सत्यमेव जयते

Government of India
Ministry of Environment, Forest and Climate Change
IA Division
(River Valley and Hydroelectric Projects)
***

Minutes of 28TH MEETING (VIRTUAL) OF THE EXPERT APPRAISAL COMM ITTEE meeting River Valley and Hydroelectric Projects held from 15/04/2025 to 15/04/2025 **Date:** 22/04/2025

MoM ID: EC/MOM/EAC/686830/4/2025

Agenda ID: EC/AGENDA/EAC/686830/4/2025

Meeting Venue: MOEF&CC, INDIRA PARYAVARAN BHAWAN, NEW DELHI

Meeting Mode: Physical

Date & Time:

15/04/2025	10:30 AM	05:30 PM

1. Opening remarks

The 28th meeting of the EAC for River Valley & Hydro-electric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 15th April, 2025 through Physical Mode, under the Chairmanship of Prof. G. J. Chakrapani.

2. Confirmation of the minutes of previous meeting

The Minutes of the Meeting held on 27th EAC meeting on 27th March, 2025 were confirmed.

3. Details of proposals considered by the committee

Day 1 -15/04/2025

3.1. Agenda Item No 1:

3.1.1. Details of the proposal

Khadakwasala Fursungi Tunnel Project Substitute to New Mutha Right Bank Canal KM 1 to Km 34 by **EXECU TIVE ENGINEER IPI DIVISION BSB PUNE** located at **PUNE,MAHARASHTRA**			
Proposal For		Fresh EC	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/MH/RIV/530305/2025	J-12011/16/2024-IA-I(R)	27/03/2025	River Valley/Irrigation project s

			(1(c))

3.1.2. Project Salient Features

25.1.1: The proposal is for grant of Environmental Clearance (EC) 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.
25.1.2: The Project Proponent and the accredited Consultant M/s MITCON Consultancy & Engineering Services Ltd., Pune, Maharashtra, made a detailed presentation on the salient features of the project and informed that:

i. The Khadakwasla Irrigation Project comprises 4 Dams the Panshet 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). Storage capacity of four reservoirs is 29.15 TMC

Length of Existing canal	New Mutha Right Bank Canal 202 KM and Old Mutha Right Bank Canal 109 KM.
Capacity	39.63 Cumecs + 4 Cumecs
Gross Command area	117837 Ha
Culturable command Area	101688 Ha
Irrigable command Area	62146 Ha
Village Under Command	107
District	Pune (Tehsils - Haveli ,Daund , Baramati, Indapur)

ii. 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. 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.

iii. First Administrative approval received vide GOM vide letter No. K. MID/1158/J dated 10/06/1958 and subsequent amendment till 1982 and the project is compledted before 1994 in various stages. The tunnel between Khadakwasala- Dam to Fursungi is proposed substitutes for New Mutha Right Bank Canal Km 1 to 34. Total Length of this Tunnel (Tunnel+ Cut & Cover + Channel) is 26.667 Km. The outlet site is located at Fursungi village, which is about 20 km from Pune city.

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

Name of the Proposal	Proposed Khadakwasala - Fursungi Tunnel Project Substitute to New Mutha Right Bank Canal KM 1 to KM 34, Dist. Pune, Maharashtra

Location (Including coordinates)	Latitude (N): 18º 26’ 02” N and 18 º 27’ 43” N Longitude(E): 73º 46’ 15” E and 74 º 01’ 02” E
Inter-state issue involved	No
Seismic zone	III

v. **Proposed Project: -**

The tunnel between Khadakwasala- Dam to Fursungi is proposed substitutes for New Mutha Right Bank Canal Km 1 to 34. Total Length of this Tunnel (Tunnel+ Cut & Cover + Channel) is 26.667 Km.

The details of Proposed tunnel are as below

Particulars	Details
Tunnel	23.450 km

Cut & Cover	2.350 km
Open Channel	0.867 km
Total Length of Project	26.667 km
Method Of Construction	Drill & Blast Method
Shape of Tunnel	Horse Shoe
No. of Shafts	06
Area to be restored from existing command Area	3471 Ha.

vi. **Status of Clearances**

Environmental Clearance: - 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. ToR Application Proposal no. IA/MH/RIV/459818/2024.

Government of Maharashtra approval: - Khadakwasala- Fursungi Tunnel Project is administratively approved by Govt of Maharashtra vide resolution GR. No. dated 05/09/2024.

Forest Clearance: Total area of forest affected due to project is 0.8064.

- Stage 1 Clearance granted for 0.8064 ha of forest land. vide online Proposal No. FP/MH /Minor Canal/ 460637/ 2024 dated 30/01/2025
- Stage 2 Clearance granted vide online Proposal No. FP/MH/MinorCanal/460637/2024 dated 22.03.2025

vii. **Land Requirement**

Total Land required for New Mutha Right Bank Canal Km 1 to 34 PR is 23.8364 Ha. 0.8064 Ha Forest land and Private land of around 23.03 Ha is proposed for acquisition. Land acquisition will require for tunnel shafts, , open channel and cut & cover portion. The land acquisition will be done and compensation shall be paid to land owners as per 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.

viii. **Command Area Details**

The New Mutha Right Bank Canal irrigates an extensive command area spanning four talukas in Pune District: Haveli, Baramati, Daund, and Indapur. The total Gross Command Area (GCA) is 117,837 hectares, of which 101,688 hectares fall under Culturable Command Area (CCA). The Irrigable Command Area (ICA), which is the area actually proposed for irrigation, covers 62,146 hectares. 2.18 TMC water will be saved and can be used for Irrigation and Non-Irrigation purpose. Total 3471 Ha command area will be restored due to saved water.

ix. **Demographic details in 10 km radius of project area:**

x. **Water requirement:**

Actual Discharge through Tunnel: 42.76 Cumecs (1510 Cusecs)

Water Saving: 2.18 TMC

Water (during construction stage): 200 KLD (Source: Water Tanker)

xi. **Project Cost:** The estimated project cost is Rs 2190.47 crores. Total capital cost earmarked towards environmental pollution control measures is Rs. 193.00 L and the Recurring cost (operation and maintenance) will be about Rs 160.00 L per annum

xii. **Project Benefit:** Total Employment will be 58 persons as direct & 20 persons indirect after expansion. Industry proposes to allocate Rs 1095 Lakh @ of 0.50 % towards CER (as per Ministry's OM dated 1st May 2018)

xiii. **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. However, Mayani Bird Conservation Reserve & Other sacred groves are present within 10 km radius.

Sr. No.	Name of the Grove/Wildlife Sanctuary/ESA	Tahsil	Distance	xiv. Direction
1	Ghera Sinhagad Village (ESA Western Ghat)	Haveli	3.65 km	SW

2	Rajiv Gandhi Zoological Park and Wildlife Research Center	Pune	1.65 km	N

MoU / any other clearance/ permission signed with State government:

Sr. No.	Approvals	Amount (Lakh)	Remarks
Khadakwasala Complex			
1	Original Approval Government Resolution	1054.59	GOM vide letter No. K. MID/1158/J dated 10/06/1958
2	Revised Government Resolution	2966	GOM letter No. Khadak/1168/35567/ IP-4/ Dt.17/06/1972
3	Revised Government Resolution	3822	GOM letter No. Khadak/1104/85964/ IP-4/Dt.28/10/1974
4	Government Resolution	10858	GOM letter No. Khadak/ 1081/ 522/ (1962)MA-Dt.21/01/1982
Khadakwasla- Fursungi Tunnel Project			
5	Govt. of Maharashtra	219047	Khadakwasala- Fursungi Tunnel Project is administratively approved by Govt of Maharashtra vide resolution dated 05/09/2024
6	Stage 1 & 2 Clearance	0.8064 ha forest Land	v Stage 1 Clearance granted for 0.8064 ha of forest land. vide online Proposal No. FP/MH /Minor Canal/ 460637/ 2024 dated 30/01/2025 v Stage 2 Clearance granted vide online Proposal No. FP/MH/MinorCanal/460637/2024 dated 22.03.2025

xv. **Resettlement and rehabilitation:**

Private land: 23.03 Ha is proposed for acquisition (8 villages)

- v 11.71 Ha land required for tunnel shafts, approach road, open channel and cut & cover portion.
- v Remaining 11.32 Ha land will be taken on rent during the construction phase.
- v 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.
- v As there are no households in the land to be acquired, there is no issue of rehabilitation & resettlement of the land owners.

Details of Land Acquisition

Sr. No	Taluka	District	Particular	Village name	Gut No.
1	Haveli	Pune	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

xvi. **Scheduled –I species:**

Sr. No	Class	Scientific Name	Common Name	IWPA Status	IUCN Status
1.	Mammal	*Panthera pardus*	Leopard	Schedule - I	VU
2.	Mammal	*Hyena hyaena*	Striped Hyena	Schedule - I	LC
3.	Mammal	*Canis lupus Sykes*	Wolf	Schedule – I	LC
4.	Mammal	*Felis chaus*	Jungle cat	Schedule – I	LC
5.	Mammal	*Vulpes bengalensis*	Fox	Schedule – I	LC
6.	Mammal	*Muntiacus vaginalis*	Barking Deer	Schedule – I	LC
7.	Reptile	*Eryx johnii*	Red sand boa	Schedule – I	NT
8	Reptile	*Daboia russelli*	Russell’s Viper	Schedule – I	NT
9.	Reptile	*Ptyas mucosa*	Indian Rat snake	Schedule – I	LC
10.	Reptile	*Naja naja*	Indian Cobra	Schedule – I	LC
11	Reptile	*Varanus bengalensis*	Indian monitor lizard	Schedule – I	NT
12.	Reptile	*Crocodylus palustris*	Muggar	Schedule – I	NT
13.	Bird	*Platalea leucorodia*	Eurasian Spoonbill	Schedule – I	LC
14	Bird	*Aythya ferina*	Common Pochard	Schedule – I	VU
15	Bird	*Haliastrus indius*	Brahmini Kite	Schedule – I	NT
16	Bird	*Accipter badius*	Shikra	Schedule – I	NT

17	Bird	*Hieraaetus fasciatus*	Bonellie's Eagle	Schedule - I	LC
18	Bird	*Butastur teesa*	White-eyed Buz zard	Schedule - I	LC
19	Bird	*Spilornis cheela*	Crested Serpent Eagle	Schedule – I	LC
20	Bird	*Falco tinnunculvs*	Common Kestra l	Schedule – I	LC
21	Bird	*Pavo cristatus*	Indian Peafowl	Sch I & IV	LC
22	Bird	*Sterna aurantia*	River Tern	Schedule – I	VU
23	Bird	*Tyto alba*	Barn Owl	Schedule – I	LC

VU = Vulnerable; NT = Near Threatened, EN = Endangered

xvii. **Alternative Studies:**

Summary of Alternatives

Challenging ar ea	**Alt - IIA**	**Alt – 1**	**Alt – 2**	**Alt – 3**	**Alt – 4**	**Alt - 5**
Length (km)	**26.75**	25.545	25.670	25.445	26.740	25.670
Rock cover (m)	**20-60 m Lo w cover for most of the stretch**	80-160 m Fr om 3 – 16 k m	20-60 m Lo w cover for most of the s tretch	20-60 m Lo w cover for most of the s tretch	70-200m mo st of stretch	80-200m mo st of stretch
Cut & Cover Tu nnel Length (k m)	**Around 3.2 km**	Around 1 k m	Around 1.5 km	Around 1.75 km	Around 1 k m	Around 1 k m
Seepage (Lake J ambhulwadi)	**Might be hi gh**	Might be lo w	Might be hi gh	Might be hi gh	Might be lo w	Might be lo w
Railway line	**To be taken care**					

xviii. **Baseline Environmental Scenario:**

Particulars	**Details**
Period of baseline data coll ection/Sampling period.	Baseline Study Period Season 1: March to May 2024 Season 2: June to August 2024 Season 3: October to December 2024
(Air, noise, water, land)	**AAQ parameters at 8 locations (min. & Max.)** • PM10 = 30.3 to 87.5 µg/m3 • PM2.5 = 12.8 to 47.5 µg/m3 • SO2 = 5.2 to 41.2 µg/m3 • NOx = 9.2 to 56.9 µg/m3. • CO = BDL **Surface water samples (4 samples)**

Parameter	Season 1	Season 2	Season 3
pH	7.05 to 7.83	6.58 to 7.5	7.1 to 7.95
TDS	154 to 352 mg/lit.	112 to 318 g/lit.	125 to 343 mg/lit.
Total Hardness as CaCO3	154.3 to 517 mg/lit.	169.54 to 490.12 mg/lit.	171 to 514 mg/lit.
Calcium as Ca	18.16 to 50.73 mg/lit	20.84 to 51.16 mg/lit	23.12 to 51.25 mg/lit
Magnesiu	8.42 to 21.	11.23 to 20.95 m	11.24 to 23.

masMg	78 mg/lit	g/lit	02 mg/lit
Chloride as Cl	25.73 to 54.25 mg/lit	14.18 to 44.16 mg/lit	13.49 to 42.37 mg/lit
Sulphate as SO4	8.52 to 24.12 mg/lit	7.12 to 25.02 mg/lit	10.98 to 23.37 mg/lit.
BOD	63 to 63 mg/lit	42 to 42 mg/lit	56 to 56 mg/lit
COD	27 to 110 mg/lit	18 to 60 mg/lit	32 to 135 mg/lit
DO	3.2 to 6 mg/lit	3.6 to 6.1 mg/lit	3.8 to 6.2 mg/lit
Total Colif	present	present	present

orms	t		

Ground Water samples at 36 locations

Parameters	**Season 1**	**Season 2**	**Season 3**
pH	7.15 to 7.57	7.02 to 7.67	7.2 to 7.69
Total Dissolved Solids	272 to 414 mg/lit.	264 to 420 mg/lit.	259 to 425 mg/lit.
Total Hardness as CaCO3	154.13 to 190.13 mg/lit.	123.69 to 187.16 mg/lit.	133.18 to 193.16 mg/lit.
Calcium as Ca	36.52 to 72.4 mg/lit	40.14 to 60.12 mg/li	43.54 to 55.84 mg/li

	&	t	t
Magnesium as Mg	12.24 to 26.5 mg/lit	14.15 to 29.54 mg/lit	13.25 to 27.15 mg/lit
Chloride as Cl &	28.52 to 58.83 mg/lit &	32.16 to 56.12 mg/lit	32.43 to 60.13 mg/lit
Sulphate as SO4	14.69 to 32.7 mg/lit.	16.54 to 32.64 mg/lit.	13.25 to 34.65 mg/lit.

Noise levels Leq (Day & Night) at 10 locations: The Leq values for day time was observed to be

Zone /Area	Day Time	Night Time
Residential Zone	51.2 to 68.2dB (A)	60.6 to 60.6 dB (A).
Silent Zone	51.6 to 52.2dB (A)	42.8 to 43.1 dB (A).
Commercial Zone	65.8 to 69.4dB (A	56.1 to 60.5 dB (A).

Soil Quality at 12 Locations

Parameters	**Season 1**	**Season 2**	**Season 3**
pH	7.57 to	7.49 to	7.57 to 8.02.

	8.05.	7.99.	
Conductivity	474.9 to 745.5 µs/cm.	483.7 to 727.6 µs/cm.	436.4 to 763.5 µs/cm.
N	126.44 to 175.1 kg/ha	108.13 to 170.12 kg/ha	111.52 to 178.02 kg/ha
P	7.58 to 13.9 kg/ha	7.32 to 13.21 kg/ha	8.05 to 14.2 kg/ha
K	145.12 to 190.13 kg/ha	142.67 to 190.13 kg/ha	138.54 to 190.14 kg/ha

flora and fauna of the project area, aquatic ecology, etc.	Total 280 floral species were recorded in and around the project area (i.e. 10 km radius study). Among them 179 Trees, 93 shrubs, 5 Herb & 3 climbers etc. **Fauna Diversity:** • 11 mammal species, • 161 bird species, • 62 freshwater Fish species, • 16 reptile species, and • 27 RET & 23 Schedule I (IWPA 1972)
Brief description on hydrology and water assessment as per the approved Pre-DPR:	**Actual Discharge through Tunnel:** 42.76 Cumecs (1510 Cusecs) **Water Saving:** 2.18 TMC

Additional detail (If any)	

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

Domestic Waste:

Name of Waste	Source	Qty (TPA)
Dry Waste	Labour Colony	147.6
Wet Waste	Labour Colony	98.4

Details of Excavation Waste (Muck)

The detail of the muck likely to be disposal at low lying area adjacent to project site

Name of Waste	**Source**	**Qty (cu.m)**	**Method of Disposal**
Muck	Excavation	1670000	v 375000 cu.m shall be used for backfilling of open channel portion. v 600000 cu.m stone & aggregates shall be utilised for construction. v Balance 695000 cu.m material shall be utilised for lo lying area and adjoining Quarry area.

xx. **Public Hearing Details:** Public Hearing for the proposed project has been conducted by the State Pollution Control Board at three districts separately.

Advertisement for PH with date	**Marathi Newspaper:** Pune: Loksatta dated 25/01/2025, A corrigendum was also published on 21st February 2025 in the same newspaper**,** **English Newspaper:** Pune: National Newspaper Indian Express dated 25/01/2025, A corrigendum was also published on 21st February 2025 in the same newspaper
Date of PH	Pune: 28/02/2025
Venue	Khadakwasla Judo Hall, Bypass road, Behind petrol pump, Khadakwasla, Haveli, Dist Pune
Chaired by	Hon. Jyoti Kadam - Chairman Resident Deputy Collector / Additional District Magistrate, Pune Shri. Jagannath Salunkhe - Member Regional Officer, MPCB, Pune Shri. Kartikeya Langote - Convener Sub Regional Officer, MPCB, Pune-1
Main issues raised during PH	1. 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. 2. Where will the muck from tunnel excavation be disposed off? 3. In Dhayari village, where the tunnel will pass, will there be any shafts? If not, since the tunnel is 80 meters underground, will the Pune Municipal Corporation or the Urban Development Department raise any objections for building permits? 4. What will be done with the to be vacant land of existing new Mutha right canal in future?

No. of people attended	Pune: 96

xxi. **Status of Litigation Pending against the proposal, if any:** Nil

xxii. **The salient features of the project are as under:**

1. EAC Meeting Details:

Date of earlier EAC meetings	1. 11th Meeting of EAC, MoEFCC, New Delhi held on 27/06/2024 (Agenda Item No. 11.5) for Terms of Reference (ToR) 2. 18st Meeting of EAC, MoEFCC, New Delhi held on 05/11/2024 (Agenda Item No. 18.1) for Reconsideration for Terms of References (TOR) - reg.

2. 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, Maharashtra
Proposal No.	IA/MH/RIV/530305/2025
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
Company’s Name	Executive Engineer Irrigation Project Investigation Division (BSB), Water Resources Department, Pune Maharashtra Krishna Valley Development Corporation (MKVDC), Pune 411011
CIN no. of Company/user agency	-
Accredited Consultant and certificate no.	MITCON Consultancy & Engineering Services Ltd., Pune, Maharashtra Certificate No. NABET/EIA/24-27/RA 0343
Project location (Coordinates /River/ Reservoir)	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
Proposed on River/ Reservoir	Khadakwasla Dam
Type of Hydro-electric project	Not Applicable
Seismic zone	Zone III (i. e. Moderate Risk Zone)

3. Category details:

Category of the project	1 (c) Cat. ‘A’
Capacity / Cultural command area (CCA)	New Mutha Right Branch Canal

	Taluka	**GCA (Ha)**	**CCA (Ha)**	**ICA (Ha)**
	Haveli	10968	9465	5785
	Baram	1859	1604	980

	ati			| Daund	53090	45814	27999 Indapur	51920	44805	27382 **Total**	**117837**	**101688**	**62146**
Attracts the General Conditions (Yes/No)	Yes, ESA Western Ghat Ghera Sinhagad Village located @ 3.65 km from proposed alignment

4. ToR/EC Details:

ToR Proposal No.	IA/MH/RIV/459818/2024, F. No. J J-12011/16/2024-IA-I(R)
EAC meeting date	05/11/2024
ToR Letter No.	J-12011/16/2024-IA-I(R)
ToR grant Date	03/12/2024
Cost of project	Rs. 2190.47
Total area of Project	Nature of Land involved in (Ha) | Private land (Ha) | Forest/Govt. land (Ha) | Total Area required (Ha) Tunnel + Cut & Cover an | 23.03* Ha | 0.8064 Ha** | 23.8364 Ha

Open Channel			
Submergence	0	0	0
Total	23.03 Ha	0.8064 Ha	23.8364 Ha

** 11.71 Ha private land acquired & remaining 11.32 Ha land will be taken on rent*

Forest Land details**

Sr. no.	Village	Gat No.	Chainage		Length	Width	Area (Sq.m)	Area (Ha.)
			From	To				
1	Khadakwasla	81	50	350	300	7.2	2160	0.2160
2	Narhe	17	6420	6780	360	7.2	2592	0.2592
3	Mangadewadi	4	8860	9040	180	7.2	1296	0.1296
4	Katraj	39	11370	11650	280	7.2	2016	0.2016
					Total		8064	0.8064

Height of Dam from River Bed (EL)	NA
Details of submergence area	Not applicable as there is no submergence.
District to provide irrigation facility (if applicable)	Pune
Details of tunnels on upper level & lower level and length of canal (if applicable)	Tunnel 23.450 km Cut & Cover 2.350 km Open Channel 0.867 km Total Length of Project 26.667 km
No. of affected Village.	8 villages

<table>
<tr><td>No. of Affected Families</td><td>
<table>
<tr><th>Sr. No</th><th>Taluka</th><th>District</th><th>Particular</th><th>Village name</th><th>Gut No.</th></tr>
<tr><td>1</td><td rowspan="8">Haveli</td><td rowspan="8">Pune</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>
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<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, 1894, 1893, 1892, 1891, 1890, 1889, 1888, 1887, 1886, 1885</td></tr>
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<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.
</td></tr>
<tr><td>R&R details</td><td>
Private land: 23.03 Ha is proposed for acquisition.
v 11.71 Ha land required for tunnel shafts, approach road, open channel and cut & cover portion.
v Remaining 11.32 Ha land will be taken on rent during the construction phase.
v 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 and for irrigation projects through private negotiation.
v As there are no households in the land to be acquired, there is no issue of rehabilitation & resettlement of the land owners.
</td></tr>
<tr><td>Command area</td><td>
<table>
<tr><td rowspan="3">New Mutha Right Branch Canal</td><th>Taluka</th><th>GCA (Ha)</th><th>CCA (Ha)</th><th>ICA (Ha)</th></tr>
<tr><td>Haveli</td><td>10968</td><td>9465</td><td>5785</td></tr>
<tr><td>Baramati</td><td>1859</td><td>1604</td><td>980</td></tr>
</table>
</td></tr>
</table>

	Daund	53090	45814	27999
	Indapur	51920	44805	27382
	Total	**117837**	**101688**	**62146**

Types of Waste and quantity of generation during Construction/ Operation

Name of Waste	Source	Qty (TPA)
Dry Waste	Labour Colony	147.6
Wet Waste	Labour Colony	98.4

Name of Waste	Source	Qty (cu.m)	Method of Disposal
Muck	Excavation	1670000	v 375000 cu.m shall be used for backfilling of open channel portion. v 600000 cu.m stone & aggregates shall be utilised for construction. v Balance 695000 cu.m material shall be utilised for lo lying area and adjoining Quarry area.

