Particulars	**Details**
Details of consultant	M/s WAPCOS Limited
Project Benefits	Ø Capacity addition of 1200 MW in the North-East Region, meeting power-requirement of the region. Ø Annual Energy Generation of ~ 4852.95 GWh of electricity Ø Integrated Development of the region in the areas of employment, communication, education, health, tourism, Ø 12% free power will be provided to the home state of Arunachal Pradesh.

	Ø In addition, 1% power/revenue shall be uti lized for contribution towards local area development.
Status of other statutory clearances	Environment Clearance: Applied Forest Clearance: Applied Wildlife Clearance: Not Applicable
R&R details	Shall be covered as apart of EIA Study
Additional detail (If any)	Nil

3.5.3. Deliberations by the committee in previous meetings

N/A

3.5.4. Deliberations by the EAC in current meetings

11.6.3 The EAC during deliberations noted the following:

- The project/activity is covered under Category A of item 1 (c) 'River Valley & Hydroelectric projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.
- The EAC noted that earlier EC process had progressed substantially, with a Public Hearing meeting held on 11-05-2012, followed by an appraisal of the project in the 66th EAC meeting on 04-05-2013. Then the committee advised the PP to include additional information and test results in the EIA/EMP reports. It shall include the outcome of the Siang River basin study, which was in an advanced stage of completion at that time. The committee emphasized that these updates are crucial for a comprehensive assessment of the project's potential impacts.
- The EAC noted that e-flow will be released into river as per Cumulative Environmental Impact Assessment Study (River Basin study) of Siang River Basin.
- The committee observed that PP will carried out various GLOF study so as to minimize the impact of disaster in future and identifying potential risk areas, developing early warning systems, and implementing preventive measures to reduce the likelihood and severity of GLOF events.

The EAC inquired about the density of the forest and composition of species present at the project site in view of project site located in very rich forest density. Additionally, it was noted that the initial total land requirement for the project was 644 hectares and after optimization, a reduction of 173.20 hectares has been achieved, bringing the total land requirement down to 470.80 hectares. The committee highlighted the importance of understanding the ecological impact on the dense forest area and acknowledged the efforts made to minimize land use.

3.5.5. Recommendation of EAC

Recommended

3.5.6. Details of Terms of Reference

3.5.6.1. Specific

(A) Environmental Management and Biodiversity Conservation

1.	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.
2.	PP shall explore the possibility to reduce the length diversion tunnel so that dry length of the river can be minimized.
3.	Predominant species of trees in the study area including their density and nomenclature shall be studied, and number of trees to be cut for the project.
4.	The EIA study should be undertaken in accordance with recommendations of the Cumulative Environmental Impact Assessment Study (River Basin study) of Siang River Basin.
5.	List of endangered species shall be obtained from state forest department and accordingly, mitigation measures for them shall be incorporate in the EIA/EMP report.
6.	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.
7.	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.
8.	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.
9.	Conducting site specific ecological study with respect to riverine ecology focus on fishes diversity, fish migration, habitat and aquatic biota and provision for fish pass shall be provided and detail of it shall be incorporated in EIA/EMP report.
10.	Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard 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.
11.	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.
12.	A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
13.	River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
14.	Geological study shall be conducted in respect to earthen dam and rock filled dam for dam safety.
15.	The project area should not come up on any critical mineral zone to be verified by GSI/NMDC.

16.	Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI.
17.	Reasons for termination of project from past Private developers.
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. Accordingly, No objection certificate from other states (Bihar and Jharkhand) must be obtained by project proponents or by the State Government being the allotter of the project to avoid scarcity of water to consumers.
2.	All the tasks including conducting Public Hearing and consultation shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter with allocated fund and timeline to complete within three years of construction of project.
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 shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.
5.	Budget earmarked for R&R, CSR shall not include in the cost of EMP and compliance of issues raised during Public Hearing.
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.	Muck disposal sites shall be located minimum 100m away from HFL of river.
4.	PP shall explore the possibilities to utilization of muck at maximum extent and muck disposal site shall be located in non-forest land/barren land.
5.	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.
6.	Restoration plan for construction area including dumping site of excavated materials by levelling, filling up of burrow pits, landscaping etc.
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.	A glacial lake outburst flood studies shall be carried out.
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 submit.
5.	Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
6.	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 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.

3.5.6.2. Standard

1(c)	**River Valley/Irrigation projects**
Scope of EIA Study	
1.	The EIA Report should identify the relevant environmental concerns and focus on potential impacts that may change due to the construction of proposed project. Based on the baseline data collected for three (3) seasons (Pre-monsoon, Monsoon and Winter seasons), the status of the existing environment in the area and capacity to bear the impact on this should be analysed. Based on this analysis, the mitigation measures for minimizing the impact shall be suggested in the EIA/EMP study.
Details of the Project and Site	
1.	General introduction about the proposed project.
2.	Details of Project and site giving L-Sections of all U/S and D/S Projects with all relevant maps and figures. Connect such information as to establish the total length of interference of Natural River and the committed unrestricted release from the site of Dam/Barrage into the main river.
3.	A map of boundary of the project site giving details of protected areas in the vicinity of 25 km of project location.
4.	Location details on a map of the project area with contours indicating main project features. The project layout

	shall be superimposed on a contour map of ground elevation showing main project features (viz. location of dam, Head works, main canal, branch canals, quarrying etc.) shall be depicted in a scaled map.
5.	Layout details and map of the project along with contours with project components clearly marked with proper scale maps of at least 1:50,000 scale and printed at least on A3 scale for clarity.
6.	Existence of National Park, Sanctuary, Biosphere Reserve etc. in the study area, if any, should be detailed and presented on a map with distinct distances from the project components.
7.	Drainage pattern and map of the river catchment up to the proposed project site.
8.	Delineation of critically degraded areas in the directly draining catchment on the basis of Silt Yield Index as per the methodology of Soil and Land use Survey of India.
9.	Soil characteristics and map of the project area.
10.	Geological and Seismo-tectonic details and maps of the area surrounding the proposed project site showing location of dam site and canal sites.
11.	Remote Sensing studies, interpretation of satellite imagery, topographic sheets along with ground verification shall be used to develop the land use/land cover pattern of the study using overlaying mapping techniques viz. Geographic Information System (GIS), False Color Composite (FCC) generated from satellite data of project area.
12.	Land details including forests, private and other land.
13.	Demarcation of snow fed and rain fed areas for a realistic estimate of the water availability.
14.	Different riverine habitats like rapids, pools, side pools and variations in the river substratum bedrocks, rocks, boulders, sand/silt or clay etc. need to be covered under the study
Description of Environment and Baseline Data	
1.	To know the present status of environment in the area, baseline data with respect to environmental components air, water, noise, soil, land and biology & biodiversity (flora & fauna), wildlife, socioeconomic status etc. should be collected within 10 km radius of the main components of the project/site i.e. dam site and power house site. The air quality and noise are to be monitored at such locations which are environmentally & ecologically more sensitive in the study area. The baseline studies should be collected for 1 season (Preferably Monsoon season). Flora-Fauna in the catchment and command area should be documented. The study area should comprise of the following:
2.	(i) Catchment area up to the dam/barrage site.
3.	(ii) Submergence Area.
4.	(iii) Project area or the direct impact area should comprise of area within 10 km radius of the main project components like dam, canals etc.
5.	(iv) Downstream upto 10 km from the tip of the reservoir.
Details of the Methology	
1.	The methodology followed for collection of base line data along with details of number of samples and their locations in the map should be included. Study area should be demarcated properly on the appropriate scale map. Sampling sites should be depicted on map for each parameter with proper legends. For Forest Classification,

	Champion and Seth (1968) methodology should be followed.
Methodology for Collection of Biodiversity Data	
1.	The number of sampling locations should be adequate to get a reasonable idea of the diversity and other attributes of flora and fauna. The guiding principles should be the size of the study area (larger area should have larger number of sampling locations) and inherent diversity at the location, as known from secondary sources (e.g. eastern Himalayan and low altitude sites should have a larger number of sampling locations owing to higher diversity).
2.	The entire area should be divided in grids of 5kmX5km preferably on a GIS domain. There after 25% of the grids should be randomly selected for sampling of which half should be in the directly affected area (grids including project components such as reservoir, dam, powerhouse, tunnel, canal etc.) and the remaining in the rest of the area (areas of influence in 10 km radius form project components). At such chosen location, the size and number of sampling units (e.g. quadrates in case of flora/transects in case of fauna) must be decided by species area curves and the details of the same (graphs and cumulative number of species in a tabulated form) should be provided in the EIA report. Some of the grids on the edges may not be completely overlapping with the study area boundaries. However, these should be counted and considered for selecting 25% of the grids. The number of grids to be surveyed may come out as a decimal number (i.e. it has an integral and a fractional part) which should be rounded to the next whole number.
3.	The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.
4.	The R.E.T. species referred to in this point should include species listed in Schedule I and II of Wildlife (Protection) Act, 1972 and those listed in the red data books (BSI, ZSI and IUCN).
Components of the EIA Study: Various aspects to be studied and provided in the EIA/EMP report are as follow s:	
1.	null
2.	null

3.	Physical geography, Topography, Regional Geological aspects and structure of the Catchment.
4.	Tectonics, seismicity and history of past earthquakes in the area. A site specific study of the earthquake parameters will be done. The results of the site specific earthquake design shall be sent for approval of the NCSDP (National Committee of Seismic Design Parameters, Central water Commission, New Delhi for large dams.
5.	Landslide zone or area prone to landslide existing in the study area should be examined.
6.	Presence of important economic mineral deposit, if any.
7.	Justification for location & execution of the project in relation to structural components (dam /barrage height).
8.	Impact of project on geological environment.
9.	null
10.	Meteorology (viz. Temperature, Relative humidity, wind speed/direction etc.) to be collected from nearest IMD station.
11.	Ambient Air Quality with parameters viz. Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM) i.e. suspended particulate materials < 10 microns, Sulphur dioxide (SO2) and Oxides of Nitrogen (NOX) in the study area at 5-6 Locations.
12.	Existing Noise Levels and traffic density in the study area at 5-6 Locations.
13.	null
14.	Soil classification, physical parameters (viz., texture, Porosity, Bulk Density and water holding capacity) and chemical parameters (viz. pH, electrical conductivity, magnesium, calcium, total alkalinity, chlorides, sodium, potassium, organic carbon, available potassium, available phosphorus, SAR, nitrogen and salinity, etc.) at @ one sample/ha of command area.
15.	null
16.	(i) Generation of thematic maps viz, slope map, drainage map, soil map, land use and land cover map, etc. Based on these, thematic maps, an erosion intensity map should be prepared.
17.	null
18.	History of the ground water table fluctuation in the study area.
19.	Water quality for both surface water and ground water for (i) Physical parameters (pH, temperature, electrical conductivity, TSS); (ii) Chemical parameters (Alkalinity, Hardness, BOD, COD, NO2, PO4, CI, SO4, Na, K, Ca, Mg, Silica, Oil & Grease, phenolic compounds, residual sodium carbonate); (iii) Bacteriological parameter (MPN, Total coliform) and (iv) Heavy Metals (Pb, As, Hg, Cd, Cr-6, total Cr, Cu, Zn, Fe) (6 locations).
20.	Delineation of sub and micro-watersheds, their locations and extent based on the All India Soil and Land Use Survey of India (AISLUS), Department of Agriculture, Government of India. Erosion levels in each micro-watershed and prioritization of micro-watershed through silt yield index (SYI) method of AISLUS

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

	for calculating various diversity indices along with details of locations of quadrates, size of quadrates etc. to be reported within the study area in different ecosystems.
39.	Existence of National park, Sanctuary, Biosphere Reserve etc in the study area, if any, should be detailed.
40.	Economically important species like medicinal plants, timber, fuel wood etc.
41.	Details of endemic species found in the project area.
42.	Flora under RET categories should be documented using International Union for the Conservation of Nature and Natural Resources (IUCN) criteria and Botanical Survey of India's Red Data list along-with economic significance. Species diversity curve for RET species should be given.
43.	Cropping pattern and Horticultural Practices in the study area.
44.	null
45.	Fauna study and inventorisation should be carried out for all groups of animals in the study area. Their present status alongwith Schedule of the species.
46.	Documentation of fauna plankton (phyto and zooplankton), periphyton, benthos and fish should be done and analysed.
47.	Information (authenticated) on Avi-fauna and wildlife in the study area.
48.	Status of avifauna their resident/ migratory/ passage migrants etc.
49.	Documentation of butterflies, if any, found in the area.
50.	Details of endemic species found in the project area.
51.	RET species-voucher specimens should be collected along-with GPS readings to facilitate rehabilitation. RET faunal species to be classified as per IUCN Red Data list and as per different schedule of Indian Wildlife (Protection) Act, 1972.
52.	Existence of barriers and corridors, if any, for wild animals.
53.	Compensatory afforestation to compensate the green belt area that will be removed, if any, as part of the proposed project development and loss of biodiversity.
54.	Collection of primary data on agricultural activity, crop and their productivity and irrigation facilities components.
55.	For categorization of sub-catchment into various erosion classes and for the consequent CAT plan, the entire catchment (Indian Portion) is to be considered and not only the directly the draining catchment.

56.	Documentation of aquatic fauna like macro-invertebrates, zooplankton, phytoplantktons, benthos etc.
57.	Fish and fisheries, their migration and breeding grounds.
58.	Fish diversity composition and maximum length & weight of the measured populations to be studies for estimation of environmental flow.
59.	Conservation status of aquatic fauna.
60.	Sampling for aquatic ecology and fisheries and fisheries must be conducted during three seasons Pre-monsoon (summer), monsoon and winter. Sizes (length & weight) of important fish species need to be collected and breeding and feeding grounds should also be identified along the project site or in vicinity.
61.	Collection of baseline data on human settlements, health status of the community and existing infrastructure facilities for social welfare including sources of livelihood, job opportunities and safety and security of workers and surroundings population.
62.	Collection of information with respect to social awareness about the developmental activity in the area and social welfare measures existing and proposed by project proponent.
63.	Collection of information on sensitive habitat of historical, cultural and religious and ecological importance.
64.	The socio-economic survey/ profile within 10 km of the study area for demographic profile; Economic Structure; Developmental Profile; Agricultural Practices; Infrastructure, education facilities; health and sanitation facilities; available communication network etc.
65.	Documentation of demographic, Ethnographic, Economic Structure and development profile of the area.
66.	Information on Agricultural Practices, Cultural and aesthetic sites, Infrastructure facilities etc.
67.	Information on the dependence of the local people on minor forest produce and their cattle grazing rights in the forest land.
68.	List of all the Project Affected Families with their name, age, educational qualification, family size, sex, religion, caste, sources of income, land & house holdings, other properties, occupation, source of income, house/land to be acquired for the project and house/land left with the family, any other property, possession of cattle, type of house etc.
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
2	Impact on breeding and nesting grounds of animals and fish.

4.	
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.

3.6. Agenda Item No 6:

3.6.1. Details of the proposal

Kalai II Hydro Electric Project by **THDC INDIA LIMITED** located at **ANJAW,ARUNACHAL PRADESH**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/AR/RIV/466561/2024	J-12011/40/2009-IA-I(R)	10/04/2024	River Valley/Irrigation projects (1(c))

3.6.2. Project Salient Features

The proposal is for grant of Terms of Reference to the project Kalai II Hydro Electric Project (Run-of-the-River) of 1200 MW in an area of 1100 Ha located at Village Kamdi, Tehsil Hawai Town, District Anjaw, Arunachal Pradesh by M/s THDC India Limited

11.7.2 The Project Proponent and the accredited Consultant M/s WAPCOS Ltd, made a detailed presentation on the salient features of the project and informed that:

iii. **Land requirement**: 1100 Ha (as per DPR) (963.764 Ha for project component + 136.236 for Base Camp Township, Store, Office, Weigh Bridge, EM & HM Store, Cement & Steel Stockyard etc*) (*136.236 ha land is under the identification stage)

iv. The Salient features of the project are as follows:

Name of the Proposal	Kalai II Hydro Electric Project (Run-of-the-River) of 1200 MW located in Tehsil Hawai Town, District Anjaw, Arunachal Pradesh by M/s THDC India Limited
Location (Including coordinates)	Anjaw District, Arunachal Pradesh Lat: $27^{0}54'$ 20" Long $96^{0}48'16"$
Inter- state issue involved	No
Seismic zone	Zone V

Category of the project	1 (c)
Provisions	As per Schedule of EIA Notification 2006
Capacity / Cultural Command Area (CCA)	1200 MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	NIL

Powerhouse Installed Capacity	1200 MW
Generation of Electricity Annually	4852.95 GWh
No. of Units	6*190 MW + 1*60 MW (07 units)
Additional information (if any)	No

Cost of project	12801.54 Cr (Submitted to CEA for approval)
Total area of Project	1100 Ha (As per DPR)
Height of Dam from River Bed (EL)	128.5 m
Length of Tunnel/Channel	The total length of five Nos of 7.5 m dia HRTs i s 534.7 m and for 8.5 m dia HRT is 63.3 m Total length of 3 nos. TRT is 3939 m plus Lengt h of 01 Auxiliary TRT is 333 m.
Details of the Submergence area	638.456 Ha
Types of Waste and quantity of generation during construction/ Operation	Domestic Solid Waste, Hazardous Waste, and M uck.
E-Flows for the Project	As per the table given below.
Is Projects earlier studies in Cumulative Impac t assessment & Carrying Capacity studies (CI A&CC) for River in which project located. If yes, then	Yes, Cumulative Impact assessment and carryin g capacity study of Lohit Basin, 2016.
a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River B asin. b) If not the E-Flows maintain criteria for s ustaining river ecosystem.	a) Listed As per the table given below.

No. of proposed disposal area/(type of land-Forest/Pvt. land)	05 sites, Forest land The erstwhile developer has proposed the muck disposal sites as per the availability of land near by the project. The land around and nearby the p roject area is mostly forest land and muck dispos al areas have been chosen considering the optimum distance f rom the project, volume accumulation capacity per sqm, and as per suitable topography. The muck management plan shall be further opti mized during EIA & EMP study based on fresh ToR. However, best efforts will be made to identify th e private land as desired for minimizing the fore st land for the proposed project without hamperi ng the project viability, if possible.
Muck Management Plan	Shall be covered as apart of EIA Study
Monitoring mechanism for Muck Disposal	Shall be covered as apart of EIA Study
Private land	Nil
Government land/Forest Land	963.764 Forest Land
Submergence area/Reservoir area	638.456 ha
Land required for project components	1100 Ha (As per DPR)
Additional information (if any)	A proposal for 963.764 Ha of forest land has been submitted and is under the process of approval. Additional 136.236 ha of land in the under-identif ication stage for base camp township, store, offic e, weighbridge, EM & HM store, cement & steel stockyard. The remaining land shall be acquired as per preva iling norms for Pvt land, Govt land or Forest land, as applicable. Initially, ToR may be granted for 963.764 ha land only for which the FC proposal has already been s ubmitted by THDCIL and for the remaining 136.2 36 ha best efforts will be made to identify the priv ate land and efforts will also be made to keep it m inimum to the limit it is indispensable for meeting project's requirements. However, amendment in ToR shall be requested f rom MoEF&CC for additional land, other than 96 3.764 ha forest land during EIA-EMP study

Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/No	Details of Certificate/letter/Remarks
Reserve Forest (RF) Protected Forest Land	295.986 Ha R.F. Nil	Application for Stage-I FC was su bmitted on 23.01.2024 for 295.986 ha of reserve forest along with 66 7.778 ha of unclassed Forest. The project land falls within the juri sdiction of two forest divisions i.e. Anjaw and Namsai. DFOs of both divisions have issued letters that the project does not fall u nder the wildlife corridor.
National Park	Nil	
Wildlife Sanctuary	Nil	

Court Case	NIL
Additional information (if any)	
Affidavit/Undertaking	Attached
Additional information (if any)	

Particulars	Letter no. and date
Certified EC compliance report (if applicab le)	NA
Status of Stage- I FC	Proposal No FP/AR/HYD/IRRIG/459593/2024 wa s submitted on 23.01.2024. Presently enumeration of trees is underway by the r espective Forest Divisions. The proposal is now forwarded to DFO after accept ance of PSC-I
Additional detail (If any)	The Project was initially allotted to Kalai Power Pr ivate Limited (a subsidiary of Reliance Power Limi ted). EAC recommended the issuance of EC vide its 81st meeting held on 28.01.2015 based on the EIA/EM P study and PH conducted 2014. After that MoEF&CC vide its letter No. J-12011/4 0/2009-IA.I dtd 20.05.2015 conveyed that Environ ment Clearance (EC) for Kalai-II HEP has been ap proved by the competent authority and EC letter sh all be issued on production of Stage-1 Forest Clear ance (FC). The proposal case for seeking Stage-1 Forest Clear ance was initiated in February 2013 and the same c ould not take off. Meanwhile, THDCIL has entered into a Memorand

	um of Agreement (MoA), executed between the Ho n'ble Governor of Arunachal Pradesh and THDC In dia Ltd on dtd 30.12.2023 for the execution of 120 0 MW Kalai-II Hydroelectric Project. A fresh application for Forest Clearance has been s ubmitted on 23.01.2024. Since EC was approved only, and was not issued, h ence, the same could not be transferred in the name of THDCIL. Accordingly, the present proposal for the issuance of ToR has been submitted on 23.03.2024.
Is FRA (2006) done for FC-I	FRA certificate issued vide Letter dated 14.11.2014 and 22.02.2024.

Particulars	**Details**
Details of consultant	M/s WAPCOS Limited
Project Benefits	Ø Capacity addition of 1200 MW in the North-E ast Region, meeting power-requirement of t he region. Ø Annual Energy Generation of ~ 4852.95 GWh of electricity Ø Integrated Development of the region in the ar eas of employment, communication, educati on, health, tourism, Ø 12% free power will be provided to the home state of Arunachal Pradesh. Ø In addition, 1% power/revenue shall be utilize d for contribution towards local area develo pment. Ø 100 unit/month free power for each PAF for 1 0 year.
Status of other statutory clearances	Environment Clearance: Applied Forest Clearance: Applied Wildlife Clearance: Not Applicable
R&R details	Shall be covered as apart of EIA Study
Additional detail (If any)	Nil

11.7.3 The project proposal was considered by the Expert Appraisal Committee (Thermal) in its 10th meeting held on 29.04.2024 for grant of Terms of Reference for the Project wherein the EAC deferred the proposal seeking additional information. PP vide its letter dated 25.05.2024 submitted the following information:

Query 1: Latest Water availability data shall be obtained CWC and hydro-graph of annual discharge based on historical data. E-flow based on hydrology and aquatic biology sustenance be recalculated based on latest data and in variable climate conditions.

Reply: The water availability series from 1985-86 to 2003-04 for Kalai-II HEP was approved by CWC

in May 2011 based on the observed hydrological data of the Mompani G&D site of CWC. Further, the latest available hydrological data for the Mompani G&D site from 2004 to 2023 was requested from CWC through CDRC Portal on 07.03.24.

A meeting on 08.04.24 for the release of classified data was held by BBO (Brahmaputra Basin Organisation), CWC, wherein, it was intimated that out of requested Gauge, Discharge, and Silt data only gauge data from 2020 to 2023 was available and hence, the request proposal was returned. The same was reiterated by SE, BBO, CWC vide email dtd. 10.04.24.

Also, since the approval of the hydrological series by CWC, no irrigation or hydroelectric project has been constructed in the upstream reach of the project which may result in any consumptive use of water of Lohit River and the river is virgin in its entire reach.

Therefore, the water availability series, approved for the Kalai-II HEP by CWC, from 1985-86 to 2003-04 is considered as a way forward for the project. Further, to observe the site-specific data the process for installation of the GDS site near the Kalai-II project location has already been initiated. The approved water series in the DPR will be further validated with the latest observed discharge data collected during EIA/EMP studies.

Regarding the e-flow it is submitted that e-flows considered in the approved DPR were as per the provisions of earlier ToR issues by MoEF&CC vide letter dated 09.12.2009 and these e-flows are greater than those recommended in the Cumulative Impact Assessment & Carrying Capacity Study of Lohit River in Arunachal Pradesh approved by MoEFCC. However, the same shall be validated with the latest observed discharge data collected during EIA/EMP studies.

