MINUTES OF THE 32ND MEETING OF THE EXPERT APPRAISAL COMMITTEE FOR RIVER VALLEY AND HYDROELECTRIC PROJECTS HELD ON 29TH MAY 2025 THROUGH VIDEO CONFERENCE

The 32nd meeting of the EAC for River Valley & Hydroelectric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 29th May, 2025 through Virtual mode, under the Chairmanship of Prof. G. J. Chakrapani. The list of Members present in the meeting is at **Annexure**.

Confirmation of the Minutes of the 30th EAC meeting:

The Minutes of the Meeting held on 31st EAC meeting on 14th May, 2025 were confirmed.

Agenda Item No. 32.1

Bhavali Pumped Storage Project (1500 MW) in an area of 278.92 Ha in Village Kalbhonde, Kothale and Jamunde, Sub District Shahapur and Igatpuri, District Thane and Nashik, Maharashtra by M/s JSW Energy PSP Two Limited – Environmental Clearance (EC) – reg.

[Proposal No. IA/MH/RIV/481391/2024; F. No. J-12011/08/2022-IA-I(R)]

32.1.1 The proposal is for grant of Environmental Clearance (EC) to the proposed project namely Bhavali Pumped Storage Project (1500 MW) in an area of 278.92 Ha in Village Kalbhonde, Kothale and Jamunde Sub District Shahapur and Igatpuri, District Thane and Nashik, Maharashtra by M/s JSW Energy PSP Two Limited.

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

i. The proposal is for environmental clearance to the project for Bhavali Pumped Storage Project (1500MW), located at Village Kalbhonde, Kothale and Jamunde Sub District Shahapur and Igatpuri, District Thane and Nashik, Maharashtra, by M/s JSW Energy PSP Two Ltd.

ii. The project proposal was considered by the Expert Appraisal Committee (Hydro River Valley Sector) in its 27th meeting held during 09.05.2022 and recommended for grant of Terms of References (ToR) for the Project. The ToR has been issued by Ministry vide letter No J-12011/08/2022-IA. I(R) dated 27.6.2022.

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

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

Upper Reservoir: $19^0$36'31.69" N ,$73^0$35' 45.06" E;
Lower Reservoir: $19^0$34' 56.38" N,73^0 35'10.0'' E"

v. The Bhavali Pumped Storage Project envisages creation of an upper reservoir (gross storage:12.35 MCM & live storage: 11.08 MCM) by constructing 962.47m long dam comprising of 822.47 m long Geomembrane faced rockfill dam (GRFD) with maximum height of 48.64m from foundation, 60m long and 61m height ungated spillway with 4 bays of 12.5m each; 4 blocks of 20m length each non-overflow section of maximum height of 49.57m from foundation, two each on either side of spillway. 80m long saddle dam (maximum height 10m from foundation) to reduce backwater to enter ESZ area. The lower reservoir (gross storage:13.26MCM; live storage:11.71MCM) shall be created by constructing concrete gravity dam 365.5m long at top with maximum height of 48.15m from foundation and 104 m long ,74m high (from foundation) ungated spillway with 8 bays of 10.5m each. Diffuser type Intake structure with 3 intakes (25.5mx10.5m) of 42.44m length shall be provided. The water conductor system shall comprise of 67.96 m long three intake tunnels of 7m diameter each with design discharge of 131.74cumec each. 5.1m diameter, followed Steel lined pressure shaft 3 nos. of independent, 5.1m diameter with length varying from 1568.09m to 1594.89m, six 3.8m diameter branch pressure shaft after first bifurcation of design discharge 65.96cumec each; two 2.9m diameter 46.83m long steel lined branch pressure shaft after second bifurcation of design discharge 32.98cumec each. Underground powerhouse (167mx22mx52.9m) housed with 7 No's. Francis vertical shaft reversible pump-turbine (5 X 250MW & 2 X 125 MW) discharging into circular draft tube 5.20 m and 4.0m diameter for large and small unit; two 4m diameter concrete lined branch tail race tunnel for 32.98cumec discharge after 3rd bifurcation; six 5.2meter diameter concrete lined branch tail race tunnel for 65.78 cumec discharge after 4th bifurcation; followed by three 7m diameter main tail race tunnel with length varying from 621.17m to 646.57m,each discharging 131.74cumec, 105m long trapezoidal tail race pool followed by 560m long trapezoidal tail race channel. Annual energy generation by Bhavali PSP in turbine mode is 4049.17 MU whereas annual energy consumed in pump mode is 5110.33 MU.

vi. **Land Requirement:** The total land requirement under the project for upper and lower rock fill dam, reservoir & other works, has been assessed as 278.92 ha of which private land is 35.18 ha, forest land 243.74 ha.

vii. **Demographic details in 10 km radius of project area:** The study area comprises of 40 villages. As per the Census of India 2011, the total households under study area villages are 9190. The total population of villages is 52201 composed of 26398 males and 25803 females with sex ratio of 977. The cast wise composition of the total population made up the Scheduled Cast population is 2234 (4.28%) and Scheduled Tribe population is