Material used for blasting and its composition as per DGMS standards.

Controlled blasting activity is proposed during construction phase.

E-Flows for the Project

NA

Is Projects earlier studied 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

Details on provision of fish pass

Not applicable

Project benefit including employment details (no of employee)

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

Area of Compensatory Afforestation (CA) with tentative no of plantation.	No trees will be affected due to the proposed project. However, 25000 number of trees will be planted and Maintained.
Previous EC details	Not applicable
EC Compliance Report by R.O, MOEF&CC	Not Applicable

5. Muck Management Details:

No. of proposed disposal area/ (type of land- Forest/Pvt. land)	Muck likely to be disposal 4 site at low lying area adjacent to project Site **Method of Disposal** • 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 low lying area and adjoining Quarry area.
Cross section of proposed muck area, Height of muck with slope.	Utilization of 60 % of excavated material shall be used for backfilled of open channel portion and stone & aggregates shall be utilized for construction. 40% shall be filled in low laying areas and abundant Quarry Area.
Distance of muck disposal area(location), from muck generation sources (project area)/ River, HFL of proposed muck disposal area.	Average 0 km to 5 km
Total Muck Disposal Area Estimate Muck to be generated	<table><tr><th>Name of Waste</th><th>Source</th><th>Qty (cu. m)</th><th>Method of Disposal</th></tr><tr><td>Muck</td><td>Excavation</td><td>1670000</td><td>v 375000 cu.m shall be used for backfilling of open channel portion. v 600000 cu.m stone & aggregates shall be utilised for construction. v Balance 695000 cu.m material shall be utilised for lo lying area and adjoining Quarry area.</td></tr></table>
Transportation	By Road
Monitoring mechanism for Muck Disposal Transportation	Environmental Management Cell (EMC) shall monitor mechanism of muck disposal.

6. Land Area Breakup:

Private land	23.03 Ha (11.32 ha land on rent basis and 11.71 ha land will be acquired)
Government land/Forest Land	0.8064 Ha * Stage 2 Clearance granted vide online Proposal No. FP/MH/MinorCanal/460637/2024 dated 22.03.2025

<table>
<tr><td>Submergence area/Reservoir area</td><td>NA</td></tr>
<tr><td>Land required for project components</td><td>
<table>
<tr><th>Nature of Land involved in (Ha)</th><th>Private land (Ha)</th><th>Forest/Govt. land (Ha)</th><th>Total Area required (Ha)</th></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>Submergence</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>Total</td><td>23.03 Ha</td><td>0.8064 Ha</td><td>23.8364 Ha</td></tr>
</table>
</td></tr>
</table>

7. Presence of Environmentally Sensitive areas in the study area

<table>
<tr><th>Forest Land/ Protected Area/ Environmental Sensitivity Zone</th><th>Yes/ No</th><th>Details of Certificate/ letter/ Remarks</th></tr>
<tr><td>Reserve Forest/Protected Forest Land</td><td>Yes</td><td>
<table>
<tr><th colspan="9">Forest Land</th></tr>
<tr><th rowspan="2">Sl.</th><th rowspan="2">Village</th><th rowspan="2">Gat No.</th><th colspan="2">Chainage</th><th rowspan="2">Length</th><th rowspan="2">Width</th><th rowspan="2">Area (Sq. m)</th><th rowspan="2">Area (Ha.)</th></tr>
<tr><th>From</th><th>To</th></tr>
<tr><td>1</td><td>Khadakwasla</td><td>81</td><td>50</td><td>350</td><td>300</td><td>7.2</td><td>2160</td><td>0.2160</td></tr>
<tr><td>2</td><td>Narhe</td><td>17</td><td>6420</td><td>6780</td><td>360</td><td>7.2</td><td>2592</td><td>0.2592</td></tr>
<tr><td>3</td><td>Mangadewadi</td><td>4</td><td>8860</td><td>9040</td><td>180</td><td>7.2</td><td>1296</td><td>0.1296</td></tr>
<tr><td>4</td><td>Katraj</td><td>39</td><td>11370</td><td>11650</td><td>280</td><td>7.2</td><td>2016</td><td>0.2016</td></tr>
<tr><td colspan="7">Total</td><td>8064</td><td>0.8064</td></tr>
</table>

Protected Areas present in the study area
<table>
<tr><th>Sr. No.</th><th>Name of the Grove/Wildlife Sanctuary/ ESA</th><th>Tahsil</th><th>Distance</th><th>Direction</th></tr>
</table>
</td></tr>
</table>

		<table><tr><td>1</td><td>Ghera Sinhagad Village (ESA Western Ghat)</td><td>Haveli</td><td>3.65 km</td><td>SW</td></tr><tr><td>2</td><td>Rajiv Gandhi Zoological Park and Wildlife Research Center</td><td>Pune</td><td>1.65 km</td><td>N</td></tr></table>
National Park	No	No within 10 km Radius
Wildlife Sanctuary	No	No within 10 km Radius
Archaeological sites monuments/ historical temples etc.	Yes	List of Historic places in study area 1. Shaniwar Wada 2. Sinhagad Fort
Additional information (if any)	-	-

8. Court case details:

Court Case	NA
Additional information (if any)	-

9. Status of other statutory clearances

Particulars	Letter no. and date
Status of Stage- I FC	v Stage 1 Clearance granted for 0.8064 ha of forest land. vide online Proposal No. FP/MH /Minor Canal/ 460 637/ 2024 dated 30/01/2025

	v Stage 2 Clearance granted vide online Proposal No. F P/MH/MinorCanal/460637/2024 dated 22.03.2025
Approval of Central Water Commission	Khadakwasala- Fursungi Tunnel Project is administrati vely approved by Govt of Maharashtra vide resolution d ated 05/09/2024
Approval of Central Electricity Authority	NA
Additional detail (If any)	NA
Is FRA (2006) done for FC-I	-

10. Details of the EMP

Sr. No	Pollution Control & Other Environment Infrastructure	Capital Cost Rs. Lakhs	Recurring Cost (per annum) Rs. Lakhs
1	Ambient Air Quality	-	18.00
2	Noise Level	-	12.00
3	Surface and Ground Water Quality	-	25.00
4	Soil Quality	-	15.00
5	Solid/ hazardous wastes	03.00	15.00
6	Green Belt Development	207.00	50.00
7	Fisheries Conservation & Management Plan	15.00	
8	Labour Management Plan	25.00	
9	Wildlife Conservation Plan	70.00	
10	Muck Management Plan	25.00	
11	Health & Safety	-	25.00
12	Command Area Development Plan	12050	
13	Corporate Environmental Responsibility	1095.00	-
Summary of allocation of fund for EMP			
1.	EMPs: (eg. Air Environment, Water Environment)	193.00 L	
2.	Capital Cost (in Cr.)	2190.47	
3.	Recurring Cost per annum (In Lakhs)	160.00 L	

3.1.3. Deliberations by the committee in previous meetings

N/A

3.1.4. Deliberations by the EAC in current meetings

28.1.3 The EAC during deliberations noted the following:

- The Expert Appraisal Committee (EAC) deliberated on the information submitted by the Project Proponent and the details presented during the meeting. The Committee observed that the proposal pertains to the grant of Environmental Clearance for the 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, constituted under the provisions of the EIA Notification, 2006, and comprising expert members/domain experts from various relevant fields, examined the proposal submitted by the Project Proponent. This examination included a review of the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) reports, which were prepared and submitted by a QCI/NABET-accredited consultant on behalf of the Project Proponent.
- The EAC noted that the Project Proponent has given an undertaking that the data and information given in the application and enclosures are true to the best of his knowledge and belief and no information has been suppressed in the EIA/EMP reports. If any part of data/information submitted is found to be false/ misleading at any stage, the project will be rejected and Environmental Clearance given, if any, will be revoked at the risk and cost of the project proponent.
- 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.
- The EAC noted that the existing canal cannot be repaired or restructured, as 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 losses it affects the water availability in the downstream.
- The EAC further noted that the total land area required for the project is 23.03 ha (11.32 ha land on rent basis and 11.71 ha land will be acquired), comprising 0.8064 Ha of forest land of which Stage- II Clearance granted by the Ministry vide online Proposal No. FP/MH/MinorCanal/460637/2024 dated 22.03.2025. The EAC observed that Khadakwasala- Fursungi Tunnel Project is administratively approved by Govt of Maharashtra vide resolution dated 05/09/2024.
- The estimated project cost is Rs 2190.47 crores. Total capital cost earmarked towards environmental pollution control measures is Rs. 193.00 L and the Recurring cost (operation and maintenance) will be about Rs 160.00 L per annum.
- The Committee discussed the issues raised during the Public Hearing (PH) which was conducted in three districts as per the EIA Notification, 2006 and reviewed the action plan submitted by the Project Proponent to address these concerns. After careful deliberation, the Committee found the action plan satisfactory.
- The committee inquired about the closure plan of existing 35 km canal and its impact on downstream users. EAC was also of the view that leaving it as it is may become a problem for local people. PP were not able to convince the EAC about the muck disposal sites reclamation of proposed tunnel. The EAC was of the view to conduct site visit by the sub-committee of the EAC to before giving any recommendation to the project.

28.1.4 The EAC after detailed deliberations deferred the proposal for want of following additional information:

1. Environmental Cost Benefit Analysis be conducted in terms of proximity of proposed tunnel to the Western Ghats Eco Sensitive Area and possibility analysis for use of existing canal after its reclamation and restoration.
2. PP shall submit ecologically sustainable closure plan for 35 km existing canal in case Cost Benefit Analysis is in favour of proposed construction of tunnel.
3. PP shall submit details of management/reclamation plan for muck disposal sites for the muck proposed to be excavated from proposed tunnel.
4. Site visit shall be conducted by a sub-committee of the EAC.

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

3.1.5. Recommendation of EAC

Deferred for ADS

3.2. Agenda Item No 2:

3.2.1. Details of the proposal

Sukhnai Pumped Storage Project by **HINDUJA RENEWABLES ENERGY PRIVATE LIMITED** located at **MIR ZAPUR,UTTAR PRADESH**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/UP/RIV/530979/2025	J-12011/14/2025-IA.I (R)	24/03/2025	River Valley/Irrigation projects (1(c))

3.2.2. Project Salient Features

PP vide email dated 14.04.2025 informed that currently they are in the process of receiving In-Principle approval from the Government of Uttar Pradesh. However, the geographical coordinates of the project are intersecting with some other IPPs project. Thus, the decision of project allotment is on hold. The clarification process with the Government is currently ongoing.
Therefore, they expressed their inability to present their project during present meeting.

3.2.3. Deliberations by the committee in previous meetings

N/A

3.2.4. Deliberations by the EAC in current meetings

Accordingly, the EAC decided to ***return*** the proposal on the above lines.

3.2.5. Recommendation of EAC

Returned in present form

3.3. Agenda Item No 3:

3.3.1. Details of the proposal

Parsapani Pumped Storage Project by **HINDUJA RENEWABLES ENERGY PRIVATE LIMITED** located at **BI LASPUR,CHHATTISGARH**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/CG/RIV/532501/2025	J-12011/12/2025-IA.I (R)	02/04/2025	River Valley/Irrigation projects (1(c))

3.3.2. Project Salient Features

28.3.1 The proposal is for grant of Terms of References (ToR) to the project for Parsapani Open Loop Pumped Storage Project (1000 MW) in an area of 231 Ha located at Village Chhatauna, Parsa Pani, Sorha Khurd etc, Sub District Kota, District Bilaspur, Chhattisgarh by M/s Hinduja Renewables Energy Private Limited.

- The proposed project area is located near Parsapani, Chureli and Chhatauna villages, which fall under Kota Tehsil of Bilaspur district. These villages have a significant Scheduled Tribe population, with approximately 85% of the residents belonging to tribal communities. These communities belong mainly to indigenous tribal groups, who preserve their traditional customs, cultural practices and local governance systems.
- The literacy rate in these villages is approximately 50%.
- Agriculture is the primary occupation, with villagers engaged in farming and allied activities, relying on traditional methods for livelihood.
- The tribal communities in these villages follow indigenous customs, celebrating local festivals and maintaining strong communal traditions.
- According to secondary sources, basic facilities such as education and healthcare remain underdeveloped in the project area.

Sl. No.	Description / Parameter	Alt - 1	Alt - 5
1.	Upper Dam / Reservoir	R_1	R_10
a)	FRL	RL 795.00 m	RL 735.00 m
b)	Dam length	2900 m	2500 m
c)	Dam height	37 m	58 m
d)	Gross storage	7.41 Mm3	7.66 Mm3
2.	Lower Dam / Reservoir	R_2	R_11
a)	FRL	RL 395.00 m	RL 419.00 m
b)	Dam length	2400 m	1500 m
c)	Dam height	28 m	30 m
d)	Gross storage	8.81 Mm3	8.03 Mm3
3.	Gross Head, H	400 m	306 m
4.	Plan length of WCS, L	1335 m	2000m
5.	L / H Ratio	3.5	6.5
6.	Head ratio	1.12	1.22
7.	Installed capacity	1000 MW	800 MW
8.	Geology	Fair	Fair
9.	**Weighted Score**	**73.0**	**67.0**
10.	Overall Ranking	1	2

11.	Source of Water		
a)	Location	Arpa River	Nallah which is tributary of Ar pa River
b)	Water transfer scheme	Single stage pumping	
c)	Pumping scheme	Lifting water from Arpa River over a length of 4 km with a st atic head of 45 m	
d)	RW pipeline	4 km	
e)	Pumping head	60 m	Self-Catchment Yield
12.	Environmental Aspects		
a)	Land category	Forest	Forest & agriculture lands
b)	Overall forest area	200 Ha **(0.20 Ha / MW)**	175 Ha **(0.22 Ha/MW)**
c)	Access	LR Accessible & UR is Inacc essible	Both reservoirs are Inaccessible

Name of the Proposal	Parsapani Close Loop Pumped Storage Project (1000 MW)
Location (Including coordinates)	Lower Reservoir : Longitude: 82° 06' 09.46" E; Latitude: 22° 29' 06.70" N Upper Reservoir : Longitude: 82° 06' 29.50" E; Latitude: 22° 29' 52.39" N
Inter- state issue involved	No
Seismic zone	Zone-II

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

Powerhouse Installed Capacity	1000 MW
Generation of Electricity Annually	2080.50 MU

No. of Units	4 nos. (4 x 250 MW)
Additional information (if any)	Nil

Cost of project	5720 Cr.
Total area of Project	231 ha
Height of Dam from River Bed (EL)	Lower Dam – 27.0 m Upper Dam –32.0 m
Length of Tunnel/Channel	1335 m
Details of Submergence area	151 ha
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Closed Loop Pumped Storage Project (PSP)
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by b) EAC as per CIA&CC study of River Basin. If not the E-Flows maintain criteria for sustaining river ecosystem.	No

No. of proposed disposal area/ (type of land- Forest/Pvt. land)	20 ha (Non-Forest Land)
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

Private Land	53 ha
Government land/Forest Land	178 ha (Forest Land)
Submergence area/Reservoir area	151 ha
Land required for project components	80 ha
Additional information (if any)	Nil

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate / letter/ Remarks**
Reserve Forest/Protected Forest Land	--	There is no Protected Area in the vic

National Park	---	inity of the proposed project. Achan akmar is about 15.0 km far from the proposed project area.
Wildlife Sanctuary	---	

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

Particulars	**Details**
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (NABET Accredited Consultant Organization) Certificate No : NABET/EIA/2225/RA0274 Validity : August 15, 2025 Contact Person : Mr. Ravinder Bhatia Name of Sector : River Valley and Hydroelectric Projects Category : A MoEF Schedule : I(C) Address : 403, Bestech Chambers, Block-B, Sushant Lok Phase I, Sector 43, Gurugram, Haryana - 122009 E-mail : ravi@rstechnologies.co.in Land Line : (0124) 4295383 Cellular : (+91) 9810136853
Project Benefits	o Least expensive source of electricity, not requiring fossil fuel for generation o An emission-free renewable source o Balancing grid for demand driven variations o Balancing generation driven variations o Voltage support and grid stability Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.
Status of other statutory clearances	Forest Clearance - Online application seeking forest diversion for around 178 Ha after receipt of ToR Approval. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studies
Additional detail (If any)	Nil

3.3.3. Deliberations by the committee in previous meetings

N/A

3.3.4. Deliberations by the EAC in current meetings

28.3.3 The EAC during deliberations noted the following:

The Expert Appraisal Committee (EAC) deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Parsapani Open Loop Pumped Storage Project (1000 MW) in an area of 231 Ha located at Village Chhatauna, Parsa Pani, Sorha Khurd etc, Sub District Kota, District Bilaspur, Chhattisgarh by M/s Hinduja Renewables Energy Private Limited.

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

The EAC noted that the total land required for the proposed project is about 231 Hectares, which includes 178 Hectares of forest land and 53 Hectares of private land. However, it was observed that the application for Stage-I Forest Clearance (FC) has not yet been submitted, which necessitates further action from the Project Proponent.

The Project Proponent indicated that there is no Protected Area in the vicinity of the proposed project. Achanakmar is about 15.0 km far from the proposed project area. River/ water body, Water will be pumped from Arpa River.

The EAC further noted that the proposed PSP will require 9.70 Mm^3 of water for initial filling. The annual water requirement of approximately 1.30 Mm^3, to compensate for evaporation losses, is proposed to be met by pumping water from the proposed intake located across the Arpa River.

During its deliberations, as informed by the Project Proponent the EAC observed that the upper dam is proposed to be located on the hilltop and the lower dam is proposed to be located across a non-perennial nallah draining into Sat nallah, which is also a non-perennial nallah draining into Arpa River.

The EAC opined that the lower reservoir is located across a non-perennial nallah draining into Sat nallah, accordingly, the project should be classified as an Open Loop project, rather than a Closed Loop project.

28.3.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Open Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Parsapani Open Loop Pumped Storage Project (1000 MW) in an area of 231 Ha located at Village Chhatauna, Parsa Pani, Sorha Khurd etc, Sub District Kota, District Bilaspur, Chhattisgarh by M/s Hinduja Renewables Energy Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

3.3.5. Recommendation of EAC

Recommended

3.3.6. Details of Terms of Reference

3.3.6.1. Specific

Miscellaneous	
1.	Both capital and recurring expenditure under EMP shall be submitted.
2.	Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.
3.	The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.