Query 2: PP shall explore the possibility of implementing PSP instead of conventional Hydroelectric project and if PSP is not feasible then technical details and reason has to be submitted.

Reply: It is pertinent to mention that the potential locations for hydropower projects in the river basins are identified on the basis of extensive studies. The hydro power projects are the primary source of energy i.e. they generate the power using inherent potential of the river basin. Whereas PSPs are not a primary source of energy and are just a power bank/ battery which are generally needed for the storage of surplus energy from renewable sources.

Further, PSPs can be established in a closed loop off the river stream after studying their feasibility. Establishing PSPs at the potential hydropower sites will deprive the country of much-needed hydropower.

Central Electricity Authority, in its assessment studies, carried out from 1978-87 had identified the site of Kalai Hydro-Electric project in Lohit River basin of Arunachal Pradesh. Further, in the report on Basin Wise Re-assessment of Hydroelectric Potential in India-Brahmaputra Basin published in November 2022 (https://cea.nic.in/wp-content/uploads/2023/07/ReportonBrahmaputraBasin.pdf), CEA has earmarked Kalai-II HEP as an exploitable hydro-electric project in the Lohit Basin.

It is also pertinent to mention here that CEA in 1984 had completed a survey for potential pumped storage hydroelectric projects in India. Recently CEA conducted re-assessment studies for on-river pumped storage hydro-electric potential in India and released its report in June 2023 (https://cea.nic.in/wpcontent/uploads/hpi/2023/08/Pumped_Storage_On_River_Final_compressed.pdf), wherein, the potentially exploitable Pumper Storage Projects with both reservoirs on the river were identified and ranked based on their profiles. In this report, no potential pumped storage project location has been identified in the Lohit basin, and only one potential pumped storage project is identified in the entire Arunachal Pradesh namely Panyor PSP.

It is to further mention that the hydro-electric projects in the Lohit basin have been conceptualized in a cascade development wherein the FRL, TWL, and free riverine stretches between the projects, have been frozen by the State Govt. The same has been considered in the Carrying Capacity Study for the Lohit Basin approved by MoEFCC in Oct-2016. Ministry of Power vide order no. 259535 dated 22.12.21 indicated two hydro power projects namely 1750 MW Demwe (Lower) and 1200 MW Kalai-ll in Lohit basin of Arunachal Pradesh for allotment to THDCIL and the upstream/ downstream projects have been allotted by the State Government of Arunachal Pradesh to various other developers.

Regarding site specific technical suitability for development of PSP, it is pertinent to mention that the discharge from each machine of Kalai-II HEP is 180.2 m^3/sec. As per the submergence discharge characteristics curve for operation of machines in pumping mode, the submergence required for the operation of the machines at this level of discharge would be more than 200m, making it practically

unfeasible. Further, as the 1200MW Kalai-II HEP is located on the Lohit River where the water discharge is generally quite high, the installation of low discharge units would not be feasible.

Query 3: Detailed study and assessment shall be carried to evaluate the potential effects of sediment transport on the proposed project.

Reply: Detailed sedimentation studies were carried out in the DPR and approved by CWC. Mathematical model studies were conducted to assess likely sedimentation pattern and profiles upstream of the proposed dam axis.

The studies were conducted using software package HEC-RAS 4.1. Model studies were carried out for the following stages :

1. Studies under existing conditions (Pre-Dam Conditions).
2. Validation of numerical model (dam constructed) with a simulation period of one year.
3. Long Term Sedimentation Profile of Reservoir (after 1 year, 5 years, 14 years, 25 years, 50 years & 70 years)
4. Studies for flushing of sediments.

It was concluded from the studies that intake will remain free from siltation even after 70 years of Sedimentation. Sufficient live storage is also available for running the powerhouse on peaking. As an additional measure, eight number low-level sluice spillways (8 m x 12 m) have also been provided with Crest level at EL 820 m, which would flush the sediments from the reservoir when inflow exceeds the requirement of water drawl for generation.

However, silt data considered in the DPR will be further validated with the latest observed silt data collected during EIA/EMP studies

Query 4: All international boundary related clearances including clearance from Ministry of Defence shall be obtained from the concerned authorities and be submitted with supporting documents.

Reply: THDCIL has already applied for fresh Defence Clearance on 15.02.2024 through the online portal. The same is under process in the Ministry of Defence and may be granted by 15.06.202024

Query 5: An affidavit shall be submitted stating that there is no construction done at the site and no violation of the EP Act (1986), Water Act (1974), Air Act (1981), Forest Act(1980), and Wild Life Protection Act (1972) has been done.

Reply: The affidavit has been submitted.

Query 6: A letter from DFO shall be obtained stating that the project does not fall under any wildlife corridor.

Reply: The project land falls within the jurisdiction of two forest divisions i.e. Anjaw and Namasri. DFOs of both divisions have issued letters that the project does not fall under the wildlife corridor.

Query 7: PP shall resubmit the proposal with revised layout of muck disposal site outside the forest area and overall minimizing the forest land for the proposed project.

Reply: The erstwhile developer has proposed the muck disposal sites as per the availability of land nearby the project. The land around and nearby the project area is mostly forest land and muck disposal areas have been chosen considering the optimum distance from the project, volume accumulation capacity per sqm, and as per suitable topography.

The minimum distance of the toe of Muck Sites from the river bank at FRL/HFL varies from 49 m to 226 m. Further, Muck Management plan envisages that the disposal of muck is done by taking engineering and biological measures in such a manner that the fill is stable and does not flow and the same will be reclaimed as per the plan.

The muck management plan shall be further optimized during EIA & EMP study based on fresh ToR.

However, best efforts will be made to identify the private land as desired for minimizing the forest land for the proposed project without hampering the project viability, if possible.

Query 8: To submit the current status of 136.236 ha land which is under the identification stage and to submit the status along with details of previous FC clearance proposal submitted to Ministry in 2014-2015.

Reply: As per DPR, the total land requirement for the project is 1100 ha and the same was also mentioned in the old EIA-EMP report. However, Forest Clearance (FC) has been applied for 963.764 ha land only as per the proposal submitted by the previous Project developer for FC. Out of 1100 ha land, the remaining 136.236 ha land for Base Camp Township, Store, Office, Weigh Bridge, EM & HM Store, Cement & Steel Stockyard etc. is still under-identification.

Initially, ToR may be granted for 963.764 ha land only for which the FC proposal has already been submitted by THDCIL and for the remaining 136.236 ha best efforts will be made to identify the private land and efforts will also be made to keep it minimum to the limit it is indispensable for meeting project's requirements.
However, amendment in ToR shall be requested from MoEF&CC for additional land, other than 963.764 ha forest land during EIA-EMP study.
Query 9: Secondary data of the presence occurrence of wildlife in consultation of forest department and local people shall be provided.
Reply: The secondary data w.r.t. Wildlife has already been gathered by the previous developer during the old EIA-EMP studies/ Public Hearing-consultation process conducted between 2011-2014. The same can be updated during EIA/EMP studies as per fresh ToR.
Query 10: The PP shall submit NOC from the previous owner in respect to the change in ownership of the said project.
Reply: The NOC has been submitted.

3.6.3. Deliberations by the committee in previous meetings

Date of EAC 1 :29/04/2024

Deliberations of EAC 1 :

The EAC after detailed deliberation observed that instant project of ToR for Hydroelectric projects lacks detailed data analysis already available with PP in a way of approved DPR and earlier EIA report. The PP shall present the available data with respect to hydrology/available water resources, sediment load, submergence area required for sediment to settle, silt load etc. for redesigning or changes (if required) instead of following earlier approved details. The committee's concern over the viability of the project reflects legitimate worries about the long-term effectiveness and economic sustainability given these challenges. It was also desired that PP shall consider the alternative of implementing Pump Storage Project (PSP) instead of conventional Hydroelectric project. If PSP is not feasible then technical details and reason has to be submitted.

In view of above and the information submitted and as presented, EAC has desired additional information on following observation for further consideration of the project:

i. Latest Water availability data shall be obtained CWC and hydro-graph of annual discharge based on historical data. E-flow based on hydrology and aquatic biology sustenance be re-calculated based on latest data and in variable climate conditions.
ii. PP shall explore the possibility of implementing PSP instead of conventional Hydroelectric project and if PSP is not feasible then technical details and reason has to be submitted
iii. Detailed study and assessment shall be carried to evaluate the potential effects of sediment transport on the proposed project.
iv. All international boundary related clearances including clearance from Ministry of Defence shall be obtained from the concerned authorities and be submitted with supporting documents
v. An affidavit shall be submitted stating that there is no construction done at the site and no violation of EP Act (1986), Water Act (1974), Air Act (1981), Forest Act (1980) and wild life protection act (1972) has been done.
vi. Letter from DFO shall be obtained stating that project does not fall under any wildlife corridor.
vii. PP shall resubmit the proposal with revised layout of muck disposal site outside the forest area and overall minimizing the forest land for the proposed project.
viii. To submit the current status of 136.236 ha land which is under identification stage and to submit the status along with details of previous FC clearance proposal submitted to Ministry in 2014-2015.
ix. Secondary data of presence/occurrence of wildlife in consultation of forest department and local people shall be provided.
x. The PP shall submit NOC from previous owner in respect to the change in ownership of the said project.

The project was ***deferred*** on above lines.

3.6.4. Deliberations by the EAC in current meetings

11.7.4 The EAC during deliberations noted the following:
The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.), additional details and as presented in the meeting and observed that the proposal is for grant of Terms of Reference (ToR) for conducting EIA study of the project for setting up of Kalai II Hydro Electric Project (Run-of-the-River) of 1200 MW in an area of 1100 Ha located in Tehsil Hawai Town, District Anjaw, Arunachal Pradesh by M/s THDC India Limited.
The project/activity is covered under Category A of item 1 (c) 'River Valley & Hydroelectric projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry. The project site is at least 20 km away from any Wildlife sanctuary.
The committee noted that E-flow release in river is more than recommended in Cumulative Environmental Impact Assessment Study of Lohit river basin. The E-flow in monsoon, lean and non-lean season is proposed to 238 cumecs, 152.7 cumec and 215.7 cumec respectively.
The EAC noted that during in the previous EIA/EMP report fish pass was available and PP has not made any design changes from the previous proposal. PP committed that they will explore the possibilities for fish ladder to EAC insisted that they should deviate and fish pass shall be implemented.
The committee noted that during construction 1km of the river stretch will be dry and water will pass through coffer dam. The EAC suggested PP to look for the possibility to reduce diversion tunnel in order to reduce ecological impacts of this temporary river diversion so as to minimize adverse effects on the local environment and aquatic life.

3.6.5. Recommendation of EAC

Recommended

3.6.6. Details of Terms of Reference

3.6.6.1. Specific

(B) Environmental Management and Biodiversity Conservation	
1.	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.
2.	PP shall explore the possibility to reduce the length diversion tunnel.
3.	Predominant species of trees in the study area including their density and nomenclature shall be studied, and number of trees to be cut for the project.
4.	The EIA study should be undertaken in accordance with recommendations of the Cumulative Environmental Impact Assessment Study (River Basin study) of Lohit River Basin.
5.	List of endangered species shall be obtained from state forest department and accordingly, mitigation measures for them shall be incorporate in the EIA/EMP report.
6.	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.

7.	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.
8.	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.
9.	Conducting site specific ecological study with respect to riverine ecology focus on fishes diversity, fish migration, habitat and aquatic biota and provision for fish pass shall be provided and detail of it shall be incorporated in EIA/EMP report.
10.	Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard 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.
11.	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.
12.	A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
13.	River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
14.	Geological study shall be conducted in respect to earthen dam and rock filled dam for dam safety.
15.	The project area should not come up on any critical mineral zone to be verified by GSI/NMDC.
16.	Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI.
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. Accordingly, No objection certificate from other states (Bihar and Jharkhand) must be obtained by project proponents or by the State Government being the allotter of the project to avoid scarcity of water to consumers.
2.	All the tasks including conducting Public Hearing and consultation shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter with allocated fund and timeline to complete within three years of construction of project.
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 shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.
5.	Budget earmarked for R&R, CSR shall not include in the cost of EMP and compliance of issues raised during Public Hearing.
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.	Muck disposal sites shall be located minimum 100m away from HFL of river.
4.	PP shall explore the possibilities to utilization of muck at maximum extent and muck disposal site shall be located in non-forest land/barren land.
5.	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.
6.	Restoration plan for construction area including dumping site of excavated materials by levelling, filling up of burrow pits, landscaping etc.
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.	A glacial lake outburst flood studies shall be carried out.
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 submit.
5.	Undertaking need to submitted on affidavit that regarding no activities has been yet started on the

	project site and water allocated to this scheme shall not be diverted to other purpose.
6.	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 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.

3.6.6.2. Standard

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

12.	Land details including forests, private and other land.
13.	Demarcation of snow fed and rain fed areas for a realistic estimate of the water availability.
14.	Different riverine habitats like rapids, pools, side pools and variations in the river substratum bedrocks, rocks, boulders, sand/silt or clay etc. need to be covered under the study
Description of Environment and Baseline Data	
1.	To know the present status of environment in the area, baseline data with respect to environmental components air, water, noise, soil, land and biology & biodiversity (flora & fauna), wildlife, socioeconomic status etc. should be collected within 10 km radius of the main components of the project/site i.e. dam site and power house site. The air quality and noise are to be monitored at such locations which are environmentally & ecologically more sensitive in the study area. The baseline studies should be collected for 1 season (Preferably Monsoon season). Flora-Fauna in the catchment and command area should be documented. The study area should comprise of the following:
2.	(i) Catchment area up to the dam/barrage site.
3.	(ii) Submergence Area.
4.	(iii) Project area or the direct impact area should comprise of area within 10 km radius of the main project components like dam, canals etc.
5.	(iv) Downstream upto 10 km from the tip of the reservoir.
Details of the Methology	
1.	The methodology followed for collection of base line data along with details of number of samples and their locations in the map should be included. Study area should be demarcated properly on the appropriate scale map. Sampling sites should be depicted on map for each parameter with proper legends. For Forest Classification, Champion and Seth (1968) methodology should be followed.
Methodology for Collection of Biodiversity Data	
1.	The number of sampling locations should be adequate to get a reasonable idea of the diversity and other attributes of flora and fauna. The guiding principles should be the size of the study area (larger area should have larger number of sampling locations) and inherent diversity at the location, as known from secondary sources (e.g. eastern Himalayan and low altitude sites should have a larger number of sampling locations owing to higher diversity).
2.	The entire area should be divided in grids of 5kmX5km preferably on a GIS domain. There after 25% of the grids should be randomly selected for sampling of which half should be in the directly affected area (grids including project components such as reservoir, dam, powerhouse, tunnel, canal etc.) and the remaining in the rest of the area (areas of influence in 10 km radius form project components). At such chosen location, the size and number of sampling units (e.g. quadrates in case of flora/transects in case of fauna) must be decided by species area curves and the details of the same (graphs and cumulative number of species in a tabulated form) should be provided in the EIA report. Some of the grids on the edges may not be completely overlapping with the study area boundaries. However, these should be counted and considered for selecting 25% of the grids. The number of grids to be surveyed may come out as a decimal number (i.e. it has an integral and a fractional part) which should be rounded to the next whole number.
3.	The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of

	such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.
4.	The R.E.T. species referred to in this point should include species listed in Schedule I and II of Wildlife (Protection) Act, 1972 and those listed in the red data books (BSI, ZSI and IUCN).
Components of the EIA Study: Various aspects to be studied and provided in the EIA/EMP report are as follow s:	
1.	null
2.	null
3.	Physical geography, Topography, Regional Geological aspects and structure of the Catchment.
4.	Tectonics, seismicity and history of past earthquakes in the area. A site specific study of the earthquake parameters will be done. The results of the site specific earthquake design shall be sent for approval of the NCSDP (National Committee of Seismic Design Parameters, Central water Commission, New Delhi for large dams.
5.	Landslide zone or area prone to landslide existing in the study area should be examined.
6.	Presence of important economic mineral deposit, if any.
7.	Justification for location & execution of the project in relation to structural components (dam /barrage height).
8.	Impact of project on geological environment.
9.	null
10.	Meteorology (viz. Temperature, Relative humidity, wind speed/direction etc.) to be collected from nearest IMD station.
11.	Ambient Air Quality with parameters viz. Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM) i.e. suspended particulate materials < 10 microns, Sulphur dioxide (SO2) and Oxides of Nitrogen (NOX) in the study area at 5-6 Locations.

12.	Existing Noise Levels and traffic density in the study area at 5-6 Locations.
13.	null
14.	Soil classification, physical parameters (viz., texture, Porosity, Bulk Density and water holding capacity) and chemical parameters (viz. pH, electrical conductivity, magnesium, calcium, total alkalinity, chlorides, sodium, potassium, organic carbon, available potassium, available phosphorus, SAR, nitrogen and salinity, etc.) at @ one sample/ha of command area.
15.	null
16.	(i) Generation of thematic maps viz, slope map, drainage map, soil map, land use and land cover map, etc. Based on these, thematic maps, an erosion intensity map should be prepared.
17.	null
18.	History of the ground water table fluctuation in the study area.
19.	Water quality for both surface water and ground water for (i) Physical parameters (pH, temperature, electrical conductivity, TSS); (ii) Chemical parameters (Alkalinity, Hardness, BOD, COD, NO2, PO4, CI, SO4, Na, K, Ca, Mg, Silica, Oil & Grease, phenolic compounds, residual sodium carbonate); (iii) Bacteriological parameter (MPN, Total coliform) and (iv) Heavy Metals (Pb, As, Hg, Cd, Cr-6, total Cr, Cu, Zn, Fe) (6 locations).
20.	Delineation of sub and micro-watersheds, their locations and extent based on the All India Soil and Land Use Survey of India (AISLUS), Department of Agriculture, Government of India. Erosion levels in each micro-watershed and prioritization of micro-watershed through silt yield index (SYI) method of AISLUS
21.	Hydro-Meteorology of the project viz. precipitation (snowfall, rainfall), temperature, relative humidity, etc. Hydro-meteorological studies in the catchment area should be established along-with real time telemetry and data acquisition system for inflows monitoring.
22.	Run off, discharge, water availability for the project, sedimentation rate, etc.
23.	Basin characteristics
24.	Catastrophic events like cloud bursts and flash floods, if any, should be documented.
25.	For estimation of Sedimentation Rate, direct sampling of river flow is to be done during the EIA study. The study should be conducted for minimum one year. Actual silt flow rate to be expressed in ha-m km2 year-1.
26.	Set up a G&D monitoring station and a few rain gauge stations in the catchment area for collecting data during the investigation.
27.	Flow series, 10 daily with 90%, 75% and 50% dependable years discharges.
28.	Information on the 10-daily flow basis for the 90 per cent dependable year the flow intercepted at the dam, the flow diverted to the power house and the spill comprising the environmental flow and additional flow towards downstream of the dam for the project may be given.

29.	The minimum environmental flow shall be 20% of the flow of four consecutive lean months of 90% dependable year, 30% of the average monsoon flow. The flow for remaining months shall be in between 20-30%, depending on the site specific requirements. A site specific study shall be carried out by an expert organization.
30.	Sedimentation data available with CWC may be used to find out the loss in storage over the years.
31.	Hydrological studies/data as approved by CWC shall be utilized in the preparation of EIA/EMP report. Actual hydrological annual yield may also be given in the report. Sedimentation data available with CWC may be used to find out the loss in storage over the years.
32.	A minimum of 1 km distance from the tip of the reservoir to the tail race tunnel should be maintained between upstream and downstream projects.
33.	Besides primary studies, review of secondary data/literature published for project area on flora & fauna including RET species shall be reported in EIA/EMP report.
34.	null
35.	Characterization of forest types (as per Champion and Seth method) in the study area and extent of each forest type as per the Forest Working Plan.
36.	Documentation of all plant species i.e. Angiosperm, Gymnosperm, Pteriodophytes, Bryophytes (all groups).
37.	General vegetation profile and floral diversity covering all groups of flora including lichens and orchids. A species wise list may be provided.
38.	Assessment of plant species with respect to dominance, density, frequency, abundance, diversity index, similarity index, importance value index (IVI) , Shannon Weiner index etc. of the species to be provided. Methodology used for calculating various diversity indices along with details of locations of quadrates, size of quadrates etc. to be reported within the study area in different ecosystems.
39.	Existence of National park, Sanctuary, Biosphere Reserve etc in the study area, if any, should be detailed.
40.	Economically important species like medicinal plants, timber, fuel wood etc.
41.	Details of endemic species found in the project area.
42.	Flora under RET categories should be documented using International Union for the Conservation of Nature and Natural Resources (IUCN) criteria and Botanical Survey of India's Red Data list along-with economic significance. Species diversity curve for RET species should be given.
43.	Cropping pattern and Horticultural Practices in the study area.
44.	null
45.	Fauna study and inventorisation should be carried out for all groups of animals in the study area. Their present status alongwith Schedule of the species.
4	Documentation of fauna plankton (phyto and zooplankton), periphyton, benthos and fish should be done and

6.	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
1	Immigration of labour population

4.	
15.	Quarrying operation and muck disposal
16.	Changes in land quality including effects of waste disposal
17.	River bank and their stability
18.	Impact due to submergence.
19.	Impact on forests, flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc.
20.	Pressure on existing natural resources
21.	Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors
22.	Compensatory afforestation-identification of suitable native tree species for compensatory afforestation and green belt.
23.	Impact on fish migration and habitat degradation due to decreased flow of water
24.	Impact on breeding and nesting grounds of animals and fish.
25.	Impact on local community including demographic profile.
26.	Impact on socio-economic status
27.	Impact on economic status.
28.	Impact on human health due to water / vector borne disease
29.	Impact on increase traffic
30.	Impact on Holy Places and Tourism
31.	Impacts of blasting activity during project construction which generally destabilize the land mass and leads to landslides, damage to properties and drying up of natural springs and cause noise population will be studies. Proper record shall be maintained of the baseline information in the post project period.
32.	Positive and negative impacts likely to be accrued due to the project are listed.