32079 (61.45%), which shows that the Scheduled Tribe is the dominant cast in most of the villages in study area. The total literate population is 28605, of which male and female population is 16974 and 11631 respectively. Total literate population is 64.83%, of which male and female literates are 76.40 % are 53.09 % respectively. The total working population is 24293 (46.53%) which comprises of main workers 18849 (36.10%) and marginal workers 5444 (10.43%) while non-workers are 27908 (53.47%). Among main workers, cultivators constitute the highest category (54.3%), followed by cultivators (29.7%) and other workers (15.90%). Among marginal workers agricultural labour constitutes the highest category (50.7%) followed by cultivators (31.9%) and other workers (15.4%).

viii. **Water Requirement:** The total water requirement during construction shall be 1000 kld(Domestic:100kld & Construction 900kld) and shall be met from the surface sources viz., nearby reservoir(s).

ix. **Project Cost**: The estimated project cost is Rs. 8964.02 Crores. Total capital cost earmarked towards environmental pollution control measures and the Recurring cost (operation and maintenance) will be about Rs. 282 lakh per annum.

x. **Project Benefit**: Employment will be 3000 persons as direct. PP proposes to allocate Rs 600 lakh for implementing issues raised during public hearing towards CER (As per Ministry's O.M. F.No.22-65/2017-IA.III, dated 30th September,2020, CER cost is not based on percentage cost of project)

xi. **Environmental Sensitive area**: Kalsubai Harichandragad Wildlife Sanctuary exists within 10 km of project boundary. However, no part of the project lies within Eco-sensitive zone of the Sanctuary. The distance between the project boundary and Kalsubai Harichandragad Wildlife Sanctuary is 2.21 km and 12.5m from ESZ boundary. The distance of the Wildlife Sanctuary has been duly approved by the Chief Wildlife Warden, Nagpur, Maharashtra vide letter no. कक्ष-२३(२)/वज्र/सर्वे/प्र.क्र.१६३/४३६६/२०२४-२५ on dated 29th Nov., 2024.

xii. **MoU / any other clearance/ permission signed with State government:**
(1) The MOU for setting up of the proposed Bhavali Pumped Storage Project (1500MW) has been made on 14th day of September,2021, between the Industries Department, Government of Maharashtra and M/s JSW Neo Energy Ltd.

(2) Govt. of Maharashtra, Water Resources Department, Hydrology and Dam Safety, issued certificate for water availability for project vide No. WFR/Ulhas/894, dated 21.11.2022.

xiii. **Resettlement and rehabilitation:** The total private land required for the project is 35.18 ha which is spread over Jamunde village in Tehsil Igatpuri, District Nashik, Maharashtra. There shall be 130 affected families of which 10 shall be displaced families. The

acquisition of the land shall be carried out by mutual negotiation in consonance with "RFCTLARRA", 2013. The total cost for implementing Rehabilitation and Resettlement Plan is Rs 1232 lakh comprised of the cost of land acquisition (Rs 854.54 lakh), R&R entitlement (Rs 82.05 lakh) and the cost of Tribal Development Plan (Rs 295 lakh).

xiv. **Scheduled –I species:** Nine mammalian species (Panther, Striped Hyaena, Jackal, Khokad, Jungle cat, Wolf, Chow Singha, Barking deer and Porcupine); 11 avifauna species (White backed Vulture, Slender billed vulture, Sparrow hawk. Brahminy kite, Booted eagle, Crested serpent eagle, Grey junglefowl, Indian peafowl, River tern, Barn owl and Brown wood) and three herpetofauna species (Indian Cobra, Russell's Viper and Rat snake) were recorded/reported from study area.

A budget of Rs. 326.50 Lakhs/- has been approved by Chief Wildlife Warden, Nagpur, Maharashtra vide letter no. कक्ष-२३(२)/वज्र/सर्वे/प्र.क्र.१६३/४३६६/२०२४-२५ on dated 29th Nov., 2024 for conservation of these Schedule-I species under Wildlife and Biodiversity Management Plan.

xv. **Alternative Studies:**

Based on ground topography and surface geo-mapping for preliminary understanding of the geological set up of the project area, for layout of WCS and powerhouse, two alternatives, viz., Alternate -1 with all components of WCS and powerhouse as underground and the Alternate-2 with surface powerhouse, were studied. Alternate-1 was preferred over Alternate-2 as the latter involved about 135m deep surface excavation for surface powerhouse, which would necessitate intricate supports and slope stability measures, besides posing seepage problem during operation compounded with problems with storm water drainage. The selected alternative has been found to be more suitable considering the minimal overall forest land requirement and minimal requirement of private land and least displacement of people habitations.

xvi. **Baseline Environmental Scenario:**

Period	**1.3.2022 to 30.12.2022 (Three seasons)**
AAQ parameters at 6 locations (minimum & maximum)	PM_{10}: 38.3 to 66.3 µg/m^3
	$PM_{2.5}$: 15.6 to 25.5 µg/m^3
	SO_2: 5.1 to 9.6 µg/m^3
	NOx: 6.5 to 12.8 µg/m^3
Incremental GLC Level	PM_{10}: Max. GLC: 13.83 µg/m^3
	$PM_{2.5}$: Max. GLC: 1.22 µg/m^3
	SO_2: Max. GLC: 1.0 µg/m^3
	NOx: Max. GLC:12.67 µg/m^3
River water samples at 3 locations	pH: 6.97to7.41
	Dissolved Oxygen: 7.3to8.3mg/l
	Total Dissolved Solids: 74to 81mg/l