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

	Notification, 2006 and as amended from time to time. A comparative chart of issues raised by General Public during Public Hearing and commitments made by the Project Proponent will be prepared and submitted in the relevant chapter of EIA/EMP report.
3.	PP shall submit the credible documents to show the status of land acquisition w.r.t project site from/through the concerned State Government as required under Ministry's OM dated 7th October, 2014 for the project land to be acquired.
4.	Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land (if any) shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. Budget earmarked for R&R, CSR shall not be included in the cost of EMP.
Environmental Management and Biodiversity Conservation:	
1.	PP shall submit the Water Utilization Mapping within a 10 km radius of the project for examining the impacts on sustainability of ecosystem of the region after withdrawal of water for proposed project.
2.	Action plan for survival or diversion of the non-perennial nallah draining into Sat nallah shall be submitted after consultation with NIH, Rurkee.
3.	Detailed action plan for large scale plantation of native species of plant sapling within 10 km radius of the project shall be prepared in consultation with State Forest Department.
4.	Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 178 ha of forest land involved in the project shall be submitted within stipulated time.
5.	Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area.
6.	Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.
7.	PP shall submit the detailed plan for filling the reservoir from the Arpa River along with necessary approval form water resource department. Necessary clearance/ approval for interstate issues/ water availability/water sharing issues shall be obtained.
8.	Transportation Plan for transporting construction materials shall be submitted.
9.	Environmental Cost Benefit Analysis shall be done in terms of loss of Forest ecosystem due to diversion of Forest land/loss of biodiversity, water availability, water uses for generation of hydro power and Ecological flows.
10.	The baseline data collection will cover the changes in biological and ecological profile of the region after monsoon with worst-case scenario study and critical mineral assessment.
11.	Calculation and values of GHGs (CO2, CH4 etc.) emissions during construction and during operation till the life of the project shall be estimated and submitted.

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

3.3.6.2. Standard

1(c)	**River Valley/Irrigation projects**
Scope of EIA Study	
1.	The EIA Report should identify the relevant environmental concerns and focus on potential impacts that may change due to the construction of proposed project. Based on the baseline data collected for three (3) seasons (Pre-monsoon, Monsoon and Winter seasons), the status of the existing environment in the area and capacity to bear the impact on this should be analysed. Based on this analysis, the mitigation measures for minimizing the impact shall be suggested in the EIA/EMP study.

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

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

	(Protection) Act, 1972 and those listed in the red data books (BSI, ZSI and IUCN).
Components of the EIA Study: Various aspects to be studied and provided in the EIA/EMP report are as follow s:	
1.	null
2.	null
3.	Physical geography, Topography, Regional Geological aspects and structure of the Catchment.
4.	Tectonics, seismicity and history of past earthquakes in the area. A site specific study of the earthquake parameters will be done. The results of the site specific earthquake design shall be sent for approval of the NCSDP (National Committee of Seismic Design Parameters, Central water Commission, New Delhi for large dams.
5.	Landslide zone or area prone to landslide existing in the study area should be examined.
6.	Presence of important economic mineral deposit, if any.
7.	Justification for location & execution of the project in relation to structural components (dam /barrage height).
8.	Impact of project on geological environment.
9.	null
10.	Meteorology (viz. Temperature, Relative humidity, wind speed/direction etc.) to be collected from nearest IMD station.
11.	Ambient Air Quality with parameters viz. Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM) i.e. suspended particulate materials < 10 microns, Sulphur dioxide (SO2) and Oxides of Nitrogen (NOX) in the study area at 5-6 Locations.
12.	Existing Noise Levels and traffic density in the study area at 5-6 Locations.
13.	null
14.	Soil classification, physical parameters (viz., texture, Porosity, Bulk Density and water holding capacity) and chemical parameters (viz. pH, electrical conductivity, magnesium, calcium, total alkalinity, chlorides, sodium, potassium, organic carbon, available potassium, available phosphorus, SAR, nitrogen and salinity, etc.) at @ one sample/ha of command area.
15.	null
16.	(i) Generation of thematic maps viz, slope map, drainage map, soil map, land use and land cover map, etc. Based on these, thematic maps, an erosion intensity map should be prepared.
17.	null
18.	History of the ground water table fluctuation in the study area.

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

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

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

2.	Changes in ambient and ground level concentrations due to total emissions from point, line and area sources.
3.	Effect on soil, material, vegetation and human health.
4.	Impact of emissions from DG set used for power during the construction, if any, on air environment.
5.	Pollution due to fuel combustion in equipments and vehicles
6.	Fugitive emissions from various sources
7.	Changes in surface and ground water quality
8.	Steps to develop pisci-culture and recreational facilities
9.	Changes in hydraulic regime and downstream flow.
10.	Water pollution due to disposal of sewage
11.	Water pollution from labour colonies/ camps and washing equipment.
12.	Adverse impact on land stability, catchment of soil erosion, reservoir sedimentation and spring flow (if any) (a) due to considerable road construction / widening activity (b) interference of reservoir with the inflowing stream (c) blasting for commissioning of HRT, TRT and some other structures.
13.	Changes in land use / land cover and drainage pattern
14.	Immigration of labour population
15.	Quarrying operation and muck disposal
16.	Changes in land quality including effects of waste disposal
17.	River bank and their stability
18.	Impact due to submergence.
19.	Impact on forests, flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc.
20.	Pressure on existing natural resources
21.	Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors
22.	Compensatory afforestation-identification of suitable native tree species for compensatory afforestation and green belt.

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

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

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

3.4. Agenda Item No 4:

3.4.1. Details of the proposal

Upper Kolab Pumped Storage Project (4x150 MW) 600 MW in District Koraput, Odisha by **ODISHA HYDRO POWER CORPORATION LIMITED** located at **KORAPUT,ODISHA**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/OR/RIV/525661/2025	J-12011/15/2025-IA.I (R)	27/03/2025	River Valley/Irrigation projects (1(c))

3.4.2. Project Salient Features

28.4.1 The proposal is for grant of Terms of References (ToR) to the project for Upper Kolab Open Loop Pumped Storage Project (4x150 MW) 600 MW in an area of 162 Ha located at Village Karnga, Daurapadar, Padmapur, etc, Sub District Koraput and Jeypore, District Koraput, Odisha by M/s Odisha Hydro Power Corporation Limited.

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

i. Upper Kolab Pump storage scheme is located near Jeypore town in Koraput district of Odisha with a proposed installed capacity of 600 MW (4 x 150 MW). It aims to utilize the existing Upper Kolab reservoir as an upper reservoir for proposed pump storage scheme after meeting irrigation, drinking water and existing Upper Kolab Hydro Electric plant demands of water.

ii. The proposed lower reservoir is to be constructed on the left side of Satiguda reservoir is to be used as lower storage reservoir. The proposed scheme envisaged to utilize the water of Upper Kolab reservoir for power generation. This water released after power generation shall be stored in proposed lower reservoir.

iii. The water stored in this proposed lower reservoir shall be pumped back (recycled) to Upper Kolab reservoir during non-peak hours. This closed loop cycle shall be repeated again and again. This shall be carried out by installing new additional reversible Francis turbines which work both ways for hydro-power generation as well as pumping back the water back to Upper Kolab reservoir.

iv. **Upper Reservoir:** The existing Kolab Reservoir having a gravity dam 54.5 m high, with live storage

capacity of 935 MCM will be utilized as Upper Reservoir. No modifications are proposed in the existing Upper Kolab reservoir and as such, no modifications in the operating levels and existing structures are needed/ proposed. The location of existing upper Kolab reservoir (near Upper Kolab Dam) is 18°47'18''N and 82°36'2''E. 3.2.

v. **Lower Reservoir:** A lower reservoir has been proposed at 18°49'41.29''N and 82°34'24.58''E on the left side of Satiguda pond near the villages. The Gross storage capacity of this proposed lower reservoir is 7.18 MCM. Tentative cost of Upper Kolab Pumped Storage Project (600MW) will around 2882.33 crores Rupees which is based on the average per MW cost worked out for different Pumped Storage Project.

vi. **Land requirement: Private land:** 47.2 ha

Government/ Forest land: 114.8 ha

Submergence/ Reservoir Area: Upper Reservoir-Existing
Lower Reservoir-77.8 ha

Project Components: 84.2 ha

The Upper Reservoir for the proposed project is to be utilized from the existing Upper Kolab Reservoir and only the Lower Reservoir is to be evolved for further studies. Therefore the boundary condition is well defined for the layout study. As Kolab River is turning towards left side of its flow, just after the Kolab dam, it was a constraint to envisage the possibilities of pumped storage project on left side of Kolab dam. Therefore alternatives located on the right side have been studied.

Alternative 1: This alternate layout has been examined and is not found suitable based on the non-availability of adequate rock cover over most of the length of head race tunnel and the intake location being in close proximity to the dam spillway which is approximately 100m.

Alternative 2: This alternative layout examined, has been located on the right side of existing Hydro Electric Project. The approximate length of this water conductor system is 5.5 km. The entire underground water conductor system is through adequate rock cover reaches which is preferable. This alternative is found to be suitable as being sufficiently away from the existing power intake as well as the dam spillway. Although the location of the lower reservoir area is coming over the local inhabitation consisting of residential units, agriculture land & a road towards Jeypore. Due to this, alternative-2 is not considered as this requires Rehabilitation and Resettlement issues.

Alternative 3: This layout is proposed at a safe distance from the existing alignment of the under operation scheme. The alignment of the water passage appears to be suitable for the underground components because of availability of sufficient rock cover on the top as well as laterally. The head race tunnel is though aligned through adequate rock cover zone but is still encountering low rock covers in one/two reaches. The use of RCC /steel lining may have to be envisaged. The power intake is proposed to be located mid-way between the existing intake for the under operation HE project as well as the dam spillway located at a distance of around 500 meters on either side. The availability of area and adequate location for the lower reservoir also exists near and to the left side of the Satiguda Reservoir. Due to this alternative is considered as final Layout Plan.

In view of the above, the only possible layout is Alternative-3 and has been studied in details for preparation of a dependable Detailed Project Report (DPR)

1. **Project details**

Name of the Proposal	UPPER KOLAB PUMPED STORAGE PROJECT, ODISHA
Location (Including coordinates)	Distt. Koraput, Odisha 18° 48' 52.30"N and 82° 42' 47.96"
Inter- state issue involved	Nil
Seismic zone	II zone

2. **Category details**

Category of the project	Category A
Provisions	Yes
Capacity / Cultural command area (CCA)	4x150 MW= 600 MW

Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	-

3. **Electricity generation capacity**

Powerhouse Installed Capacity	4x150 MW= 600 MW
Generation of Electricity Annually	1308.52 GWh
No. of Units	4 Nos
Additional information (if any)	-

4. **ToR/EC Details**

Cost of project	2882.33 Cr
Total area of Project	152 Ha.
Height of Dam from River Bed (EL)	8 m
Length of Tunnel/Channel	3677.45 m
Details of Submergence area	Upper Reservoir –Existing Lower Reservoir -77.8 ha
Types of Waste and quantity of generation during construction/ Operation	19.8 lakh m^3
E-Flows for the Project	As per Norms of MoEF & CC
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.	a) Not Applicable b) For 90% dependable year •Monsoon Season-30% of average flow •Non-Monsoon, Non Lean Season – 25% of average flow Lean Season – 20% of average flow

5. **Muck Management Details**

No. of proposed disposal area/(type of land-Forest/Pvt. land)	5
Muck Management Plan	To be prepared as part of CEIA Studies
Monitoring mechanism for Muck Disposal	Muck disposal sites shall be monitored on a monthly basis

6. **Land Area Breakup**

Private land	47.2
Government land/Forest Land	114.8 ha
Submergence area/Reservoir area	Upper Reservoir –Existing Lower Reservoir -77.8 ha

Land required for project component	84.2 ha 103 ha
Additional information (if any)	- -

7. **Presence of Environmentally Sensitive areas in the study area**

Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/No	**Details of Certificate/ letter/Remarks**
Reserve Forest/Protected Forest Land	Yes	Ghataghumara Reserved Forest
National Park	No	
Wildlife Sanctuary	No	

8. **Court case detail**

Court Case	NA
Additional information (if any)	-

9. Previous EC compliance and necessary approvals

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	NA
Status of Stage- I FC	Under Process
Additional detail (If any)	-
Is FRA (2006) done for FC-I	No

12. Miscellaneous

Particulars	**Details**
Details of consultant	WAPCOS Limited
Project Benefits	Energy generation of 1308.52 GWh in 90% dependable flow Employment during project construction and operation phases
Status of other statutory clearances	Under Process
R&R details	R&R plan will be prepared as per the norms of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (RFCTLARR Act, 2013). The same shall be prepared as part of CEIA studies.
Additional detail (If any)	-

3.4.3. Deliberations by the committee in previous meetings

N/A

3.4.4. Deliberations by the EAC in current meetings

28.4.3 The EAC during deliberations noted the following:

The Expert Appraisal Committee (EAC) deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Upper Kolab Open Loop Pumped Storage Project (4x150 MW) 600 MW in an area of 162 Ha located at Village Karnga, Daurapadar, Padmapur, etc, Sub District Koraput and Jeypore, District Koraput, Odisha by M/s Odisha Hydro Power Corporation Limited.

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

The EAC noted that the there is an existing Upper Kolab hydro power plant (320 MW) has a surface power house with four units of Francis turbine of 80 MW each. Irrigation is provided to a CCA of 47985 ha in Jeypore, Boriguma & Kotpad tehsils of Koraput District. Water from Power House is diverted to Satiguda Barrage, which acts as a balancing reservoir. The proposed Upper Kolab Pumped Storage Project (UKPSP) envisages utilization of the water of the existing Kolab reservoir as the Upper Reservoir and a Lower Reservoir proposed on the left side of the Satiguda pond draining the existing tail race channel flows from the Upper Kolab H.E Project. There is no direct supply of irrigation from the Upper Kolab Reservoir as releases from the power channel are stored in the Satiguda pond and diverted for irrigation.

As informed by the PP the EAC observed that TOR for 320 MW Upper Kolab PSP was accorded by the EAC for River Valley projects and issued vide Letter No. J-12011/16/2019-IA-I, dated 28.02.2020. Investigations were kept on hold on account of Clearance of usage of Existing Kolab Reservoir contemplated as Upper Reservoir. Now as per MoM of first Consultation meeting held at CEA on 12.07.2023, PP has revised their capacity from 320 MW to 600 MW.

The EAC noted that overall land area required for the proposed project is approximately same it was proposed for 320 MW. The total land requirement is about 162 Hectares, which includes 114.7 Hectares of forest land and 47.1 Hectares of private land. However, it was observed that the application for Stage-I Forest Clearance (FC) has not yet been submitted, which necessitates further action from the Project Proponent. The Project Proponent indicated that there is no Protected Area in the vicinity of the proposed project. Ghataghumara Reserved Forest is present in the proposed location of the project.

The EAC further noted that the one time requirement of 7.18 MCM to fill the Lower Reservoir from Existing Upper Reservoir with Gross Storage Capacity of 1232 MCM Equivalent to 0.58% of Gross Storage Capacity of Existing Upper Reservoir.

During the deliberation the EAC observed that 10.5 Ha of forest land is required for Muck disposal site, which is not acceptable to the committee therefore it was requested to find suitable area in non-forest land and to optimize the forest land requirement in other components as well, wherever possible.

28.4.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Open Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Upper Kolab Open Loop Pumped Storage Project (4x150 MW) 600 MW in an area of 162 Ha located at Village Karnga, Daurapadar, Padmapur, etc, Sub District Koraput and Jeypore, District Koraput, Odisha by M/s Odisha Hydro Power Corporation Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

3.4.5. Recommendation of EAC

Recommended

3.4.6. Details of Terms of Reference

3.4.6.1. Specific

Miscellaneous

1.	Both capital and recurring expenditure under EMP shall be submitted.
2.	Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.
3.	The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.
4.	Drone video of project site shall be recorded and to be submitted.
5.	Undertaking need to be submitted on affidavit stating that no activities has been started on the project site.
6.	Detailed plan to restore wider roads and convert them into narrow up to 10m after construction of the project.
7.	Specific Terms of Reference (ToRs) issued by the Ministry vide Office Memorandum No. F. No. IA3-22/33/2022-IA.III dated 14.08.2023 for Pumped storage projects shall be used for preparation of EIA/ EMP reports.
8.	As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.
Disaster Management	
1.	Impact of Project activities (specially blasting and drilling) on the aquatic and terrestrial ecosystem, within study area to be studied and be incorporated in EIA/EMP report.
2.	The muck dumping sites shall be located with a distance of 100 mts from HFL. The PP shall submit the detailed action plan for transportation of muck along with monitoring mechanism of movement of muck carrying trucks.
Muck Management	
1.	Details of quantity of muck generation component wise, types of muck (Excavation in tunnels, pressure shaft and powerhouse etc.) and disposal site/ transportation to be provided.
2.	Details of muck management such as dumping sites and its locations, transportation plan along with monitoring mechanism for muck transportation, detailing the road map of project construction site/ indicating the distances from HFL, river, project construction site along with types of road etc.
3.	Safety measures for avoiding spill over muck into the riverbed/streams and its flow into the river during the high discharge/ flood or monsoon period. Prepare plan for stabilization of muck disposal sites using biological and engineering measures to ensure that muck does not roll down the slopes and shall be disposed safely and that it does not pollute the natural streams and water bodies in surrounding area.

4.	Restoration plan for construction area including dumping site of excavated materials by levelling, filling up of burrow pits, landscaping etc.
Socio-economic Study	
1.	Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
2.	All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. A comparative chart of issues raised by General Public during Public Hearing and commitments made by the Project Proponent will be prepared and submitted in the relevant chapter of EIA/EMP report.
3.	PP shall submit the credible documents to show the status of land acquisition w.r.t project site from/through the concerned State Government as required under Ministry's OM dated 7th October, 2014 for the project land to be acquired.
4.	Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land (if any) shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. Budget earmarked for R&R, CSR shall not be included in the cost of EMP.
Environmental Management and Biodiversity Conservation:	
1.	Detailed action plan for large scale plantation of native species of plant sapling within 10 km radius of the project shall be prepared in consultation with State Forest Department.
2.	Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 114.7 ha of forest land involved in the project shall be submitted within stipulated time.
3.	Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area. Rock quarrying and Borrow area shall be located in non-forest area as well, if not able to relocate the area proper justification shall be provided.
4.	Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.
5.	Necessary clearance/ approval for interstate issues/ water availability/water sharing issues shall be obtained.
6.	Transportation Plan for transporting construction materials shall be submitted.
7.	Environmental Cost Benefit Analysis shall be done in terms of loss of Forest ecosystem due to diversion of Forest land/loss of biodiversity, water availability, water uses for generation of hydro power and Ecological flows.
8.	The baseline data collection will cover the changes in biological and ecological profile of the region after monsoon with worst-case scenario study and critical mineral assessment.
9.	Calculation and values of GHGs (CO2, CH4 etc.) emissions during construction and during

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

3.4.6.2. Standard

1(c)	**River Valley/Irrigation projects**
Scope of EIA Study	
1.	The EIA Report should identify the relevant environmental concerns and focus on potential impacts that may change due to the construction of proposed project. Based on the baseline data collected for three (3) seasons (Pre-monsoon, Monsoon and Winter seasons), the status of the existing environment in the area and capacity to bear the impact on this should be analysed. Based on this analysis, the mitigation measures for minimizing the impact

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

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

4.	The R.E.T. species referred to in this point should include species listed in Schedule I and II of Wildlife (Protection) Act, 1972 and those listed in the red data books (BSI, ZSI and IUCN).
Components of the EIA Study: Various aspects to be studied and provided in the EIA/EMP report are as 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
24.	Impact on breeding and nesting grounds of animals and fish.
25.	Impact on local community including demographic profile.
26.	Impact on socio-economic status
27.	Impact on economic status.
28.	Impact on human health due to water / vector borne disease
29.	Impact on increase traffic
30.	Impact on Holy Places and Tourism
31.	Impacts of blasting activity during project construction which generally destabilize the land mass and leads to landslides, damage to properties and drying up of natural springs and cause noise population will be studies. Proper record shall be maintained of the baseline information in the post project period.
32.	Positive and negative impacts likely to be accrued due to the project are listed.
Environmental Management Plan	
1.	null
2.	Biodiversity and Wildlife Conservation and Management Plan for the conservation and preservation of rare, endangered or endemic floral/faunal species or some National Park/Sanctuary/ Biosphere Reserve or other protected area is going to get affected directly or indirectly by construction of the project, then suitable conservation measures should be prepared in consultation with the State Forest Department and with the physical and financial details. Suitable conservation techniques (in-situ/ ex-situ) will be proposed under the plan and the areas where such conservation is proposed will be marked on a project layout map.
3.	Compensatory Afforestation shall be prepared by the State Forest Department in lieu of the forest land proposed to be diverted for construction of the project as per the Forest (Conservation) Act, 1980. Choice of plants for afforestation should include native and RET species, if any. This will be a part of the forest clearance proposal.
4.	Fisheries Conservation and Management Plan - a specific fisheries management measures should be prepared for river and reservoir. If the construction of fish ladder/ fish-way etc. is not feasible then measures for reservoir fisheries will be proposed. The plan will detail out the number of hatcheries, nurseries, rearing ponds etc. proposed under the plan with proper drawings. If any migratory fish species is getting affected then the migratory routes, time/season of upstream and downstream migration, spawning grounds etc will be discussed in details.
5.	Green Belt Development Plan along the periphery of the reservoir, approach roads around the colonies and other project components, local plant species must be suggested with physical and financial details. A layout map showing the proposed sites for developing the green belt should be prepared.
6.	Environmental Monitoring Programme to monitor the mitigatory measures implemented at the project site is

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

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

3.5. Agenda Item No 5:

3.5.1. Details of the proposal

Development of 1000 MW (4x250 MW) Upper Bhavani Pumped Storage Project by **NTPC TAMILNADU ENER GY COMPANY LIMTIED** located at **THE NILGIRIS,TAMIL NADU**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/TN/RIV/519675/2025	J-12011/08/2025-IA.I (R)	22/01/2025	River Valley/Irrigation projects (1(c))

3.5.2. Project Salient Features

28.5.1: The proposal is for grant of Terms of References (ToR) to the project for Upper Bhavani Open loop Pumped Storage Project (1000 MW) in an area of 167.85 Ha located at Village Mulligur, Sub District Kundah, District The Nilgiris, Tamil Nadu by M/s NTPC Tamilnadu Energy Company Limited.