Environmental Management Plan	
1.	null
2.	Biodiversity and Wildlife Conservation and Management Plan for the conservation and preservation of rare, endangered or endemic floral/faunal species or some National Park/Sanctuary/ Biosphere Reserve or other protected area is going to get affected directly or indirectly by construction of the project, then suitable conservation measures should be prepared in consultation with the State Forest Department and with the physical and financial details. Suitable conservation techniques (in-situ/ ex-situ) will be proposed under the plan and the areas where such conservation is proposed will be marked on a project layout map.
3.	Compensatory Afforestation shall be prepared by the State Forest Department in lieu of the forest land proposed to be diverted for construction of the project as per the Forest (Conservation) Act, 1980. Choice of plants for afforestation should include native and RET species, if any. This will be a part of the forest clearance proposal.
4.	Fisheries Conservation and Management Plan - a specific fisheries management measures should be prepared for river and reservoir. If the construction of fish ladder/ fish-way etc. is not feasible then measures for reservoir fisheries will be proposed. The plan will detail out the number of hatcheries, nurseries, rearing ponds etc. proposed under the plan with proper drawings. If any migratory fish species is getting affected then the migratory routes, time/season of upstream and downstream migration, spawning grounds etc will be discussed in details.
5.	Green Belt Development Plan along the periphery of the reservoir, approach roads around the colonies and other project components, local plant species must be suggested with physical and financial details. A layout map showing the proposed sites for developing the green belt should be prepared.
6.	Environmental Monitoring Programme to monitor the mitigatory measures implemented at the project site is required will be prepared. Provision for Environment Management Cell should be made. The plan will spell out the aspects required to be monitored, monitoring indicators/parameters with respect to each aspect and the agency responsible for the monitoring of that particular aspect throughout the project implementation.
7.	Catchment Area Treatment (CAT) Plan should be prepared micro-watershed wise. Identification of free draining/ directly draining catchment based upon Remote Sensing and Geographical Information System (GIS) methodology and Sediment Yield Index (SYI) method of AISLUS, Deptt. of Agriculture, Govt. of India coupled with ground survey. Areas or watersheds falling under 'very severe' and 'severe' erosion categories should be provided and required to be treated. Both biological as well as engineering measures should be proposed in consultation with State Forest Department for areas requiring treatment. Year-wise schedule of work and monetary allocation should be provided. Mitigation measures to check shifting cultivation in the catchment area with provision for alternative and better agricultural practices should be included.
8.	Study of Design Earthquake Parameters: A site specific study of earthquake parameters should be done. Results of the site specific earthquake design parameters should be approved by National Committee of Seismic Design Parameters, Central Water Commission (NCSDP), New Delhi.
9.	Dam Break Analysis and Disaster Management Plan The outputs of dam break model should be illustrated with appropriate graphs and maps clearly bringing out the impact of Dam Break scenario. To identify inundation areas, population and structures likely to be affected due to catastrophic floods in the event of dam failure. DMP will be prepared with the help of Dam Break Analysis. Maximum water level that would be attained at various points on the downstream in case of dam break will be marked on a detailed contour map of the downstream area, to show the extent of inundation. The action plan will include Emergency Action and Management plan including measures like preventive action notification, warning procedure and action plan for co-ordination with various authorities.
10.	Reservoir Rim Treatment Plan for stabilization of land slide / land slip zones, if any, around the reservoir periphery is to be prepared based on detailed survey of geology of the reservoir rim area. Suitable engineering and biological measures for treatment of identified slip zones to be suggested with physical and financial schedule. Layout map showing the landslide/landslip zones shall be prepared and appended in the chapter.
11.	Muck Disposal Plan- suitable sites for dumping of excavated material should be identified in consultation with the State Pollution Control Board and Forest Department. All Muck disposal sites should be minimum 30 m away

	from the HFL of river. Plan for rehabilitation of muck disposal sites should also be given. The L- section/ cross section of muck disposal sites and approach roads to be given. Financial out lay for this may be given separately. Deatailed muck transportation plan delinating the path ways, number of trucks, quantity of muck to be transportated along with monitoring mechanism using latest technology, shall be prepared.
12.	Restoration Plan for Quarry Sites and landscaping of colony areas, working areas, roads etc. Details of the coarse/fine aggregate/clay etc. required for construction of the project and the rock/clay quarries/river shoal sites identified for the project should be discussed along-with the Engineering and Biological measures proposed for their restoration with physical and financial details. Layout map showing quarry sites vis-à-vis other project components, should be prepared.
13.	Resettlement and Rehabilitation Plan needed to be prepared on the basis of findings of the socio- economic survey coupled with the outcome of public consultation held. The R&R package shall be prepared after consultation with the representatives of the project affected families and the State Government. Detailed budgetary estimates are to be provided. Resettlements site should be identified. The plan will also incorporate community development strategies.
14.	Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local populace.
15.	Local Area Development Plan to be formulated in consultation with the Revenue Officials and Village Pancahayats. Appropriate schemes shall be prepared under EMP for the Local Area Development Plan with sufficient financial provisions.
16.	Labour Management Plan for their Health and Safety.
17.	Sanitation and Solid waste management plan for domestic waste from colonies and labour camps etc.
18.	Energy Conservation Measures for the work force during construction with physical and financial details. Alternatives will be proposed for the labour force so that the exploitation of the natural resource (wood) for the domestic and commercial use is curbed.
19.	Environmental safeguards during construction activities including Road Construction.
20.	A summary of Cost Estimates for all the plans, cost for implementing all the Environmental Management Plans.
21.	Water, Air and Noise Management Plans to be implemented during construction and post-construction periods.

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 Uday Kumar R Y	Member (EAC)	uda********@yahoo.com	

3	Dr Mukesh Sharma	Member (EAC)	muk***@iitk.ac.in	
4	Dr J V Tyagi	Member (EAC)	jvt******@gmail.com	
5	Shri Kartik Sapre	Member (EAC)	kar********@gmail.com	Absent
6	Shri Ajay Kumar Lal	Member (EAC)	akl****@gmail.com	
7	Shri Rajeev Varshney	Member	rva**********@gov.in	
8	Dr J A Johnson	Member (EAC)	jaj@wii.gov.in	Absent
9	Dr A K Sahoo	Member (EAC)	ami***@gmail.com	Absent
10	Shri Alok Paul Kalsi	Member (EAC)	emo***@nic.in	Absent
11	Mr Munna Kumar Shah	Scientist E	mun********@gov.in	

MINUTES OF THE 11TH MEETING OF THE EXPERT APPRAISAL COMMITTEE FOR RIVER VALLEY AND HYDROELECTRIC PROJECTS HELD ON 27TH JUNE, 2024 FROM 10:30 AM – 05:30 PM THROUGH VIDEO CONFERENCE (ONLINE).

The 11th meeting of the EAC for River Valley & Hydroelectric Projects, Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 27th June, 2024 through virtual (online) mode, under the Chairmanship of Prof. G. J. Chakrapani. The list of Members present in the meeting is provided in **Annexure.**

The Minutes of the Meeting held on 10th EAC meeting on 29th April, 2024 were confirmed. It was also decided that if the project proponent and/or consultant approaches the committee directly/indirectly for any advice, it be reported to the member-secretary for greater transparency and propriety. Also, the project proponent must ensure that the guidelines of plagiarism are meticulously followed and a duly signed self-certification be attached.

Agenda No. 11.1

Maa Ratangarh Multipurpose Project erstwhile Sindh (Seondha) Barrage project (CCA: 78,484 ha and 9 MW) in an area of 3337.63 Ha near village Dangdiroli, Tehsil Seondha, District Datia, Madhya Pradesh by M/s Water Resource Division, Government of Madhya Pradesh, District Gwalior, Madhya Pradesh - Reconsideration for Environmental Clearance–reg.

[Proposal No. IA/MP/RIV/62833/2017; F. No. J-12011/21/2016-IA. I (R)]

11.1.1 The proposal is for grant of Environmental Clearance to the project for Maa Ratangarh Multipurpose Project erstwhile Sindh (Seondha) Barrage project (CCA: 78,484 ha and 9 MW) in an area of 3337.63 Ha near village Dangdiroli, Tehsil Seondha, District Datia, Madhya Pradesh by M/s Water Resource Division, Government of Madhya Pradesh, District Gwalior, Madhya Pradesh.

11.1.2 The Project Proponent and the accredited Consultant M/s Enviro Infra Solutions Pvt Ltd, made a detailed presentation on the salient features of the project and informed that:

i. The proposal is for Environmental Clearance to the project for Maa Ratangarh Multipurpose Project Sindh (Seondha) Barrage project" (CCA: 78,484 ha and 9 MW) in an area of 3337.63 Ha, Near village Dangdiroli, Tehsil Seondha, District Datia (Madhya Pradesh) by M/s Project Administrator, Maa Ratangarh P.I.U, WRD, Mau, District – Bhind (M.P.)

ii. The project proposal was considered by the Expert Appraisal Committee (Hydro River Valley Sector) in its 30th Meeting held on 15th October 2018 and recommended for grant of Terms of References (ToRs) for the Project. The ToR has been issued by Ministry vide letter No. J-12011/21/2016-IAI(R) Dated15.10. 2018.

iii. The project is listed at S. No.1(c) River Valley projects of the Schedule to the Environment Impact Assessment (EIA) Notification under category 'A' and are appraised at Central Level by Expert Appraisal Committee (EAC).

iv. The geographical co-ordinate of the project is

Coordinates: Longitude 78° 44'20" (DEM Area)
Latitude 26°08'29"

v. There is no construction done at the site
vi. Land requirement: 3185.208 Ha
vii. The quantity of water required during construction is estimated as 500KLD which shall be drawn from surface water resources i.e. Sindh River for works pertaining to water conductor system and for works of dam complex ground water resource shall be harnessed during non-monsoon months and during monsoon in the year.
viii. The estimated project cost is Rs Rs.2244.97 Cr including existing investment of Rs 38895 Lakhs. Total capital cost earmarked towards environmental pollution control measures is Rs 38193.5 Lakhs and the Recurring cost (operation and maintenance) will be about Rs 233.5 Lakhs per annum with total Employment of 1050 persons. The project authorities will contribute 0.5% as per the notification of the direct and indirect charges of project cost (Rs. 224497.00 lakh) towards this fund i.e. Rs. 1122.5 lakhs towards creation of local area development fund to undertake works under corporate social responsibility
ix. There are no national parks, wildlife sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site. River/ water body Sindh River is flowing in south east to North east direction.
x. **MoU / any other clearance/ permission signed with State government: NA**
ix. Resettlement and rehabilitation: R&R in process
x. Scheduled -I species: Crocodile and Indian Peafowl
xi. Alternative Studies: The Project Site has already been finalized by Water Resources Department, Madhya Pradesh keeping in view of irrigation potential, therefore analysis of alternatives is not recommended for scoping stage.
xii. Baseline Environmental Scenario: (Applicable for EC proposals):

	From December 2017- February 2018 From July 2018 -September 2018 From October 2018-December 2018 From December 2023 to February 2024

AAQ parameters at -- locations (min. & max.)	• PM10 = 36.8 (Kitaura) to 55.7 (Seondha) µg/m^3 • PM2.5 = 16.0 (Kitaura) to 25.8 (Dangdiroli) µg/m^3 • SO2 = 10.5 (Kiti) to 19.2 (Seondha) µg/m^3 • NOx = 10.3 to 19.5 µg/m^3. • CO = (BDL) Below Detectable level • NH_3= BDL • Pb= BDL • As = BDL
Incremental GLC Level At Dangdiroli	• PM10 = 46.2 Max. GLC: 25.7 µg /m^3
Pond water samples quality at locations (Mau branch Bhind canal near kanathar)	pH: 7.1-8.3 Dissolved Oxygen: 5.6 to 7.6 mg/lit; Total Dissolved Solids: 322.80 to 462.40mg/l; total Hardness (as $CaCO_3$): 150.40 to 285.20 mg/l ; Magnesium (as Mg): 8.2 to 11.3 mg/lit; Oil and grease: <0.1 (<1.4 mg/lit); Sulphate (asSO4): 43.5 to -53.8 mg/lit, Nitrate (as NO3): 10.6 to 26.3 mg/lit; Chloride (as Cl): 20.3 to 32.6 mg/lit; Iron (as Fe): 1.35 to 3.9 mg/lit; Heavy metals like Copper (as Cu) <0.001, Lead (as Pb), Cadmium (as Cd), <0.01 Chromium (as Cr), Manganese (as Mn) 11.30 to 13.73 mg/L, Arsenic (as As) and Mercury (as Hg): <0.001
Ground Water samples at 17 locations	pH: 6.70 to 8.0; Total Dissolved Solids: 244.75 to 382.12 mg/l mg/lit; total Hardness (as CaCO3): 241.5 to 265 mg/lit; Total Alkalinity(asCaCO3): 231.4 to 262.3 mg/lit; Calcium (as Ca): 54.4 to 80.52 mg/l; Magnesium (as Mg): 16.59 to 20.91 mg/lit; Oil and grease: <0.1 (<1.4 mg/lit); Sulphate (asSO4): 28.4 to -32.4 mg/lit, Nitrate (as NO3): 28.6 to 34.8 mg/lit; Chloride (as Cl): ---to --- mg/lit; Iron (as Fe): <0.05 mg/lit; Heavy metals like Copper (as Cu), Lead (as Pb), Cadmium(as Cd),Chromium (as Cr), Manganese (as Mn), Arsenic (as As) and Mercury(as Hg) : <0.001.
Noise levels Leq (Day & Night) at -locations	The Leq values for day time was observed to be 44.6 to 54.8 dB (A) in residential area, while during night time 32.6 to 43.8 dB (A).
Soil Quality at -- Locations	Bulk density: 1.34 to 1.46 gm/cm3; pH range 6.9 to 7.39; Electrical conductivity (EC); 290 to 386 ^mhos/cm; calcium content: 1525.9 to 2010.55 mg/kg; sodium: 77.7 to 96.2 mg/kg; potassium: 42.41 to 57.32 mg/kg; Nitrogen: 10.23 to 14.89 mg/kg; Phosphorous: 1.6 to 2.5 mg/kg; Magnesium: 8.10 to 11.0 mg/kg; Sulphur: 26.9 to 39.8 mg/kg; Organic Matter: 0.46 to
Flora & Fauna	Schedule-I species observed in the study area: Wild boar, Eagle and Crocodile.

xiii. Details of Solid waste/ Hazardous waste generation/ Muck and its management: Solid waste: 270 Kg/Annum domestic waste and disposed as per MSW rules. 817,339.61 cum muck will be generated which will be utilized in the project.

xiv. Public Hearing for the proposed project has been conducted by the State Pollution Control Board in three districts at : In Datiya District: Panchayat Bhawan Bishora ; In Gwalior District: Panchayat Bhawan Devgarh, Dabra ; In Bhind District: Panchayat Bhawan Amayan.

xv. The main issues raised during the public hearing are related to: Main issue raised during the public hearing were regarding the compensation of land acquired by project and employment.

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

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

1	**Name of project**	**Maa Ratangarh Multipurpose Project**			
2	**Location**				
a)	State	Madhya Pradesh			
b)	District	Datia			
c)	Tehsil/Block	Seondha/Seondha			
d)	Village	Dangdiroli			
e)	Longitude	78^0 44'20"			
f)	Latitude	$26^0$08'29"			
g)	Topo Sheet No.	54J/12 scale 1:50000			
3	**Hydrology**				
a)	Catchment area	12739 Sq.km.			
b)	Average annual rainfall	875 mm (Datia)			
c)	Maximum Flood (PMF)	43127Cumec			
d)	**Annual yield**				
(i)	Total Yeild	4113.15 Mcum			
(ii)	Yield available at site	2812.76 Mcum (deducting U/S use)			
4	**Reservoir Data**				
(A)	**Capacity**	**Dam**			
a)	Gross Capacity (Mcum)	246.95			
b)	Dead Storage (Mcum)	9.08			
c)	Live Capacity (Mcum)	237.87			
B)	**Principal Level**	**DAM**			
a)	Nalla bed level	135.00 m			

	(N.B.L.)				
b)	Lowest sill level (L.S.L.)	142.00 m			
c)	Max.Draw down level (MDDL)	142.00 m			
d)	Full tank level (F.T.L.)	161.00 m			
e)	Max. water level (M.W.L.)	162.80 m			
f)	Top bund level (T.B.L.)	166.00 m			
C)	**Water spread area**				
a)	Water spread area at L.S.L.	234.57 ha.			
b)	Water spread area at F.T.L.	3149.648 ha.			
c)	Villages coming under submergence	21 Nos.			
(i)	Fully submerged	5 Nos – Dheemarpura(Khamroli), Medhpura, Dhubyai(Budhera), Madikheda, Berchha			
(ii)	Partially submerged	16 Nos. Diroli Dang, Shikarpur, Bisor, Basai Malik, Mersani Khurd, Mersani Buzurg, Dhorri, Dhorra, Rubaha, Pahadi, Dang Seondha, Dongarpur, Pali, Atrenta,Nanat, Jiganiya & Barkari (Devgarh)			
d)	Population Affected	3879 No.			
e)	Total Area Required for Project	3185.208 Ha			
S. No.	**Particulars**	**Govt Land in Ha**	**Private Land in Ha**	**Forest Land in Ha**	**Total in Ha**
1	Submergence Area	1127.218	752.848	1269.582	3149.648
2	For Dam	0	0	35.56	35.56
	TOTAL	**1127.218**	**752.848**	**1305.142**	**3185.208**

Percentage of Submergence (culturable land)	1.84%
% of forest	1.13%

Land				
D) DAM DATA				
a) Length of Dam	1740 M			
b) Length of Earthen Dam	1162 M			
c) Length of Concrete Dam	464 M (Spilway) + 114.0 M(NOF) = 578 M			
d)Height of Dam	31.0 M			
e) No. and size of Gate	29 Nos., 12m X 15 m Each			
5 Irrigation	**Ratwa Amayan**	**Bilaua Devgrah**	**Fed to Bhind canal**	**Total**
a) Gross command area (GCA)	48655 Ha	28200 Ha	32160 ha	109015 ha
b) Culturable command area (CCA)	39200 Ha	18984 Ha	20300 ha	78484 ha
c) No. of benefitted villages	156 No.- 15 No. in Datia, 141 No. in Bhind Distt	59 No.in Gwalior Distt		215 Nos.
d) Length of Rising Main	4.4 Km (3.0M Dia in 2 row)	5.1 Km (2.4 m Dia)		13.9 km
e) Length of pipe line for Pressurized irrigation system	35.5 Km	21.0 Km		56.50 Km
f) Length of Gravity Main for fed to BMC at RL 152 m from BR1 RL 200 M	-	-	30 Km (2 m dia)	
g) Total Power Requirement	16.60MW	8.21MW		24.81 MW
h) Proposed	3*3 MW=9 MW			

Power Generation				
i) Average Level of Command Area	160M	200M		
6. Estimated cost	2244.97 Crores			
7. Cost Per Hectare in Lakhs	2.86 Lakhs			
8. B C Ratio	1.85			

11.1.3 The EAC during deliberations noted the following:

- Earlier, the proposal was considered by the Expert Appraisal Committee (Hydro River Valley Sector) in its 30th meeting held on 27.01.2020. The EAC deferred the proposal seeking additional information. The PP submitted the replies of observations of EAC on PARIVESH portal. The replies of observations are:

Sr. No.	Observation of EAC	Reply of PP
1.	Recent Met data from the IMD shall be used in preparing EIA report.	Recent Met data of 2020 from the Climatological table of India, IMD, Gwalior has been included in the EIA report and attached
2.	Water availability studies / hydrological studies needs to be revised as the average yield considering the catchment area (12739 Sq km), average rainfall and runoff factor is less than 75% dependable yield of 4113.55 MCM and should be approved by the Central Water Commission.	Government of Madhya Pradesh has empowered Chief Engineer, Bureau of Design to approve hydrological studies as well as design of all irrigation structures. Yield is approved by Chief Engineer, Bureau of Design. After deducting U/S use available yield at site is 2812.76 MCM while this project uses only 354.523 MCM including evaporation losses and environmental flow
3.	As the Project site is 6.8 Km from National Chambal Sanctuary and ESZ of the said sanctuary is not notified therefore application seeking permission from the Standing Committee of NBWL clearance shall be submitted	Project site is 50 Km from National Chambal Sanctuary and ESZ as per Certificate of DFO, Forest Division, Datia by letter no 1297 Datia dtd 30/3/2016. (Annexure II). Therefore permission from the Standing Committee of NBWL clearance is not applicable.
4.	TOR has been granted for construction of barrage (31m	Project envisages construction of Earthen and Concrete Dam. All Design parameters of the

	high) however in the presentation made before the committee, project envisages construction of Earthen and Concrete Dam. Justification in this regard shall be submitted	project are calculated accordingly. In TOR application term barrage wrote down symbolically.
5.	Clarification regarding Chairing of Public at Gwalior by the officer (SDM) not authorized as per EIA Notification 2006 shall be submitted from the concerned State PCB and District Magistrate/ Additional District Magistrate.	Collector, Bhind instructed Additional District Magistrate, Mehgaon to chair Public hearing at Amayan Distt Bhind conducted on 14/1/2019 but due to emergency situation ADM instructed SDM to chair the meeting. However, Collector Bhind (DM) has authorized the proceeding by signing it.
6.	Status of Stage I FC shall be submitted.	Proposal FP/MP/IRRIG/40397/2019 Part 1 uploaded on 1 portal on dtd 18/6/2019 for 1248.821 ha forest land. After all compliances finally proposal uploaded on 28/7/2020. Current forest diversion is 1305.142 ha (instead of 1248.821 ha). Forest clearance stage I is under progress. In recent minutes of meeting dated 20.10.2023, File No: 8-28/2021-FC, Agenda Item no. 14, Online No. FP/MP/IRRIG/40397/2019), the Committee recommended the proposal for diversion of 1305.142 ha (instead of 1248.821 ha) forest land for the construction of Maa Ratangarh Multipurpose Project with General, Standard with specific conditions. After that proposal has been resubmitted with Layout plan and site specific wildlife management plan for further consideration.
7.	Seasonal variability of all the environmental attributes including biological environment.	Additional one season (December 2023 to February 2024) monitoring has been done to represent current baseline conditions. Seasonal variability of all the environmental attributes including biological environment along with Additional one season (December 2023 to February 2024) monitoring is included in Chapter 3 of the EIA report and attached
8.	Environment flow shall be revisited as per the hydrological studies approved by the CWC.	Environment flow is provided as per Technical Circular 61 dt 15/1/2018 of Madhya Pradesh Water Resources Department which provide release of minimum 15% to 20% of lean season flow shall be made for maintaining Ecological /

		environmental flow in downstream of the river, As per decision of National Green Tribunal, New Delhi dated 09-08-2017 passed in case No 498/2015 (Pushp Saini v/s MOEF & others) for planning of Major/Medium Irrigation projects while as per Clause 8.42 (u) of C.W.C guidelines for preparation of detailed project report of Irrigation and multipurpose projects 2010 provision is 10 %. Actual provision in this project is 20 %
9.	Environmental matrix for construction as well operational phase	Environmental matrix for construction as well operational phase is attached
10	Compliance of additional ToR stipulated in the amendment ToR dated 15thOctober, 2018.	Compliance of additional ToR stipulated in the amendment ToR dated 15th October, 2018 is attached
11	QCI/NABET certificate of the consultant for the period during which the base line data was collected	QCI/NABET certificate of the consultant for the period during which the base line data was collected is attached
12	Revised form 2.	Form-2 has been revised and attached
13	Revised budgetary provision for EMP excluding CER plan shall be submitted	EMP plan excluding CER is attached

- The project/activity is covered under Category B of item 1 (c) 'River Valley & Hydroelectric projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at State level. However, the project was 1st considered by the EAC, the proposal appraised by the EAC at Central level in the Ministry.
- The Committee noted that the forest land area has been increased from 1235.25 ha to 1305.142, the project proponent need to submit clarification in this regard.
- The EAC asked PP that they have made certain changes including change in name of the project to proposal to which ToR has been granted and accordingly, the EAC inquired from the PP whether they can come for fresh proposal for fresh ToR so that all the deficiencies may be have occurred during the course of time can be rectified for easy process for grant of EC. During the meeting the EAC note that the TOR was granted for construction of barrage however, the project proposes construction of other and concrete dam, the committee suggested for submitting proof for the same with justification.
- The committee noted that Public Hearing at Gwalior was chaired by the officer (SDM) which was not authorized as per EIA Notification 2006, to which PP submitted that Collector, Bhind instructed Additional District Magistrate, Mehgaon to chair Public hearing at Amayan Distt Bhind conducted on 14/1/2019 but due to emergency situation ADM instructed SDM to chair the meeting. The provision for chairing Public hearing by SDM dully authorised by the DM was notified by the MoEF&CC in 2022, whereas Public

hearing was conducted in 2019. In view of the above PP shall justify the reason for not following the provisions of EIA Notification, 2006.

- The committee noted Environment flow is provided as per Technical Circular dated 15/1/2018 of Madhya Pradesh Water Resources Department which provide release of minimum 15% to 20% of lean season flow. It was further noted that PP has not complied with ADS point raised in the earlier meeting as the project proponent has not submitted the approved Water availability studies/hydrological studies from Central Water Commission.
- The EAC also examined the Revised budgetary provision for EMP excluding CER activities in which PP has proposed overall budget Rs 40073.72 Lakhs including recurring cost. In the overall revised budget, the committee pointed out that PP has also included Resettlement & Rehabilitation Plan which amounts to Rs. 30116.00 Lakhs. Accordingly, the committee suggested to submit the revised budget with timeline.

11.1.4 The EAC after detailed deliberation desired additional information on following observation for further consideration of the project:

i. Latest Water availability data shall be obtained from CWC and hydro-graph of annual discharge prepared based on historical data. E-flow based on hydrology and aquatic biology sustenance be re-calculated based on latest data and in variable climate conditions.
ii. Revised budgetary provision for EMP excluding CER plan shall be submitted with timeline.
iii. Clarification/Justification for increasing forest land from 1235.25 ha to 1305.142 ha / change in any other landuse, changes from barrage to concrete dam etc other changes which were not mentioned in ToR/ToR amendments.
iv. Clarification/Justification is required for conducting Public Hearing under the chairmanship of SDM instead of ADM/DM in 2019. Letter of confirmation through DM/ADM shall be submitted with compliance of issues raised during public hearing.
v. A Letter shall be through PCCF shall be submitted regarding distance of project area from Chambal Sanctuary instead of DFO
vi. Distance of project site from the Ken Betwa Link project.
vii. Detailed plan for plantation with budgetary provision shall be submitted.
viii. Details of muck generation/sites and its utilization and reclamation of muck disposal site
ix. Letter from Government of Uttar Pradesh since the Sindh river is the tributary of Yamuna
x. Details of transportation route for transfer of man/machinery and construction material.
xi. Air Pollution mitigation measures to be taken during construction of structures.
xii. Plan for creation of Environment Management Cell with officer having Environment Engineering and Science background, in the department for compliance of EC conditions
xiii. Revision of EMP budget by excluding cost of R&R, CA scheme and by addition machinery/systems required for mitigation of air/water/solid waste pollution.