	Total Hardness (as $CaCO_3$):56 to63mg/l
	Total Alkalinity (as $CaCO_3$):2 to28 mg/l
	Calcium (as Ca):16.8to18.4 mg/l
	Magnesium (as Mg):2.9to4.7 mg/l
	Oil and Grease: <2mg/l
	Sulphate (as SO_4):8.2 to11.6 mg/l
	Nitrate (as Na):2.4 to6.7mg/l
	Chloride (as Cl):30.3 to40.8mg/l
	Iron (as Fe):0.12to 0.3mg/l
	Copper (as Cu): <0.05 mg/l
	Lead (as Pb): <0.01mg/l
	Cadmium (as Cd): <0.003mg/l
	Chromium (as Cr): <0.05mg/l
	Manganese (as Mn): <0.05mg/l
	Arsenic (as As): <0.01mg/l
	Mercury (as Hg): <0.001mg/l
Pond water samples at 3 locations	pH:7.12 to7.56
	Dissolved Oxygen:6.9 to8.4mg/l
	Total Dissolved Solids:82to 107mg/l
	Total Hardness (as $CaCO_3$):59to77mg/l
	Total Alkalinity (as $CaCO_3$):2to27mg/l
	Calcium (as Ca):18.1to21. mg/l
	Magnesium (as Mg):3.3 to5.8mg/l
	Oil and Grease:<2mg/l
	Sulphate (as SO_4):7.4to14.1mg/l
	Nitrate (as Na): 3.1to 4.9mg/l
	Chloride (as Cl):30.9to 41.1 mg/l
	Iron (as Fe):0.05 to 0.21mg/l
	Copper (as Cu): <0.05 mg/l
	Lead (as Pb): <0.01mg/l
	Cadmium (as Cd): <0.003mg/l
	Chromium (as Cr): <0.05mg/l
	Manganese (as Mn): <0.05mg/l
	Arsenic (as As): <0.01mg/l
	Mercury (as Hg): <0.001mg/l
Ground Water samples at 6 locations	pH: 6.58 to 7.86
	Total Dissolved Solids: 216 to 310 mg/l
	Total Hardness (as $CaCO_3$):140 to190mg/l
	Total Alkalinity (as $CaCO_3$): 37 to 89 mg/l
	Calcium (as Ca): 34.1 to 47mg/l
	Magnesium (as Mg): 12.4 to26.9 mg/l
	Oil and Grease: :<2mg/l

	Sulphate (as SO_4):21.3to36.0 mg/l
	Nitrate (as Na):2.8 to 5.1 mg/l
	Chloride (as Cl):57.1to 83 mg/l
	Iron (as Fe) : 0.3 to 0.10mg/l
	Copper (as Cu): <0.05 mg/l
	Lead (as Pb): <0.01mg/l
	Cadmium (as Cd): <0.003mg/l
	Chromium (as Cr): <0.05mg/l
	Manganese (as Mn): <0.05mg/l
	Arsenic (as As): <0.01mg/l
	Mercury (as Hg): <0.001mg/l
Noise levels Leq (Day & Night) at 6 locations	Residential Area Leq. (Day): 46.9 to 53.1 dB (A)
	Residential Area Leq. (Night): 35.7 to 42.8 dB (A)
	Commercial Area Leq. (Day): 59.9 to 62.6 dB (A)
	Commercial Area Leq. (Night): 48.3 to 50.3 dB (A)
Soil Quality at 10 locations	Bulk density:1.28 to 1.49 gm/cc
	pH range: 6.60 to 7.34
	Electrical conductivity (EC);107 to 446 µmhos/cm
	Calcium content:1524 to 3281mg/kg;
	Sodium:154 to 418 mg/kg
	Potassium: 127to 826 mg/kg;
	Nitrogen:153to 849 mg/kg
	Phosphorous: 6.6to 46.9 mg/kg;
	Cation Exchange Capacity (CEC):10.7 to 23.67 meq/100gm
	Magnesium: 242 to 452mg/kg
	Sulphur: 15.4 to 32.8 mg/kg
	Organic Matter: 1.33 % to 5.26%
Flora & Fauna	**Flora:** During primary and secondary study carried out under present project, 88 tree species (37 families), 41 shrub species (23 families), 40 herbs species (26 families) and 14 species of climbers (10 families) and 18 species of grasses (1 family) were recorded from the study area. About 5 economically important and 36 important medicinal/ethnobotanical importance plant species were recorded. One endemic specie was also reported.
	Fauna Sixteen mammalian species were found/reported from secondary sources as well as from the primary survey and consultations. Out of reported species nine species are Schedule-I species and three species and four species