The EAC considered the proposal in its 24th meeting held on 14.02.2025 wherein the EAC deferred the proposal inter-alia with following observation:

"…..*The EAC expressed serious concerns regarding the ecological and environmental sensitivity of the region, emphasizing that it forms part of the Western Ghats, a globally recognized biodiversity hotspot. Given the area's rich biodiversity, fragile ecosystems, and critical environmental significance, the committee stressed the necessity of conducting comprehensive environmental assessments and implementing robust mitigation measures to minimize potential adverse impacts.*

Additionally, the EAC noted that a substantial portion of the forestland requirement is attributed to transmission lines in addition to the core project components. Considering these factors, the committee recommended that the PP be asked to find out alternative sites considering that the present location is within 1 km of Mukurthi National Park in Nilgiri Hills….."

Accordingly, the PP submitted the report on alternative site analysis vide ADS reply dated 27.03.2025 on Parivesh Portal.

24.3.2: The Project Proponent and the accredited Consultant M/s. Voyants Solutions Private Limited, made a detailed presentation on the salient features of the project and informed that:

i. The Upper Bhavani PSP is in the Nilgiris district, the North-western part of Tamil Nadu State. The project is proposed to be developed as Pumped Storage Plant by M/s NTPC Tamilnadu Energy Company Limited (NTECL), a joint venture

company of NTPC Ltd. and Tamilnadu Generation And Distribution Corporation Limited (TANGEDCO).

ii. The Upper Bhavani PSP area is located between latitude 11°15'00" to 11°20'00" and Longitude 76°32'30" to 76° 37'30". The project location falls in Kundah Reserved Forest of the Nilgiris District.

iii. Upper Bhavani Pumped Storage Project envisages generation of power by utilizing waters of the existing reservoirs of the Upper Bhavani dam and Avalanche-Emerald reservoir system (as the lower reservoir) operating under a head of approx. 291.81 m to generate 1000MW power. Both the reservoirs shall be connected through an underground water conductor system comprising of Head Race Tunnel, Surge-shaft, steel-lined Pressure-Shafts, an Underground Powerhouse with Transformer Cavern and Tail Race Tunnel. The Underground Powerhouse House contains four fixed speed reversible Pump-Turbines along with the Generator-Motor assembly, unit step up transformers, and other appurtenant equipment. The scheme of operation considered for the project envisages daily generation of 6 hours to meet the grid demand.

iv. Upper Bhavani PSP comprises an existing upper Bhavani reservoir (As upper reservoir) and the existing Avalanche reservoir (As lower reservoir). There will be no additional submergence of land in the proposed Pumped Storage Project as both the reservoirs already exist. Land shall be required for the construction of powerhouse complex and other appurtenant structures.

v. The Upper Bhavani Pumped Storage Project envisages construction of:

a. Surface Works

Upper Intake

TRT Outfall /Lower Intake

b. Under Ground Works

HRT & Pressure shaft (steel lined)

Upstream Surge Shaft

Underground Powerhouse and Transformer Cavern/GIS

Downstream Surge Shaft

Tailrace Tunnel

Main Access Tunnel and other Adits

vi. **Land requirement:**

Total land requirement for the project is 167.85 ha of which 56.35 ha is forest land while 111.50 ha is non-forest land.

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

Total population of the study area is 46,307 comprising of Males 22,335 (48.23%) and Females 23972 (51.77%) females with 3.35 person's average household size. Out of total population 16,830 (36.34%) is scheduled caste and 421 (1.13%) is schedule tribes.

viii. **Water requirement:** During Construction: 200 KLD; During Operation, Domestic: 40 KLD and non-consumptive: 9 MCM. Consent for utilisation of 9 MCM water received from concerned authority vide letter dated 29.01.2025.

ix. **Project Cost**: The preliminary cost estimate of the project has been prepared as per guidelines of CEA/CWC. The total project cost has been estimated at 5005.52 Crore for year 2023-24 price level.

x. **Project Benefit:** During construction permanent employment will be 70 persons and temporary employment through contractors: 1140 persons.

xi. **Environmental Sensitive area:** There is 1 National park (Mukurthi National Park) within 10 km distance from the project site. No wildlife sanctuaries, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site. Upper Bhavani River is flowing near to the project site.

xii. **MoU / any other clearance/ permission signed with State government:** In-Principle approval accorded by Govt. of Tamil Nadu for one Pumped Storage Hydro Electric Project (Upper Bhavani PSP 1000 MW) to NTECL for development in the State of Tamil Nadu vide G.O. (Ms.) No. 33, Energy (B1) Development dated: 11.03.2024.

xiii. **Alternative Studies:**

Various layout options were studied in the proposed area considering the topography, geological features and environment aspects, which led to the following six alternatives:

Alternative 1: Straight Water Conductor System Alignment

This alignment proposed a direct connection between the Upper Bhavani Dam and the Avalanche Reservoir, minimizing the water conductor system length to approximately 5.3 km. A key advantage was the relatively shorter construction time and lower overall land requirement. However, the approach required long channels inside the reservoir, leading to increased construction complexity. Geological challenges, such as seepage risks, were significant, threatening the stability of underground structures. Additionally, the alignment would generate approximately 45 lakh m³ of muck, requiring extensive disposal measures. The estimated cost of Rs. 200 crore for muck removal, coupled with potential environmental disruption near Mukurthi National Park, rendered this alternative unsuitable.

Alternative 2: Extended Alignment for Year-Round Water Availability (Selected Site)

This option positioned the intakes strategically to ensure year-round water availability, making it the most viable alternative. With a water conductor system length of 7.68 km, it provided stable geological conditions and minimized environmental impact by keeping most components underground. Additionally, it required the least amount of forest land (56.35 ha), avoiding sensitive Shola forests and resettlement concerns. While being close to Mukurthi National Park (within 1 km), mitigation measures such as a Wildlife Conservation Plan could minimize ecological disturbances. The overall balance of technical feasibility, environmental protection, and cost-effectiveness made this the preferred site.

Alternative 3: Alignment with Lower Intake Shifted Near Avalanche Dam

This alternative involved an 8.8 km-long water conductor system with the lower intake positioned closer to the Avalanche Dam. The proximity to an existing village posed resettlement and rehabilitation (R&R) challenges, particularly for the Toda tribal community. Additionally, the alignment crossed through Shola forests, increasing the ecological footprint of the project. The longer pressure shaft and increased head loss reduced energy efficiency while raising construction costs. Although water availability was stable, the environmental and social costs outweighed the benefits, leading to the rejection of this alternative.

Alternative 4: Upper Intake Shifted Towards the East

By shifting the upper intake 0.8 km northeast within the Upper Bhavani Reservoir, this alternative slightly increased the distance from Mukurthi National Park (1.61 km). This helped create a minor environmental buffer but introduced major construction difficulties. The plan required a 1.5 km additional channel inside the reservoir, generating 64 lakh m³ of muck, which would need extensive land for disposal. The increased excavation would also raise project costs significantly. The necessity of building dikes to keep the reservoir sections dry during construction added further complexity. Given these challenges, the alternative was deemed infeasible.

Alternative 5: New Upper Reservoir by Hill Cutting and Embankment (NE of Upper Bhavani)

This proposal aimed to create a new reservoir at an elevation of 2550 meters, offering potential for 2000 MW power generation. However, the environmental impact was substantial, requiring 81 ha of forest land diversion, including 34 ha for the reservoir alone. Hill cutting for excavation would generate 68 lakh m³ of muck, posing logistical and environmental challenges. Water availability remained a concern, as the new reservoir's bed level was high, leading to unreliable storage. Additionally, extensive infrastructure, such as approach roads and muck disposal sites, would be needed, increasing costs and environmental strain. The severe ecological consequences led to the rejection of this alternative.

Alternative 6: New Upper Reservoir in the Southwest of Upper Bhavani

Positioned 2.7 km from Mukurthi National Park, this alternative involved the construction of an artificial reservoir with a 360-meter-long dam. It provided a slight increase in environmental buffer but required 114 ha of forest land, making it the most environmentally invasive option. The plan also included a new road network, increasing tree felling and habitat loss in the Western Ghats. Procuring suitable earth materials for embankment construction presented additional challenges, either requiring further deforestation or costly transportation from outside the project area. Given the large-scale deforestation, ecosystem disruption, and high costs, this alternative was deemed unviable.

xiv. **Details of Solid waste/ Hazardous waste generation/ Muck and its management.** About 54.00 TPA and 14.6TPA Municipal Solid Waste will be generated during construction and operation of project. This shall be managed as per new Solid Wastes Management Rules, 2016. The municipal solid waste generated in the project complex/ project colony/ labour colony, shall be managed and handled in accordance with the duties set forth under clause 4 (1) through 4(3) and clause 20 of the rules. Detailed Solid Waste Management Plan shall be evolved while formulating EMP.

About 53.81 lakh cubic meter muck shall be generated from excavation during construction. It is assumed that 50% of the generated quantity shall be reused and the balance is proposed to be disposed in 2 designated sites which shall be developed from below the ground level by providing hard engineering measures such as retaining structures, crate walls and gabions. Garland drains shall be laid all along outer periphery of the muck

piles for carrying rainwater. Detailed Muck Management Plan shall be evolved while formulating EMP.

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

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

1. EAC Meeting Details:

EAC meeting/s	28th EAC Meeting
Date of Meeting/s	15.04.2025
Date of earlier EAC meetings	24th EAC Meeting held on 14.02.2025

2. Project Details:

Name of the Proposal	Development of 1000 MW (4x250 MW) Upper Bhavani Pumped Storage Project
Location (Including coordinates)	The project is proposed near village Mulligur and Avilanji, Sub district Kundah, district Nilgiri in Tamil Nadu. It is located between latitude 11°15’00” to 11°20’00” and Longitude 76°32’30” to 76° 37’30”.
Inter- state issue involved	No
Seismic zone	Seismic zone III: Moderate risk zone

3. Category Details:

Category of the project	A
Provisions	Project activity is covered at S. No. 1(c)(i) Hydro Projects (PSP) EIA Notification 14th September 2006 and amendments thereof
Capacity / Cultural command area (CCA)	1000 MW/6000 MWH pumped storage component with 6.0 hours storage capacity for peak power generation. Power required for 6.58 hours pumping operation for backfilling of upper reservoir of PSP shall be about 1100 MW.
Attracts the General Conditions (Yes/No)	Yes, Project is located within the default 10km ESZ of Mukurthi National Park.
Additional information (if any)	None

4. Electricity Generation Capacity:

Powerhouse Installed Capacity	1000MW
Generation of Electricity Annually	2080.50 MU
No. of Units	4 Nos. (4X250 MW)
Additional information (if any)	The project with installed capacity of 1000 MW (4x250 MW) by utilizing a design discharge of 97.76 cum

	ec per unit with net head of 286.40m for 6.0 hour pea king hour daily will annually generate 2080 MU at 9 0% plant availability. The PSP will utilize 1100 MW to pump 82.15 cumec per unit from lower reservoir (Avalanch) to the upper reservoir (Upper Bhavani) in 6.58 hours. The annual pumping energy required shal l be 2507.87 MU. The cycle efficiency of the PSP wo rks out to be about 82.96%.

5. ToR/EC Details:

Cost of project	INR 5005.52 Crore
Total area of Project	167.85 Ha
Height of Dam from River Bed (EL)	No new dams will be constructed, as the existing Up per Bhavani Dam (Height 80m; Gross Storage: 97.04 MCM) proposed as upper reservoir and the existing Avalanche Dam (Height 57m; Gross Storage: 149.57 MCM) serves as the lower reservoir for the PSP.
Length of Tunnel/Channel	14069 m
Details of Submergence area	Nil, as upper and lower reservoir exists, and no new s ubmergence is proposed.
Types of Waste and quantity of generation during co nstruction/ Operation	MSW During construction:54.00 TPA During operation: 14.60 TPA
E-Flows for the Project	Not Applicable
Is Projects earlier studies in Cumulative Impact Asse ssment & 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 sustainin g river ecosystem	No Not Applicable Not Applicable

6. Muck Management Details:

No. of proposed disposal area/(type of land-Forest/Pvt. land)	Total area of 42 ha has been proposed for dumping of muck at two designated muck disposal sites (Non-Fo rest land: 42 ha)
Muck Management Plan	Muck disposal sites shall be developed by providing hard engineering measures such as retaining structure s, crate walls and gabions. Garland drains shall be lai d all along outer periphery of the muck piles for carry ing rainwater. The muck shall be laid with vertical angle not exceed ing 28° in such a manner that rock mass is properly st acked behind the wall with minimum of voids. The muck pile shall be later covered with Geo-coir te xtile properly held to the ground by steel wire U-nail s and rehabilitated by afforestation of herbs and shru

	bs. Geo-coir textile shall also be provided on surface of muck piles where top surface is to be vegetated. D etailed Muck Management Plan shall be prepared alo ng with other EMP.
Monitoring mechanism for Muck Disposal	The project authorities shall erect a barrier to regulate the traffic flow to and fro the muck piles site. Entry o f all vehicles passing the barrier and the information r egarding quantities of muck being transported shall b e properly arrayed in a register in a transparent mann er. Adequate measures shall be undertaken as per the norms.

7. Land Area Breakup:

Private land	111.50 ha
Government land/Forest Land	0.00/56.35 ha
Submergence area/Reservoir area	0.00
Land required for project components	56.35 ha
Additional information (if any)	Non-forest land, i.e., 111.50 ha will be primarily take n from TANGEDCO and balance, if required, will be acquired from private owners.

8. Presence of Environmentally Sensitive Areas in the Study Area:

Forest Land/ Protected Area/ Environmen tal Sensitivity Zone	Yes/No	Details of Certificate/ letter/Remark s
Reserve Forest/Protected Forest Land	Yes	Mukurthi National Park is situated wit hin 1 km from the project site. Nation al park is located on Western side of e xisting Upper Bhavani reservoir and p roposed project is on Eastern side of t he reservoir.
National Park	Yes	
Wildlife Sanctuary	No	

9. Court Case Details:

Court Case	None
Additional in	None

formation (if any)	

10. 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 for diversion of forest land is under preparation.
Additional detail (If any)	None
Is FRA (2006) done for FC-I	Not yet

11. Miscellaneous:

Particulars	**Details**
Details of consultant	Voyants Solutions Private Limited QCI-NABET Certificate No. NABET/EIA/2225/SA 0229
Project Benefits	The project would generate designed energy 2080.50 MU during peaking hours. It will help in balancing grid for demand driven variations as well as balancing generation driven variations besides providing voltage support and grid stability. Apart from this, it will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.
Status of other statutory clearances	The mandatory statutory clearance like approval of power potential studies from CEA, site specific earthquake design parameters to be approved by NCSDP, Geological report approval from GSI, DPR approval from CWC and CEA; Forest clearance for diversion of forest land, are yet to be sought.
R&R details	Will be provided in EIA/EMP report
Additional detail (If any)	None

3.5.3. Deliberations by the committee in previous meetings

Date of EAC 1 :14/02/2025

Deliberations of EAC 1 :

24.3.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Upper Bhavani Open loop Pumped Storage Project (1000 MW) in an area of 167.85 Ha located at Village Mulligur, Sub District Kundah, District The Nilgiris, Tamil Nadu by M/s NTPC Tamilnadu Energy Company Limited.

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

The EAC observed that though upper reservoir and lower reservoir are existing reservoirs of the Upper Bhavani dam and Avalanche-Emerald reservoir system respectively, but the project is located in the Nilgiris district, which is an ecological hotspot rich in diverse vegetation and wildlife, including elephants, tigers, and other species. Additionally, Mukurthi National Park is situated within 1 km of the project site, further raising concerns about potential ecological and environmental impacts.

The EAC expressed serious concerns regarding the ecological and environmental sensitivity of the region, emphasizing that it forms part of the Western Ghats, a globally recognized biodiversity hotspot. Given the area's rich biodiversity, fragile ecosystems, and critical environmental significance, the committee stressed the necessity of conducting comprehensive environmental assessments and implementing robust mitigation measures to minimize potential adverse impacts.

Additionally, the EAC noted that a substantial portion of the forestland requirement is attributed to transmission lines in addition to the core project components. Considering these factors, the committee recommended that the PP be asked to find out alternative sites considering that the present location is within 1 km of Mukurthi National Park in Nilgiri Hills.

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

3.5.4. Deliberations by the EAC in current meetings

28.5.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Upper Bhavani Open loop Pumped Storage Project (1000 MW) in an area of 167.85 Ha located at Village Mulligur, Sub District Kundah, District The Nilgiris, Tamil Nadu by M/s NTPC Tamilnadu Energy Company Limited.

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

The EAC observed the following in in its 24th meeting held on 14.02.2025:

- The EAC expressed serious concerns regarding the ecological and environmental sensitivity of the region, emphasizing that it forms part of the Western Ghats, a globally recognized biodiversity hotspot. Given the area's rich biodiversity, fragile ecosystems, and critical environmental significance, the committee stressed the necessity of conducting comprehensive environmental assessments and implementing robust mitigation measures to minimize potential adverse impacts.
- Additionally, the EAC noted that a substantial portion of the forestland requirement is attributed to transmission lines in addition to the core project components. Considering these factors, the committee recommended that the PP be asked to find out alternative sites considering that the present location is within 1 km of Mukurthi National Park in Nilgiri Hills.

Current Deliberations:

The EAC noted that the total land requirement for the project is 167.85 ha of which 56.35 ha is forest land while 111.50 ha is non-forest land. However, it was observed that the application for Stage-I Forest Clearance (FC) has not yet been submitted, which necessitates further action from the Project Proponent.

Further, it was noted that the alternatives studied by the PP is satisfied and alternative suggested by the PP is best site for proposed project as it site specific constraint are also applicable due existing of both lower and upper reservoir. Therefore, the EAC were satisfied with the information submitted the proponent, however, the EAC was of the view to conduct site visit by the sub-committee of the EAC to before giving recommendation to the project for Environmental Clearance.