The project was ***deferred*** on above lines.

Agenda No. 11.2

Pedakota Pumped Storage Project (1800 MW), in an area of 202.11 ha. located at Village Dayarti, Tehsil Ananthagiri, District, Alluri Sitharama Raju, Andhra Pradesh by M/s Adani Green Energy Limited - Reconsideration for Terms of References (TOR) - reg.

[Proposal No. IA/AP/RIV/450630/2023; F. No. J-12011/57/2023-IA.I (R)]

11.2.1 The proposal is for grant of Terms of References (ToR) to the project for Pedakota Open Loop Pumped Storage Project of capacity 1800 MW in an area of 202.11 ha located at Tehsil Anathagiri Taluka, Distrcit Alluri Seetharama Raju, (Andhra Pradesh) by M/s Adani Green Energy Limited.

11.2.2 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. The proposal is for reconsideration of ToR to the project for Pedakota Pumped Storage Project (1800 MW) in an area of 257.62 Ha located at village Dayatri, tehsil Ananthagiri, district Alluri Sitharama Raju and Anakapalle (Andhra Pradesh) by M/s Adani Green Energy Limited.
ii. 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).
iii. The geographical co-ordinate of the project are Lower Reservoir: 82°53'28.25"E; 18°01'38.84"N; Upper Reservoir : 82°52'56.92"E; 18°03'32.17"N.
iv. The Pedakota Pumped Storage Project envisages construction of two artificial reservoirs. The Upper reservoir is located near Dayarti & Madriba villages and lower reservoir near Sariya & Nagarampalem villages in Alluri Seetharama Raju district, Andhra Pradesh.
v. Land requirement: Forest Land: 136.90ha ; Non-forest Land : 120.72ha ; Total Land : 257.62ha
vi. Demographic details in 10km radius of project area is attached as Appendix I.
vii. Water requirement: Pedakota PSP (1800 MW) will require 16.547 MCM for initial reservoir filling and thereafter 0.85 MCM per year will be required on annual basis from Konam Reservoir for restoring the storage capacity lost due to evaporation.
viii. Project Cost: The estimated project cost is Rs 10094.0 crore. Total capital cost earmarked towards environmental pollution control measures will be worked out during EIA study as well as the Recurring cost (operation and maintenance).
ix. Project Benefit: Total Employment will be 1200 persons as direct & 200 persons indirect.
x. Environmental Sensitive area: Kambalakonda WLS is located about 45 Km south east from project site. ESZ boundary of WLS was notified vide MoEF&CC's notification no. S.O. 1366(E) dated 28th April, 2017. River/ water body, Minor rivlet dra is flowing at the aerial distance of 0.5 km in north to south direction.

xi. MoU signed with State Government on 18-01-2023 MoU no. ENE01-APRE0MISC/14/2022-MLO-ENE-Part (2) for 1000 MW and application for increase in capacity is pending with State Government.

xii. Resettlement and rehabilitation: will be covered in EIA study

xiii. Scheduled – I species: will be worked out during EIA study

xiv. Alternative Studies: a total of 11 schemes with various combinations of reservoirs (R-1 to R-12) and water conductor alignments and the combinations have been prepared and compared for development of PSP. Alternative study is attached as **Appendix II**.

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

xvi. The silent features of the project is as under,

ELECTRICITY GENERATION AND CAPACITY			
i	Powerhouse Installed Capacity	:	1800 MW
ii	Generation of Electricity Annually	:	3744.90 MU
iii	No. of Units	:	7 nos. (5 X 300 MW + 2 X 150 MW)
iv	Additional information (if any)	:	Nil
TOR DETAILS			
i	Cost of project	:	INR 10094.00crore
ii	Total area of Project	:	257.62 ha
iii	Height of Dam from Riverbed (EL)	:	Lower Dam – 73m, Upper Dam – 87m
iv	Length of Tunnel/Channel	:	2877m
v	Details of Submergence area	:	177.16ha
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 Off-Stream 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
MUCK MANAGEMENT DETAILS			
i	No. of proposed disposal area/ (type of land-Forest/Pvt. land)	:	42.5 ha Private 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
LAND AREA BREAK-UP			
i	Private Land	:	120.72ha
ii	Government land/Forest Land	:	136.90ha
iii	Submergence area/Reservoir area	:	177.16ha
iv	Land required for project components	:	80.46ha
v	Additional information (if any)	:	Nil

PRESENCE OF ENVIRONMENTALLY SENSITIVE AREAS IN THE STUDY AREA

S.no	Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/ NO	Details of Certificate/letter/Remarks
i	Reserve Forest/PF Land	NO	There is no Protected Area in the vicinity of the proposed project. Kambalakonda WLS is about 45.0 km from site, is the nearest protected area.
ii	National Park	NO	
iii	Wildlife Sanctuary	NO	

COURT CASE DETAILS			
i	Court Case	:	Nil
ii	Additional Information if any	:	Nil
AFFIDAVIT/UNDERTAKING DETAILS			
i	Affidavit/Undertaking	:	Enclosed
ii	Additional information (if any)	:	Nil
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		Not Applicable

	MISCELLANEOUS		
i	**Details of Consultant**		
	Name of Consultant	:	M/s. RS Envirolink Technologies Pvt. Ltd. (RSET) (*NABET* Accredited *Consultant Organization*)

11.2.3 The EAC during deliberations noted the following:

- Earlier, the proposal was considered by the Expert Appraisal Committee (Hydro River Valley Sector) in its 3rd meeting held on 10.11.2023. The EAC deferred the proposal seeking additional information. The PP submitted the replies of observations of EAC on PARIVESH portal as under:

<table>
<tr><th>S. No.</th><th>EAC Query</th><th>Reply by PP</th></tr>
<tr><td>1.</td><td>The EAC noted that the lower reservoir is proposed to be located within the catchment of Bodderu river, a major tributary of Sarada River. It was noted that the project site is located in dense forest area and the lower reservoir is blocking the path of Bodderu river. Explain the criterion/ justification for selecting the project site.</td><td>For identification of the suitable PSP location in the area, 12 locations have been shortlisted for reservoirs' locations. Keeping in view of these 12 locations suitable for creating reservoirs, 11 layouts have been prepared. These layouts were compared based on technical parameters and environmental considerations and best suited layout was shortlisted for further investigation. Total land requirement is 257.62 ha, out of which 136.9 ha is forest land.

Project to understand the density of the forest. Project layout has been superimposed on the classified FSI data. The Indian Forest Survey Report (ISFR) data of 2021 has been procured from Forest Survey of India, Dehradun. For the project layout, forest classification is as given below.

<table>
<tr><th>Forest Cover</th><th>Area (%)</th><th>Canopy density</th></tr>
<tr><td>Moderately Dense Forest</td><td>23.18</td><td>Between 40% and 70%</td></tr>
<tr><td>Open Forest</td><td>37.02</td><td>Between 10% and 40%</td></tr>
<tr><td>Scrubs</td><td>14.35</td><td>Less than 10%</td></tr>
<tr><td>Waterbodies</td><td>0.03</td><td></td></tr>
<tr><td>Non Forest</td><td>25.42</td><td></td></tr>
<tr><td></td><td>100.00</td><td></td></tr>
</table>

As far as the concern, of lower reservoir blocking the path of Bodderu river, the project is re-designed as off stream closed loop project with water sourced</td></tr>
</table>

		from Konam reservoir so that all the catchment contribution from the catchment of upper and lower reservoirs get released downstream.
2	The EAC was of the view that the tributaries/rivulets have vital role in survival of major river/reservoir and its ecosystem. The committee therefore suggested that the proponent to identify a suitable site in terms of forest land involvement or revise the project layout keeping in view the all environmental and ecosystem related aspects of Bodderu river.	When the project was proposed for the TOR and discussed in EAC meeting of 10th November 2023, we had proposed it as an off-stream open loop project, where the Upper dam is located in between Dayarti village and Madrebu village, Alluri Seetharama Raju district and Lower dam is located near Sariya village, Alluri Seetharama Raju district of Andhra Pradesh. Both the dams are located across minor nallas draining into Sarda river, which is a Minor East flowing River between Mahanadi & Pennar. Upper Dam Catchment area is 2.34km^2 and Catchment area of lower dam location is 81.20km^2. Water requirement from initial/one-time filling for reservoirs is about 16.547Mm^3 and annual water requirement for recuperating of losses has been estimated to be about 0.85Mm^3. Water requirement was proposed to be met with from the catchment contribution of lower reservoir. However, keeping in view the EAC's concern about tributaries/rivulets role in river ecosystem, the project layout have been revised and it has been redesigned as off stream closed loop PSP. All the water from the catchment of upper as well as lower reservoir will be released downstream and onetime water filling requirement as well as recuperation requirement will be met with from Konam reservoir, which is about 6.8 Km away from lower reservoir.

		Site of Sri Vechalapu Palavelli Konam Reservoir Project is across River Bodderu near Konam (V) in Cheedikada (M) of Visakhapatnam (Dist) in Andhra Pradesh. It serves the purpose of irrigation water supply for 12638 acre ayacut. Gross storage capacity is 48.14 MCM and live storage capacity is 23.589 MCM. Inflow-outflow data over the last decade during monsoon have been studied to ensure water availability for the project for one time filling during monsoon and recuperation of losses.
3.	It was noted that alternative site analysis was largely based on economic variability of the project; whereas, it should be focused on sustainable environment and ecology. viz. loss of minimum forested area due to diversion of Forest land/loss of biodiversity and its impacts on productivity of the ecosystem, water availability, water uses for generation of hydro power and ecological flows in the small stream/Nallah.	Alternative site analysis has been revised and updated report covering environmental considerations is enclosed.
4.	The EAC also suggested to submit the land record and provide details of category of Forest land with revised layout and make a visual graphic of the project site showing the actual status of the site.	As per the land requirement working in the PFR, project would require a total of 257.62 ha, out of which 136.9 ha is forest land and 120.72 ha is non forest land. Forest compartment map have been superimposed on the project layout to identify the forest land. Further, forest land categorization have been carried out using FSI data; which shows that for the study area – 63% is forest and 37% is non forest. Out of 63% forest area – 22% is moderately dense forest, 26% is open forest and 15% is scrub forest. Similar, exercise was also carried out for the project land i.e. 257.62 ha area required for the project. As per FSI data

		74.55% is forest land and remaining 25.45% is non forest. Out of forest land required for the project, 23.18% is moderately dense forest, 37.02% is open forest and 14.35% is scrub forest. Private land of 120.72 ha belongs to 5 villages viz. Bembi, Sariya, Tankota, Madrebu and Dayatri of Ananthagiri Mandal, Alluri Seetharama Raju district. Khasra wise land records are not available and shall be made available after detailed survey at site. Demography and occupation pattern for these 5 villages has been submitted. For the visual graphic of the project site, a drone videography presented during the EAC meeting.

- The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of references (ToR) to the project for Pedakota Open Loop Pumped Storage Project of capacity 1800 MW in an area of 202.11 ha located at Tehsil Anathagiri Taluka, Distrcit Alluri Seetharama Raju, (Andhra Pradesh) by M/s Adani Green Energy Limited.
- The project/activity is covered under Category A of item 1 (c) 'River Valley & Hydroelectric projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.
- The MoU submitted by the project proponent 1000MW, however the proposal is submitted for the 1800 MW capacity, the committee suggested that PP shall submit the revised MoU from state department during the appraisal of EC.
- The EAC noted that PP has changed its project layout as it was earlier open loop project but due to change in water source to Konam reservoir so that all the catchment contribution from the catchment of upper and lower reservoirs get released downstream. Accordingly, the project category changed to Close loop pumped storage project. It was also noted that water conducting system has been changed from the previous proposal and the location of Upper and lower reservoirs is almost same.
- The PP has informed that the proposed Upper and Lower Reservoir is on the Boderu river and a tributary. The committee suggested to shift the both the reservoirs site, in this regard the PP informed that the same is not possible and informed that the river will be diverted through spillway under dam to release water in downstream. Committee suggested at no point of time flow of the river shall be disturbed. In view of the

submission by the PP, the committee opined that the project shall be considered as open loop instead of close loop project as lower reservoir is located on the river.

- The committee inquired about the applicability of Godavari and Krishna water dispute tribunal to which PP has informed that both tribunal is not related to this project.
- The committee noted that there is no settlement in the proposed land area and no R&R issues are involved. Further, PP has informed that no approach road is available the same will made under the project, the committee suggested not to use forest land for road construction.
- The PP was unable to show the toposheet of the project site which is essential document for the preparation of feasibility report.
- The project proponent must also include information if any, on the critical mineral zone mining or potential in the projected area from Geological Survey of India /Mineral Exploration Corporation Ltd or similar such Government organizations.
- The project proponent has re-designed the project as off stream closed loop project with water sourced from Konam reservoir so that all the catchment contribution from the catchment of upper and lower reservoirs get released downstream.

11.2.5: The EAC after detailed deliberation on the information submitted and as presented during the meeting **recommended** for grant of Standard ToR for conducting EIA study to the project with Public Consultation (Public Hearing + Written Submission) for Pedakota Open Loop Pumped Storage Project of capacity 1800 MW in an area of 202.11 ha located at Tehsil Anathagiri Taluka, Distrcit Alluri Seetharama Raju, (Andhra Pradesh) by M/s Adani Green Energy Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR.

[A] Environmental Management and Biodiversity Conservation:

- Proposal of EC would be such that all the water from the catchment of upper as well as lower reservoir will be released downstream. Accordingly, DPR shall be prepared for seeking approval from CEA/CWC.
- Report on water availability studies/hydrological studies of Konam reservoir duly approved from CWC.
- Alternative sites for various components shall be identified in terms of loss of forest area and other environmental aspects with respect of change of Installed capacity.
- Explore the possibilities to reduce forest area for the construction of proposed project. Reduction of forest land with changing installed capacity.
- Conduct geological survey and find out availability of mineral in study area. Take Geological opinion from GSI regarding mineral zone in the project study area.
- Density of forest and its types including tentative nos of tree felled during construction of the project and details of plants species to be planted under compensatory plantation be mentioned in Compensatory Afforestation Plan under EIA/EMP.

- MoU for water uses for the project signed and approved by concerned State Government Authority be submitted and revised MoU to implement the project for proposed capacity of 1800 MW shall be submitted through approved authority of State Government.
- Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir. Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
- Conduct Environmental Cost Benefit Analysis in terms of loss of Forest ecosystem due to diversion of Forest land/ loss of biodiversity and its impacts on ecosystem, water availability, water uses for generation of hydro power in study area 10 km from periphery of Project components.
- Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard 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.
- 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.
- Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/ EMP report.
- A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
- Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located outside the Eco Sensitive Zone (ESZ) and Wildlife Sanctuary.
- In case any Wildlife corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.
- Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
- Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR)and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
- Environmental matrix during construction and operational phase needs to be submitted.
- Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.

- Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation and other project component.
- Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.
- The project proponent must also include information if any, on the critical mineral zone mining or potential in the projected area from Geological Survey of India /Mineral Exploration Corporation Ltd or similar such Government organizations.

[B] Socio-economic Study

- Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
- All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.
- Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F.No.22-65/2017- IA.III dated 30th September, 2020 shall be submitted.
- Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared. Also, details of settlement in 10 km area shall be submitted.

[C] Muck Management/ Disaster Management

- Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.
- Details of Muck Management plan prepared along with estimated cost incorporated in EIA/ EMP report.
- Techno-economic viability of the project must be recommended from CEA/ CWC

[D] Miscellaneous

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

- Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project.
- 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 Pump storage projects shall be used for preparation of EIA/ EMP reports.

Agenda No. 11.3

Musakhand Pumped Storage Project (600 MW), in an area of 344.609 ha. located at Village Janipur, Malhar, Munsakand and etc, Sub District Chakia, District Chandauli, Uttar Pradesh by M/s Acme Cleantech Solutions Private Limited – Amendment in Terms of References (ToR) - reg.

[Proposal No. IA/UP/RIV/471521/2024; F. No. J-12011/41/2023-IA.I (R)]

The project proponent had requested for withdrawal of the proposal due to certain reasons vide its email dated 27th May, 2024 and thereby did not attend the meeting. Accordingly, EAC agreed with the withdrawal of proposal by PP.

Agenda No. 11.4

Kamala Hydro Electric Project of capacity 1720 MW located at Village Amperi, Baktap, Rabam and etc, Sub District Kamporijo Circle, District Kamle, Arunachal Pradesh by M/s NHPC Limited - Terms of References (ToR) - reg.

[Proposal No. IA/AR/RIV/465936/2024; F. No. J-12011/11/2024-IA.I (R)]

11.4.1 The proposal is for grant of terms of references (ToR) to the project for Kamala Hydro Electric Project of capacity 1720 MW in an area of 4001.67 ha. located at Village Amperi, Baktap, Rabam and etc, Sub District Kamporijo Circle, District Kamle, Arunachal Pradesh by M/s NHPC Limited.

11.4.2 The project proponent made a detailed presentation features of the project and informed that:-

i. The proposal is for grant of terms of reference to the project for Kamala Hydro Electric Project of capacity 1720 MW in an area of 4001.67 ha. located at Village Amperi, Baktap, Rabam and etc, Sub District Kamporijo Circle, District Kamle, Arunachal Pradesh by M/s NHPC Limited.
ii. Kamala HEP is proposed to be developed on Kamala River in Arunachal Pradesh and is conceived as a Run off the river project with small Pondage with twin objectives of power generation and flood moderation.\

iii. The project is located on river Kamala, a major right bank tributary of Subansiri River in Lower Subansiri District of Arunachal Pradesh and falls in the Lower Himalayan region. Kamala river valley is almost entirely hilly and mostly covered by dense forests.

iv. 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).

v. The geographical co-ordinate of the project are Lat. 27°46'18"N Long. 93°59'19"E

vi. The Project envisages construction of: The Kamala HE Project envisages construction of 1720 MW hydroelectric project with the twin objectives of power generation and flood moderation.

vii. Land requirement: 4001.67 ha (Approx.). Demographic details in 10 km radius of project area: About 6 nos. of villages comprising 1300 families are likely to be affected due to the proposed Project. The socio-economic study aims to assess the overall impacts on various facets of socio- economic environment due to establishment of the project. The information on various aspects of the affected population viz., demographic details, socio-economic and cultural characteristics, enumeration of personal properties of the affected population, education level and occupational profile etc. shall be collected besides ethnographic assessment of PAFs during the EIA & SIA study.

viii. Water requirement: Hydroelectric projects do not generate any bye-product during electricity generation. Hydroelectric power is generated by non-consumptive use of water.

ix. Project Cost: The estimated project cost is Rs. 21815.00 Crores. Total capital cost earmarked towards environmental pollution control measures is approx. 2% to 3% of the estimated project cost. Detail allocation along with Recurring cost (operation and maintenance) shall be done after preparation of EIA/EMP study.

x. Project Benefit: Setting up of the project shall reduced dependence on fossil fuels and promote Clean Energy generation alongwith overall economic growth, and enhancing energy security for both the state and the nation as a whole. Besides providing flood control benefits, it shall also generate employment in the rural area, boost local economies such as small markets, shops etc. Total employment as direct & indirect shall be taken up during later stages of development of the Project.

xi. Environmental Sensitive area: There are no National Parks, Wildlife Sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site.

xii. MoU / any other clearance/ permission signed with State government: Memorandum of Agreement signed on 12.08.2023 between Govt. of Ar. P and NHPC Ltd for development, commissioning, implementation, operation and maintenance of Kamala HEP on BOOT basis for a lease period of 40 years from the commercial operation date.

xiii. Resettlement and rehabilitation: A comprehensive R&R scheme shall be prepared for project affected families (PAFs) by the District Admin. as part of the land acquisition process under RFCTLARR Act, 2013. Also, community development activities of

the Project under other heads (Local Area Development Plan, CSR scheme) are also expected to be beneficial for the local people residing in and around Project area.

xiv. Scheduled -I species: The status of Scheduled-I species in respect of Kamala HEP shall be studied during EIA study.

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

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

Dam: Type	Concrete Gravity
Average river bed level	El. 275.00 m
Deepest Foundation level	El. 259.00 m
Top of Dam	El. 475.00 m

Height above deepest foundation	216 m
Length of dam at top	628 m
Reservoir: Maximum Water Level(MWL)	El. 470.00 m
Full Reservoir Level (FRL)	El. 455.00 m
Minimum Draw Down Level (MDDL)	El. 430.00 m
Live Storage	623.60 MCM
Area under Submergence at FRL	2775 Ha
Hydrology: Catchment Area	7213 sq.km
Probable Maximum Flood (PMF)	17416 cumec
River Diversion Flood (1 in 25 NonMonsoon)	4054 cumec
Glacier lake outburst flood (GLOF)	1663 cumec

Installed Capacity	Total - 1720 MW 8 X 210 MW (Main Unit) + 1 x 40 MW (Auxiliary Unit)
Design discharge per unit	Main Unit: 160 cumec + Auxiliary unit 30.47 cumec
Type of Turbines	Vertical Axis Francis
Number of Units	09 (8 x 210MW +1x 40 MW)
Design discharge per unit	Main Units 160 cumec & Auxiliary Units 30.47cumec
TRT	Horse Shoe Shape; 8 nos. + 1 no.
Tailrace Tunnels	4 + 1
Estimated Cost of Project:	Rs. 21815.00 Crores

11.4.3 The EAC during deliberations noted the following:

- The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of references

(ToR) to the project for Kamala Hydro Electric Project of capacity 1720 MW in an area of 4001.67 ha. located at Village Amperi, Baktap, Rabam and etc, Sub District Kamporijo Circle, District Kamle, Arunachal Pradesh by M/s NHPC Limited.

- The project/activity is covered under Category A of item 1 (c) 'River Valley & Hydroelectric projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.
- The EAC observed that initially development rights for Subansiri Middle project (which was renamed as Kamala Hydroelectric Project) was accorded to Kamala Hydro Electric Power Company Limited (KHEPCL), a joint venture between Jindal Power Ltd and Hydro Power Development Corporation of Arunachal Pradesh Ltd. Further, Ministry of Power (MOP) vide letter dated 22.12.2021 allotted the Project to NHPC for its development. The NOC for Kamala H.E. Project was issued by Government of Arunachal Pradesh (GOAP) on 28.06.2023 and has approved allotment of projects to NHPC on 21.07.2023.
- Additionally, Memorandum of Agreement (MOA) was signed on 12.08.2023 between GOAP and NHPC Limited for development, commissioning, implementation, operation and maintenance of Kamala H.E. Project on Build, Own, Operate and Transfer (BOOT) basis for a lease period of 40 (Forty) years from the commercial operation date (COD).
- Status of ToR accorded to Kamala HEP in case of Kamala Hydro Electric Power Company Limited (KHEPCL):

Sl. No.	Particulars	Date of Issue
1	Applied as Subansiri Middle HEP (1600 MW) – 04.03.2010	27.12.2010
2	Applied as Kamala HEP (1600 MW) – 23.08.2012 for extension of TOR for 1 year (27.12.2012 to 27.12.2013)	08.02.2013
3	Applied as Kamala HEP (1800 MW) 29.01.2014 – Fresh TOR	05.06.2014
4	Applied as Kamala HEP (1800 MW) 29.01.2014 – Validity of TOR – till 04.06.2018.	22.05.2017
5	Applied as Kamala HEP (1800 MW) – 10.07.2018 – Fresh TOR	25.09.2018

- The Committee noted that the ToR issued to M/s Jindal Power Ltd vide dated 25.09.2018 is still valid till 25.09.2024. Therefore, the committee suggested the project proponent to withdraw the said ToR first from earlier proponent and submit NOC from M/s Jindal Power Ltd in this regard.
- The committee observed that the submergence of the river is upto 65 Km and river bed at intake area 275 m and after submergence FRL will be rose upto 455m and additionally the water level in Kurung and Kumey river will also rose due to submergence.
- This project falls in Kamala river which is tributary of Subansari river. The CIA& CCS study has been completed for Subansari river basin, wherein the instant proposal has been included and recommended in said CIA&CCS.
- The committee noted that earlier the proponent submitted the DPR to CEA wherein it is mentioned that all clearance has been revoked, to which PP replied that DPR was

submitted to CEA in 2013 and after observations of the CEA earlier PP didn't pursue the matter therefore CEA revoked all the clearances in 2018.