	belong to Schedule -II and IV respectively. As per IUCN criteria (3.1) study area harbors three vulnerable species and one species categorized under threatened category, Forty-nine bird species were observed /reported during the survey of which ten species belong to Schedule-1 of WPA, 1972. Rest of the species belong to either Schedule-II or IV. As per the IUCN Red list two species Vultures are categorized as "Critically Endangered" and all other species are listed as "Least Concern". Two species of amphibians, 4 species of snakes and 4 species of lizards recorded/confirmed in the study area of which Indian Cobra, Russell's Viper and Rat snake belong to Schedule-I of WPA,1972, as amended in December,2022. Eight species of butterflies were recorded/reported of which none belong to Schedule-1 **Aquatic** Twenty-one Phytoplankton species were recorded: Cyanophycean (8), Bacillariophyceae (5), Chlorophyceae (7), Euglenophycin (1). Twelve species of Zooplankton were recorded: Rotifera (5), Cladocera (4), Copepods (2) and Ostracoda (1). Among fish population 10 species belonging to 4 families viz., Cyprinidae (*Catla catla, Labeo rohita, Cirrihinus mrigala, Labeo calbasu, Puntius chola* and *Garra mullya*); Channidae (*Channa gachua*&*Channa punctatus*);*Bagridae*(*Rita rita)*; Saccobranchidae (*Heteropneustes fossilis*) were identified.

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

a) Solid Waste: Municipal Solid Waste (MSW) likely to be generated during construction and operation shall be 38.8 Ton/annum and 7.2ton/annum respectively which shall be managed as per Solid Wastes Management Rules, 2016.

Hazardous waste: It inter alia includes burnt mobile oil and greases (6ton/annum) from vehicles and construction machinery and equipment which shall be handled and disposed through authorised dealer as per Hazardous and other Wastes (Management &Transboundary Movement) Rules,2016.

b) Muck & its management

The total quantity of muck / debris, to be generated due to the project, shall be 64.06 lakh cum, out of which 36.08 lakh cum shall be consumed on the project work leaving 28.43 lakh cum, which with 42% swell factor shall amount to 40.37 lakh cum shall be disposed at two designated muck disposal sites in an area of 44.09 ha. The muck disposal sites shall be

developed from below the ground level by providing retaining wall. After construction of retaining wall, the muck brought in dumpers shall be dumped and manually spread behind the wall. The muck shall be laid with vertical angle not exceeding 28^0 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-Geo-coir textile properly held to the ground by steel wire U-nails and rehabilitated by afforestation of herbs and shrubs.

xviii. **Public Hearing:**

Particular	District Nashik	District Thane
Advertisement for PH with date	Local newspaper "Sakal" (Marathi) and the "Times of India" (English) on 07.12.2023.	Local newspaper" Sakal" (Marathi) and the "Free Press Journal" (English) on 12.01.2024.
Date of Public Hearing	10.01.2024	13.02.2024
Venue	Near to the Upper Reservoir, in village Jamunde, Post Manvede, Tehsil Igatpuri, District Nashik	Near to the Lower Reservoir, in village Kalbhonde, Tehsil Shahpur, District Thane.
Chaired by	Mr. Ravindra Thakre, SDM, Igatpuri, Nashik	Ms. Manisha Jaybhaye Dhule, Additional Collector, Thane
Main issues raised during PH	• Adequate compensation should be granted for acquiring their land •Job opportunities for the youth and unemployed people • Impact to flow of water, wildlife, trees and medicinal plants, agricultural and horticultural crops •Remedial measures for addressing pollution control and wildlife impacts during construction •Addressal of problems like scarcity of water, electricity and lack of roads and education facilities, • Relocation of Temple in Jamunde. • Demanded school bus for children •Assistance to the villagers in education, health and employment sector	•Job opportunities for the youth and unemployed people •Addressal of problems like scarcity of water, electricity and lack of roads and education facilities •Demanded Company to establish a High School in the village •Repairs of local Deities & clan God •Mobile team of health workers should be provided •Books and clothes should be distributed to village children •Plantation of trees by the company •Job opportunities for the youth and unemployed people

	•Livelihood opportunities for the people of the area •CSR grant for developing local villages	

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

- **Project Details**

EAC meeting/s	30th EAC meeting for reconsideration of EC proposal
Date of Meeting/s	30th April, 2025
Date of earlier EAC meetings	Earlier, the proposal was appraised in front of the EAC (River Valley & Hydroelectric Project) in its 14th EAC meeting held on 30th Aug., 2024. The proposal was deferred for want of additional details.

- **Project Details**

Name of the Proposal	**"Bhavali Pumped Storage Project"** (1500MW) at village Jamunde, Tehsil Igatpuri, District Nashik and villages Kalbhonde and Kothale, Tehsil Shahpur District Thane, Maharashtra M/s JSW Energy PSP Two Limited
Proposal No.	Proposal No.: IA/MH/RIV/481391/2024; File No. J-12011/08/2022-IA. I(R)
Location (Including Coordinates)	Upper dam: Jamunde (Igatpuri Tehsil-Nasik) Lower dam: Kalbhonde & Kothale (Shahapur Tehsil - Thane) Upper Reservoir: $19^0$36'31.69" N ,$73^0$35' 45.06" E; Lower Reservoir: $19^0$34' 56.38" N,73^0 35'10.0'' E
Company's Name	JSW Energy PSP Two Ltd.
CIN no. of Company/user agency	U40108MH2021PLC367136
Accredited Consultant and certificate no.	EQMS India Pvt. Ltd., Karkardooma, Delhi-110092 QCI/NABET/ENV/ACO/2225/0303, Valid up to 23.11.2025.