28.5.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Open Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Upper Bhavani Open loop Pumped Storage Project (1000 MW) in an area of 167.85 Ha located at Village Mulligur, Sub District Kundah, District The Nilgiris, Tamil Nadu by M/s NTPC Tamilnadu Energy Company Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

3.5.5. Recommendation of EAC

Recommended

3.5.6. Details of Terms of Reference

3.5.6.1. Specific

Miscellaneous	
1.	Both capital and recurring expenditure under EMP shall be submitted.
2.	Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.
3.	The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.
4.	Drone video of project site shall be recorded and to be submitted.
5.	Undertaking need to be submitted on affidavit stating that no activities has been started on the project site.
6.	Detailed plan to restore wider roads and convert them into narrow up to 10m after construction of the project.
7.	Specific Terms of Reference (ToRs) issued by the Ministry vide Office Memorandum No. F. No. IA3-22/33/2022-IA.III dated 14.08.2023 for Pumped storage projects shall be used for preparation of EIA/ EMP reports.
8.	As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.
9.	Site visit shall be conducted by a sub-committee of the EAC before considering the proposal for Environmental Clearance.
Disaster Management	
1.	Impact of Project activities (specially blasting and drilling) on the aquatic and terrestrial ecosystem,

	within study area to be studied and be incorporated in EIA/EMP report.
2.	The muck dumping sites shall be located with a distance of 100 mts from HFL. The PP shall submit the detailed action plan for transportation of muck along with monitoring mechanism of movement of muck carrying trucks.
Muck Management	
1.	Details of quantity of muck generation component wise, types of muck (Excavation in tunnels, pressure shaft and powerhouse etc.) and disposal site/ transportation to be provided.
2.	Details of muck management such as dumping sites and its locations, transportation plan along with monitoring mechanism for muck transportation, detailing the road map of project construction site/ indicating the distances from HFL, river, project construction site along with types of road etc.
3.	Safety measures for avoiding spill over muck into the riverbed/streams and its flow into the river during the high discharge/ flood or monsoon period. Prepare plan for stabilization of muck disposal sites using biological and engineering measures to ensure that muck does not roll down the slopes and shall be disposed safely and that it does not pollute the natural streams and water bodies in surrounding area.
4.	Restoration plan for construction area including dumping site of excavated materials by levelling, filling up of burrow pits, landscaping etc.
Socio-economic Study	
1.	Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
2.	All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. A comparative chart of issues raised by General Public during Public Hearing and commitments made by the Project Proponent will be prepared and submitted in the relevant chapter of EIA/EMP report.
3.	PP shall submit the credible documents to show the status of land acquisition w.r.t project site from/through the concerned State Government as required under Ministry's OM dated 7th October, 2014 for the project land to be acquired.
4.	Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land (if any) shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. Budget earmarked for R&R, CSR shall not be included in the cost of EMP.
Environmental Management and Biodiversity Conservation:	
1.	In view of several under construction /commissioned projects in the vicinity of project area Cumulative Impact on the region shall be studied.
2.	PP shall submit detail plan for boring, drilling and blasting and use latest technology during construction of the project. The same shall be incorporated in EIA/EMP report.
3.	Blasting Plan shall be formed in view movement and pattern behaviour of the birds in consultation

	with reputed institution such as SACON.
4.	Continuous monitoring plan during the construction and operation of project shall be submitted and to be incorporate in EIA/EMP report.
5.	Detailed action plan for large scale plantation of native species of plant sapling within 10 km radius of the project shall be prepared in consultation with State Forest Department.
6.	Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 56.35 ha of forest land involved in the project shall be submitted within stipulated time.
7.	Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area. Rock quarrying and Borrow area shall be located in non-forest area as well.
8.	Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site. In case the project site is located within 10 KM of any Wildlife Sanctuary/National Park necessary Clearance/ permission from the Standing Committee of NBWL clearance shall be submitted.
9.	Necessary clearance/ approval for interstate issues/ water availability/water sharing issues shall be obtained.
10.	Transportation Plan for transporting construction materials shall be submitted.
11.	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.
12.	The baseline data collection will cover the changes in biological and ecological profile of the region after monsoon with worst-case scenario study and critical mineral assessment.
13.	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.
14.	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.
15.	Details of mineral zone, if any, in the study area, certified by Geological Survey of India or any other concerned Government Organization shall be submitted. The project area should not come up on any critical mineral zone, the same shall to be verified by GSI/NMDC.
16.	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.
17.	Conducting site-specific ecological study emphasizing on riverine ecology viz. fishes diversity, fish migration, habitat and aquatic biota due to construction PSP. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.

18.	Cumulative Impact of projects in the basin on carrying capacity and sustainability of Reservoir/ River /nala of catchment area due to tapping of water for filling reservoir shall be studied.
19.	Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Specific ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.
20.	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.
21.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
22.	Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Indian Council of Agriculture Research (ICAR) Institutes/ Expert Govt. institutions and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
23.	Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI.

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.
4	Economically important species like medicinal plants, timber, fuel wood etc.

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

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

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

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

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

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

4. Any Other Item(s)

N/A

5. List of Attendees

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

MINUTES OF THE 28TH MEETING (VIRTUAL) OF THE EXPERT APPRAISAL COMMITTEE FOR RIVER VALLEY AND HYDROELECTRIC PROJECTS HELD ON 15TH APRIL, 2025

The 28th meeting of the EAC for River Valley & Hydro-electric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 15th April, 2025 through Physical Mode, under the Chairmanship of Prof. G. J. Chakrapani. The list of Members present in the meeting is at **Annexure**.

Confirmation of the Minutes of the 27th EAC meeting:

The Minutes of the Meeting held on 27th EAC meeting on 27th March, 2025 were confirmed.

Agenda Item No. 28.1

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 – Environmental Clearance - reg.
[Proposal No. IA/MH/RIV/530305/2025; F. No. J-12011/16/2024-IA-I(R)]

25.1.1: The proposal is for grant of Environmental Clearance (EC) 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.

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

i. The Khadakwasla Irrigation Project comprises 4 Dams the Panshet 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). Storage capacity of four reservoirs is 29.15 TMC

Length of Existing canal	New Mutha Right Bank Canal 202 KM and Old Mutha Right Bank Canal 109 KM.
Capacity	39.63 Cumecs + 4 Cumecs
Gross Command area	117837 Ha
Culturable command Area	101688 Ha
Irrigable command Area	62146 Ha
Village Under Command	107
District	Pune (Tehsils - Haveli ,Daund , Baramati, Indapur)

ii. 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. 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.

iii. First Administrative approval received vide GOM vide letter No. K. MID/1158/J dated 10/06/1958 and subsequent amendment till 1982 and the project is compledted before 1994 in various stages. The tunnel between Khadakwasala- Dam to Fursungi is proposed substitutes for New Mutha Right Bank Canal Km 1 to 34. Total Length of this Tunnel (Tunnel+ Cut & Cover + Channel) is 26.667 Km. The outlet site is located at Fursungi village, which is about 20 km from Pune city.

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

Name of the Proposal	Proposed Khadakwasala - Fursungi Tunnel Project Substitute to New Mutha Right Bank Canal KM 1 to KM 34, Dist. Pune, Maharashtra
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

v. **Proposed Project: -**

The tunnel between Khadakwasala- Dam to Fursungi is proposed substitutes for New Mutha Right Bank Canal Km 1 to 34. Total Length of this Tunnel (Tunnel+ Cut & Cover + Channel) is 26.667 Km.

The details of Proposed tunnel are as below

Particulars	Details
Tunnel	23.450 km
Cut & Cover	2.350 km
Open Channel	0.867 km
Total Length of Project	26.667 km
Method Of Construction	Drill & Blast Method
Shape of Tunnel	Horse Shoe
No. of Shafts	06
Area to be restored from existing command Area	3471 Ha.

vi. **Status of Clearances**

Environmental Clearance: - 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. ToR Application Proposal no. IA/MH/RIV/459818/2024.

Government of Maharashtra approval: - Khadakwasala- Fursungi Tunnel Project is administratively approved by Govt of Maharashtra vide resolution GR. No. प्रमाप्र-2023/(प्र.क्र.294/2023)/सिंव्य(कामे) dated 05/09/2024.

Forest Clearance: Total area of forest affected due to project is 0.8064.

- Stage 1 Clearance granted for 0.8064 ha of forest land. vide online Proposal No. FP/MH /Minor Canal/ 460637/ 2024 dated 30/01/2025
- Stage 2 Clearance granted vide online Proposal No. FP/MH/MinorCanal/460637/2024 dated 22.03.2025

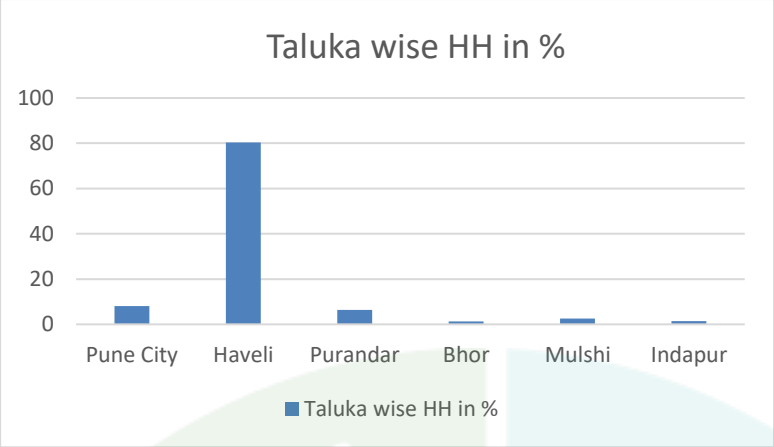
vii. **Land Requirement**

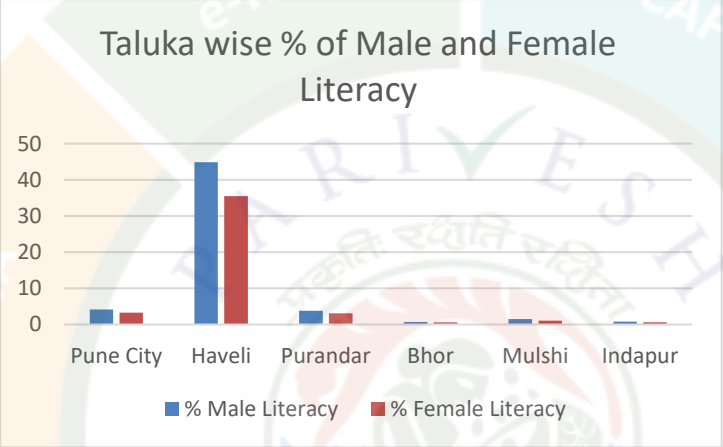
Total Land required for New Mutha Right Bank Canal Km 1 to 34 PR is 23.8364 Ha. 0.8064 Ha Forest land and Private land of around 23.03 Ha is proposed for acquisition. Land acquisition will require for tunnel shafts, , open channel and cut & cover portion. The land acquisition will be done and compensation shall be paid to land owners as per 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.

viii. **Command Area Details**

The New Mutha Right Bank Canal irrigates an extensive command area spanning four talukas in Pune District: Haveli, Baramati, Daund, and Indapur. The total Gross Command Area (GCA) is 117,837 hectares, of which 101,688 hectares fall under Culturable Command Area (CCA). The Irrigable Command Area (ICA), which is the area actually proposed for irrigation, covers 62,146 hectares. 2.18 TMC water will be saved and can be used for Irrigation and Non-Irrigation purpose. Total 3471 Ha command area will be restored due to saved water.

ix. **Demographic details in 10 km radius of project area:**





x. **Water requirement:**

Actual Discharge through Tunnel: 42.76 Cumecs (1510 Cusecs)
Water Saving: 2.18 TMC
Water (during construction stage): 200 KLD (Source: Water Tanker)

xi. **Project Cost:** The estimated project cost is Rs 2190.47 crores. Total capital cost earmarked towards environmental pollution control measures is Rs. 193.00 L and the Recurring cost (operation and maintenance) will be about Rs 160.00 L per annum

xii. **Project Benefit:** Total Employment will be 58 persons as direct & 20 persons indirect after expansion. Industry proposes to allocate Rs 1095 Lakh @ of 0.50 % towards CER (as per Ministry's OM dated 1st May 2018)

xiii. **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. However, Mayani Bird Conservation Reserve & Other sacred groves are present within 10 km radius.

Sr. No.	Name of the Grove/Wildlife Sanctuary/ESA	Tahsil	Distance	Direction
1	Ghera Sinhagad Village (ESA Western Ghat)	Haveli	3.65 km	SW
2	Rajiv Gandhi Zoological Park and Wildlife Research Center	Pune	1.65 km	N

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

Sr. No	Approvals	Amount (Lakh)	Remarks
Khadakwasala Complex			
1	Original Approval Government Resolution	1054.59	GOM vide letter No. K. MID/1158/J dated 10/06/1958
2	Revised Government Resolution	2966	GOM letter No. Khadak/1168/35567/ IP-4/ Dt.17/06/1972
3	Revised Government Resolution	3822	GOM letter No. Khadak/1104/85964/ IP-4/Dt.28/10/1974
4	Government Resolution	10858	GOM letter No. Khadak/ 1081/ 522/ (1962)MA-Dt.21/01/1982
Khadakwasla- Fursungi Tunnel Project			
5	Govt. of Maharashtra	219047	Khadakwasala- Fursungi Tunnel Project is administratively approved by Govt of Maharashtra vide resolution प्रमाप्र-2023/(प्र.क्र.294/2023)/सिंव्य(कामे) dated 05/09/2024
6	Stage 1 & 2 Clearance	0.8064 ha forest Land	❖ Stage 1 Clearance granted for 0.8064 ha of forest land. vide online Proposal No. FP/MH /Minor Canal/ 460637/ 2024 dated 30/01/2025 ❖ Stage 2 Clearance granted vide online Proposal No. FP/MH/MinorCanal/460637/2024 dated 22.03.2025

xv. **Resettlement and rehabilitation:**

Private land: 23.03 Ha is proposed for acquisition (8 villages)

- 11.71 Ha land required for tunnel shafts, approach road, open channel and cut & cover portion.
- Remaining 11.32 Ha land will be taken on rent during the construction phase.
- 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.

Details of Land Acquisition

Sr. No	Taluka	District	Particular	Village name	Gut No.
1	Haveli	Pune	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

xvi. **Scheduled –I species:**

Sr. No	Class	Scientific Name	Common Name	IWPA Status	IUCN Status
1.	Mammal	*Panthera pardus*	Leopard	Schedule - I	VU

2.	Mammal	*Hyena hyaena*	Striped Hyena	Schedule - I	LC
3.	Mammal	*Canis lupus Sykes*	Wolf	Schedule – I	LC
4.	Mammal	*Felis chaus*	Jungle cat	Schedule – I	LC
5.	Mammal	*Vulpes bengalensis*	Fox	Schedule – I	LC
6.	Mammal	*Muntiacus vaginalis*	Barking Deer	Schedule – I	LC
7.	Reptile	*Eryx johnii*	Red sand boa	Schedule – I	NT
8	Reptile	*Daboia russelli*	Russell's Viper	Schedule – I	NT
9.	Reptile	*Ptyas mucosa*	Indian Rat snake	Schedule – I	LC
10.	Reptile	*Naja naja*	Indian Cobra	Schedule – I	LC
11	Reptile	*Varanus bengalensis*	Indian monitor lizard	Schedule – I	NT
12.	Reptile	*Crocodylus palustris*	Muggar	Schedule – I	NT
13.	Bird	*Platalea leucorodia*	Eurasian Spoonbill	Schedule – I	LC
14	Bird	*Aythya ferina*	Common Poachard	Schedule – I	VU
15	Bird	*Haliastrus indius*	Brahmini Kite	Schedule – I	NT
16	Bird	*Accipter badius*	Shikra	Schedule – I	NT
17	Bird	*Hieraaetus fasciatus*	Bonellie's Eagle	Schedule - I	LC
18	Bird	*Butastur teesa*	White-eyed Buzzard	Schedule - I	LC
19	Bird	*Spilornis cheela*	Crested Serpent Eagle	Schedule – I	LC
20	Bird	*Falco tinnunculvs*	Common Kestral	Schedule – I	LC
21	Bird	*Pavo cristatus*	Indian Peafowl	Sch I & IV	LC
22	Bird	*Sterna aurantia*	River Tern	Schedule – I	VU
23	Bird	*Tyto alba*	Barn Owl	Schedule – I	LC

VU = Vulnerable; NT = Near Threatened, EN = Endangered

xvii. **Alternative Studies:**

Summary of Alternatives

Challenging area	Alt - IIA	Alt – 1	Alt – 2	Alt – 3	Alt – 4	Alt - 5

Length (km)	**26.75**	25.545	25.670	25.445	26.740	25.670
Rock cover (m)	**20-60 m Low cover for most of the stretch**	80-160 m From 3 – 16 km	20-60 m Low cover for most of the stretch	20-60 m Low cover for most of the stretch	70-200m most of stretch	80-200m most of stretch
Cut & Cover Tunnel Length (km)	**Around 3.2 km**	Around 1 km	Around 1.5 km	Around 1.75 km	Around 1 km	Around 1 km
Seepage (Lake Jambhulwadi)	**Might be high**	Might be low	Might be high	Might be high	Might be low	Might be low
Railway line	**To be taken care**					

xviii. **Baseline Environmental Scenario:**

Particulars	**Details**
Period of baseline data collection/Sampling period.	Baseline Study Period Season 1: March to May 2024 Season 2: June to August 2024 Season 3: October to December 2024
(Air, noise, water, land)	**AAQ parameters at 8 locations (min. & Max.)** • PM10 = 30.3 to 87.5 µg/m3 • PM2.5 = 12.8 to 47.5 µg/m3 • SO2 = 5.2 to 41.2 µg/m3 • NOx = 9.2 to 56.9 µg/m3. • CO = BDL **Surface water samples (4 samples)**

Parameter	**Season 1**	**Season 2**	**Season 3**
pH	7.05 to 7.83	6.58 to 7.5	7.1 to 7.95
TDS	154 to 352 mg/lit.	112 to 318 g/lit.	125 to 343 mg/lit.
Total Hardness as CaCO3	154.3 to 517 mg/lit.	169.54 to 490.12 mg/lit.	171 to 514 mg/lit.
Calcium as Ca	18.16 to 50.73 mg/lit	20.84 to 51.16 mg/lit	23.12 to 51.25 mg/lit
Magnesium as Mg	8.42 to 21.78 mg/lit	11.23 to 20.95 mg/lit	11.24 to 23.02 mg/lit

Chloride as Cl	25.73 to 54.25 mg/lit	14.18 to 44.16 mg/lit	13.49 to 42.37 mg/lit
Sulphate as SO4	8.52 to 24.12 mg/lit	7.12 to 25.02 mg/lit	10.98 to 23.37 mg/lit.
BOD	63 to 63 mg/lit	42 to 42 mg/lit	56 to 56 mg/lit
COD	27 to 110 mg/lit	18 to 60 mg/lit	32 to 135 mg/lit
DO	3.2 to 6 mg/lit	3.6 to 6.1 mg/lit	3.8 to 6.2 mg/lit
Total Coliforms	present	present	present

Ground Water samples at 36 locations

Parameters	**Season 1**	**Season 2**	**Season 3**
pH	7.15 to 7.57	7.02 to 7.67	7.2 to 7.69
Total Dissolved Solids	272 to 414 mg/lit.	264 to 420 mg/lit.	259 to 425 mg/lit.
Total Hardness as CaCO3	154.13 to 190.13 mg/lit.	123.69 to 187.16 mg/lit.	133.18 to 193.16 mg/lit.
Calcium as Ca	36.52 to 72.4 mg/lit &	40.14 to 60.12 mg/lit	43.54 to 55.84 mg/lit
Magnesium as Mg	12.24 to 26.5 mg/lit	14.15 to 29.54 mg/lit	13.25 to 27.15 mg/lit
Chloride as Cl &	28.52 to 58.83 mg/lit &	32.16 to 56.12 mg/lit	32.43 to 60.13 mg/lit
Sulphate as SO4	14.69 to 32.7 mg/lit.	16.54 to 32.64 mg/lit.	13.25 to 34.65 mg/lit.

Noise levels Leq (Day & Night) at 10 locations: The Leq values for day time was observed to be

Zone /Area	Day Time	Night Time
Residential Zone	51.2 to 68.2dB (A)	60.6 to 60.6 dB (A).
Silent Zone	51.6 to 52.2dB (A)	42.8 to 43.1 dB (A).
Commercial Zone	65.8 to 69.4dB (A	56.1 to 60.5 dB (A).

Soil Quality at 12 Locations

Parameters	**Season 1**	**Season 2**	**Season 3**

	pH	7.57 to 8.05.	7.49 to 7.99.	7.57 to 8.02.
	Conductivity	474.9 to 745.5 µs/cm.	483.7 to 727.6 µs/cm.	436.4 to 763.5 µs/cm.
	N	126.44 to 175.1 kg/ha	108.13 to 170.12 kg/ha	111.52 to 178.02 kg/ha
	P	7.58 to 13.9 kg/ha	7.32 to 13.21 kg/ha	8.05 to 14.2 kg/ha
	K	145.12 to 190.13 kg/ha	142.67 to 190.13 kg/ha	138.54 to 190.14 kg/ha
flora and fauna of the project area, aquatic ecology, etc.	Total 280 floral species were recorded in and around the project area (i.e. 10 km radius study). Among them 179 Trees, 93 shrubs, 5 Herb & 3 climbers etc. **Fauna Diversity:** • 11 mammal species, • 161 bird species, • 62 freshwater Fish species, • 16 reptile species, and • 27 RET & 23 Schedule I (IWPA 1972)			
Brief description on hydrology and water assessment as per the approved Pre-DPR:	**Actual Discharge through Tunnel:** 42.76 Cumecs (1510 Cusecs) **Water Saving:** 2.18 TMC			
Additional detail (If any)				

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

Domestic Waste:

Name of Waste	Source	Qty (TPA)
Dry Waste	Labour Colony	147.6
Wet Waste	Labour Colony	98.4

Details of Excavation Waste (Muck)

The detail of the muck likely to be disposal at low lying area adjacent to project site

Name of Waste	Source	Qty (cu.m)	Method of Disposal
Muck	Excavation	1670000	❖ 375000 cu.m shall be used for backfilling of ope channel portion. ❖ 600000 cu.m stone & aggregates shall be utilise

			for construction. ❖ Balance 695000 cu.m material shall be utilised for lo lying area and adjoining Quarry area.

xx. **Public Hearing Details:** Public Hearing for the proposed project has been conducted by the State Pollution Control Board at three districts separately.