- The EAC inquired about the proposed fish pass in the project, to which PP replied that there no fish pass proposed in the said HEP, therefore the committee opined that PP need to justify the reason for not proposing fish pass/fish ladder in the current proposal.

11.4.4: The EAC after detailed deliberation on the information submitted and as presented during the meeting **recommended** for grant of Standard ToR for conducting EIA study to the project with Public Consultation (Public Hearing + Written Submission) for Kamala Hydro Electric Project of capacity 1720 MW in an area of 4001.67 ha. located at Village Amperi, Baktap, Rabam and etc, Sub District Kamporijo Circle, District Kamla, Arunachal Pradesh by M/s NHPC Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR. The PP shall be responsible for any objections on adverse impacts on the States downstream.

[A] Environmental Management and Biodiversity Conservation:

1) The project involves diversion of 4001.67 ha of forestland. Forest clearance shall be obtained as per the prevailing norms of Forest (Conservation) Act, 1980. Application to obtain prior approval of Central Government under the Forest (Conservation) Act, 1980, for diversion of forestland required, should be submitted as soon as the actual extent of forestland required for the project is known, and in any case, within six months of issuance of this letter.
2) 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.
3) The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report.
4) Environmental matrix during construction and operational phase needs to be submitted. Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used shall be mentioned in the EIA report.
5) Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature required to be cut for barrage creation and other project component.
6) Three season (Pre-monsoon, Monsoon and winter season) baseline data of all the environmental attributes including biological environment as mentioned in the Standard ToR shall be collected for preparation of EIA/EMP report.
7) Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
8) 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.

9) A detailed wildlife conservation plan for Schedule –I species be prepared duly approved by the Chief Wild Life Warden be submitted.
10) Explore the possibilities to reduce forest area for the construction of proposed project. Reduction of forest land with changing installed capacity.
11) Conduct geological survey and find out availability of mineral in study area. Take Geological opinion from GSI regarding mineral zone in the project study area.
12) Density of forest and its types including tentative nos of tree felled during construction of the project and details of plants species to be planted under compensatory plantation be mentioned in Compensatory Afforestation Plan under EIA/EMP.
13) Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir. Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
14) A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
15) Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located outside the Eco Sensitive Zone (ESZ) and Wildlife Sanctuary.
16) In case any Wildlife corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.
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 Govt. institutions/ Indian Council of Agriculture Research (ICAR)and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
19) Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.
20) Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation and other project component.
21) Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.
22) The project proponent must also include information if any, on the critical mineral zone mining or potential in the projected area from Geological Survey of India /Mineral Exploration Corporation Ltd or similar such Government organizations.

[B] 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. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.

3) Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F.No.22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.
4) Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared. Details of settlement in 10 km area shall be submitted.
5) Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013

[C] Muck Management/ Disaster 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) Details of water sprinkling arrangements for arresting the fugitive / dust, emission from transportation and other project activities in project construction area.
4) 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.
5) Restoration plan for construction area including dumping site of excavated materials by levelling, filling up of burrow pits, landscaping etc.

(D) Disaster Management

1) CAT plan, Dam break analysis, Disaster Management Plan and Fisheries Management Plan be prepared along with other EMPs and incorporated in the EIA/EMP report.
2) 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.
3) Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly approved by CWC /CEA shall be submitted.

[E] Miscellaneous

1) Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.

2) Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
3) Both capital and recurring expenditure under EMP shall be submitted.
4) The photograph should bear the date, time, latitude & longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.
5) Aerial view video of project site shall be recorded and to be submitted.
6) Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project.

Agenda No. 11.5

Khadakwasala Fursungi Tunnel Project Substitute to New Mutha Right Bank Canal KM 1 to Km 34 in an area of 23.8364 Ha located at Village Akole, Rui etc, Sub-district Indapur, Haveli, Pune City, etc, District Pune, Maharashtra by M/s Executive Engineer IPI Division Bsb Pune – Terms of References (ToR) - reg.

[Proposal No. IA/MH/RIV/459818/2024; F. No. J-12011/16/2024-IA-I(R)]

11.5.1 The proposal is for grant of Terms of References (ToR) to the project for Khadakwasala Fursungi Tunnel Project Substitute to New Mutha Right Bank Canal KM 1 to Km 34 in an area of 23.8364 Ha located at Village Akole, Rui etc, Sub-district Indapur, Haveli, Pune City, etc, District Pune, MAHARASHTRA by M/s Executive Engineer Ipi Division Bsb Pune.

11.5.2 The Project Proponent and the accredited Consultant M/s. MITCON Consultancy & Engineering Services Ltd, made a detailed presentation on the salient features of the project and informed that:

i. The Khadakwasla Irrigation Project comprises 4 Dams the Panset dam (10.65 TMC) (Ambi River), the Varasgaon Dam (12.82TMC) (Mose River), & Temghar Dam (3.71 TMC) (Mutha River) the Khadakwasla Dam (1.97 TMC) (Mutha river).
ii. The main canal - New Mutha Right Bank Canal (NMRBC) is a 202 km long contour canal, serving a projected irrigation area of about 62150 Hectares. Storage capacity of four reservoirs is 29.15 TMC
iii. The Tunnel is substitute to New Mutha Right Bank Canal Km. 1 to 34 and proposed in upstream of Khadakwasla dam in Pune district of Maharashtra. The proposed Intake site is in upstream of Kadakwasla Dam and outlet at in Canal CH-34/00. The outlet site is located at Fursungi village, which is about 20 km from Pune city.
iv. Khadakwasla dam on the Mutha River situated 21 km from the City of Pune. This dam is one of the main sources of water for Pune city as well as for irrigation in Daund, Indapur, Haveli, Baramati Taluka.

v. New Mutha Right Bank Canal: - Khadakwasla Project having canal namely New Mutha Right Bank Canal (NMRBC) is 202 KM. along counter with proper distribution system and Old Mutha Right Bank Canal is 109 KM. At the head of canal is designed for flowing 2050 Cusecs of water.

vi. The first 30 Km. length of canal is flowing through densely populated area of Pune City. Due to numerous difficulties faced during operation of the canal, a tunnel is proposed in upstream of Khadakwasla dam and outlet at Mutha Right Bank Canal Km. 1 to 34 in Pune district of Maharashtra.

vii. The original Khadakwasla Dam Construction work was started in 1860 and completed in 1878. Hence Environmental Clearance was not applicable to existing project. As per the Gazette Notification dated 14th Sep, 2006 and its subsequent amendments, a tunnel between Khadakwasala- Dam to Fursungi is proposed substitutes for New Mutha Right Bank Canal Km 1 to 34 is applied for Environmental Clearance.

viii. Total area of forest affected due to project is 0.8064 ha. Actual acquisition of this area is not required. The proposal for forest land is submitted on parivesh with application no. FP/MH/MinorCanal/460637/2024.

ix. Benefits of Project:

- 2.18 TMC water will be saved and can be used for Irrigation and Non-Irrigation purpose.
- Increasing demand for drinking and industrial purposes in Pune city and surroundings, leakage in canals etc. Due to these reasons, the stress on the irrigation sector can be reduced through this saving. Also, additional water may be available for drinking.
- Total 3471 Ha command area has been restored due to saved water.
- Land acquisition will not require except for tunnel shafts, approach road, open channel and cut & cover portion (11.71 Ha). So, as there will be no question of rehabilitation.
- No requirement of approval from Krishna Water Dispute Tribunal-2 (KWDT-2).

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

- **Project details:**

Name of the Proposal	Proposed Khadakwasala-Fursungi Tunnel Project Substitute to New Mutha Right Bank Canal KM 1 to KM 34, Dist. Pune
Location (Including coordinates)	Latitude (N): 18o 26’ 02” N and 18o 27’ 43” N Longitude(E): 73o 46’ 15” E and 74o 01’ 02” E
Inter- state issue	No
Seismic zone	III

- **Category details:**

Category of the project	A
Provisions	Irrigation to draught prone area of Dist. Satara, Sangli and Solapur Maharashtra
Capacity / Cultural	Irrigation facilities in the project command area

<table>
<tr><td>command area (CCA)</td><td>
<table>
<tr><td>New Mutha Right Branch Canal</td><td>Taluka</td><td>GCA (Ha)</td><td>CCA (Ha)</td><td>ICA (Ha)</td></tr>
<tr><td></td><td>Haveli</td><td>10968</td><td>9465</td><td>5785</td></tr>
<tr><td></td><td>Baramati</td><td>1859</td><td>1604</td><td>980</td></tr>
<tr><td></td><td>Daund</td><td>53090</td><td>45814</td><td>27999</td></tr>
<tr><td></td><td>Indapur</td><td>51920</td><td>44805</td><td>27382</td></tr>
<tr><td></td><td>Total</td><td>117837</td><td>101688</td><td>62146</td></tr>
</table>
</td></tr>
<tr><td>Attracts the General Conditions (Yes/~~No~~)</td><td>Yes, Western Ghat ESA boundary near Ghera Sinhagad Village at 3.65 km towards south west</td></tr>
<tr><td></td><td></td></tr>
</table>

- **Electricity generation capacity:**

Powerhouse Installed Capacity	NA
Generation of Electricity Annually	NA
No. of Units	0
Additional information (if any)	Total electricity requirement will be 10 MW

- **ToR Details:**

<table>
<tr><td>Cost of project</td><td>Proposed Project (In Crore): Rs. 2277
Total Cost (In Crore) : Rs. 2277</td></tr>
<tr><td>Total area of Project</td><td>
<table>
<tr><td>Nature of Land involved in (Ha)</td><td>Private Land in Ha</td><td>Govt. land in Ha</td><td>Total Area required in Ha</td></tr>
<tr><td>Tunnel + Cut & Cover and Open Channel</td><td>23.03</td><td>0.8064</td><td>23.8364 Ha</td></tr>
<tr><td>Total</td><td>23.03</td><td>0.8064 Ha</td><td>23.8364 Ha</td></tr>
</table>
</td></tr>
<tr><td>Height of Dam from River Bed (EL)</td><td>Existing: 36.09 m</td></tr>
<tr><td>Length of Tunnel/Channel</td><td>Length of Proposed Tunnel: 23450 m
Cut & Cover Section: 2350 m
Open Channel Section: 867 m</td></tr>
<tr><td>Details of Submergence area</td><td>Existing area: 1480 Ha</td></tr>
<tr><td>Types of Waste and quantity of generation during construction/ Operation</td><td>Domestic Waste:
<table>
<tr><td>Name of Waste</td><td>Source</td><td>Qty (TPA)</td></tr>
<tr><td>Dry Waste</td><td>Labour Colony</td><td>147.6</td></tr>
<tr><td>Wet Waste</td><td>Labour Colony</td><td>98.4</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td></td><td>Excavation Waste
<table><tr><th>Name of Waste</th><th>Source</th><th>Qty (cu.m)</th></tr><tr><td>Muck</td><td>Excavation & Tunnel Work</td><td>1670000</td></tr></table></td></tr>
<tr><td>E-Flows for the Project</td><td>NA</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.
b) If not the E-Flows maintain criteria for sustaining river ecosystem.</td><td>NA</td></tr>
</table>

- **Muck Management Details:**

No. of proposed disposal area /(type of land/Forest/Pvt. land) Muck Management Plan	❖ 375000 cu.m shall be used for backfilling of open channel portion ❖ 600000 cu.m stone & aggregates shall be utilised for construction ❖ Balance 695000 cu.m material shall be utilised for lo lying area and adjoining Quarry area
Monitoring mechanism for Muck Disposal	Environmental Management Cell (EMC) shall monitor mechanism of muck disposal

- **Land Area Breakup:**

Private land	23.03 Ha
Government land/Forest Land	0.8064 Ha
Submergence area/Reservoir area	Existing area: 1480 Ha

Land required for project components	Nature of Land involved in (Ha)	Private Land in Ha	Govt. land in Ha	Total Area required in Ha
	Tunnel + Cut & Cover and Open Channel	23.03	0.8064	23.8364
	Total	23.03	0.8064	23.8364
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	Nature of Land involved in (Ha)	Area Existing in Ha	Area Proposed in Ha	Total Area required in Ha
		Forest Land	0	0.8064	0.8064
National Park	No	Not within 10 km radius from proposed command area boundary			
Wildlife Sanctuary	No	Western Ghat ESA boundary near Ghera Sinhagad Village at 3.65 km towards south			

- **Court case details: NA**

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

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	Not Applicable
Status of Stage- I FC	Application Submitted FP/MH/MinorCanal/460637/2024
Additional detail (If any)	The original Khadakwasla Dam Construction work was started in 1860 and completed in 1878. Hence Environmental Clearance was not applicable to existing project. As per the Gazette Notification dated 14th Sep, 2006 and its subsequent amendments, a tunnel between Khadakwasala- Dam to Fursungi is proposed substitutes for New Mutha Right Bank Canal Km 1 to 34 is applied for

	Environmental Clearance.
Is FRA (2006) done for FC-I	NA

- **Miscellaneous**

Particulars	**Details**
Details of consultant	MITCON Consultancy & Engineering Services Ltd. Pune **Certificate No.** Certificate No. NABET/EIA/2124/RA 229_Rev 03 **Extension** dated 9th Feb 24: Valid Up to 8th May 2024 **Extension** dated 13th May 24: Valid Up to 12th August 2024
Project Benefits	❖ 2.18 TMC water will be saved and can be used for Irrigation and Non-Irrigation purpose. ❖ Increasing demand for drinking and industrial purposes in Pune city and surroundings, leakage in canals etc. Due to these reasons, the stress on the irrigation sector can be reduced through this saving. Also, additional water may be available for drinking. ❖ Total 3471 Ha command area has been restored due to saved water. ❖ Land acquisition will not require except for tunnel shafts, approach road, open channel and cut & cover portion (11.71 Ha). So, as there will be no question of rehabilitation. ❖ **During construction phase** ***Permanent employment*** No. of permanent employment: 75 Period of employment (days): 7461 ***Temporary employment*** Temporary employment: 1350 Temporary / Contractual employment (No. of Man days): 1972350 **During operational phase** Permanent employment proposed: 58 Temporary employment: 20
Status of other statutory clearances	Forest Clearance Application Submitted Proposal No. FP/MH/Minor Canal/460637/2024
R&R details	Total private land of around 23.03 Ha is proposed for acquisition. The land acquisition will be done and compensation shall be paid to land owners as per the "The Right to Fair Compensation & Transparency in Land acquisition, Rehabilitation and Resettlement Act 2013" or as per Government of Maharashtra GR dated 12 May, 2015 for purchase of land for irrigation projects through private negotiation. As there are no households in the land to be acquired, there is no

issue of rehabilitation & resettlement of the land owners.

Sr. No	District Taluka	Particular	Village name	Gut No.
1	Dist: Pune Tal: Haveli	Shaft no. 1	Kirkatwadi	356, 358, 359, 360
2		Shaft no. 2	Dhayari	35, 36
3		Shaft no. 3	Mangadewadi	6, 9, 10
4		Shaft no. 4	Yevalewadi	29, 30, 35, 36
5		Shaft no. 5	Vadachiwadi	33, 34
6		Shaft no. 6	Holkarwadi	111, 116
7		Cut & Cover	Vadaki	128, 129, 130, 183, 187
8		Open Channel	Loni Kalbhor	1995, 1997, 1996, 1998, 1971, 2010, 2009, 2008, 2007, 2006, 2005, 2013, 2014, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2137, 2138, 2140, 2141, 2152, 2153, 2151, 2168, 2167, 1894, 1893, 1892, 1891, 1890, 1889, 1888, 1887, 1886, 1885

SI	Particular	Qty	Unit
1	Acquisition of Land required for stacking excavated stuff and for shafts etc.		
	a) Shaft	0.94	Ha.
	b) Cut & Cover	7.10	Ha.
	c) Open channel	1.67	Ha.
	d) Approach road	2.00	Ha.
	e) Land for Disposal	11.32	Ha.
	Total	**23.03**	**Ha.**

11.5.3 The EAC during deliberations noted the following:

- The EAC deliberated on the additional information submitted and as presented in the meeting and observed that the proposal is for grant of Terms of Reference (ToR) for

conducting EIA study of the project for Khadakwasala Fursungi Tunnel Project Substitute to New Mutha Right Bank Canal KM 1 to Km 34 in an area of 23.8364 Ha located at Village Akole, Rui etc, Sub-district Indapur, Haveli, Pune City, etc , District Pune, MAHARASHTRA by M/s Executive Engineer Ipi Division Bsb Pune.

- The project/activity is covered under Category B of item 1 (c) 'River Valley & Hydroelectric projects' but due to applicability of general condition (3.6 km from ESA boundary of Western Ghats) the project appraised at Central level by the sectoral EAC in the Ministry.

- The EAC noted that the proposed project is to construct a Tunnel which is substitute to New Mutha Right Bank Canal Km. 1 to 34 which is more than 60 years old and proposed in upstream of Khadakwasla dam in Pune district of Maharashtra.

- During the presentation, the EAC inquired about the constraints due to which new canal is proposed and why the existing canal cannot be repaired or restructured, accordingly, PP replied that the 35km of pipeline passes through city which has been encroached form both side of the canal and people around the canal are dumping garbage into it. Also it was noted that due to large amount of seepage lossesit affects the water availability in the downstream. Additionally, the committee inquired about the decommissioned plan of the canal to which PP replies that it will be handed over to Pune municipal cooperation for the development of the city.

- The EAC inquired that people residing near to the canal, they must be dependent on the water from the canal to which PP replied that all the people in Pune city receives water from Municipal Corporation limited.

- The EAC insisted PP to restructure or modification can be done in the canal so as to avoid construction of new tunnel which seems to be more environmental friendly, also it was suggested that lining of the canal can be done which can further reduce the seepage losses, afterwards PP defended their proposal and submitted that if they opt for modifying the existing they need to shutdown canal for at least 2-3 years due to which irrigation facilities will get disrupted and it will not become economical viable.

- The committee observed that the total muck generation will be generated 1670000 cu.m out of which 375000 cum shall be used for backfilling of open channel portion, 600000 cum stone & aggregates shall be utilised for construction and Balance 695000 cum material shall be utilised for lo lying area and adjoining Quarry area.

11.5.4 The EAC after detailed deliberation on the information submitted and as presented **deferred** the proposal for want of following additional information:

i. PP shall submit technical analysis along with cost of new tunnel and old tunnel modification shall be submitted.

ii. Detailed plan along with time bound, budget wise shall be summited for green plantation or park development in the old channel.
iii. Ground water level studies analysis shall be carried out to quantify the changes will occur after underground pipelines installation.
iv. Necessary permission from government shall be taken for change in land use pattern.
v. Approved DPR of the project to be submitted.
vi. Option analysis to be carried out.

Agenda No. 11.6

Naying Hydro Electric Project of capacity 1000 MW (4x250 MW) run-of-river project on river Siyom, in an area of 470.8 ha. located at Village Yapik, Hone, Lipo, Row and etc, Sub District Payum Circle and tato, Distrcit Shi Yomi & Siang, Arunachal Pradesh by M/s North Eastern Electric Power Corporation Ltd. – Terms of References (ToR) - reg.

[Proposal No. IA/AR/RIV/470969/2024; F. No. J-12011/19/2017-IA.I (R)]

11.6.1 The proposal is for grant of Terms of Reference to the project Naying Hydro Electric Project of capacity 1000 MW (4x250 MW) run-of-river project on river Siyom, in an area of 470.8 ha. located at Village Yapik, Hone, Lipo, Row and etc, Sub District Payum Circle and tato, Distrcit Shi Yomi & Siang, Arunachal Pradesh by M/s North Eastern Electric Power Corporation Ltd.

11.6.2 The Project Proponent along with consultant M/s P and M Solution, made a detailed presentation on the salient features of the project and informed that:

i. Naying HEP is proposed to be developed as a run-of-river type development on river Siyom, a tributary of Siang river, with proposed dam site located at 28°31'10"N, 94°30'25"E. The project dam site is located 4 km downstream of village Yapik, 40 km upstream of Middle Siyom HEP dam site and 100 km upstream of Aalo (Along) Town (nearest major town and the District HQ of West Siang District).

ii. The project envisages to harness a gross head of about 285 m in a stretch of about 15 km (from FRL to TWL). The project with a proposed installation of 1000 MW (4x250 MW) will generate annual energy of 3809.60 MU in 90% dependable year with 95% machine availability giving 43.71% load factor.

iii. Naying Hydro Electric Project (1000 MW) is currently allotted to North Eastern Electric Power Corporation Limited (NEEPCO), a Govt of India Enterprise. Memorandum of Agreement has been executed between Government of Arunachal Pradesh & NEEPCO for development of the Project on 12th August 2023.

iv. Appraisal of the DPR of Naying HEP (1000 MW) was carried out by CEA and accorded Concurrence vide Office Memorandum No. 2/ARP/17/CEA/09-PAC/5387-5419 dated 11-09-2013 which was subsequently transferred to NEEPCO vide CEA's letter No. CEA-HY-12-12/14/2023-HPA Division dated 20-10-2023 having validity upto 30-09-2025.

v. Earlier, the Environmental Clearance process also progressed substantially with holding of Public Hearing meeting on 11-05-2012 followed by appraisal of the project in the 66th EAC meeting held on 04-05-2013. The committee advised the PP to include some more information/ test result in the EIA/EMP reports including outcome of Siang River basin study which was in advanced stage of completion at the time.

vi. As regards to the outcome of the Cumulative Environmental Impact Assessment Study (River Basin study) of Siang River Basin, it may be mentioned that the MOEF&CC, GOI vide F. No. J-12011/22/2015- IA-1(T)(Pt.) dated 14-10-2016 has decided for development of Naying HEP and Tato-II HEP (immediate upstream project) in the present form without any reduction of FRL. The FRL of Siyom Middle HEP (immediate downstream project) to be reduced by 10 m to create free flow river stretch between the FRL of Siyom Middle and the TWL of Naying HEP. The Ministry vide the above communication has also directed Naying, Tato-II and Hirong HEP for implementation of the Environment flow release as mentioned in the Siang Basin Study report without any relaxation.

vii. NEEPCO carried out Power Potential Studies (PPS) based on recommendations of Basin Study report for introduction of e-flow for development of Naying, HEP. The CEA vide letter dated 29.03.2022 cleared the PPS for Naying H.E. Project (1000MW) as submitted by NEEPCO.

viii. In the meantime, NEEPCO has also reassessed the total land requirement of 644 Ha projected earlier and after optimization, the total land quantity now stands at about 470.80 Ha (a reduction of 173.20 Ha). Since the entire project area may be categorized as Unclassed State Forest (USF), above exercise has considerably reduced the requirement of Forest diversion, thus reducing the extent of adverse environmental impacts due to the project.

ix. Project Cost: The estimated project cost is Rs. 9558.52 Crores.Total capital cost earmarked towards environmental pollution control measures is Rs 82.03 Crores (includes Recurring cost of operation and maintenance – detail breakup shall be provided in the EIA and EMP reports).

x. Project Benefit: Total Employment will be 150 and 100 persons as direct benefits during construction & operational phase respectively besides labour force & (this project does not envisage any expansion) persons indirect after expansion. Industry proposes to allocate, Local Area Development Fund @2% of power generation (1% by the State Govt and 1 % by NEEPCO) per year will be a recurring source of fund available for

development/ improvement of the local infrastructures and for overall benefit of the local community.

xi. Environmental Sensitive area: There are no National Parks, Wildlife Sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site. The project lies on the River Siyom.

xii. MoU / any other clearance/ permission signed with State government: Memorandum of Agreement has been executed between Government of Arunachal Pradesh & NEEPCO for development of the Project on 12th August 2023.

xiii. Resettlement and rehabilitation: One circle comprising 9 villages, with 120 Project affected families, is likely to be affected due to land acquisition for various components of the proposed HEP. The Resettlement & rehabilitation plan for the PAF of the proposed project shall be formulated within the provisions and/or guidelines as given in the NRRP, 2007 & State R&R Policy, 2008. Also "Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013" to provide rehabilitation to the affected families including services like job opportunities, training, skill development opportunities and financial assistance to the people shall be done.

xiv. Alternative Studies: Several alternative studies have been carried out for arriving at the most suitable scheme for the project. These broadly included:

(i) Study of left bank vs. right bank development
(ii) Identification and assessment of several dam axis
(iii) Identification and assessment of different locations of the intake and
(iv) Identification and assessment of different locations of the powerhouse.