Project location (Coordinates /River/Reservoir)	Upper Reservoir: $19^0$36'31.69" N ,$73^0$35' 45.06" E; Lower Reservoir: $19^0$34' 56.38" N,73^0 35'10.0'' E
Inter- state issue involved	No
Proposed on River/ Reservoir	This is an Off-stream Open Loop Pumped Storage Project
Type of Hydro-electric project	Standalone Pump Storage Project.
Seismic zone	Zone III (Moderate Damage Risk Zone)

- **Category Details**

Category of the project	A
Capacity / Cultural command area (CCA)	1500MW/11600 MWH
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	-

- **ToR/EC Details**

ToR Proposal No.	IA/MH/RIV/265129/2022
EAC meeting date	27th meeting held on 09.05.2022.
ToR Letter No.	J-12011/08/2022-IA. I(R)
ToR grant Date	27th June 2022.
Cost of project	Rs. 8964.02 Crores
Total area of Project	278.92 ha (excluding transmission line ROW)
Height of Dam from Riverbed (EL)	Upper dam: Maximum 48.64m from foundation Lower dam: Maximum 48.15m from foundation
Details of submergence area	169.60 ha
District to provide irrigation facility (if applicable)	Not applicable
Details of tunnels on upper level & lower level and length of canal (if applicable)	Intake tunnel (3 Nos ,7.0 m dia and 67.96 m long) 3 Nos. of Independent Penstocks (5.2 m dia.)- 2 nos. bifurcating into 4 nos. individual units (250 MW each) and 1 no. bifurcating for 3 nos. individual unit 1 no. 250 MW unit & 2 nos. 125MW Units). Length of Penstock/Pressure Shaft: 1741m Main TRT (7.0 m dia.;621.17 to 646.57m long) Branched TRT (4.0 m & 5.20 m diameter

	Total length of TRT: 713.43 m from Draft tube
No. of affected Village.	3
No. of Affected Families	130
Project Benefits	Project benefits *inter alia* shall include the benefits like (i) Average annual generation of 4044.06 MU of energy with 95% plant availability; (ii) Increased vegetal cover due to implementing of CAT Plan and Green Belt Development Plans (iii) Employment Potential during construction (3000 labour); (iv) Overall development of area by implementing CER initiatives based on the Public hearing issues and Watershed Development Plan.
R&R details	Total Private land to be acquired: 35.18 ha. Displaced families: 10 Project Affected Families:130 Land acquisition cost: Rs 854.54 lakh R&R Grants: Rs 82.05 lakh Tribal Development Plan: Rs 295 lakh Total: Rs 1232 lakh
Catchment area/ Command area	Catchment :11.72 sq.km; Command area: Nil
Types of Waste and quantity of generation during construction/Operation	MSW-38.8 Ton/annum during construction and 7.2 Ton/annum during operation
Material used for blasting and its composition as per DGMS standards	Ammonium Nitrate Fuel Oil (ANFO), a mixture of ammonium nitrate and fuel oil.
E-Flows for the Project	The inflow of Darna River at upper dam site shall be released from bottom outlet throughout the year. The inflow of Chorni River at lower dam site shall be released from spillway after first filling of reservoir.
Is Projects earlier studied in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then c) E-flow with TOR/Recommendation by EAC as per CIA&CC study of River Basin. d) If not the E-Flows maintain criteria for sustaining river ecosystem.	No Not applicable, in case of PSP. Not applicable, in case of PSP
Details on provision of fish pass	Pumping operation can have strong impacts like mortality of fishes through turbine

	passage, change of habitat etc. During operation phase water shall travel through reversible turbines under high pressure from the column of water above it, conditions for organic species are quite tough. Larger species like fish or water animals cannot survive passing through turbines. The diurnal very high extent of water-level fluctuation of about 26 m in the upper reservoir and 30m in lower reservoir may affect changes in the fish-food fauna and cause mortality of fries and fingerlings. Extreme fluctuations can increase turbidity which is detrimental to egg and fry survival. Therefore, no fisheries management plan is proposed in either of pump storage reservoir.
Project benefit including employment details (no of employee)	Benefits from project already stated at S.N.4 Temporary employment during construction: 1575000 man-days Permanent employment during construction :100 Nos.
Area of Compensatory Afforestation (CA) with tentative no of plantation.	Area proposed for Compensatory afforestation is 245.735 ha. Out of 245.735 ha area, 18750 tall plants (625 tall plants/ ha) will be planted in 30 ha area and remaining 215.735 ha will be developed/ maintained under Crop Investment Programme.
Previous EC details	None, as EC is yet to be granted
EC Compliance Report by R.O, MOEF&CC	Not applicable

- **Electricity Generation Capacity**

Powerhouse Installed Capacity	1500MW
Generation of Electricity Annually	4049.17 MU
No. of Units	5 X 250MW + 2 X 125 MW