Advertisement for PH with date	**Marathi Newspaper:** Pune: Loksatta dated 25/01/2025, A corrigendum was also published on 21st February 2025 in the same newspaper**,** **English Newspaper:** Pune: National Newspaper Indian Express dated 25/01/2025, A corrigendum was also published on 21st February 2025 in the same newspaper
Date of PH	Pune: 28/02/2025
Venue	Khadakwasla Judo Hall, Bypass road, Behind petrol pump, Khadakwasla, Haveli, Dist Pune
Chaired by	Hon. Jyoti Kadam - Chairman Resident Deputy Collector / Additional District Magistrate, Pune
	Shri. Jagannath Salunkhe - Member Regional Officer, MPCB, Pune
	Shri. Kartikeya Langote - Convener Sub Regional Officer, MPCB, Pune-1
Main issues raised during PH	1. 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. 2. Where will the muck from tunnel excavation be disposed off? 3. In Dhayari village, where the tunnel will pass, will there be any shafts? If not, since the tunnel is 80 meters underground, will the Pune Municipal Corporation or the Urban Development Department raise any objections for building permits? 4. What will be done with the to be vacant land of existing new Mutha right canal in future?
No. of people attended	Pune: 96

xxi. **Status of Litigation Pending against the proposal, if any:** Nil

xxii. **The salient features of the project are as under:**

1. EAC Meeting Details:

Date of earlier EAC meetings	1. 11th Meeting of EAC, MoEFCC, New Delhi held on 27/06/2024 (Agenda Item No. 11.5) for Terms of Reference (ToR) 2. 18st Meeting of EAC, MoEFCC, New Delhi held on 05/11/2024 (Agenda Item No. 18.1) for Reconsideration for Terms of References (TOR) - reg.

2. 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, Maharashtra
Proposal No.	IA/MH/RIV/530305/2025
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
Company's Name	Executive Engineer Irrigation Project Investigation Division (BSB), Water Resources Department, Pune Maharashtra Krishna Valley Development Corporation (MKVDC), Pune 411011
CIN no. of Company/user agency	-
Accredited Consultant and certificate no.	MITCON Consultancy & Engineering Services Ltd., Pune, Maharashtra Certificate No. NABET/EIA/24-27/RA 0343
Project location (Coordinates /River/ Reservoir)	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
Proposed on River/ Reservoir	Khadakwasla Dam
Type of Hydro-electric project	Not Applicable
Seismic zone	Zone III (i. e. Moderate Risk Zone)

3. Category details:

Category of the project	1 (c) Cat. 'A'

<table>
<tr><td>Capacity / Cultural command area (CCA)</td><td><table>
<tr><td rowspan="6">New Mutha Right Branch Canal</td><td>Taluka</td><td>GCA (Ha)</td><td>CCA (Ha)</td><td>ICA (Ha)</td></tr>
<tr><td>Haveli</td><td>10968</td><td>9465</td><td>5785</td></tr>
<tr><td>Baramati</td><td>1859</td><td>1604</td><td>980</td></tr>
<tr><td>Daund</td><td>53090</td><td>45814</td><td>27999</td></tr>
<tr><td>Indapur</td><td>51920</td><td>44805</td><td>27382</td></tr>
<tr><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, ESA Western Ghat Ghera Sinhagad Village located @ 3.65 km from proposed alignment</td></tr>
</table>

4. ToR/EC Details:

<table>
<tr><td>ToR Proposal No.</td><td>IA/MH/RIV/459818/2024, F. No. J J-12011/16/2024-IA-I(R)</td></tr>
<tr><td>EAC meeting date</td><td>05/11/2024</td></tr>
<tr><td>ToR Letter No.</td><td>J-12011/16/2024-IA-I(R)</td></tr>
<tr><td>ToR grant Date</td><td>03/12/2024</td></tr>
<tr><td>Cost of project</td><td>Rs. 2190.47</td></tr>
<tr><td>Total area of Project</td><td>
<table>
<tr><td>Nature of Land involved in (Ha)</td><td>Private land (Ha)</td><td>Forest/Govt. land (Ha)</td><td>Total Area required (Ha)</td></tr>
<tr><td>Tunnel + Cut & Cover and Open Channel</td><td>23.03* Ha</td><td>0.8064 Ha**</td><td>23.8364 Ha</td></tr>
<tr><td>Submergence</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>Total</td><td>23.03 Ha</td><td>0.8064 Ha</td><td>23.8364 Ha</td></tr>
</table>
* 11.71 Ha private land acquired & remaining 11.32 Ha land will be taken on rent
Forest Land details**
<table>
<tr><td rowspan="2">Sr. no.</td><td rowspan="2">Village</td><td rowspan="2">Gat No.</td><td colspan="2">Chainage</td><td rowspan="2">Length</td><td rowspan="2">Width</td><td rowspan="2">Area (Sq.m)</td><td rowspan="2">Area (Ha.)</td></tr>
<tr><td>From</td><td>To</td></tr>
<tr><td>1</td><td>Khadakwasla</td><td>81</td><td>50</td><td>350</td><td>300</td><td>7.2</td><td>2160</td><td>0.2160</td></tr>
<tr><td>2</td><td>Narhe</td><td>17</td><td>6420</td><td>6780</td><td>360</td><td>7.2</td><td>2592</td><td>0.2592</td></tr>
</table>
</td></tr>
</table>

	3	Mangadewadi	4	8860	9040	180	7.2	1296	0.1296
	4	Katraj	39	11370	11650	280	7.2	2016	0.2016
						Total		8064	0.8064

Height of Dam from River Bed (EL)	NA
Details of submergence area	Not applicable as there is no submergence.
District to provide irrigation facility (if applicable)	Pune

Details of tunnels on upper level & lower level and length of canal (if applicable)

Tunnel	23.450 km
Cut & Cover	2.350 km
Open Channel	0.867 km
Total Length of Project	26.667 km

No. of affected Village.	8 villages

No. of Affected Families

Sr. No	Taluka	District	Particular	Village name	Gut No.
1	Haveli	Pune	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
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.					

<table>
<tr><td></td><td>
❖ 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.
</td></tr>
<tr><td>R&R details</td><td>
Private land: 23.03 Ha is proposed for acquisition.

❖ 11.71 Ha land required for tunnel shafts, approach road, open channel and cut & cover portion.
❖ Remaining 11.32 Ha land will be taken on rent during the construction phase.
❖ 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.
</td></tr>
<tr><td>Command area</td><td>
<table>
<tr><td rowspan="6">New Mutha Right Branch Canal</td><td>Taluka</td><td>GCA (Ha)</td><td>CCA (Ha)</td><td>ICA (Ha</td></tr>
<tr><td>Haveli</td><td>10968</td><td>9465</td><td>5785</td></tr>
<tr><td>Baramati</td><td>1859</td><td>1604</td><td>980</td></tr>
<tr><td>Daund</td><td>53090</td><td>45814</td><td>27999</td></tr>
<tr><td>Indapur</td><td>51920</td><td>44805</td><td>27382</td></tr>
<tr><td>Total</td><td>117837</td><td>101688</td><td>62146</td></tr>
</table>
</td></tr>
<tr><td>Types of Waste and quantity of generation during Construction/ Operation</td><td>
<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>
<table>
<tr><th>Name of Waste</th><th>Source</th><th>Qty (cu.m)</th><th>Method of Disposal</th></tr>
<tr><td>Muck</td><td>Excavation</td><td>1670000</td><td>❖ 375000 cu.m shall be used for backfilling of open channel portion.
❖ 600000 cu.m stone & aggregates shall</td></tr>
</table>
</td></tr>
</table>

				be utilised for construction. ❖ Balance 695000 cu.m material shall be utilised for lo lying area and adjoining Quarry area.
Material used for blasting and its composition as per DGMS standards.	Controlled blasting activity is proposed during construction phase.			
E-Flows for the Project	NA			
Is Projects earlier studied 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			
Details on provision of fish pass	Not applicable			
Project benefit including employment details (no of employee)	**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			

Area of Compensatory Afforestation (CA) with tentative no of plantation.	No trees will be affected due to the proposed project. However, 25000 number of trees will be planted and Maintained.
Previous EC details	Not applicable
EC Compliance Report by R.O, MOEF&CC	Not Applicable

5. Muck Management Details:

<table>
<tr><td>No. of proposed disposal area/ (type of land- Forest/Pvt. land)</td><td colspan="4">Muck likely to be disposal 4 site at low lying area adjacent to project Site

Method of Disposal
• 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 low lying area and adjoining Quarry area.</td></tr>
<tr><td>Cross section of proposed muck area, Height of muck with slope.</td><td colspan="4">Utilization of 60 % of excavated material shall be used for backfilled of open channel portion and stone & aggregates shall be utilized for construction. 40% shall be filled in low laying areas and abundant Quarry Area.</td></tr>
<tr><td>Distance of muck disposal area(location), from muck generation sources (project area)/River, HFL of proposed muck disposal area.</td><td colspan="4">Average 0 km to 5 km</td></tr>
<tr><td>Total Muck Disposal Area

Estimate Muck to be generated</td><td>Name of Waste</td><td>Source</td><td>Qty (cu.m)</td><td>Method of Disposal</td></tr>
<tr><td></td><td>Muck</td><td>Excavation</td><td>1670000</td><td>❖ 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</td></tr>
</table>

				material shall be utilised for lo lying area and adjoining Quarry area.
Transportation	By Road			
Monitoring mechanism for Muck Disposal Transportation	Environmental Management Cell (EMC) shall monitor mechanism of muck disposal.			

6. Land Area Breakup:

Private land	23.03 Ha (11.32 ha land on rent basis and 11.71 ha land will be acquired)			
Government land/Forest Land	0.8064 Ha * Stage 2 Clearance granted vide online Proposal No. FP/MH/MinorCanal/460637/2024 dated 22.03.2025			
Submergence area/Reservoir area	NA			
Land required for project components	Nature of Land involved in (Ha)	Private land (Ha)	Forest/Govt. land (Ha)	Total Area required (Ha)
	Tunnel + Cut & Cover and Open Channel	23.03	0.8064	23.8364 Ha
	Submergence	0	0	0
	Total	23.03 Ha	0.8064 Ha	23.8364 Ha

7. Presence of Environmentally Sensitive areas in the study area

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

SI.	Village	Gat No.	Chainage		Length	Width	Area (Sq.m)	Area (Ha.)
			From	To				

		<table><tr><td>1</td><td>Khadakwasla</td><td>81</td><td>50</td><td>350</td><td>300</td><td>7.2</td><td>2160</td><td>0.2160</td></tr><tr><td>2</td><td>Narhe</td><td>17</td><td>6420</td><td>6780</td><td>360</td><td>7.2</td><td>2592</td><td>0.2592</td></tr><tr><td>3</td><td>Mangadewadi</td><td>4</td><td>8860</td><td>9040</td><td>180</td><td>7.2</td><td>1296</td><td>0.1296</td></tr><tr><td>4</td><td>Katraj</td><td>39</td><td>11370</td><td>11650</td><td>280</td><td>7.2</td><td>2016</td><td>0.2016</td></tr><tr><td colspan="5"></td><td colspan="2">Total</td><td>8064</td><td>0.8064</td></tr></table> Protected Areas present in the study area <table><tr><th>Sr. No.</th><th>Name of the Grove/Wildlife Sanctuary/ ESA</th><th>Tahsil</th><th>Distance</th><th>Direction</th></tr><tr><td>1</td><td>Ghera Sinhagad Village (ESA Western Ghat)</td><td>Haveli</td><td>3.65 km</td><td>SW</td></tr><tr><td>2</td><td>Rajiv Gandhi Zoological Park and Wildlife Research Center</td><td>Pune</td><td>1.65 km</td><td>N</td></tr></table>
National Park	No	No within 10 km Radius
Wildlife Sanctuary	No	No within 10 km Radius
Archaeological sites monuments/ historical temples etc.	Yes	List of Historic places in study area . Shaniwar Wada . Sinhagad Fort
Additional information (if any)	-	-

8. Court case details:

Court Case	NA
Additional information (if any)	-

9. Status of other statutory clearances

Particulars	Letter no. and date
Status of Stage- I FC	❖ Stage 1 Clearance granted for 0.8064 ha of forest land. vide online Proposal No. FP/MH /Minor Canal/ 460637/ 2024 dated 30/01/2025 ❖ Stage 2 Clearance granted vide online

	Proposal No. FP/MH/MinorCanal/460637/2024 dated 22.03.2025
Approval of Central Water Commission	Khadakwasala- Fursungi Tunnel Project is administratively approved by Govt of Maharashtra vide resolution dated 05/09/2024
Approval of Central Electricity Authority	NA
Additional detail (If any)	NA
Is FRA (2006) done for FC-I	-

10. Details of the EMP

Sr. No	Pollution Control & Other Environment Infrastructure	Capital Cost Rs. Lakhs	Recurring Cost (per annum) Rs. Lakhs
1	Ambient Air Quality	-	18.00
2	Noise Level	-	12.00
3	Surface and Ground Water Quality	-	25.00
4	Soil Quality	-	15.00
5	Solid/ hazardous wastes	03.00	15.00
6	Green Belt Development	207.00	50.00
7	Fisheries Conservation & Management Plan	15.00	
8	Labour Management Plan	25.00	
9	Wildlife Conservation Plan	70.00	
10	Muck Management Plan	25.00	
11	Health & Safety	-	25.00
12	Command Area Development Plan	12050	
13	Corporate Environmental Responsibility	1095.00	-
Summary of allocation of fund for EMP			
1.	EMPs: (eg. Air Environment, Water Environment)	193.00 L	
2.	Capital Cost (in Cr.)	2190.47	
3.	Recurring Cost per annum (In Lakhs)	160.00 L	

28.1.3 The EAC during deliberations noted the following:

- The Expert Appraisal Committee (EAC) deliberated on the information submitted by the Project Proponent and the details presented during the meeting. The Committee observed that the

proposal pertains to the grant of Environmental Clearance for the 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, constituted under the provisions of the EIA Notification, 2006, and comprising expert members/domain experts from various relevant fields, examined the proposal submitted by the Project Proponent. This examination included a review of the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) reports, which were prepared and submitted by a QCI/NABET-accredited consultant on behalf of the Project Proponent.

- The EAC noted that the Project Proponent has given an undertaking that the data and information given in the application and enclosures are true to the best of his knowledge and belief and no information has been suppressed in the EIA/EMP reports. If any part of data/information submitted is found to be false/ misleading at any stage, the project will be rejected and Environmental Clearance given, if any, will be revoked at the risk and cost of the project proponent.

- 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.

- The EAC noted that the existing canal cannot be repaired or restructured, as 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 losses it affects the water availability in the downstream.

- The EAC further noted that the total land area required for the project is 23.03 ha (11.32 ha land on rent basis and 11.71 ha land will be acquired), comprising 0.8064 Ha of forest land of which Stage- II Clearance granted by the Ministry vide online Proposal No. FP/MH/MinorCanal/460637/2024 dated 22.03.2025. The EAC observed that Khadakwasala-Fursungi Tunnel Project is administratively approved by Govt of Maharashtra vide resolution dated 05/09/2024.

- The estimated project cost is Rs 2190.47 crores. Total capital cost earmarked towards environmental pollution control measures is Rs. 193.00 L and the Recurring cost (operation and maintenance) will be about Rs 160.00 L per annum.

- The Committee discussed the issues raised during the Public Hearing (PH) which was conducted in three districts as per the EIA Notification, 2006 and reviewed the action plan submitted by the Project Proponent to address these concerns. After careful deliberation, the Committee found the action plan satisfactory.

- The committee inquired about the closure plan of existing 35 km canal and its impact on downstream users. EAC was also of the view that leaving it as it is may become a problem for local people. PP were not able to convince the EAC about the muck disposal sites reclamation of proposed tunnel. The EAC was of the view to conduct site visit by the sub-committee of the EAC to before giving any recommendation to the project.

28.1.4 The EAC after detailed deliberations deferred the proposal for want of following additional information:

1. Environmental Cost Benefit Analysis be conducted in terms of proximity of proposed tunnel to the Western Ghats Eco Sensitive Area and possibility analysis for use of existing canal after its reclamation and restoration.
2. PP shall submit ecologically sustainable closure plan for 35 km existing canal in case Cost Benefit Analysis is in favour of proposed construction of tunnel.
3. PP shall submit details of management/reclamation plan for muck disposal sites for the muck proposed to be excavated from proposed tunnel.
4. Site visit shall be conducted by a sub-committee of the EAC.

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

Agenda Item No. 28.2

Sukhnai Close Loop Pumped Storage Project (1000 MW) in an area of 284 Ha located at Village Mahuwat, Devhat, Durjanipur, etc Sub-district Lalganj, District Mirzapur, Uttar Pradesh by M/s Hinduja Renewables Energy Private Limited - Terms of References (TOR) – reg.

[Proposal No. IA/UP/RIV/530979/2025; F. No J-12011/14/2025-IA.I (R)]

PP vide email dated 14.04.2025 informed that currently they are in the process of receiving In-Principle approval from the Government of Uttar Pradesh. However, the geographical coordinates of the project are intersecting with some other IPPs project. Thus, the decision of project allotment is on hold. The clarification process with the Government is currently ongoing.

Therefore, they expressed their inability to present their project during present meeting.

Accordingly, the EAC decided to ***return*** the proposal on the above lines.

Agenda Item No. 28.3

Parsapani Open Loop Pumped Storage Project (1000 MW) in an area of 231 Ha located at Village Chhatauna, Parsa Pani, Sorha Khurd etc, Sub District Kota, District Bilaspur, Chhattisgarh by M/s Hinduja Renewables Energy Private Limited - Terms of References (TOR) – reg.
[Proposal No. IA/CG/RIV/532501/2025; F. No J-12011/12/2025-IA.I (R)]

28.3.1 The proposal is for grant of Terms of References (ToR) to the project for Parsapani Open Loop Pumped Storage Project (1000 MW) in an area of 231 Ha located at Village Chhatauna, Parsa Pani, Sorha Khurd etc, Sub District Kota, District Bilaspur, Chhattisgarh by M/s Hinduja Renewables Energy Private Limited.

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

i. The Proposed Parsapani PSP is an Off- stream Closed Loop pumped storage scheme with an installed capacity of 1000 MW. The scheme of operation considered for project is daily regulation with 1 cycle per day. Accordingly, the plant will meet the demand of about 6.00 hours of peak power daily. Off-peak pumping hours are considered as 6.54 hours daily.

ii. Project envisaged construction of two artificial reservoirs; Upper reservoir and Lower reservoir near village Parsapani in Kota tehsil of Bilaspur district, Chhattisgarh. Water for one time filling and for recuperation of losses will be sourced from Arpa River with a 4 km long pipeline.

iii. The upper reservoir is formed by constructing dam all around on a hilltop and it is located in forest area within the administrative boundary of Kota tehsil of Bilaspur district with the geographical latitude of 22° 29' 52.39" N and longitude of 82° 06' 29.50" E. The lower reservoir is formed by constructing dam on a non-perennial nallah and it is located in forest area near Parsapani village, Kota Tehsil of Bilaspur district with the geographical latitude of 22° 29' 06.70" N and longitude of 82° 06' 09.46" E.

iv. **Land requirement:** The total land required for the project components and related works has been estimated to be about 231 Hectares, which includes 178 Hectares of forest land and 53 Hectares of private land.

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

- The proposed project area is located near Parsapani, Chureli and Chhatauna villages, which fall under Kota Tehsil of Bilaspur district. These villages have a significant Scheduled Tribe population, with approximately 85% of the residents belonging to tribal communities. These communities belong mainly to indigenous tribal groups, who preserve their traditional customs, cultural practices and local governance systems.

- The literacy rate in these villages is approximately 50%.
- Agriculture is the primary occupation, with villagers engaged in farming and allied activities, relying on traditional methods for livelihood.
- The tribal communities in these villages follow indigenous customs, celebrating local festivals and maintaining strong communal traditions.
- According to secondary sources, basic facilities such as education and healthcare remain underdeveloped in the project area.

vi. **Water requirement**: The Parsapani Closed Loop Pumped Storage Project will require 9.70 Mm^3 of water for initial filling. The annual water requirement of approximately 1.30 Mm^3, to compensate for evaporation losses, is proposed to be met by pumping water from the proposed intake located across the Arpa River.

vii. **Project Cost:** The estimated project cost is Rs 5720 crore. Total capital cost earmarked towards environmental pollution control measures will be worked out during EIA study as well as the Recurring cost (operation and maintenance).

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

ix. **Environmental Sensitive area:** There is no Protected Area in the vicinity of the proposed project. Achanakmar is about 15.0 km far from the proposed project area. River/ water body, Water will be pumped from Arpa River.

x. The Letter of Intent was awarded to HREPL by the honorable Chief Minister on 04-12-2024 for Invitation to Invest which states that HREPL will setup a Pumped Storage Project with proposed investment of INR 13,500 Crores. Following this the project was registered with the Chhattisgarh Government with Udyam Aakansha / Unit no. 1160126673002 on 25-12-2024 as an Ultra-Mega Enterprise. (LoI Attached)

xi. **Alternative Studies:** Eleven (11) potential reservoir sites have been identified within the study area. Various combinations of above reservoir sites have been studied to identify potential alternative layouts that could be considered for the project for further evaluation.

The alternatives have been eliminated based on ***Administrative & Environmental and technical criteria.*** Among all Alt-1, Alt-3 and Alt-5 have been shortlisted and ranked for further evaluation.