Based on the initial reconnaissance and study of the maps, it was concluded that the project should be developed on the right bank. Also for the dam Site, five potential alternative schemes were considered in the allotted river reach with FRL and TWL taken as El 805 m and El 520 m, respectively (as allotted for the project by the Government of Arunachal Pradesh). Correspondingly, the dam top is considered at El 808 m. Moreover, in all the alternative schemes, the powerhouse complex is located underground in the same general area and the water conductor system is located on the right bank of the river. Considering and studying various factors, the location of diversion has been finalized with the concrete dam (4 km downstream of village Yapik), at 138m high from the deepest foundation level to top of dam at El 808 m where the river bed level is El 700 m. Using the long term flow data and the allotted head, power potential studies have been carried out and Project's installed capacity has been assessed to be 1000 MW.

xv. Details of Solid waste/ Hazardous waste generation/ Muck and its Management: The project would generate substantial quantity i.e. around 2310000 TPA of muck from excavation of various structures. About 30% of the muck generated is proposed to be carried to the aggregate processing plants for production of coarse and fine aggregates.

The balance quantity and material found unsuitable for processing would be directed to the designated disposal sites. Municipal Solid waste shall be disposed off by landfilling which shall be transported by road. The detailed Management plan shall be given in the EIA and EMP Reports.

xvi. The Salient features of the project are as follows:

- **Project details:**

Name of the Proposal	Kalai II Hydro Electric Project (Run-of-the-River) of 1200 MW located in Tehsil Hawai Town, District Anjaw, Arunachal Pradesh by M/s THDC India Limited
Location (Including coordinates)	Anjaw District, Arunachal Pradesh Lat: $27^0$54' 20" Long $96^0$48'16"
Inter- state issue involved	No
Seismic zone	Zone V

- **Category details:**

Category of the project	1 (c)
Provisions	As per Schedule of EIA Notification 2006
Capacity / Cultural Command Area (CCA)	1200 MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	NIL

- **Electricity generation capacity:**

Powerhouse Installed Capacity	1200 MW
Generation of Electricity Annually	4852.95 GWh
No. of Units	6*190 MW + 1*60 MW (07 units)
Additional information (if any)	No

- **ToR Details:**

Cost of project	12801.54 Cr (Submitted to CEA for approval)
Total area of Project	1100 Ha
Height of Dam from River Bed (EL)	128.5 m
Length of Tunnel/Channel	The total length of five Nos of 7.5 m dia HRTs is 534.7 m and for 8.5 m dia HRT is 63.3 m .

	Total length of 3 nos. TRT is 3939 m plus Length of 01 Auxiliary TRT is 333 m.
Details of the Submergence area	638.456 Ha
Types of Waste and quantity of generation during construction/ Operation	Domestic Solid Waste, Hazardous Waste, and Muck.
E-Flows for the Project	As per the table given below.
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then	Yes, Cumulative Impact assessment and carrying capacity study of Lohit Basin, 2016.
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.	a) Listed As per the table given below.

E-Flow as per	**% and EF in (Cumecs)**			
Cumulative Impact assessment and carrying capacity study of Lohit Basin	**June-Sept (Monsoon)**	**April-May (Non Monsoon Non Lean)**	**Oct-Nov (Non Monsoon Non Lean)**	**Dec-March (Lean)**
	20% 163.48	21% 118.9	21% 81.97	15% 42.09

- **Muck Management Details:**

No. of proposed disposal area/(type of land-Forest/Pvt. land)	05 sites, Forest land
Muck Management Plan	Shall be covered as apart of EIA Study
Monitoring mechanism for Muck Disposal	Shall be covered as apart of EIA Study

- **Land Area Breakup**

Private land	Nil
Government land/Forest Land	963.764 Forest Land
Submergence area/Reservoir area	638.456 ha
Land required for project components	1100 Ha
Additional information (if any)	A proposal for 963.764 Ha of forest land has been submitted and is under process of

	approval. Additional 136.236 ha of land in the under-identification stage for base camp township, store, office, weigh bridge, EM & HM store, cement & steel stockyard. The remaining land shall be acquired as per prevailing norms for Pvt land, Govt land or Forest land, as applicable.

- **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 (RF)	295.986 Ha R.F.	Application for Stage-I FC was submitted on 23.01.2024 for 295.986 ha of reserve forest along with 667.778 ha of unclassed Forest.
Protected Forest Land	Nil	
National Park	Nil	
Wildlife Sanctuary	Nil	

- **Court Case Details**

Court Case	NIL
Additional information (if any)	

- **Affidavit/ Undertaking Details**

Affidavit/Undertaking	Attached
Additional information (if any)	

- **Previous EC compliance and necessary approvals**

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	NA
Status of Stage- I FC	Proposal No FP/AR/HYD/IRRIG/459593/2024 was submitted on 23.01.2024.
Additional detail (If any)	The Project was initially allotted to Kalai Power Private Limited (a subsidiary of Reliance Power Limited).

	EAC recommended the issuance of EC vide its 81st meeting held on 28.01.2015 based on the EIA/EMP study and PH conducted 2014. After that MoEF&CC vide its letter No. J-12011/40/2009-IA.I dtd 20.05.2015 conveyed that Environment Clearance (EC) for Kalai-II HEP has been approved by the competent authority and EC letter shall be issued on production of Stage-1 Forest Clearance (FC). The proposal case for seeking Stage-1 Forest Clearance was initiated in February 2013 and the same could not take off. Meanwhile, THDCIL has entered into a Memorandum of Agreement (MoA), executed between the Hon'ble Governor of Arunachal Pradesh and THDC India Ltd on dtd 30.12.2023 for the execution of 1200 MW Kalai-II Hydroelectric Project. A fresh application for Forest Clearance has been submitted on 23.01.2024. Since EC was approved only, and was not issued, hence, the same could not be transferred in the name of THDCIL. Accordingly, the present proposal for the issuance of ToR has been submitted on 23.03.2024.
Is FRA (2006) done for FC-I	FRA certificate issued vide Letter dated 14.11.2014 and 22.02.2024.

- **Miscellaneous**

Particulars	**Details**
Details of consultant	M/s WAPCOS Limited
Project Benefits	➢ Capacity addition of 1200 MW in the North-East Region, meeting power-requirement of the region.

	➢ Annual Energy Generation of ~ 4852.95 GWh of electricity ➢ Integrated Development of the region in the areas of employment, communication, education, health, tourism, ➢ 12% free power will be provided to the home state of Arunachal Pradesh. ➢ In addition, 1% power/revenue shall be utilized for contribution towards local area development.
Status of other statutory clearances	Environment Clearance: Applied Forest Clearance: Applied Wildlife Clearance: Not Applicable
R&R details	Shall be covered as apart of EIA Study
Additional detail (If any)	Nil

11.6.3 The EAC during deliberations noted the following:

- The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of Terms of Reference (ToR) for conducting EIA study of the project for setting up of Naying Hydro Electric Project of 1000 MW (4x250 MW) run-of-river project on river Siyom, in an area of 470.8 ha. located at Village Yapik, Hone, Lipo, Row and etc, Sub District Payum Circle and tato, Distrcit Shi Yomi & Siang, Arunachal Pradesh by M/s North Eastern Electric Power Corporation Ltd.

- The project/activity is covered under Category A of item 1 (c) 'River Valley & Hydroelectric projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

- The EAC noted that earlier EC process had progressed substantially, with a Public Hearing meeting held on 11-05-2012, followed by an appraisal of the project in the 66th EAC meeting on 04-05-2013. Then the committee advised the PP to include additional information and test results in the EIA/EMP reports. It shall include the outcome of the Siang River basin study, which was in an advanced stage of completion at that time. The committee emphasized that these updates are crucial for a comprehensive assessment of the project's potential impacts.

- The EAC noted that e-flow will be released into river as per Cumulative Environmental Impact Assessment Study (River Basin study) of Siang River Basin.

- The committee observed that PP will carried out various GLOF study so as to minimize

the impact of disaster in future and identifying potential risk areas, developing early warning systems, and implementing preventive measures to reduce the likelihood and severity of GLOF events.

- The EAC inquired about the density of the forest and composition of species present at the project site in view of project site located in very rich forest density. Additionally, it was noted that the initial total land requirement for the project was 644 hectares and after optimization, a reduction of 173.20 hectares has been achieved, bringing the total land requirement down to 470.80 hectares. The committee highlighted the importance of understanding the ecological impact on the dense forest area and acknowledged the efforts made to minimize land use.

11.6.4 The EAC based on the information submitted and as presented during the meeting, **recommended** the proposal for grant of Standard ToR for conducting EIA study with Public consultation (Public Hearing + written submission) to the project for Naying Hydro Electric Project of 1000 MW (4x250 MW) run-of-river project on river Siyom, in an area of 470.8 ha. located at Village Yapik, Hone, Lipo, Row and etc, Sub District Payum Circle and tato, Distrcit Shi Yomi & Siang, Arunachal Pradesh by M/s North Eastern Electric Power Corporation Ltd, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR. The PP shall ensure that no adverse impacts on downstream States are observed.

(A) Environmental Management and Biodiversity Conservation

i. 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.
ii. PP shall explore the possibility to reduce the length diversion tunnel so that dry length of the river can be minimized.
iii. Predominant species of trees in the study area including their density and nomenclature shall be studied, and number of trees to be cut for the project.
iv. The EIA study should be undertaken in accordance with recommendations of the Cumulative Environmental Impact Assessment Study (River Basin study) of Siang River Basin.
v. List of endangered species shall be obtained from state forest department and accordingly, mitigation measures for them shall be incorporate in the EIA/EMP report.
vi. 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.
vii. 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.
viii. 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.

ix. Conducting site specific ecological study with respect to riverine ecology focus on fishes diversity, fish migration, habitat and aquatic biota and provision for fish pass shall be provided and detail of it shall be incorporated in EIA/EMP report.

x. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard 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.

xi. 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.

xii. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.

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

xiv. Geological study shall be conducted in respect to earthen dam and rock filled dam for dam safety.

xv. The project area should not come up on any critical mineral zone to be verified by GSI/NMDC.

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

xvii. Reasons for termination of project from past Private developers.

(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. Accordingly, No objection certificate from other states (Bihar and Jharkhand) must be obtained by project proponents or by the State Government being the allotter of the project to avoid scarcity of water to consumers.

ii. All the tasks including conducting Public Hearing and consultation shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter with allocated fund and timeline to complete within three years of construction of project.

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 shall be acquired as per

provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.

v. Budget earmarked for R&R, CSR shall not include in the cost of EMP and compliance of issues raised during Public Hearing.

(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 Muck disposal sites shall be located minimum 100m away from HFL of river.

iv PP shall explore the possibilities to utilization of muck at maximum extent and muck disposal site shall be located in non-forest land/barren land.

v 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.

vi 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 A glacial lake outburst flood studies shall be carried out.

(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 submit.

v Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.

vi 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 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. 11.7

Kalai II Hydro Electric Project (Run-of-the-River) of 1200 MW in an area of 1100 Ha located at Village Kamdi, Tehsil Hawai Town, District Anjaw, Arunachal Pradesh by M/s THDC India Limited – Reconsideration for Terms of Reference - reg.

[Proposal No.: IA/AR/RIV/466561/2024; F. No. J-12011/40/2009-IA-I(R)]

11.7.1 The proposal is for grant of Terms of Reference to the project Kalai II Hydro Electric Project (Run-of-the-River) of 1200 MW in an area of 1100 Ha located at Village Kamdi, Tehsil Hawai Town, District Anjaw, Arunachal Pradesh by M/s THDC India Limited

11.7.2 The Project Proponent and the accredited Consultant M/s WAPCOS Ltd, made a detailed presentation on the salient features of the project and informed that:

i. The proposal is for ToR to the project for Kalai II Hydro Electric Project (Run-of-the-River) of 1200 MW located in Tehsil Hawai Town, District Anjaw, Arunachal Pradesh by M/s THDC India Limited. The geographical coordinates of the project are Lat: 27054' 20" N Long 96048'16" E.

ii. The Kalai II HEP envisages the construction of a 198.00 m high concrete gravity dam (from the deepest foundation level) and an underground powerhouse. The project is proposed to be developed as a run-of-the-river with a pondage scheme. The project envisages utilization of the discharge of the Lohit River, a tributary of the Brahmaputra River to generate about 1200 MW of power or 4852.95 GWh of design Energy (90% dependable year with 95% machine availability).

iii. **Land requirement**: 1100 Ha (as per DPR) (963.764 Ha for project component + 136.236 for Base Camp Township, Store, Office, Weigh Bridge, EM & HM Store, Cement & Steel Stockyard etc*) (*136.236 ha land is under the identification stage)

iv. The Salient features of the project are as follows:

- **Project details:**

Name of the Proposal	Kalai II Hydro Electric Project (Run-of-the-River) of 1200 MW located in Tehsil Hawai Town, District Anjaw, Arunachal Pradesh by M/s THDC India Limited

Location (Including coordinates)	Anjaw District, Arunachal Pradesh Lat: $27^0$54’ 20” Long $96^0$48’16”
Inter- state issue involved	No
Seismic zone	Zone V

- **Category details:**

Category of the project	1 (c)
Provisions	As per Schedule of EIA Notification 2006
Capacity / Cultural Command Area (CCA)	1200 MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	NIL

- **Electricity generation capacity:**

Powerhouse Installed Capacity	1200 MW
Generation of Electricity Annually	4852.95 GWh
No. of Units	6*190 MW + 1*60 MW (07 units)
Additional information (if any)	No

- **ToR Details:**

Cost of project	12801.54 Cr (Submitted to CEA for approval)
Total area of Project	1100 Ha (As per DPR)
Height of Dam from River Bed (EL)	128.5 m
Length of Tunnel/Channel	The total length of five Nos of 7.5 m dia HRTs is 534.7 m and for 8.5 m dia HRT is 63.3 m Total length of 3 nos. TRT is 3939 m plus Length of 01 Auxiliary TRT is 333 m.
Details of the Submergence area	638.456 Ha
Types of Waste and quantity of generation during construction/ Operation	Domestic Solid Waste, Hazardous Waste, and Muck.
E-Flows for the Project	As per the table given below.
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then	Yes, Cumulative Impact assessment and carrying capacity study of Lohit Basin, 2016.

c) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. d) If not the E-Flows maintain criteria for sustaining river ecosystem.	b) Listed As per the table given below.

E-Flow as per	**% and EF in (Cumecs)**			
Cumulative Impact assessment and carrying capacity study of Lohit Basin	**June-Sept (Monsoon)**	**April-May (Non Monsoon Non Lean)**	**Oct-Nov (Non Monsoon Non Lean)**	**Dec-March (Lean)**
	20% 163.48	20% 103.60	20% 90.67	15% 39.71

- **Muck Management Details:**

No. of proposed disposal area/(type of land- Forest/Pvt. land)	05 sites, Forest land The erstwhile developer has proposed the muck disposal sites as per the availability of land nearby the project. The land around and nearby the project area is mostly forest land and muck disposal areas have been chosen considering the optimum distance from the project, volume accumulation capacity per sqm, and as per suitable topography. The muck management plan shall be further optimized during EIA & EMP study based on fresh ToR. However, best efforts will be made to identify the private land as desired for minimizing the forest land for the proposed project without hampering the project viability, if possible.
Muck Management Plan	Shall be covered as apart of EIA Study
Monitoring mechanism for Muck Disposal	Shall be covered as apart of EIA Study

- **Land Area Breakup**

Private land	Nil
Government land/Forest Land	963.764 Forest Land
Submergence area/Reservoir area	638.456 ha
Land required for project components	1100 Ha (As per DPR)
Additional information (if any)	A proposal for 963.764 Ha of forest land has been submitted and is under the process of approval. Additional 136.236 ha of land in the under-identification stage for base camp township, store, office, weighbridge, EM & HM store, cement & steel stockyard. The remaining land shall be acquired as per prevailing norms for Pvt land, Govt land or Forest land, as applicable. Initially, ToR may be granted for 963.764 ha land only for which the FC proposal has already been submitted by THDCIL and for the remaining 136.236 ha best efforts will be made to identify the private land and efforts will also be made to keep it minimum to the limit it is indispensable for meeting project's requirements. However, amendment in ToR shall be requested from MoEF&CC for additional land, other than 963.764 ha forest land during EIA-EMP study

- **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 (RF) Protected Forest Land	295.986 Ha R.F. Nil	Application for Stage-I FC was submitted on 23.01.2024 for 295.986 ha of reserve forest along with 667.778 ha of

Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/No	Details of Certificate/letter/Remarks
National Park	Nil	unclassed Forest. The project land falls within the jurisdiction of two forest divisions i.e. Anjaw and Namsai. DFOs of both divisions have issued letters that the project does not fall under the wildlife corridor.
Wildlife Sanctuary	Nil	

- **Court Case Details**

Court Case	NIL
Additional information (if any)	

- **Affidavit/ Undertaking Details**

Affidavit/Undertaking	Attached
Additional information (if any)	

- **Previous EC compliance and necessary approvals**

Particulars	Letter no. and date
Certified EC compliance report (if applicable)	NA
Status of Stage- I FC	Proposal No FP/AR/HYD/IRRIG/459593/2024 was submitted on 23.01.2024. Presently enumeration of trees is underway by the respective Forest Divisions. The proposal is now forwarded to DFO after acceptance of PSC-I
Additional detail (If any)	The Project was initially allotted to Kalai Power Private Limited (a subsidiary of Reliance Power Limited). EAC recommended the issuance of EC vide its 81st meeting held on 28.01.2015 based on the EIA/EMP study and PH conducted 2014.

	After that MoEF&CC vide its letter No. J-12011/40/2009-IA.I dtd 20.05.2015 conveyed that Environment Clearance (EC) for Kalai-II HEP has been approved by the competent authority and EC letter shall be issued on production of Stage-1 Forest Clearance (FC). The proposal case for seeking Stage-1 Forest Clearance was initiated in February 2013 and the same could not take off. Meanwhile, THDCIL has entered into a Memorandum of Agreement (MoA), executed between the Hon'ble Governor of Arunachal Pradesh and THDC India Ltd on dtd 30.12.2023 for the execution of 1200 MW Kalai-II Hydroelectric Project. A fresh application for Forest Clearance has been submitted on 23.01.2024. Since EC was approved only, and was not issued, hence, the same could not be transferred in the name of THDCIL. Accordingly, the present proposal for the issuance of ToR has been submitted on 23.03.2024.
Is FRA (2006) done for FC-I	FRA certificate issued vide Letter dated 14.11.2014 and 22.02.2024.

- **Miscellaneous**

Particulars	**Details**
Details of consultant	M/s WAPCOS Limited
Project Benefits	➢ Capacity addition of 1200 MW in the North-East Region, meeting power-requirement of the region. ➢ Annual Energy Generation of ~ 4852.95 GWh of electricity ➢ Integrated Development of the region in the areas of employment, communication, education, health, tourism,

	➢ 12% free power will be provided to the home state of Arunachal Pradesh. ➢ In addition, 1% power/revenue shall be utilized for contribution towards local area development. ➢ 100 unit/month free power for each PAF for 10 year.
Status of other statutory clearances	Environment Clearance: Applied Forest Clearance: Applied Wildlife Clearance: Not Applicable
R&R details	Shall be covered as apart of EIA Study
Additional detail (If any)	Nil

11.7.3 The project proposal was considered by the Expert Appraisal Committee (Thermal) in its 10th meeting held on 29.04.2024 for grant of Terms of Reference for the Project wherein the EAC deferred the proposal seeking additional information. PP vide its letter dated 25.05.2024 submitted the following information:

Query 1: Latest Water availability data shall be obtained CWC and hydro-graph of annual discharge based on historical data. E-flow based on hydrology and aquatic biology sustenance be recalculated based on latest data and in variable climate conditions.

Reply: The water availability series from 1985-86 to 2003-04 for Kalai-II HEP was approved by CWC in May 2011 based on the observed hydrological data of the Mompani G&D site of CWC. Further, the latest available hydrological data for the Mompani G&D site from 2004 to 2023 was requested from CWC through CDRC Portal on 07.03.24.

A meeting on 08.04.24 for the release of classified data was held by BBO (Brahmaputra Basin Organisation), CWC, wherein, it was intimated that out of requested Gauge, Discharge, and Silt data only gauge data from 2020 to 2023 was available and hence, the request proposal was returned. The same was reiterated by SE, BBO, CWC vide email dtd. 10.04.24.

Also, since the approval of the hydrological series by CWC, no irrigation or hydroelectric project has been constructed in the upstream reach of the project which may result in any consumptive use of water of Lohit River and the river is virgin in its entire reach.

Therefore, the water availability series, approved for the Kalai-II HEP by CWC, from 1985-86 to 2003- 04 is considered as a way forward for the project. Further, to observe the site-specific data the process for installation of the GDS site near the Kalai-II project location has already been initiated. The approved water series in the DPR will be further validated with the latest observed discharge data collected during EIA/EMP studies.

Regarding the e-flow it is submitted that e-flows considered in the approved DPR were as per

the provisions of earlier ToR issues by MoEF&CC vide letter dated 09.12.2009 and these e-flows are greater than those recommended in the Cumulative Impact Assessment & Carrying Capacity Study of Lohit River in Arunachal Pradesh approved by MoEFCC. However, the same shall be validated with the latest observed discharge data collected during EIA/EMP studies.

Query 2: PP shall explore the possibility of implementing PSP instead of conventional Hydroelectric project and if PSP is not feasible then technical details and reason has to be submitted.

Reply: It is pertinent to mention that the potential locations for hydropower projects in the river basins are identified on the basis of extensive studies. The hydro power projects are the primary source of energy i.e. they generate the power using inherent potential of the river basin. Whereas PSPs are not a primary source of energy and are just a power bank/ battery which are generally needed for the storage of surplus energy from renewable sources.

Further, PSPs can be established in a closed loop off the river stream after studying their feasibility. Establishing PSPs at the potential hydropower sites will deprive the country of much-needed hydropower.

Central Electricity Authority, in its assessment studies, carried out from 1978-87 had identified the site of Kalai Hydro-Electric project in Lohit River basin of Arunachal Pradesh. Further, in the report on Basin Wise Re-assessment of Hydroelectric Potential in India-Brahmaputra Basin published in November 2022 (https://cea.nic.in/wp-content/uploads/2023/07/ReportonBrahmaputraBasin.pdf), CEA has earmarked Kalai-II HEP as an exploitable hydro-electric project in the Lohit Basin.

It is also pertinent to mention here that CEA in 1984 had completed a survey for potential pumped storage hydroelectric projects in India. Recently CEA conducted re-assessment studies for on-river pumped storage hydro-electric potential in India and released its report in June 2023 (https://cea.nic.in/wpcontent/uploads/hpi/2023/08/Pumped_Storage_On_River_Final_compressed.pdf), wherein, the potentially exploitable Pumper Storage Projects with both reservoirs on the river were identified and ranked based on their profiles. In this report, no potential pumped storage project location has been identified in the Lohit basin, and only one potential pumped storage project is identified in the entire Arunachal Pradesh namely Panyor PSP.

It is to further mention that the hydro-electric projects in the Lohit basin have been conceptualized in a cascade development wherein the FRL, TWL, and free riverine stretches between the projects, have been frozen by the State Govt. The same has been considered in the Carrying Capacity Study for the Lohit Basin approved by MoEFCC in Oct-2016. Ministry of Power vide order no. 259535 dated 22.12.21 indicated two hydro power projects namely 1750 MW Demwe (Lower) and 1200 MW Kalai-ll in Lohit basin of Arunachal Pradesh for allotment to THDCIL and the upstream/ downstream projects have been allotted by the State

Government of Arunachal Pradesh to various other developers.