- **Muck Management Details:**

No. of proposed disposal area/ (type of land-Forest/Pvt land)	2 (Forest land)

Cross section of proposed muck area, height of muck with slope.	D-1: Area=22.3ha, Height average=12.50m D-2: Area=22.6ha, Height average=5.5m Slope of muck shall be lesser than 28^0
Distance of muck disposal area(location), from muck generation sources (project area)/River, HFL of proposed muck disposal area.	1.0-2.5 km No river at muck disposal site.
Total Muck Disposal Area	44.90 ha (forest)
Estimate Muck to be generated	Muck to be generated: 64.51 lakh cum Consumed on work: 36.08 lakh cum To be disposed: 28.43 lakh cum
Transportation	By road
Monitoring mechanism for Muck Disposal	The project authorities shall erect a barrier to regulate to and fro movement of traffic from the excavation site. Entry of all vehicles passing the barrier and the information regarding quantities of earth material being transported shall be properly arrayed in a register in a transparent manner and shall be liable to be made public by the project authorities as and when required. Proper e-challan shall be issued.

- **Land Area Breakup:**

Private land	35.18 ha
Forest Land	243.74 ha
Government land	0.00 ha
Submergence area/Reservoir area	169.60
Land required for project components	74.14 ha

- **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	-
National Park	No	Kalsubai Harichandragad Wildlife Sanctuary exists within 10 km of project boundary. However, no part of the project lies within Eco-sensitive zone of the Sanctuary.
Wildlife Sanctuary	Yes	

		The distance between the project boundary and Kalsubai Harichandragad Wildlife Sanctuary is 2.21 km and 12.5 m from ESZ boundary. The distance of the Wildlife Sanctuary has been duly autheticated by the Chief Wildlife Warden, Nagpur, Maharashtra vide their letter no. कक्ष-२३(२)/वज्र/सर्वे/प्र.क्र.१६३/४३६६/२०२४-२५ on dated 29th Nov., 2024
Archaeological sites monuments/historical temples etc	No	-
Additional information (if any)	No	-

- **Court case details:** No court case/litigation is pending.

- **Status of other statutory clearances:**

Particulars	Letter no. and date
Status of Stage- I FC	Application for Diversion of 243.74 ha forest land has been submitted via Proposal no: FP/MH/HYD/153240/2022 on 6th March, 2022. The application has been recommended by DFO West Nashik Division, Nashik Circle on 10th April, 2025 and DFO Shahapur Division, Thane Circle on 12th April, 2025 by filling part-II of Form-A on 'PARIVESH Portal' and the same is yet to be recommended & forwarded by CCF at Nodal Office for his further approval.
Approval of Central Water Commission	Hydrology approved vide letter CWC U.O.:7/Maha-2021-Hyd(S)/107, dated 28.6.2022
Approval of Central Electricity Authority	The power potential Studies have been cleared by Directorate (HPA) CEA, New Delhi, vide letter dated 05.09.2024
Additional detail (If any)	The Concurrence on DPR has been granted by Ministry of Power, Central Electricity Authority, Hydro Project Appraisal Division vide their letter no. CEA-HY-12-24/4/2021-HPA Division I/43296/2024 on dated 24.09.2024

Is FRA (2006) done for FC-I	FRA for Village: Kothale & Kalbhonde, District Thane is completed on 3rd March, 2025 and FRA for District Nashik is under implementation.

- **Details of the EMP:**

S. N.	Plans	Cost (Rs. Lakh)	Capital cost (Rs lakh)	Annual recurring cost (Rs lakh)
1.	Catchment Area Treatment Plan	250.00	210.00	10.00
2.	Compensatory Afforestation Scheme	3914.26	3914.26	
3.	Wildlife and Bio-diversity Management plan	326.00	326.50	0.00
4.	Resettlement & Rehabilitation Plan	1232.00	1232.00	0.00
5.	Green Belt Development Plan	120.00	80.00	10.00
6.	Reservoir Rim Treatment Plan	30.00	30.00	0.00
7.	Fisheries Management Plan	130.00	130.00	0.00
8.	Muck Management Plan	2390.00	2350.00	10.00
9	Restoration Plan for Quarry Sites &landscaping	65.00	45.00	5.00
10.	Disaster Management Plan	30.00	26.0	1.00
11.	Water, Air and Noise Management Plan	140.00	48.00	23.00
12.	Public Health Delivery Plan	95.00	31.00	16.00
13.	Labour Management Plan	160.00	42.00	29.50
14.	Sanitation & Solid Waste Management Plan	145.00	85.00	15.00
15.	Local Area Development Plan	100.00	100.00	0.00
16.	Environmental Safeguards During Const.	316.00	00.00	79.00
17.	Energy Conservation Measures	225.00	15.00	52.50
18.	Environmental Monitoring Plan	140.00	16.00	31.00
19	CER Plan for addressing issues raised during public hearing	600.00	600.00	0.00
20	Watershed Management	500.00	500.00	0.00
Total EMP		**11848.00**	**10680.00**	**292.00**

30.1.3 The proposal was earlier considered by the EAC in its 14th meeting held on 30th August, 2024. Accordingly, PP submitted following additional details sought by the EAC on 14th April, 2025.