The weightage score for each alternative has been calculated using a set of technical parameters (i.e., capacity, head, head ratio, L / H ratio, length and height of upper and lower dams and geological suitability) and environmental parameters (i.e., WLS, forest area, R & R issues).

The top ranked two sites, viz., Alt - 1 and Alt - 5 were further evaluated based on additional information gathered during site visit and a techno-economic comparison was made to finalize the most suitable alternative for the project.

Sl. No.	Description / Parameter	Alt - 1	Alt - 5
1.	Upper Dam / Reservoir	R_1	R_10
a)	FRL	RL 795.00 m	RL 735.00 m
b)	Dam length	2900 m	2500 m
c)	Dam height	37 m	58 m
d)	Gross storage	7.41 Mm3	7.66 Mm3
2.	Lower Dam / Reservoir	R_2	R_11
a)	FRL	RL 395.00 m	RL 419.00 m
b)	Dam length	2400 m	1500 m
c)	Dam height	28 m	30 m
d)	Gross storage	8.81 Mm3	8.03 Mm3
3.	Gross Head, H	400 m	306 m
4.	Plan length of WCS, L	1335 m	2000m
5.	L / H Ratio	3.5	6.5
6.	Head ratio	1.12	1.22
7.	Installed capacity	1000 MW	800 MW
8.	Geology	Fair	Fair
9.	**Weighted Score**	**73.0**	**67.0**
10.	Overall Ranking	1	2
11.	Source of Water		
a)	Location	Arpa River	Nallah which is tributary of Arpa River
b)	Water transfer scheme	Single stage pumping	Self-Catchment Yield
c)	Pumping scheme	Lifting water from Arpa River over a length of 4 km with a static head of 45 m	
d)	RW pipeline	4 km	
e)	Pumping head	60 m	
12.	Environmental Aspects		
a)	Land category	Forest	Forest & agriculture lands
b)	Overall forest area	200 Ha **(0.20 Ha / MW)**	175 Ha **(0.22 Ha/MW)**

c)	Access	LR Accessible & UR is Inaccessible	Both reservoirs are Inaccessible

- Based on overall evaluation and observations made during the site visit, it is found that the Alternative 1 is techno-economically and environmentally a better alternative compared to Alternative 5.
- Although, Alternative 5 is techno-economically attractive, the site has major issues like high CAPEX requirements and higher forest land requirement per MW.
- Further, installed capacity, head available and the overall weighted score for the Alternative - 5 is found to be lesser when compared to Alternative - 1 (which is the top ranked alternative in terms of overall techno-economic evaluation).
- Based on overall evaluation and geological suitability of top ranked alternate layouts, Alternative - 1 with an installed capacity of 1000 MW (4 x 250 MW) has been recommended for development.
- Considering the deep excavation and high CAPEX involved in the project, surface powerhouse option is not recommended.
- The option of underground powerhouse for the finalized layout of Alternative - 1 has been recommended to be adopted for the project.

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

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

1. Project details:

Name of the Proposal	Parsapani Close Loop Pumped Storage Project (1000 MW)
Location (Including coordinates)	Lower Reservoir : Longitude: 82° 06' 09.46" E; Latitude: 22° 29' 06.70" N Upper Reservoir : Longitude: 82° 06' 29.50" E; Latitude: 22° 29' 52.39" N
Inter- state issue involved	No
Seismic zone	Zone-II

2. Category details:

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

Additional information (if any)	Nil

3. Electricity generation capacity:

Powerhouse Installed Capacity	1000 MW
Generation of Electricity Annually	2080.50 MU
No. of Units	4 nos. (4 x 250 MW)
Additional information (if any)	Nil

4. ToR/EC Details:

Cost of project	5720 Cr.
Total area of Project	231 ha
Height of Dam from River Bed (EL)	Lower Dam – 27.0 m Upper Dam –32.0 m
Length of Tunnel/Channel	1335 m
Details of Submergence area	151 ha
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Closed Loop Pumped Storage Project (PSP)
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. If not the E-Flows maintain criteria for sustaining river ecosystem.	No

5. Muck Management Details:

No. of proposed disposal area/ (type of land-Forest/Pvt. land)	20 ha (Non-Forest Land)
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

6. Land Area Breakup:

Private Land	53 ha
Government land/Forest Land	178 ha (Forest Land)
Submergence area/Reservoir area	151 ha
Land required for project components	80 ha
Additional information (if any)	Nil

7. Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate / letter/ Remarks**
Reserve Forest/Protected Forest Land	--	There is no Protected Area in the vicinity of the proposed project. Achanakmar is about 15.0 km far from the proposed project area.
National Park	---	
Wildlife Sanctuary	---	

8. Court case details: Nil

9. Previous EC compliance and necessary approvals:

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

10. Miscellaneous

Particulars	**Details**
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (NABET Accredited Consultant Organization) Certificate No : NABET/EIA/2225/RA0274 Validity : August 15, 2025 Contact Person : Mr. Ravinder Bhatia Name of Sector : River Valley and Hydroelectric Projects Category : A MoEF Schedule : I(C)

	Address : 403, Bestech Chambers, Block-B, Sushant Lok Phase I, Sector 43, Gurugram, Haryana - 122009 E-mail : ravi@rstechnologies.co.in Land Line : (0124) 4295383 Cellular : (+91) 9810136853
Project Benefits	• Pumped storage hydropower is a modified use of conventional hydropower technology to store and manage energy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 80%, comparing favorably to other energy storage technologies and thermal technologies. This effectively shifts, stores, and reuses energy generated until there is corresponding demand for system reserves and variable energy integration. This shifting can also occur to avoid transmission congestion periods, to help more efficiently manage transmission grid, and to avoid potential interruptions to energy supply. This is important because many of the renewable energy resources being developed (e.g., wind and solar) are generated at times of low demand and off-peak energy demand periods are still being met with fossil fuel resources, often at inefficient performance levels that increase the release of greenhouse gas emissions. • Further, pumped storage projects are critical to the national economy and overall energy reliability because it's: o Least expensive source of electricity, not requiring fossil fuel for generation o An emission-free renewable source

	○ Balancing grid for demand driven variations ○ Balancing generation driven variations ○ Voltage support and grid stability Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.
Status of other statutory clearances	Forest Clearance - Online application seeking forest diversion for around 178 Ha after receipt of ToR Approval. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studies
Additional detail (If any)	Nil

28.3.3 The EAC during deliberations noted the following:

The Expert Appraisal Committee (EAC) deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Parsapani Open Loop Pumped Storage Project (1000 MW) in an area of 231 Ha located at Village Chhatauna, Parsa Pani, Sorha Khurd etc, Sub District Kota, District Bilaspur, Chhattisgarh by M/s Hinduja Renewables Energy Private Limited.
The project/activity falls under Category A of item 1(c), 'River Valley Projects,' as per the Schedule of the Environmental Impact Assessment Notification, 2006, and requires appraisal at the central level by the sectoral EAC in the Ministry.

The EAC noted that the total land required for the proposed project is about 231 Hectares, which includes 178 Hectares of forest land and 53 Hectares of private land. However, it was observed that the application for Stage-I Forest Clearance (FC) has not yet been submitted, which necessitates further action from the Project Proponent.

The Project Proponent indicated that there is no Protected Area in the vicinity of the proposed project. Achanakmar is about 15.0 km far from the proposed project area. River/ water body, Water will be pumped from Arpa River.

The EAC further noted that the proposed PSP will require 9.70 Mm^3 of water for initial filling. The annual water requirement of approximately 1.30 Mm^3, to compensate for evaporation losses, is proposed to be met by pumping water from the proposed intake located across the Arpa River.

During its deliberations, as informed by the Project Proponent the EAC observed that the upper dam is proposed to be located on the hilltop and the lower dam is proposed to be located across a non-perennial nallah draining into Sat nallah, which is also a non-perennial nallah draining into Arpa River.

The EAC opined that the lower reservoir is located across a non-perennial nallah draining into Sat nallah, accordingly, the project should be classified as an Open Loop project, rather than a Closed Loop project.

28.3.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Open Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Parsapani Open Loop Pumped Storage Project (1000 MW) in an area of 231 Ha located at Village Chhatauna, Parsa Pani, Sorha Khurd etc, Sub District Kota, District Bilaspur, Chhattisgarh by M/s Hinduja Renewables Energy Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

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

ii. Action plan for survival or diversion of the non-perennial nallah draining into Sat nallah shall be submitted after consultation with NIH, Rurkee.

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

iv. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 178 ha of forest land involved in the project shall be submitted within stipulated time.

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

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

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

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

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

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

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

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

xiii. Details of mineral zone, if any, in the study area, certified by Geological Survey of India or any other concerned Government Organization shall be submitted. The project area should not come up on any critical mineral zone, the same shall to be verified by GSI/NMDC.

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

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

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

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

xviii. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic

ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.

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

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

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

[B] Socio-economic Study

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

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

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

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

[C] Muck Management

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

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

iii. Safety measures for avoiding spill over muck into the riverbed/streams and its flow into the

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

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

[D] Disaster Management

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

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

[E] Miscellaneous

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

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

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

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

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

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

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

viii. As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest

land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.

Agenda Item No. 28.4

Upper Kolab Open Loop Pumped Storage Project (4x150 MW) 600 MW in an area of 162 Ha located at Village Karnga, Daurapadar, Padmapur, etc, Sub District Koraput and Jeypore, District Koraput, Odisha by M/s Odisha Hydro Power Corporation Limited - Terms of References (TOR) – reg.

[Proposal No. IA/OR/RIV/525661/2025; F. No J-12011/15/2025-IA.I (R)]

28.4.1 The proposal is for grant of Terms of References (ToR) to the project for Upper Kolab Open Loop Pumped Storage Project (4x150 MW) 600 MW in an area of 162 Ha located at Village Karnga, Daurapadar, Padmapur, etc, Sub District Koraput and Jeypore, District Koraput, Odisha by M/s Odisha Hydro Power Corporation Limited.

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

i. Upper Kolab Pump storage scheme is located near Jeypore town in Koraput district of Odisha with a proposed installed capacity of 600 MW (4 x 150 MW). It aims to utilize the existing Upper Kolab reservoir as an upper reservoir for proposed pump storage scheme after meeting irrigation, drinking water and existing Upper Kolab Hydro Electric plant demands of water.

ii. The proposed lower reservoir is to be constructed on the left side of Satiguda reservoir is to be used as lower storage reservoir. The proposed scheme envisaged to utilize the water of Upper Kolab reservoir for power generation. This water released after power generation shall be stored in proposed lower reservoir.

iii. The water stored in this proposed lower reservoir shall be pumped back (recycled) to Upper Kolab reservoir during non-peak hours. This closed loop cycle shall be repeated again and again. This shall be carried out by installing new additional reversible Francis turbines which work both ways for hydro-power generation as well as pumping back the water back to Upper Kolab reservoir.

iv. **Upper Reservoir:** The existing Kolab Reservoir having a gravity dam 54.5 m high, with live storage capacity of 935 MCM will be utilized as Upper Reservoir. No modifications are proposed in the existing Upper Kolab reservoir and as such, no modifications in the operating levels and existing structures are needed/ proposed. The location of existing upper Kolab reservoir (near Upper Kolab Dam) is 18°47’18’’N and 82°36’2’’E. 3.2.

v. **Lower Reservoir:** A lower reservoir has been proposed at 18°49’41.29’’N and 82°34’24.58’’E on the left side of Satiguda pond near the villages. The Gross storage capacity

of this proposed lower reservoir is 7.18 MCM. Tentative cost of Upper Kolab Pumped Storage Project (600MW) will around 2882.33 crores Rupees which is based on the average per MW cost worked out for different Pumped Storage Project.

vi. **Land requirement:** **Private land:** 47.2 ha

Government/ Forest land: 114.8 ha
Submergence/ Reservoir Area: Upper Reservoir-Existing
Lower Reservoir-77.8 ha
Project Components: 84.2 ha

vii. **Water requirement:** The water released after power generation shall be stored in proposed lower reservoir and shall be pumped back to Upper Kolab reservoir during pumping mode. This closed loop cycle shall be repeated again and again. There is no consumptive use of water except from operation and evaporation loss therefore only one time requirement of water of 7.18 MCM.

viii. **Project Cost:** The estimated project cost is Rs 2882.33 crores..

ix. **Project Benefit:** Total Employment will be 1350 Persons as direct.

x. **Environmental Sensitive area:** There is Ghataghumara Reserved Forest is present in the proposed location of the project.

xi. **Resettlement and rehabilitation:** R&R plan will be prepared as per the norms of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (RFCTLARR Act, 2013). The same shall be prepared as part of CEIA studies.

xii. **Alternative Layouts :**

The Upper Reservoir for the proposed project is to be utilized from the existing Upper Kolab Reservoir and only the Lower Reservoir is to be evolved for further studies. Therefore the boundary condition is well defined for the layout study. As Kolab River is turning towards left side of its flow, just after the Kolab dam, it was a constraint to envisage the possibilities of pumped storage project on left side of Kolab dam. Therefore alternatives located on the right side have been studied.

Alternative 1: This alternate layout has been examined and is not found suitable based on the non-availability of adequate rock cover over most of the length of head race tunnel and the intake location being in close proximity to the dam spillway which is approximately 100m.

Alternative 2: This alternative layout examined, has been located on the right side of existing Hydro Electric Project. The approximate length of this water conductor system is 5.5 km. The entire underground water conductor system is through adequate rock cover reaches which is preferable. This alternative is found to be suitable as being sufficiently away from the existing power intake as well as the dam spillway. Although the location of the lower reservoir area is coming over the local inhabitation consisting of residential units, agriculture land & a road towards Jeypore. Due to this, alternative-2 is not considered as this requires Rehabilitation and Resettlement issues.

Alternative 3: This layout is proposed at a safe distance from the existing alignment of the under operation scheme. The alignment of the water passage appears to be suitable for the underground components because of availability of sufficient rock cover on the top as well as laterally. The head race tunnel is though aligned through adequate rock cover zone but is still encountering low rock covers in one/two reaches. The use of RCC /steel lining may have to be envisaged. The power intake is proposed to be located mid-way between the existing intake for the under operation HE project as well as the dam spillway located at a distance of around 500 meters on either side. The availability of area and adequate location for the lower reservoir also exists near and to the left side of the Satiguda Reservoir. Due to this alternative is considered as final Layout Plan.

In view of the above, the only possible layout is Alternative-3 and has been studied in details for preparation of a dependable Detailed Project Report (DPR)

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

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

1. **Project details**

Name of the Proposal	UPPER KOLAB PUMPED STORAGE PROJECT, ODISHA
Location (Including coordinates)	Distt. Koraput, Odisha 18° 48’ 52.30”N and 82° 42’ 47.96”
Inter- state issue involved	Nil
Seismic zone	II zone

2. **Category details**

Category of the project	Category A
Provisions	Yes
Capacity / Cultural command area (CCA)	4x150 MW= 600 MW
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	-

3. **Electricity generation capacity**

Powerhouse Installed Capacity	4x150 MW= 600 MW
Generation of Electricity Annually	1308.52 GWh
No. of Units	4 Nos
Additional information (if any)	-

4. **ToR/EC Details**

Cost of project	2882.33 Cr
Total area of Project	152 Ha.
Height of Dam from River Bed (EL)	8 m
Length of Tunnel/Channel	3677.45 m
Details of Submergence area	Upper Reservoir –Existing Lower Reservoir -77.8 ha
Types of Waste and quantity of generation during construction/ Operation	19.8 lakh m^3
E-Flows for the Project	As per Norms of MoEF & CC
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.	a) Not Applicable b) For 90% dependable year Monsoon Season-30% of average flow Non-Monsoon, Non Lean Season – 25% of average flow Lean Season – 20% of average flow

5. **Muck Management Details**

No. of proposed disposal area/(type of land-Forest/Pvt. land)	5
Muck Management Plan	To be prepared as part of CEIA

Monitoring mechanism for Muck Disposal	Muck disposal sites shall be monitored on a monthly basis

6. **Land Area Breakup**

Private land	47.2
Government land/Forest Land	114.8 ha
Submergence area/Reservoir area	Upper Reservoir –Existing Lower Reservoir -77.8 ha
Land required for project component	84.2 ha
Additional information (if any)	-

7. **Presence of Environmentally Sensitive areas in the study area**

Forest Land/ Protected Area/ Environmental Sensitivity Zone		**Details of Certificate/ letter/Remarks**
Reserve Forest/Protected Forest Land	Yes	Ghataghumara Reserved Forest
National Park	No	
Wildlife Sanctuary	No	

8. **Court case detail**

Court Case	NA
Additional information (if any)	-

9. Previous EC compliance and necessary approvals

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	NA

Status of Stage- I FC	Under Process
Additional detail (If any)	-
Is FRA (2006) done for FC-I	No

12. Miscellaneous

Particulars	**Details**
Details of consultant	WAPCOS Limited
Project Benefits	Energy generation of 1308.52 GWh in 90% dependable flow Employment during project construction and operation phases

Status of other statutory clearances	Under Process
R&R details	R&R plan will be prepared as per the norms of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (RFCTLARR Act, 2013). The same shall be prepared as part of CEIA studies.
Additional detail (If any)	-

28.4.3 The EAC during deliberations noted the following:

The Expert Appraisal Committee (EAC) deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Upper Kolab Open Loop Pumped Storage Project (4x150 MW) 600 MW in an area of 162 Ha located at Village Karnga, Daurapadar, Padmapur, etc, Sub District Koraput and Jeypore, District Koraput, Odisha by M/s Odisha Hydro Power Corporation Limited.

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

The EAC noted that the there is an existing Upper Kolab hydro power plant (320 MW) has a surface power house with four units of Francis turbine of 80 MW each. Irrigation is provided to a CCA of 47985 ha in Jeypore, Boriguma & Kotpad tehsils of Koraput District. Water from Power House is diverted to Satiguda Barrage, which acts as a balancing reservoir. The proposed Upper Kolab Pumped Storage Project (UKPSP) envisages utilization of the water of the existing Kolab reservoir as the Upper Reservoir and a Lower Reservoir proposed on the left side of the Satiguda pond draining the existing tail race channel flows from the Upper Kolab H.E Project. There is no direct supply of irrigation from the Upper Kolab Reservoir as releases from the power channel are stored in the Satiguda pond and diverted for irrigation.

As informed by the PP the EAC observed that TOR for 320 MW Upper Kolab PSP was accorded by the EAC for River Valley projects and issued vide Letter No. J-12011/16/2019-IA-I, dated 28.02.2020. Investigations were kept on hold on account of Clearance of usage of Existing Kolab Reservoir contemplated as Upper Reservoir. Now as per MoM of first Consultation meeting held at CEA on 12.07.2023, PP has revised their capacity from 320 MW to 600 MW.

The EAC noted that overall land area required for the proposed project is approximately same it was proposed for 320 MW. The total land requirement is about 162 Hectares, which includes 114.7

Hectares of forest land and 47.1 Hectares of private land. However, it was observed that the application for Stage-I Forest Clearance (FC) has not yet been submitted, which necessitates further action from the Project Proponent. The Project Proponent indicated that there is no Protected Area in the vicinity of the proposed project. Ghataghumara Reserved Forest is present in the proposed location of the project.

The EAC further noted that the one time requirement of 7.18 MCM to fill the Lower Reservoir from Existing Upper Reservoir with Gross Storage Capacity of 1232 MCM Equivalent to 0.58% of Gross Storage Capacity of Existing Upper Reservoir.

During the deliberation the EAC observed that 10.5 Ha of forest land is required for Muck disposal site, which is not acceptable to the committee therefore it was requested to find suitable area in non-forest land and to optimize the forest land requirement in other components as well, wherever possible.

28.4.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Open Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Upper Kolab Open Loop Pumped Storage Project (4x150 MW) 600 MW in an area of 162 Ha located at Village Karnga, Daurapadar, Padmapur, etc, Sub District Koraput and Jeypore, District Koraput, Odisha by M/s Odisha Hydro Power Corporation Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

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

ii. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 114.7 ha of forest land involved in the project shall be submitted within stipulated time.

iii. Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area. Rock quarrying and Borrow area shall be located in non-forest area as well, if not able to relocate the area proper justification shall be provided.

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

v. Necessary clearance/ approval for interstate issues/ water availability/water sharing issues shall be obtained.

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

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

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

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

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

xi. Details of mineral zone, if any, in the study area, certified by Geological Survey of India or any other concerned Government Organization shall be submitted. The project area should not come up on any critical mineral zone, the same shall to be verified by GSI/NMDC.

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

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

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

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

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

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

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

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

[B] Socio-economic Study

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

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

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

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

[C] Muck Management

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

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

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

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

[D] Disaster Management

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

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

[E] Miscellaneous

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

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

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

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

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

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

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

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

Agenda Item No. 28.5

Upper Bhavani Open loop Pumped Storage Project (1000 MW) in an area of 167.85 Ha located at Village Mulligur, Sub District Kundah, District The Nilgiris, Tamil Nadu by M/s NTPC Tamilnadu Energy Company Limited– Terms of Reference (TOR) - reg.