Regarding site specific technical suitability for development of PSP, it is pertinent to mention that the discharge from each machine of Kalai-II HEP is 180.2 m^3/sec. As per the submergence discharge characteristics curve for operation of machines in pumping mode, the submergence required for the operation of the machines at this level of discharge would be more than 200m, making it practically unfeasible. Further, as the 1200MW Kalai-II HEP is located on the Lohit River where the water discharge is generally quite high, the installation of low discharge units would not be feasible.

Query 3: Detailed study and assessment shall be carried to evaluate the potential effects of sediment transport on the proposed project.

Reply: Detailed sedimentation studies were carried out in the DPR and approved by CWC. Mathematical model studies were conducted to assess likely sedimentation pattern and profiles upstream of the proposed dam axis.
The studies were conducted using software package HEC-RAS 4.1. Model studies were carried out for the following stages :
1. Studies under existing conditions (Pre-Dam Conditions).
2. Validation of numerical model (dam constructed) with a simulation period of one year.
3. Long Term Sedimentation Profile of Reservoir (after 1 year, 5 years, 14 years, 25 years, 50 years & 70 years)
4. Studies for flushing of sediments.

It was concluded from the studies that intake will remain free from siltation even after 70 years of Sedimentation. Sufficient live storage is also available for running the powerhouse on peaking. As an additional measure, eight number low-level sluice spillways (8 m x 12 m) have also been provided with Crest level at EL 820 m, which would flush the sediments from the reservoir when inflow exceeds the requirement of water drawl for generation.

However, silt data considered in the DPR will be further validated with the latest observed silt data collected during EIA/EMP studies

Query 4: All international boundary related clearances including clearance from Ministry of Defence shall be obtained from the concerned authorities and be submitted with supporting documents.

Reply: THDCIL has already applied for fresh Defence Clearance on 15.02.2024 through the online portal. The same is under process in the Ministry of Defence and may be granted by 15.06.202024

Query 5: An affidavit shall be submitted stating that there is no construction done at the site and no violation of the EP Act (1986), Water Act (1974), Air Act (1981), Forest Act(1980), and Wild Life Protection Act (1972) has been done.

Reply: The affidavit has been submitted.

Query 6: A letter from DFO shall be obtained stating that the project does not fall under any wildlife corridor.

Reply: The project land falls within the jurisdiction of two forest divisions i.e. Anjaw and Namasri. DFOs of both divisions have issued letters that the project does not fall under the wildlife corridor.

Query 7: PP shall resubmit the proposal with revised layout of muck disposal site outside the forest area and overall minimizing the forest land for the proposed project.

Reply: The erstwhile developer has proposed the muck disposal sites as per the availability of land nearby the project. The land around and nearby the project area is mostly forest land and muck disposal areas have been chosen considering the optimum distance from the project, volume accumulation capacity per sqm, and as per suitable topography.

The minimum distance of the toe of Muck Sites from the river bank at FRL/HFL varies from 49 m to 226 m. Further, Muck Management plan envisages that the disposal of muck is done by taking engineering and biological measures in such a manner that the fill is stable and does not flow and the same will be reclaimed as per the plan.

The muck management plan shall be further optimized during EIA & EMP study based on fresh ToR.

However, best efforts will be made to identify the private land as desired for minimizing the forest land for the proposed project without hampering the project viability, if possible.

Query 8: To submit the current status of 136.236 ha land which is under the identification stage and to submit the status along with details of previous FC clearance proposal submitted to Ministry in 2014-2015.

Reply: As per DPR, the total land requirement for the project is 1100 ha and the same was also mentioned in the old EIA-EMP report. However, Forest Clearance (FC) has been applied for 963.764 ha land only as per the proposal submitted by the previous Project developer for FC. Out of 1100 ha land, the remaining 136.236 ha land for Base Camp Township, Store, Office, Weigh Bridge, EM & HM Store, Cement & Steel Stockyard etc. is still under-identification.

Initially, ToR may be granted for 963.764 ha land only for which the FC proposal has already been submitted by THDCIL and for the remaining 136.236 ha best efforts will be made to identify the private land and efforts will also be made to keep it minimum to the limit it is indispensable for meeting project's requirements.

However, amendment in ToR shall be requested from MoEF&CC for additional land, other than 963.764 ha forest land during EIA-EMP study.

Query 9: Secondary data of the presence occurrence of wildlife in consultation of forest department and local people shall be provided.

Reply: The secondary data w.r.t. Wildlife has already been gathered by the previous developer during the old EIA-EMP studies/ Public Hearing-consultation process conducted between 2011-2014. The same can be updated during EIA/EMP studies as per fresh ToR.

Query 10: The PP shall submit NOC from the previous owner in respect to the change in ownership of the said project.

Reply: The NOC has been submitted.

11.7.4 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.), additional details and as presented in the meeting and observed that the proposal is for grant of Terms of Reference (ToR) for conducting EIA study of the project for setting up of Kalai II Hydro Electric Project (Run-of-the-River) of 1200 MW in an area of 1100 Ha located in Tehsil Hawai Town, District Anjaw, Arunachal Pradesh by M/s THDC India Limited.

The project/activity is covered under Category A of item 1 (c) 'River Valley & Hydroelectric projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry. The project site is at least 20 km away from any Wildlife sanctuary.

The committee noted that E-flow release in river is more than recommended in Cumulative Environmental Impact Assessment Study of Lohit river basin. The E-flow in monsoon, lean and non-lean season is proposed to 238 cumecs, 152.7 cumec and 215.7 cumec respectively.

The EAC noted that during in the previous EIA/EMP report fish pass was available and PP has not made any design changes from the previous proposal. PP committed that they will explore the possibilities for fish ladder to EAC insisted that they should deviate and fish pass shall be implemented.

The committee noted that during construction 1km of the river stretch will be dry and water will pass through coffer dam. The EAC suggested PP to look for the possibility to reduce diversion tunnel in order to reduce ecological impacts of this temporary river diversion so as to minimize adverse effects on the local environment and aquatic life.

11.7.5 The EAC based on the information submitted and as presented during the meeting, **recommended** the proposal for grant of Standard ToR for conducting EIA study with Public

consultation (Public Hearing + written submission) to the project for Kalai II Hydro Electric Project (Run-of-the-River) of 1200 MW in an area of 1100 Ha located at Village Kamdi, Tehsil Hawai Town, District Anjaw, Arunachal Pradesh by M/s THDC India Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR. The PP must ensure that there are no adverse impacts on downstream States.

(B) Environmental Management and Biodiversity Conservation

i. 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.
ii. PP shall explore the possibility to reduce the length diversion tunnel.
iii. Predominant species of trees in the study area including their density and nomenclature shall be studied, and number of trees to be cut for the project.
iv. The EIA study should be undertaken in accordance with recommendations of the Cumulative Environmental Impact Assessment Study (River Basin study) of Lohit River Basin.
v. List of endangered species shall be obtained from state forest department and accordingly, mitigation measures for them shall be incorporate in the EIA/EMP report.
vi. 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.
vii. 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.
viii. 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.
ix. Conducting site specific ecological study with respect to riverine ecology focus on fishes diversity, fish migration, habitat and aquatic biota and provision for fish pass shall be provided and detail of it shall be incorporated in EIA/EMP report.
x. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard 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.
xi. 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.
xii. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
xiii. River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.

xiv. Geological study shall be conducted in respect to earthen dam and rock filled dam for dam safety.

xv. The project area should not come up on any critical mineral zone to be verified by GSI/NMDC.

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

(B) Socio-economic Study

xvii. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project. Accordingly, No objection certificate from other states (Bihar and Jharkhand) must be obtained by project proponents or by the State Government being the allotter of the project to avoid scarcity of water to consumers.

xviii. All the tasks including conducting Public Hearing and consultation shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter with allocated fund and timeline to complete within three years of construction of project.

xix. 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.

xx. Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.

xxi. Budget earmarked for R&R, CSR shall not include in the cost of EMP and compliance of issues raised during Public Hearing.

(C) Muck Management

xxii. 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.

xxiii. 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.

xxiv. Muck disposal sites shall be located minimum 100m away from HFL of river.

xxv. PP shall explore the possibilities to utilization of muck at maximum extent and muck disposal site shall be located in non-forest land/barren land.

xxvi. 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.

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

(D) Disaster Management

xxviii. 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.

xxix. A glacial lake outburst flood studies shall be carried out.

(E) Miscellaneous

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

xxxi. Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly approved by CWC /CEA shall be submitted.

xxxii. 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.

xxxiii. Drone video of project site shall be recorded and to be submit.

xxxiv. Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.

xxxv. 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 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

Any other item

Agenda No. 11.8

Conventional barrage across the River Tapi in an area of 36.03 ha. at Tehsil - Surat City, District - Surat, Gujarat by M/s Surat Municipal Corporation – For clarification – reg.

11.8.1 A letter dated 26.02.2024 received from M/s Surat Municipal Corporation seeking clarification about the applicability of EIA Notification, 2006 and its subsequent amendment on the instant project.

Additionally, M/s Surat Municipal Corporation submitted the proposal no. IA/GJ/RIV/260681/2022 on 09.03.2022 for grant of ToR/ clarification about the applicability of EIA Notification 2006 and its subsequent amendment. Accordingly, the proposal was considered by the EAC in its meeting held on 14.03.2023 wherein EAC had returned the proposal and inter-alia observed that:

"*……25.4.3 The EAC observed that the instant proposal is for construction of conventional barrage across the River Tapi in an area of 36.03 ha. between Rundh and Bhatha localities in Tehsil Surat City, District - Surat, Gujarat by M/s Surat Municipal Corporation. The project was undertaken to supplement water supply to the Surat city as well as to various industries situated along the right bank of river Tapi in Hazira area. This committee is mandated to consider the River valley projects having components of electricity generation and/or irrigation facility under the schedule 1(c) of the EIA Notification 2006, as amended. As per project details available for the instant proposal there is no mention of electricity generation and/or irrigation component. So, the proposal is not attracting the provisions mentioned under schedule 1(c) of the EIA Notification 2006, as amended. However, other prevailing rules and regulations shall be complied with….."*

11.8.2 Thereafter, after examination in the Ministry, it was decided to seek the opinion of EAC for stipulation of necessary conditions towards environment mitigations during construction and operation of this project. It was also noted and informed by project proponent that instant project is for drinking purpose.

11.8.3 The EAC, in its 9th meeting held on 29.04.2024 deferred the proposal seeking additional information, the EAC inter-alia observed that:

"…..After detailed deliberation the EAC of the view that the proposal lacks information in terms eflow in river, water quality, water balance, species of avi-flora and fauna and migration species in the river. The issues related to sediment in the river Tapi were discussed which may impact the aqueous environment. Therefore, the EAC deferred the proposal for want of more information on the project and mitigation measures taken in respect to Environment. It was desired that Project Authorities shall submit the all the studies conducted (if any) before the EAC with its technical presentation during next EAC meeting……"

11.8.4 The Project Proponent presented additional information sought by the EAC and on the salient features of the project and informed that:

i. Surat city is situated on the banks of the Tapi River, about 14 km from the Arabian Sea.
ii. Tapi river is the only major source of fresh water in Surat city.
iii. Surat Municipal Corporation (S.M.C) had constructed a low height weir across river Tapi at Singapore in the year 1995, 30 km upstream of the confluence with the sea having storage capacity of about 31.01 MCM (Million Cubic Meter).
iv. Considering the rapid growth of the Surat City, at the end of year 2041, water requirement for domestic purpose will be around 2,367 MLD.
v. The construction of Conventional Barrage across Tapi River near Rundh (left side) and Bhatha (right bank) is proposed by SMC to create additional fresh water storage reservoir of capacity 18.735 MCM.
vi. Also, at present, the tidal water from sea reaches upto Singapore weir and make ground water of river bed and surrounding area saline.

vii. Due to this barrage, a new storage reservoir will be created and tidal effect will move further downstream. As a result, ground water quality of the surrounding area of the reservoir will be improved over the time.

viii. **Need of the Project**

- Tapi River has been an important part for the city of Surat. It is a perennial river and becomes very dynamic in nature at the end of its course when it meets with the Arabian ocean.
- S.M.C. had constructed a low height weir across river Tapi at Singapore in the year 1995, 30 km upstream of the confluence with the sea having storage capacity of about 31.01 MCM (Million Cubic Meter).
- The project was undertaken to supplement water supply to the Surat city as well as to various industries situated along the right bank of river Tapi in Hazira area. River Tapi is the only source of drinking water at present for Surat City.
- Due to impounding of the reservoir the SMC has constructed various water works at Sarthana, Katargam and Jahangirpura. The reservoir has also caused continuous ground water recharging of Surat city area as well as reduction in salinity ingress.
- The top level of the weir is at El 6.00 m which is higher than the high tide level 5.5 m. The length of the weir is 580 m with ungated weir length 486.5 m and scouring sluice length 93.5 m. Crest width is 10 m and FRL at El 5.0 m.

ix. **E-flow of the River**

- Tapi River is declared as the notified River under section 5 of Bombay Irrigation Act, 1879 vide No. *MIP 1053 of 7-6-1954* by Public Work Department, Sachivalaya, Bomday memorandum No. RIA 1659-T dated 23/03/1959.
- As per the resolution of Narmada and Water Resources Department, Government of Gujarat Resolution No. *WTR/1092/4/P dated 24/07/1996*, it is mandatory to maintain the flow of 162 MGD (300 cusec) in Tapi river at d/s of the Singanpore weir as per riparian rights of Surat city. Existing Ecology and Biodiversity is sustaining in the said flow. After construction of the barrage, same flow will be maintained in the river.
- Further, SMC has requested to increase the demand of drinking water for Surat city from 300 Cusecs to 600 Cusecs vide letter No. 30/08/1997. In reply of that Executive Engineer Surat Canal division vide letter No. *SCD/PB-4/SMC/172* asked to sanction the demand from the Government of Gujarat.
- Hence, in any case minimum existing flow of 300 Cusecs will be maintained after construction of barrage which may increase upto 600 Cusecs so there won't be any significant adverse impact on the ecology of the Tapi River.
- As per the Tapi River estuary study carried out by SVNIT- Surat

x. The salient features of the project is as under:

1) EAC Meeting Details:

EAC meeting/s	11th Meeting of EAC (River Valley and

	Hydroelectric Projects)
Date of Meeting/s	27/06/2024
Date of earlier EAC meetings	25th Meeting of EAC (River Valley Projects) scheduled on 14/03/2022 10TH Meeting of EAC (River Valley and Hydroelectric Projects) scheduled on 29/04/2024

2) Project Details:

Name of the Proposal	Clarification letter regarding non-applicability of EIA Notification for proposed Conventional Barrage for water purpose across River Tapi near Village Rundh-Bhatha with Adjoining Fly Over Bridge at Left Bank of River Tapi
Location (Including coordinates)	21° 9'58.86"N, 72°45'19.38"E 21°10'51.13"N, 72°46'22.89"E 21° 9'27.05"N, 72°45'44.65"E 21° 9'54.05"N, 72°46'24.77"E 21°10'5.48"N, 72°45'28.24"E 21° 9'45.93"N, 72°45'44.23"E 21° 9'33.34"N, 72°45'53.41"E
Inter- state issue involved	No
Seismic zone	III

3) Category Details:

Category of the project	A, 1 (c) (ii) Irrigation Projects
Provisions	Proposing Barrage along with Retaining walls on both side of the bank of the Tapi River
Capacity / Cultural command area (CCA)	Cultural command area – 0 Ha. (no irrigation activities will be proposed) Reservoir capacity – 18.735 MCM (Million Cubic Meter)
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	This project will only for domestic/drinking purpose, no irrigation activities to be carried out.

4) Electricity generation capacity:

Powerhouse Installed Capacity	-
Generation of Electricity Annually	-
No. of Units	-
Additional information (if any)	This project will only for domestic/drinking purpose, no irrigation activities to be

	carried out.

5) ToR/EC Details :

Cost of project	706.67 Crore
Total area of Project	36.03 Hectare ~ (3,60,300 m^2)
Height of Dam from River Bed (EL)	-
Length of Tunnel/Channel	-
Details of Submergence area	0
Types of Waste and quantity of generation during construction/ Operation	15 KLD domestic wastewater will be generated till construction phase. Out of 12.5 lakh cu.m. of muck (excavated soil) generation, about 0.15 lakh cu.m. shall be consumed on project work leaving 12.35 lakh cum which shall be disposed in embankment, adjacent to masonry / concrete structure, key walls and utilized for greenbelt development in Tapi Riverfront project.
E-Flows for the Project	It would be incorporated in later phase
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.	Not Any

6) Muck Management Details:

No. of proposed disposal area/(type of land Forest/Pvt. land)	Owned by SMC for Tapi River front Project
Muck Management Plan	For the proposed project the total quantity of muck, to be disposed during construction of project, shall be 12.5 lakh cu.m. The muck which is suitable for use as aggregate material for concrete on non wearing surface, backfill concrete and for widening of the road shall be properly stacked. The muck unsuitable for use in concrete etc. shall be used on slopes and treated to mix and match with the surrounding environment with least change in landscape. The total quantity of muck to be generated due to excavation of

	project components, shall be about 12.50 lakh cu.m., of which about 0.15 lakh cu.m. shall be consumed on project work leaving 12.35 lakh cu.m. which shall be disposed in embankment adjacent to masonry/concrete structure, key walls and utilized for greenbelt development in Tapi Riverfront project.
Monitoring mechanism for Muck Disposal	It would be incorporated in later phase

7) Land Area Breakup:

Private land	-
Government land/Forest Land	36.03 Hectare
Submergence area/Reservoir area	-
Land required for project components	36.03 Hectare
Additional information (if any)	-

8) 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	No	Not required as no Reserve Forest/Protected Forest Land within 10 km radius from the proposed project
National Park	No	Not required as no National Park within 10 km radius from the proposed project
Wildlife Sanctuary	No	Not required as no Wild life Sanctuary within 10 km radius from the proposed project

9) Court case details:

Court Case	No
Additional information (if any)	-

10) Affidavit/Undertaking details:

Affidavit/Undertaking	-
Additional information (if any)	-

11) Previous EC compliance and necessary approvals:

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	Not applicable as this is proposed project
Status of Stage- I FC	Not required
Additional detail (If any)	-
Is FRA (2006) done for FC-I	-

12) Miscellaneous:

Particulars	Details
Details of consultant	Self
Project Benefits	Environment Benefits • Reduction in Salinity Ingress • Environment and Aesthetic condition of the city will be improved • Reduce risk of erosion and flooding Social Benefits • To create fresh water storage reservoir of capacity 18.735 MCM at FRL 5.00 m to meet the water supply demand for the Surat city. • To provide the new road corridor across the river for improving traffic solution and urban mobility between Dumas road and Ichapore. • To interlink the city network with areas across river. • Recreational activity water sports for Surat city. • Employment Generation • A total amount of Rs. 7.06 Crores would be utilized for CER, which is 1% of proposed project cost i.e. Rs. 706.67 Crores as per CER guidelines
Status of other statutory clearances	CRZ clearance is obtained from MoEF&CC vide File No. 11/49/2023-IA.III dated 17/01/2024
R&R details	No R&R is required. Compensation to the PAFs whose land will be acquired for this project will be given as per the Land acquisition act 2013.
Additional detail (If any)	-

11.8.3 The EAC during deliberations noted the following:

The EAC observed that the instant proposal is for construction of conventional barrage across the River Tapi in an area of 36.03 ha. near Rundh (left side) and Bhatha (right bank) of Surat, Gujarat is proposed by SMC to create additional fresh water storage reservoir of capacity 18.735 MCM in Tehsil Surat City, District - Surat, Gujarat by M/s Surat Municipal Corporation. The proposed project is not an irrigation project; it is proposed only for

domestic/drinking water purpose. The MoEF&CC has granted CRZ Clearance to said project vide letter dated 17.01.2024.

".....After detailed deliberation the EAC of the view that the proposal lacks information in terms eflow in river, water quality, water balance, species of avi-flora and fauna and migration species in the river. The issues related to sediment in the river Tapi were discussed which may impact the aqueous environment. Therefore, the EAC deferred the proposal for want of more information on the project and mitigation measures taken in respect to Environment. It was desired that Project Authorities shall submit the all the studies conducted (if any) before the EAC with its technical presentation during next EAC meeting....."

The EAC deliberated on e-flow to which PP relied that minimum existing flow of 300 Cusecs will be maintained after construction of barrage which may increase upto 600 Cusecs so there won't be any significant adverse impact on the ecology of the Tapi River. The committee emphasized that PP shall follow the direction of Hon'ble NGT vide its Order dated 09.08.2017 in the matter of Pushp Saini Verses Ministry of Environment, Forest & Climate Change.

The EAC noted that Budget for Environment Protection is 253 Lakhs. The Cost Breakup for Environment Protection Measures for proposed project as under:

Sr. No.	Head	Detail	INR in Lakhs
			Capital Cost
1	Solid Waste / Top Soil Management	Provisions of dustbins, management of solid waste / debris / Top soil	64
2	Air Pollution	Barricading around construction activity area	13
3	Water	Drinking water, mobile toilet facilities, drainage network and sanitation facility, Monitoring of Tapi River	26
4	Ecology and Bio-diversity	Mangroves Management Plan, post project Fish diversity study, conservation plan	110
5	Occupational Health & Fire Safety	Medical check-up, PPE, Disaster Management (Alert system, control room etc.)	40
		Total	**253**

The EAC noted that project cost is 700 Cr of which at least 1% of the project cost shall be

earmarked for the environment protection, accordingly revise plan shall be submitted. Accordingly, PP vide its email dated 28th June, 2024 submitted the revised Environment Management Plan with revised budget of 7 Cr and recurring cost of 65 lakhs. The details are mentioned below:

The details of capital and recurring budget earmarked for Environment Management is given in table below:

Table-1: Break-up of Capital and Recurring Cost for Environment Protection Measures for proposed project

Sr. No	Head	Detail	INR in Lakhs	
			Capital Cost	Annual Recurring Cost
1	Sanitation and Solidwaste Management	Management of solid waste/debris/muck, Provision of dustbins	80	8
2	Air Environment	Barricading around Construction activity area, Air quality monitoring during construction phase	20	4
3	Water Environment	Mobile toilets facilities, Drainage network andsanitation facility, Drinking water facility, Silt fencing in construction area, Monitoring of Water quality	70	6
4	Noise Environment	Acoustic enclosure; Anti-Vibration pads; PPEs, Ambient Noise level monitoring	10	2
5	Ecology and Biodiversity	Mangroves management plan, Conservation Plan of Schedule-I Species, Fish Diversity study and Monitoring, Fish Pass/ Fish Ladder	450	30
6	Occupational Health& Safety	Medical checkup, PPE, Disaster management(Alert system, control room etc.)	70	15
Total			**700**	**65**

The committee observed that to identify the potential environmental impacts and to propose the mitigation measures, following studies are conducted:

Sr No.	Name of the Study	Name of the Agency
1	Environment Impact Assessment study (Marine Component)	Central Salt & Marine Chemicals Research Institute (CSMCRI), Bhavnagar. (NABET/ QCI Accredited consulting

		organization)
2	Environment Impact Assessment study (Terrestrial Component)	Envision Enviro Technologies Pvt. Ltd., Surat (NABET/ QCI Accredited consulting organization)
3	Ecological Health of River Tapi	Department of Aquatic Biology, Veer Narmad South Gujarat University, Surat
4	Wild Life Conservation Plan	Envision Enviro Technologies Pvt. Ltd., Surat (NABET/ QCI Accredited consulting organization)
5	Environment Impact Assessment study	Indian Institutes of Technology (IIT), Mumbai
6	Disaster Management Plan	Facile Maven Pvt. Ltd., Surat

Additionally, the EAC opined that PP shall follow the observation and recommendation of the studies carried out and accordingly, budget for environment protection shall be update and implement in time bound manner.