Query 1: The Project Proponent (PP) shall re-visit soil sampling analysis as results show very high organic carbon in soils and submit the revised results mentioning permissible limits in the results of soil analysis.

Reply: The soil sampling results were reviewed for all ten locations in the study area and the range of soil organic carbon analysed is presented in the following table which also mentions the soil fertility status for organic carbon as outlined in Soil manual of ICAR at National level and State (Maharashtra) level. It is evident from the table that the soil of the study area is medium to very high in organic matter.

S. N	Location	Environmental Setting	Organic carbon %	Soil fertility range for SOC
1.	Upper dam site (Jamunde)	Forest	1.04-1.19	**National Level** <0.5%-Low 0.5%-0.75%-Medium >0.75%-High **State Level** <0.2%- Very Low 0.21%-0.40 %-Low 0.41%-0.60 %- Medium Low 0.61%-0.80 %- Medium 0.81%-1.00 %- High >1.00 %-Very High
2.	Dhamudkiwadi	Scrub	0.89-1.14	
3.	Bhavali Khurd	Agriculture	0.78-1.02	
4.	Lower dam site (Kalbhonde)	Forest	2.57-2.67	
5.	Kothale	Agriculture	2.83-3.00	
6.	Kahnodapada	Agriculture	1.08-1.17	
7.	Hinglod	Agriculture	1.93-2.05	
8.	Manwedhe	Forest	1.19-1.31	
9.	Kurungwadi	Agriculture	1.04-1.16	
10	Borli	Agriculture	0.76-0.91	

Factors controlling Soil Organic Carbon status inter alia include climate (especially rainfall and temperature), hydrology, biological activity, vegetation and land use.

The study area lies in western coast area under the foothills of Sahyadri hills in Igatpuri Tehsil (District Nashik) & Shahpur Tehsil (District Thane) and experiences very high rainfall (Av. 3000mm). Soil of the study area is derived from the Deccan trap. The dominant land use classes in the study area are dense forest (47.75%), agriculture land (29.87%), and open forest (20.61%). Agricultural fields are very close to forested areas. The organic carbon content in the surface soil is relatively higher due to accumulation of vegetative residues during soil formation, combined with very high rainfall in the region.

According to soil fertility data from the Soil Health Card (SHC) Scheme (Cycle-II, 2017–19), soil samples from six villages were analyzed. The results indicate that organic carbon levels are high in most of the samples. For sampling location Kalbhonde, out of 49 samples analysed, 41 samples contained organic carbon levels exceeding 1.0%, with 25 samples

registering above 3.0%. For sampling location Kothale, out of 39 samples analysed, 31 samples had organic carbon levels above 1.0%, with 23 samples exceeding 3.0%.

Sampling Village	Soil Organic Carbon (%)								
	Total Samples	**<0.5**	**0.51-0.75**	**0.76-0.99**	**1.0-3.0**	**>3.0**	**Min**	**Max**	**AV**
Bhavali Khurd	23	1	8	13	1	-	0.45	1.03	0.78
(Kalmonde)	49	1	4	3	16	25	0.38	4.8	2.73
Kothala	39	1	3	4	8	23	0.45	4.64	2.83
Hinglod	54	1	4	1	37	11	0.45	3.60	1.93
Kurungwadi	63	16	14	11	22	-	0.11	1.40	0.71
Borli	15	10	2	1	2	-	0.19	1.67	0.5

Source: *https://soilhealth.dac.gov.in/PublicReports/NutrientsStatusReportFarmer Wise*

Query 2: PP shall relocate the location of Muck Disposal site and should be away from Forest land.

Reply: The upper reservoir of the Bhavali Pumped Storage Project is proposed in Village Jamunde, Tehsil Igatpuri, District Nashik while the lower reservoir is proposed in Village Kalbhonde, Tehsil Shahpur, District Thane, Maharashtra. Muck generated during the construction will be disposed on the designated area. Since no viable alternative locations with better ecological advantages are available nearby, the earmarked area for muck disposal in forest land has been considered to minimise the impacts of project on the Environment and Forest.

The forest land diversion proposal has been duly accepted by the Forest Department, with the Deputy Conservator of Forests (DCF) recommending it by completing Part-II of Form-A under the Forest (Conservation) Act. Furthermore, the Project layout of the Proposed PSP site has been approved by the Central Water Commission, Hydel Civil Designs (E&NE) Directorate, New Delhi vide their letter dated 15th Feb., 2024. All measures outlined in the 'Muck Disposal Management Plan' will be implemented by the Company, with a separate budget allocated under the Muck Management Plan.

Additionally, the same has been verified by the Members of Sub-Committee of EAC (Hydro & River Valley Project) during their project site visit on 2nd & 3rd Jan., 2025. The findings of the site visit were discussed amongst the Hon'ble EAC members at Additional Agenda Item 22.4 in the 22nd EAC Meeting held on 10th Jan., 2025. As per the recommendations of Minutes of the Meeting,

"the relocation of muck disposal site may not be insisted on while considering the proposal for clearance since the muck disposal site was found to have been selected properly. Further, ecologically better sites were not appeared available in nearby areas. Any relocation at this

stage might lead to much changes and may lead to more adverse consequences. However, safety measures as contained in EMP and in other documents should be adhered into".