[Proposal No. IA/TN/RIV/519675/2025; F. No. J-12011/08/2025-IA.I (R)]

28.5.1: The proposal is for grant of Terms of References (ToR) to the project for Upper Bhavani Open loop Pumped Storage Project (1000 MW) in an area of 167.85 Ha located at Village Mulligur, Sub District Kundah, District The Nilgiris, Tamil Nadu by M/s NTPC Tamilnadu Energy Company Limited.

The EAC considered the proposal in its 24th meeting held on 14.02.2025 wherein the EAC deferred the proposal inter-alia with following observation:

"…..*The EAC expressed serious concerns regarding the ecological and environmental sensitivity of the region, emphasizing that it forms part of the Western Ghats, a globally recognized biodiversity hotspot. Given the area's rich biodiversity, fragile ecosystems, and critical environmental significance, the committee stressed the necessity of conducting comprehensive environmental assessments and implementing robust mitigation measures to minimize potential adverse impacts. Additionally, the EAC noted that a substantial portion of the forestland requirement is attributed to transmission lines in addition to the core project components. Considering these factors, the committee recommended that the PP be asked to find out alternative sites considering that the present location is within 1 km of Mukurthi National Park in Nilgiri Hills*….."

Accordingly, the PP submitted the report on alternative site analysis vide ADS reply dated 27.03.2025 on Parivesh Portal.

24.3.2: The Project Proponent and the accredited Consultant M/s. Voyants Solutions Private Limited, made a detailed presentation on the salient features of the project and informed that:

i. The Upper Bhavani PSP is in the Nilgiris district, the North-western part of Tamil Nadu State. The project is proposed to be developed as Pumped Storage Plant by M/s NTPC Tamilnadu Energy Company Limited (NTECL), a joint venture company of NTPC Ltd. and Tamilnadu Generation And Distribution Corporation Limited (TANGEDCO).

ii. The Upper Bhavani PSP area is located between latitude 11°15'00" to 11°20'00" and Longitude 76°32'30" to 76° 37'30". The project location falls in Kundah Reserved Forest of the Nilgiris District.

iii. Upper Bhavani Pumped Storage Project envisages generation of power by utilizing waters of the existing reservoirs of the Upper Bhavani dam and Avalanche-Emerald reservoir system (as the lower reservoir) operating under a head of approx. 291.81 m to generate 1000MW power. Both the

reservoirs shall be connected through an underground water conductor system comprising of Head Race Tunnel, Surge-shaft, steel-lined Pressure-Shafts, an Underground Powerhouse with Transformer Cavern and Tail Race Tunnel. The Underground Powerhouse House contains four fixed speed reversible Pump-Turbines along with the Generator-Motor assembly, unit step up transformers, and other appurtenant equipment. The scheme of operation considered for the project envisages daily generation of 6 hours to meet the grid demand.

iv. Upper Bhavani PSP comprises an existing upper Bhavani reservoir (As upper reservoir) and the existing Avalanche reservoir (As lower reservoir). There will be no additional submergence of land in the proposed Pumped Storage Project as both the reservoirs already exist. Land shall be required for the construction of powerhouse complex and other appurtenant structures.

v. The Upper Bhavani Pumped Storage Project envisages construction of:

a. Surface Works
   - ➢ Upper Intake
   - ➢ TRT Outfall /Lower Intake

b. Under Ground Works
   - ➢ HRT & Pressure shaft (steel lined)
   - ➢ Upstream Surge Shaft
   - ➢ Underground Powerhouse and Transformer Cavern/GIS
   - ➢ Downstream Surge Shaft
   - ➢ Tailrace Tunnel
   - ➢ Main Access Tunnel and other Adits

vi. **Land requirement:**
Total land requirement for the project is 167.85 ha of which 56.35 ha is forest land while 111.50 ha is non-forest land.

vii. Demographic details in 10 km radius of project area:
Total population of the study area is 46,307 comprising of Males 22,335 (48.23%) and Females 23972 (51.77%) females with 3.35 person's average household size. Out of total population 16,830 (36.34%) is scheduled caste and 421 (1.13%) is schedule tribes.

viii. **Water requirement:** During Construction: 200 KLD; During Operation, Domestic: 40 KLD and non-consumptive: 9 MCM. Consent for utilisation of 9 MCM water received from concerned authority vide letter dated 29.01.2025.

ix. **Project Cost**: The preliminary cost estimate of the project has been prepared as per guidelines of CEA/CWC. The total project cost has been estimated at 5005.52 Crore for year 2023-24 price level.

x. **Project Benefit:** During construction permanent employment will be 70 persons and temporary employment through contractors: 1140 persons.

xi. **Environmental Sensitive area:** There is 1 National park (Mukurthi National Park) within 10 km distance from the project site. No wildlife sanctuaries, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site. Upper Bhavani River is flowing near to the project site.

xii. **MoU / any other clearance/ permission signed with State government:** In-Principle approval accorded by Govt. of Tamil Nadu for one Pumped Storage Hydro Electric Project (Upper Bhavani PSP 1000 MW) to NTECL for development in the State of Tamil Nadu vide G.O. (Ms.) No. 33, Energy (B1) Development dated: 11.03.2024.

xiii. Alternative Studies:

Various layout options were studied in the proposed area considering the topography, geological features and environment aspects, which led to the following six alternatives:

Alternative 1: Straight Water Conductor System Alignment

This alignment proposed a direct connection between the Upper Bhavani Dam and the Avalanche Reservoir, minimizing the water conductor system length to approximately 5.3 km. A key advantage was the relatively shorter construction time and lower overall land requirement. However, the approach required long channels inside the reservoir, leading to increased construction complexity. Geological challenges, such as seepage risks, were significant, threatening the stability of underground structures. Additionally, the alignment would generate approximately 45 lakh m^3 of muck, requiring extensive disposal measures. The estimated cost of Rs. 200 crore for muck removal, coupled with potential environmental disruption near Mukurthi National Park, rendered this alternative unsuitable.

Alternative 2: Extended Alignment for Year-Round Water Availability (Selected Site)

This option positioned the intakes strategically to ensure year-round water availability, making it the most viable alternative. With a water conductor system length of 7.68 km, it provided stable geological conditions and minimized environmental impact by keeping most components underground. Additionally, it required the least amount of forest land (56.35 ha), avoiding sensitive Shola forests and resettlement concerns. While being close to Mukurthi National Park (within 1 km), mitigation measures such as a Wildlife Conservation Plan could minimize ecological disturbances. The overall balance of technical feasibility, environmental protection, and cost-effectiveness made this the preferred site.

Alternative 3: Alignment with Lower Intake Shifted Near Avalanche Dam

This alternative involved an 8.8 km-long water conductor system with the lower intake positioned closer to the Avalanche Dam. The proximity to an existing village posed resettlement and rehabilitation (R&R) challenges, particularly for the Toda tribal community. Additionally, the alignment crossed through Shola forests, increasing the ecological footprint of the project. The longer pressure shaft and increased head loss reduced energy efficiency while raising construction costs. Although water availability was stable, the environmental and social costs outweighed the benefits, leading to the rejection of this alternative.

Alternative 4: Upper Intake Shifted Towards the East

By shifting the upper intake 0.8 km northeast within the Upper Bhavani Reservoir, this alternative slightly increased the distance from Mukurthi National Park (1.61 km). This helped create a minor environmental buffer but introduced major construction difficulties. The plan required a 1.5 km additional channel inside the reservoir, generating 64 lakh m^3 of muck, which would need extensive land for disposal. The increased excavation would also raise project costs significantly. The necessity of building dikes to keep the reservoir sections dry during construction added further complexity. Given these challenges, the alternative was deemed infeasible.

Alternative 5: New Upper Reservoir by Hill Cutting and Embankment (NE of Upper Bhavani)

This proposal aimed to create a new reservoir at an elevation of 2550 meters, offering potential for 2000 MW power generation. However, the environmental impact was substantial, requiring 81 ha of forest land diversion, including 34 ha for the reservoir alone. Hill cutting for excavation would generate 68 lakh m^3 of muck, posing logistical and environmental challenges. Water availability remained a concern, as the new reservoir's bed level was high, leading to unreliable storage. Additionally, extensive infrastructure, such as approach roads and muck disposal sites, would be needed, increasing costs and environmental strain. The severe ecological consequences led to the rejection of this alternative.

Alternative 6: New Upper Reservoir in the Southwest of Upper Bhavani

Positioned 2.7 km from Mukurthi National Park, this alternative involved the construction of an artificial reservoir with a 360-meter-long dam. It provided a slight increase in environmental buffer but required 114 ha of forest land, making it the most environmentally invasive option. The plan also included a new road network, increasing tree felling and habitat loss in the Western Ghats. Procuring suitable earth materials for embankment construction presented additional challenges, either requiring further deforestation or costly transportation from outside the project area. Given the large-scale deforestation, ecosystem disruption, and high costs, this alternative was deemed unviable.

xiv. **Details of Solid waste/ Hazardous waste generation/ Muck and its management.** About 54.00 TPA and 14.6TPA Municipal Solid Waste will be generated during construction and operation of project. This shall be managed as per new Solid Wastes Management Rules, 2016. The municipal solid waste generated in the project complex/ project colony/ labour colony, shall be managed and handled in accordance with the duties set forth under clause 4 (1) through 4(3) and clause 20 of the rules. Detailed Solid Waste Management Plan shall be evolved while formulating EMP.

About 53.81 lakh cubic meter muck shall be generated from excavation during construction. It is assumed that 50% of the generated quantity shall be reused and the balance is proposed to be disposed in 2 designated sites which shall be developed from below the ground level by providing hard engineering measures such as retaining structures, crate walls and gabions. Garland drains shall be laid all along outer periphery of the muck piles for carrying rainwater. Detailed Muck Management Plan shall be evolved while formulating EMP.

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

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

1. EAC Meeting Details:

EAC meeting/s	28th EAC Meeting
Date of Meeting/s	15.04.2025
Date of earlier EAC meetings	24th EAC Meeting held on 14.02.2025

2. Project Details:

Name of the Proposal	Development of 1000 MW (4x250 MW) Upper Bhavani Pumped Storage Project
Location (Including coordinates)	The project is proposed near village Mulligur and Avilanji, Sub district Kundah, district Nilgiri in Tamil Nadu. It is located between latitude 11°15'00" to 11°20'00" and Longitude 76°32'30" to 76° 37'30".
Inter- state issue involved	No
Seismic zone	Seismic zone III: Moderate risk zone

3. Category Details:

Category of the project	A
Provisions	Project activity is covered at S. No. 1(c)(i) Hydro Projects (PSP) EIA Notification 14th September 2006 and amendments thereof
Capacity / Cultural command area (CCA)	1000 MW/6000 MWH pumped storage component with 6.0 hours storage capacity for peak power generation. Power required for 6.58 hours pumping operation for backfilling of upper reservoir of PSP shall be about 1100 MW.
Attracts the General Conditions (Yes/No)	Yes, Project is located within the default 10km ESZ of Mukurthi National Park.
Additional information (if any)	None

4. Electricity Generation Capacity:

Powerhouse Installed Capacity	1000MW
Generation of Electricity Annually	2080.50 MU
No. of Units	4 Nos. (4X250 MW)

Additional information (if any)	The project with installed capacity of 1000 MW (4x250 MW) by utilizing a design discharge of 97.76 cumec per unit with net head of 286.40m for 6.0 hour peaking hour daily will annually generate 2080 MU at 90% plant availability. The PSP will utilize 1100 MW to pump 82.15 cumec per unit from lower reservoir (Avalanch) to the upper reservoir (Upper Bhavani) in 6.58 hours. The annual pumping energy required shall be 2507.87 MU. The cycle efficiency of the PSP works out to be about 82.96%.

5. ToR/EC Details:

Cost of project	INR 5005.52 Crore
Total area of Project	167.85 Ha
Height of Dam from River Bed (EL)	No new dams will be constructed, as the existing Upper Bhavani Dam (Height 80m; Gross Storage: 97.04 MCM) proposed as upper reservoir and the existing Avalanche Dam (Height 57m; Gross Storage: 149.57 MCM) serves as the lower reservoir for the PSP.
Length of Tunnel/Channel	14069 m
Details of Submergence area	Nil, as upper and lower reservoir exists, and no new submergence is proposed.
Types of Waste and quantity of generation during construction/ Operation	MSW During construction:54.00 TPA During operation: 14.60 TPA
E-Flows for the Project	Not Applicable
Is Projects earlier studies in Cumulative Impact Assessment & Carrying Capacity Studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem	No Not Applicable Not Applicable

6. Muck Management Details:

No. of proposed disposal area/(type of land-Forest/Pvt. land)	Total area of 42 ha has been proposed for dumping of muck at two designated muck disposal sites (Non-Forest land: 42 ha)
Muck Management Plan	Muck disposal sites shall be developed by providing hard engineering measures such as retaining structures, crate walls and gabions. Garland drains shall be laid all along outer periphery of the muck piles for carrying rainwater. The muck shall be laid with vertical angle not exceeding 28° in such a manner that rock mass is properly stacked behind the wall with minimum of voids. The muck pile shall be later covered with Geo-coir textile properly held to the ground by steel wire U-nails and rehabilitated by afforestation of herbs and shrubs. Geo-coir textile shall also be provided on surface of muck piles where top surface is to be vegetated. Detailed Muck Management Plan shall be prepared along with other EMP.
Monitoring mechanism for Muck Disposal	The project authorities shall erect a barrier to regulate the traffic flow to and fro the muck piles site. Entry of all vehicles passing the barrier and the information regarding quantities of muck being transported shall be properly arrayed in a register in a transparent manner. Adequate measures shall be undertaken as per the norms.

7. Land Area Breakup:

Private land	111.50 ha
Government land/Forest Land	0.00/56.35 ha
Submergence area/Reservoir area	0.00
Land required for project components	56.35 ha
Additional information (if any)	Non-forest land, i.e., 111.50 ha will be primarily taken from TANGEDCO and balance, if required, will be acquired from private owners.

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	Yes	Mukurthi National Park is situated within 1 km from the project site. National park is located on Western side of existing Upper Bhavani reservoir and proposed project is on Eastern side of the reservoir.
National Park	Yes	
Wildlife Sanctuary	No	

9. Court Case Details:

Court Case	None
Additional information (if any)	None

10. 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 for diversion of forest land is under preparation.
Additional detail (If any)	None
Is FRA (2006) done for FC-I	Not yet

11. Miscellaneous:

Particulars	**Details**
Details of consultant	Voyants Solutions Private Limited QCI-NABET Certificate No. NABET/EIA/2225/SA 0229
Project Benefits	The project would generate designed energy 2080.50 MU during peaking hours. It will help in balancing grid for demand driven variations as well as balancing generation driven variations besides providing voltage support and grid stability. Apart from this, it will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.
Status of other statutory clearances	The mandatory statutory clearance like approval of power potential studies from CEA, site specific earthquake design parameters to be approved by NCSDP, Geological report approval from GSI, DPR approval from CWC and CEA; Forest

	clearance for diversion of forest land, are yet to be sought.
R&R details	Will be provided in EIA/EMP report
Additional detail (If any)	None

28.5.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Upper Bhavani Open loop Pumped Storage Project (1000 MW) in an area of 167.85 Ha located at Village Mulligur, Sub District Kundah, District The Nilgiris, Tamil Nadu by M/s NTPC Tamilnadu Energy Company Limited.
The project/activity falls under Category A of item 1(c), 'River Valley Projects,' as per the Schedule of the Environmental Impact Assessment Notification, 2006, and requires appraisal at the central level by the sectoral EAC in the Ministry.

The EAC observed the following in in its 24th meeting held on 14.02.2025:

- The EAC observed that though upper reservoir and lower reservoir are existing reservoirs of the Upper Bhavani dam and Avalanche-Emerald reservoir system respectively, but the project is located in the Nilgiris district, which is an ecological hotspot rich in diverse vegetation and wildlife, including elephants, tigers, and other species. Additionally, Mukurthi National Park is situated within 1 km of the project site, further raising concerns about potential ecological and environmental impacts.

- The EAC expressed serious concerns regarding the ecological and environmental sensitivity of the region, emphasizing that it forms part of the Western Ghats, a globally recognized biodiversity hotspot. Given the area's rich biodiversity, fragile ecosystems, and critical environmental significance, the committee stressed the necessity of conducting comprehensive environmental assessments and implementing robust mitigation measures to minimize potential adverse impacts.
- Additionally, the EAC noted that a substantial portion of the forestland requirement is attributed to transmission lines in addition to the core project components. Considering these factors, the committee recommended that the PP be asked to find out alternative sites considering that the present location is within 1 km of Mukurthi National Park in Nilgiri Hills.

Current Deliberations:

The EAC noted that the total land requirement for the project is 167.85 ha of which 56.35 ha is forest land while 111.50 ha is non-forest land. However, it was observed that the application for Stage-I Forest Clearance (FC) has not yet been submitted, which necessitates further action from the Project Proponent.

Further, it was noted that the alternatives studied by the PP is satisfied and alternative suggested by the PP is best site for proposed project as it site specific constraint are also applicable due existing of both lower and upper reservoir. Therefore, the EAC were satisfied with the information submitted the proponent, however, the EAC was of the view to conduct site visit by the sub-committee of the EAC to before giving recommendation to the project for Environmental Clearance.

28.5.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Open Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Upper Bhavani Open loop Pumped Storage Project (1000 MW) in an area of 167.85 Ha located at Village Mulligur, Sub District Kundah, District The Nilgiris, Tamil Nadu by M/s NTPC Tamilnadu Energy Company Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. In view of several under construction /commissioned projects in the vicinity of project area Cumulative Impact on the region shall be studied.

ii. PP shall submit detail plan for boring, drilling and blasting and use latest technology during construction of the project. The same shall be incorporated in EIA/EMP report.

iii. Blasting Plan shall be formed in view movement and pattern behaviour of the birds in consultation with reputed institution such as SACON.

iv. Continuous monitoring plan during the construction and operation of project shall be submitted and to be incorporate in EIA/EMP report.

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

vi. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 56.35 ha of forest land involved in the project shall be submitted within stipulated time.

vii. Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area. Rock quarrying and Borrow area shall be located in non-forest area as well.

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

necessary Clearance/ permission from the Standing Committee of NBWL clearance shall be submitted.

ix. Necessary clearance/ approval for interstate issues/ water availability/water sharing issues shall be obtained.

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

xi. 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.

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

xiii. 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.

xiv. 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.

xv. Details of mineral zone, if any, in the study area, certified by Geological Survey of India or any other concerned Government Organization shall be submitted. The project area should not come up on any critical mineral zone, the same shall to be verified by GSI/NMDC.

xvi. 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.

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

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

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

xx. 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.

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

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

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

[B] Socio-economic Study

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

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

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

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

[C] Muck Management

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

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

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

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

[D] Disaster Management

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

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

[E] Miscellaneous

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

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

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

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

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

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

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

viii. As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of

forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.

ix. Site visit shall be conducted by a sub-committee of the EAC before considering the proposal for Environmental Clearance.

The meeting concluded with thanks to the Chair

****

ANNEXURE

ATTENDANCE SHEET

28th MEETING OF EXPERT APPRAISAL COMMITTEE (EAC)

(RiverValley & Hydroelectric Sector)

DATE & TIME : **15th April 2025 from 10:30 AM to 5:30 PM**

VENUE : **Indus Conference Hall, Ground Floor, Jal Wing**
Indira Paryavaran Bhawan, New Delhi

Sl. No.	Name of Member	Role	Signature [15.04.2025]
1.	Prof. G.J. Chakrapani	Chairman	G.J. Chakrapani
2.	Shri Ajay Kumar Lal	Member	Online.
3.	Dr. Udaykumar R.Y.	Member	
4.	Dr. Mukesh Sharma	Member	online
5.	Dr. J.V. Tyagi	Member	
6.	Shri Kartik Sapre	Member	
7.	Dr. A.K. Sahoo	Member	online
~~8.~~	~~Representative of CIFRI~~	~~Member~~	———
9.	Shri Rakesh Goyal	Member	
10.	Shri Balram Kumar	Member	
11.	Shri Yogendra Pal Singh	Member Secretary	

12. Dr. J.A. Johnson, Scientist 'F'/Member/ V.C

Approval of the Chairman

Re: Draft MOM of 28TH EAC meeting held on 15.04.2025-reg.

CG Chakrapani GovindaJoseph <govind.chakrapani@es.iitr.ac.in>
Tue, 22 Apr 2025 1:56:50 PM +0530

To "Yogendra Pal Singh" <yogendra78@nic.in>

Approved.
Chakrapani

On 22-Apr-2025 12:04, Yogendra Pal Singh <yogendra78@nic.in> wrote:

Dear Sir,

The draft MOM of the 28th EAC meeting was circulated to all EAC members. The comments received from Member representative CEA have been incorporated. The modified draft MOM is attached herewith for approval please.

With Regards,

Yogendra Pal Singh
Scientist 'F'
Government of India
M/o Environment, Forest and Climate Change
Room No. 236, 2nd Floor, Vayu Wing
Indira Paryavaran Bhawan
Jor Bagh, New Delhi-110003
Tele-fax: 011-20819364