11.8.3 The EAC after detailed deliberation on the information submitted by the PP suggested following Environmental Safeguard Measures for sustainable implementation of the proposed construction of Conventional barrage across the River Tapi in an area of 36.03 ha. at Tehsil - Surat City, District - Surat, Gujarat by M/s Surat Municipal Corporation:

A. Environmental Management:

i. Monitoring stations for regular monitoring (Monsoon Season and Post Monsoon Season) of various environmental parameters viz., Water Quality, Ambient Air Quality and Noise levels as per the prescribed guidelines at designated locations (Surface water quality at two locations of Somb nadi U/s of Dam and 2 locations of D/s of dam) may be installed.

ii. Appropriate Air Pollution Control (APC) system should be in place for all the dust generating points including fugitive dust from all vulnerable sources, so as to comply prescribed standards.

iii. Necessary control measures such as water sprinkling arrangements, etc. should be taken up to arrest fugitive dust at all the construction sites.

iv. The Environmental flow in the Tapi River for the project should be maintained as per the direction given by the Hon'ble NGT vide its Order dated 09.08.2017

in the matter of Pushp Saini Verses Ministry of Environment, Forest & Climate Change so as to preserve the ecosystem of the Somb River and it may become a perennial resource.

v. A detailed plan should be prepared and implemented in consultation with IARI for watersheds development in the catchment area of Tapi River.

vi. All the equipment likely to generate high noise should be appropriately enclosed or inbuilt noise enclosures be provided so as to meet the ambient noise standards as notified under the Noise Pollution (Regulation and Control) Rules, 2000, as amended in 2010 under the Environment Protection Act (EPA), 1986.

vii. The ambient noise levels should conform to the standards prescribed under E(P)A Rules, 1986 viz. 75 dB(A) during day time and 70 dB(A) during night time.

viii. Necessary steps should be under taken to control growth of weeds like Bolivia, water hyacinth, etc in reservoir area.

ix. Revised Environment Management Plan with revised budget of 7 Cr and recurring cost of 65 lakhs shall be complied by PP as per details provided below:

Sr. No	**Head**	**Detail**	**INR in Lakhs**	
			Capital Cost	**Annual Recurring Cost**
1	Sanitation and Solidwaste Management	Management of solid waste/debris/muck, Provision of dustbins	80	8
2	Air Environment	Barricading around Construction activity area, Air quality monitoring during construction phase	20	4
3	Water Environment	Mobile toilets facilities, Drainage network and sanitation facility, Drinking water facility, Silt fencing in construction area, Monitoring of Water quality	70	6
4	Noise Environment	Acoustic enclosure; Anti-Vibration pads; PPEs, Ambient Noise level monitoring	10	2
5	Ecology and Biodiversity	Mangroves management plan, Conservation Plan of Schedule-I Species,Fish Diversity study and Monitoring, Fish Pass/ Fish Ladder	450	30
6	Occupational Health& Safety	Medical checkup, PPE, Disaster management (Alert system, control room etc.)	70	15
Total			**700**	**65**

B. Waste management

i. Muck disposal be carried out only in the approved and earmarked sites. The dumping sites should be located sufficiently away from the HFL of the river. Efforts be made to reuse the muck for construction and other filling purposes and balanced be disposed of at the designated disposal sites. Once the muck disposal sites are inactive, proper treatment measures like both engineering and biological measures be carried out so that sites are stabilized quickly.

ii. Restoration of construction area including dumping site of excavated materials should be ensured by levelling, filling up of burrow pits, landscaping etc. The area should be properly treated with suitable plantation.

iii. Sanitation and Solid Waste Management Plan for domestic waste from colonies and labour camps etc. should be prepared and implemented in consultation with public health department. Land filling of plastic waste should be avoided. Efforts be made to avoid one time use of plastics.

- **Green Belt and Wildlife Management**

i. Wildlife Conservation & Management Plan for conservation and preservation of endemic, rare and endangered species of flora and fauna including the measures for free movement of wild animals should be prepared and implemented in consultation with State Forest Department after approval of Principal Chief Conservator of Forests & Chief Wildlife Warden.

ii. To enrich the habitat of the project site, peripheral plantation of different plant species and grassing of the slop of embankment of reservoir should be undertaken in consultation with State Forest Department.

iii. Compensatory afforestation in lieu of project affected areas, soil & moisture conservation should be implemented as per the prevailing law/act.

iv. Fish ladder/pass should be provided for migration of fishes in consultation with CIFRI and CWC. Regular monitoring of this facility may be carried out to ensure it effectiveness.

C. Public and Human health issues

i. Resettlement & Rehabilitation plan should be implemented in terms of the provisions of the State Government, as applicable.

ii. Budget provisions should be made for the community and social development plan including community welfare schemes and may be implemented in toto.

iii. Provision should be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

iv. The labourers to be engaged for construction works should be thoroughly examined periodically (at least quarterly) by qualified health personnel and adequately treated before issuing them work permit.

v. Public Health Delivery Plan including the provisions for drinking water facility for the local community should be prepared and implemented.

vi. Preventive measures viz. fuming and spraying of mosquito control should be done in and around the labour colonies, affected villages, stagnated pools, etc. Provisions should be made to not to create any stagnated pools to avoid creation of breeding grounds of the vector borne diseases.

D. Risk Mitigation and Disaster Management:

i. Early Warning Telemetric system should be installed in the upper catchment area of the project for advance intimation of flood forecast.

ii. Drilling and blasting should be done only either by licensed explosive agent or by the proponent after obtaining required approvals from Competent Authorities.

iii. Emergency preparedness and Disaster Management Plan should be prepared for any eventuality of the dam failure and should be implemented before commencement of the project.

iv. Stabilization of muck disposal sites using biological and engineering measures to ensure that muck does not roll down the slopes and should be disposed safely and that it does not pollute the natural streams and water bodies in surrounding area. The engineering measures for the muck disposal arrangements be evolved after carrying out required slope stability analysis.

v. Catchment Area Treatment Plan should be prepared in consultation with the State Forest Department and should be implemented in synchronization with the construction of the project.

vi. Measures for prevention of animal overgrazing in catchment and reservoir areas and control of sediment and pollution in reservoir areas should be taken.

E. Statutory compliance

i. Forest clearance should be obtained under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for non-forest purpose involved in the project.

ii. Consent to Establish / Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 should be obtained from the concerned State Pollution Control Board/ Committee.

iii. NOC/ necessary clearance shall be from state government for change in use pattern and obtained from National Commission of Seismic Design Parameters (NCSDS) of CWC.

F. Miscellaneous

i. Stipulations made by the State Pollution Control Board and the State Government should be adhered.

ii. Any changes made in the scope of the project, necessary clearance should be obtained as per EIA Notification, 2006 and as amended.

iii. Workforce employed for the project should be provided with LPG and kerosene, so the workforce will not cut trees for firewood.

iv. PP should procure/extract construction material only from those Pvt. Agencies / corporations /etc. that are having all applicable legal/statutory clearances.

v. A dedicated team of persons having post graduate qualification in environmental sciences / environmental management/ environmental engineering should be deployed for effective monitoring and implementation of all environmental safeguards measures.

vi. The responsibility of implementation of environmental safeguards and carrying out environmental monitoring rests fully with Government of Haryana.

vii. Study on post construction impacts on environmental flow, change in upstream and downstream ecology of entire river ecosystem should be conducted after every 5 years of implementation of the project through reputed government expert institution.

Agenda No. 11.9

Site Visit report in reference of proposal of Terms of Reference to Bilaspur Closed Loop Pumped Storage Project of capacity 1000 MW in an area of 301.5 Ha in Village Manjurpah & Karichhaper, District Bilaspur, Chhattisgarh by M/s Jindal Renewable Power Private Limited.

The EAC during deliberation appraised the site visit report of sub-committee to the above said project. After deliberation, EAC agreed with observations of EAC and suggested that PP shall comply with the observation during its submission of proposal of ToR. The details of site visit report are given below:

A. Background of the project

The proposal for grant of Terms of Reference (ToR) for Setting up of Bilaspur Closed Loop Pumped Storage Project of capacity 1000 MW in an area of 301.5 Ha in Village Manjurpah & Karichhaper, District Bilaspur, Chhattisgarh by M/s Jindal Renewable Power Private Limited, was submitted to the Ministry. As per the provisions, the instant proposal was taken to EAC for its appraisal and deliberations.

The project was considered by Expert Appraisal Committee (EAC) in its 6th meeting held on 23.01.2024. The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the *observed that the project proponent has not given the justification for proposing water from Khutaghat dam as the reservoir is about 16 km from the proposed lower reservoir. Also, the availability of water in the said reservoir is unknown. Further, it was observed that the location of the project is near to Achanakmar Tiger Reserve and presence of Tiger corridor is required to be affirmed. Also, the proposed location of the project comes under dense forest especially Sal Forest which is having high ecological value and hence the EAC is concerned with the proposed location of the project. The EAC was of the view to conduct site visit by the sub-committee of the EAC to examine forest status and alternative locations proposed by the project proponent*. Accordingly, the proposal was deferred for compliance.

In view of the above observation of EAC, the Ministry constituted a sub-committee in consultation with Chairman EAC, comprising of EAC members which would carry out site inspection before making any further recommendations on proposal. In accordance with the mandate given, a site inspection was proposed during 10-12 May, 2024 (3 days-including departure and arrival) for the purpose with following members:

S. No	Name	Role
1.	Shri Ajay Kumar Lal	Chairman
2.	Dr Antony Johnson	Member
3.	Munna Kumar Shah	Member

B. Site visit details

The MoEF&CC vide its order F. No. J-12011/06/2024-IA-I(RV) dated 22.04.2024 constituted a subcommittee with a task to undertake a site visit during 10-12 May, 2024 to examine forest status and alternative locations submitted by the Project Proponent for execution of Pump Storage Project at Bilaspur (Chhattisgarh).

The team from M/s Jindal Renewable Power Private Limited were represented by their employees (Pramod Singh (DGM), Santosh Kumar (AGM), Chater Singh (Dy. Manager)), EIA consultant (M/s RS Envirolink Technologies Pvt. Ltd.) and technical consultant (i.e. M/s Aquagreen Engineering Management Private Limited). They explained the subcommittee about the details of the project and its salient features.

It was observed that this is an off stream closed loop pumped storage project and the nearest reservoir from water is proposed to be withdrawn for initial storage of the proposed lower reservoir is almost 16 km. The proposed site is around 10 km from NTPC Sipat (Thermal Power Plant) and one coal washery of Hind Energy. For reaching the site, currently village road is used which is mainly unpaved road. The upper reservoir is located near Manjurpah village and lower reservoir is located near Karichhaper village.

C. Observations the sub-committee

The Subcommittee in compliance to completed the task between 10-12 May, 2024 pointed observations and findings are summarised as below:

(i) Topography and Physiology

The proposed project site is an undulating, rugged terrain with thin top soil and rocky surface beneath. Part land where lower reservoir (55 ha) is almost flat whereas the area to be used for upper reservoir at further elevation of almost 400m. Being un-habited and forest land, no approach to the upper reservoir site is available, PP has proposed 10 m wide connecting road to be built and the penstock connecting the reservoirs will be laid on the acquired forest land. The proposed muck dumping area (95 ha) is privately owned as reaffirmed by the accompany members of Project Proponent and is approachable by motorable road.

Heavy machinery required for construction may not be feasible to move near the site in present condition through the village road. The village road is roughly about 8 ft only. No activity or project site office has been established/constructed by project proponent. The PP may be required to construct new road of adequate width bypassing the villages for transporting man and heavy machinery. The proposed area consists of number of manmade ponds for storage of rain water and small streamlets/nalla originating from hill top and gets drained out in the downstream. It was observed that plantation and fenced boundary has been constructed within in forest area which is proposed for lower reservoir. Electrical connection in villages have been provided by the state government.

Currently, the PP is in process of collecting land records from state authorities to finalise the type of land, forest, non-forest etc involved in the project area. The transportation and availability of construction material have not yet been worked upon. One small temple is located along the side of project area.

(ii) Vegetative cover and biodiversity

The entire project site is on predominantly forest land (166 ha out of 301.50 ha) having dry deciduous forest type class of forest. Vegetation comprises of mixed tree and shrub species and mixed sal forest was observed along the periphery of project areas. Prominent tree species noticed are Sal (*Shorearobusta*), Tendu (*Diospyros melanoxylon*), Amla (Indian gooseberry), Mahua (*Madhuca longifolia*), Harad (Myrobalan) etc whereas extensive undergrowth and shrubs cover the land surface. Crown density is low (10-20 %) at lower reservoir site comparatively high at the upper reservoir site (30-50 % as could be visualized through drone videos & pictures. But for Sal and couple of other species sparsely growing, other species are not so much valuable. However, Non-Timber Forest Products (NTFPs) such as tendu leaves, mahua, amla and some medicinal herbs were found to grow in good quantity.

The area being devoid of human habitation at proximity (except 2 villages slightly away from the project area). The entire vegetation cover is virgin and undisturbed. Top soil being them grasses and bushes are not profuse or dense and biodiversity variance is not extensive.

(iii) Status of Wildlife.

As per forest records a number of wildlife is recorded. A few signs of chital deer presence observed; Local villagers also confirmed their presence and sighting time to time. It is also known habitats of Sloth bear. However, nearby Tiger Reserve namely Achanakmar Tiger Reserve is 35 km away and area appears not falling in tiger corridor, diversion of land should not result into adverse situation.

(iv) Water availability:

PP has proposed to source water from existing Khutaghat dam/reservoir (Sanjay Gandhi Jalashay) is in Ratanpur tehsil of Bilaspur district, which is approx. 16 km away from the lower reservoir. The instant dam was built on Kharang/Khurang river, a tributary of Shivnath river in Mahanadi basin. The dam was constructed during 1929-1930. This location of dam is also used as picnic spot by the locals. The water of dam is used for irrigation purpose and as informed by PP, there is surplus water in monsoon/lean season for the project and as per ocular observation. Other technical and administrative details cannot be examined or verified as of now.

It was informed that about 1.5 mtrs diameter pipe will be laid along the 16 kms length for transporting water from dam. As of now, no permission has been obtained by PP for using this water. It was observed that since the instant river is part of Mahanadi basin, PP may explore the requirement of clearance from Mahanadi Water Dispute Tribunal. State government may clarify the same regarding this usage of water.

No intake location of the dam has been identified or finalised yet. Protection/presence of aquatic species in the dame shall be assessed and submitted by PP during EIA/EMP report.

Local people are dependent on ground water for domestic purpose for which hand pump are used. PP has informed that no ground water shall be used for construction or for domestic purpose, during construction and operational phase.

(v) Settlement and R&R issue:

Relocation, rehabilitation or resettlement issues are not significant due to human habitat being least affected by the project. During the construction phase, there will be some inconvenience to the local inhabitants which could be resolved by taking befitting measures after detail EIA & Public Hearing process.

(vi) Alternative sites:

The alternates have more or less similar vegetative and other conditions. There is a possibility of slight reduction in the area of muck dump by increasing the height of muck and reclaim with adequate plantation of local species.

(vii) Other Environmental features:

The project area has very low interference of human and remain naturally maintained without any issue of air pollution. Air quality (visually) of the area are observed to be clear. No baseline monitoring has been started by PP as of now. No source of air pollution such as manufacturing industries, brick kiln etc were observed in the project area. The potential source may be due to impact of transportation in villages, wood combustion used for cooking otherwise there is no major source of air pollution. With regard to water pollution, it was observed that there is no source of water pollution in the area. Further no discharge of industrial effluent or sewage was seen around the project area. Also, there is no dumping of any waste was observed during the site visit.

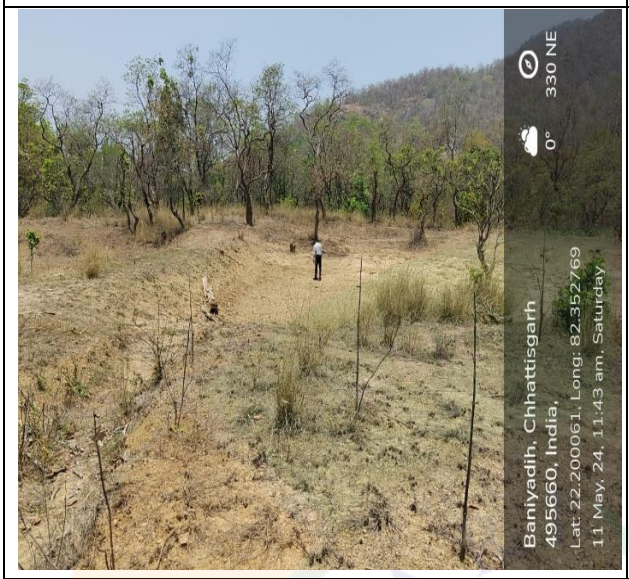
D. Findings& Recommendations:

1. Vegetative cover and forests being prime issue due to their predominant presence, any decision on environment clearance will heavily hinge on the forest clearance (FC). Therefore, grant of ToR calls for strict condition of any further consideration for EC will be subject to Stage-I Clearance. Detailed documents pertaining to species diversity, density, enumeration and proposed CA plans etc. should be submitted before EAC also, applying for FC
2. The 16 km long pipeline proposed to withdraw water from the existing reservoir and later to fill the proposed lower reservoir to be given requisite details of land and type of land requirement likely soil and area disturbance etc. This details should be an integral part of the overall proposal.
3. Necessary permission for water allocation from State Government and Mahanadi Water Dispute Tribunal (MWDT) (if applicable) should be obtained. The clarification regarding clearance/permission from MWDT shall be submitted through State Water Resource Department.
4. Possibility be explored to reduce dumping area by increasing height and vertical capacity in case of forest land, if used for dumping of muck. Also, a full progressive reclamation with local species of fruit bearing trees and actions need to be placed while seeking EC.
5. Constructions of proposed reservoir boundary/ peripheral walls/dams will require excavation, reuse and carriages. At present, air quality and noise level is not at all a concern. However, adequate measures need to ensure, no considerable damage to either

local population (villages) or any existing streams/ nallahs etc.

6. The 1.5 mts diameter pipe is proposed for filling the reservoir in the two monsoon seasons. However, after filling of reservoir, this pipeline would be required for only 10-15% make up water annually. Therefore, it is advised to evolve a mechanism for using the full capacity of pipe by sharing with state authorities for water supply to the nearest town/villages/cities etc.
7. Ambient Air Quality Monitoring Station shall be established in the villages for collecting the air quality data and impact assessment modelling due to construction and transportation of man/material shall be assessed and submitted in EIA/EMP report.
8. PP shall explore and demarcate the area for solid waste management/recycling to be generated during construction / operation since it was not clear from the present proposal.
9. Conservation of flora fauna in existing Upper Reservoir area.
10. Project Proponent shall explore alternate road for accessing the project area, movement of man and heavy machinery during investigation and survey of site. Same alternate road can be used for construction, if in case of grant of EC.

Some of the photographs during site visit are given below:

Lower Reservoir	
	
	
Drone Picture of Upper Reservoir	
	
Source of Water- Khutaghat dam	

*****

The meeting ended with vote of thanks to and from the Chair.

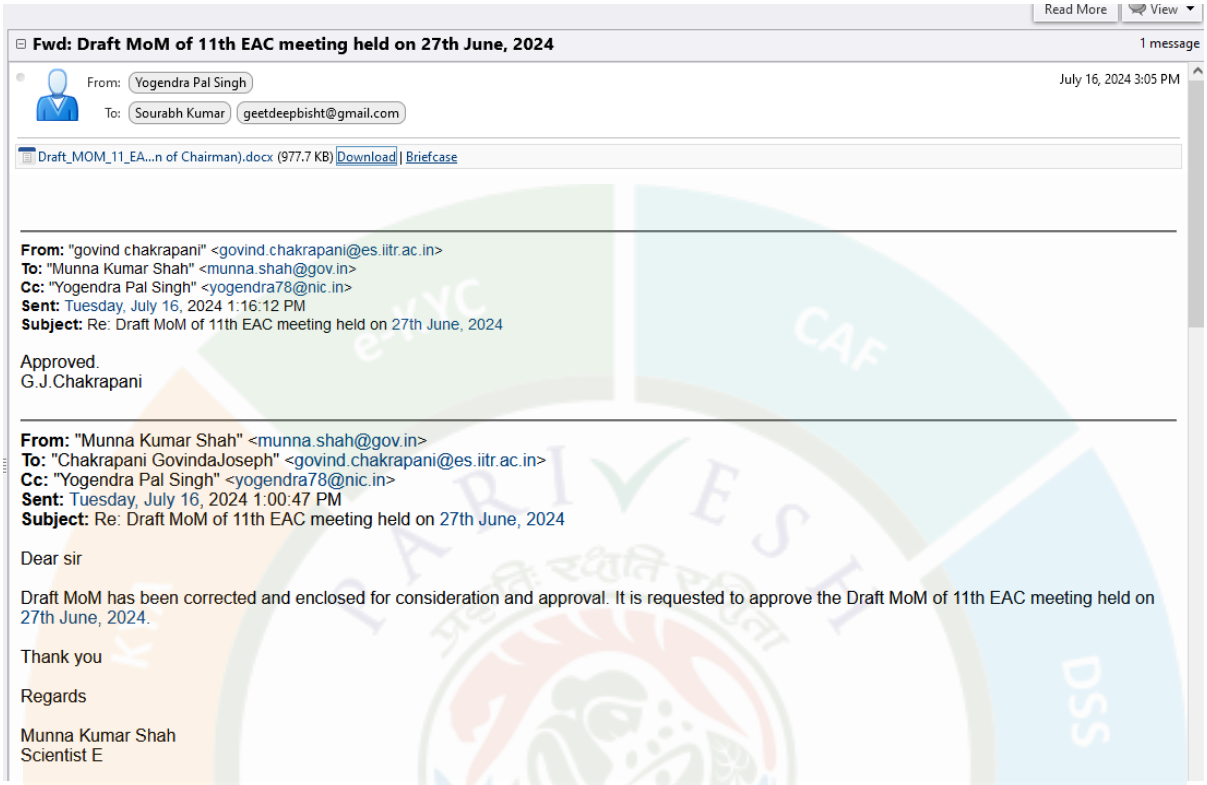
****

Annexure

ATTENDANCE

S. No.	Name	Role	Attendance
1.	Prof. G. J. Chakrapani	**Chairman**	P
2.	Dr. Udaykumar R. Y.	Member	P
3.	Dr. Mukesh Sharma	Member	P
4.	Dr. J V Tyagi	Member	P
5.	Shri Kartik Sapre	Member	A
6.	Shri Ajay Kumar Lal	Member	P
7.	Shri Rajeev Varshney	Representative of CEA	P
8.	Shri Alok Paul Kalsi	Representative of CWC	A
9.	Dr. J.A. Johnson	Representative of WII	A
10.	Dr. A.K. Sahoo	Representative of CIFRI	A
11.	Shri Munna Kumar Shah	Member Secretary	P
12.	Dr Saurabh Upadhyay	Scientist C	P

APPROVAL OF THE CHAIRMAN



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Fwd: Draft MoM of 11th EAC meeting held on 27th June, 2024 1 message

From: Yogendra Pal Singh July 16, 2024 3:05 PM
To: Sourabh Kumar geetdeepbisht@gmail.com

Draft_MOM_11_EA...n of Chairman).docx (977.7 KB) Download | Briefcase

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From: "govind chakrapani" <govind.chakrapani@es.iitr.ac.in>
To: "Munna Kumar Shah" <munna.shah@gov.in>
Cc: "Yogendra Pal Singh" <yogendra78@nic.in>
Sent: Tuesday, July 16, 2024 1:16:12 PM
Subject: Re: Draft MoM of 11th EAC meeting held on 27th June, 2024

Approved.
G.J.Chakrapani

From: "Munna Kumar Shah" <munna.shah@gov.in>
To: "Chakrapani GovindaJoseph" <govind.chakrapani@es.iitr.ac.in>
Cc: "Yogendra Pal Singh" <yogendra78@nic.in>
Sent: Tuesday, July 16, 2024 1:00:47 PM
Subject: Re: Draft MoM of 11th EAC meeting held on 27th June, 2024

Dear sir

Draft MoM has been corrected and enclosed for consideration and approval. It is requested to approve the Draft MoM of 11th EAC meeting held on 27th June, 2024.

Thank you

Regards

Munna Kumar Shah
Scientist E