In view of the above submissions, it is being requested by the Company to kindly consider the muck disposal site as proposed in the Approved Project Layout.

Copy of the Layout approval letter issued by the CWC and the Copy of Minutes of 22nd EAC Meeting has been submitted.

Query 2: Assessment of water requirement of local population and water availability shall be studied.

Reply: Total water requirement for all purposes in the micro-watershed villages has been assessed, considering domestic consumption by inhabitants, water needs for livestock, and irrigation requirements for crop grown in irrigated areas during both cropping seasons. The total water requirement for domestic use, including drinking water and livestock needs has been estimated at 2056806 cum (205.68 ham) and 205680.6 cum (20.57 ham), respectively. The irrigation water requirement based on groundwater abstraction has been assessed at 2402400 cum (240.24 ham). Thus, the total water requirement for all purposes shall be 466.49 ham.

S.N.	Name	Population census 2011	Projected Population 2022	Annual Domestic water Requirement @70 lpcd (cum)	Irrigation Requirement		Annual Domestic animal Requirement @10% of domestic water requirement	Total Annual requirement (ham)
					Area (ha)	cum		
1.	Bhavli Bk	1023	1146	29274	0	0	2927.4	3.22
2.	Titoli	1076	1205	30791	0	0	3079.1	3.39
3.	Bortembhe	1673	1874	47875	0	0	4787.5	5.27
4.	Kanchangaon	1906	2135	54542	84	672000	5454.2	73.20
5.	Talogha	2501	2801	71569	60	480000	7156.9	55.87
6.	Taloshi	1795	2010	51366	44	352000	5136.6	40.85
7.	Nandgaonsado	4203	4707	120273	0	0	12027.3	13.23
8.	Pimpri Sadroddin	2316	2594	66275	0	0	6627.5	7.29
9.	Fangul	1531	1715	43811	0	0	4381.1	4.82

	Gavhan							
10.	Borli	616	690	17627	0	0	1762.7	1.94
11.	Bhavli Kh	23073	25842	660257	83.9	671200	66025.7	139.75
12.	Kaluste	3885	4351	111173	20.1	160800	11117.3	28.31
13.	Bharwaj	819	917	23437	0	0	2343.7	2.58
14.	Manjargaon	889	996	25440	0	0	2544	2.80
15.	Nirpan	828	927	23694	0	0	2369.4	2.61
16.	Gavhande	701	785	20060	8.3	66400	2006	8.85
17.	Jamunde	589	660	16855	0	0	1685.5	1.85
18.	Kurungwadi	1055	1182	30190	0	0	3019	3.32
19.	Ambewadi	2183	2445	62469	0	0	6246.9	6.87
20.	Taked Kh	1120	1254	32050	0	0	3205	3.53
21.	Kasara Kh.	2588	2717	69430	0	0	6943	7.64
22.	Dand	165	173	4427	0	0	442.7	0.49
23.	Umbravane	249	261	6680	0	0	668	0.73
24.	Fugale	1018	1069	27310	0	0	2731	3.00
25.	Vashala Bk	1439	1511	38605	0	0	3860.5	4.25
26.	Vashala Kh	325	341	8719	0	0	871.9	0.96
27.	Susarwadi	1044	1096	28008	0	0	2800.8	3.08
28.	Pingalwadi	162	170	4346	0	0	434.6	0.48
29.	Dhakane	1882	1976	50489	0	0	5048.9	5.55
30.	Kothale	1233	1295	33078	0	0	3307.8	3.64
31.	Kalbhonde	997	1047	26747	0	0	2674.7	2.94
32.	Julawani	1382	1451	37076	0	0	3707.6	4.08
33.	Jambhulwad	665	698	17840	0	0	1784	1.96
34.	Roadvahal	476	500	12770	0	0	1277	1.40
35.	Hinglud	404	424	10838	0	0	1083.8	1.19
36.	Chondhe Kh.	384	403	10302	0	0	1030.2	1.13
37.	Chilhar	588	617	15775	0	0	1577.5	1.74
38.	Ranvihir	1468	1541	39383	0	0	3938.3	4.33
39.	Ghatghar	1176	1288	32901	0	0	3290.1	3.62
40.	Udadawane	1539	1685	43057	0	0	4305.7	4.74
Grand Total		**72966**	**80501**	**2056806**	**300.3**	**2402400**	**205680.6**	**466.49**

Table 2: Ground Water Recharge & Annual Requirement

S. No.	Name	Rainfall recharge (ham)	Total annual ground water requirement (ham)	Deficit (-ve) Surplus (+)
1.	Bhavli Bk	101.33	3.22	98.11
2.	Titoli	42.22	3.39	38.83
3.	Bortembhe	46.91	5.27	41.64
4.	Kanchangaon	139.50	73.20	66.3
5.	Talogha	132.85	55.87	76.98
6.	Taloshi	172.84	40.85	131.99
7.	Nandgaonsado	150.41	13.23	137.18
8.	Pimpri Sadroddin	209.82	7.29	202.53
9.	Fangul Gavhan	103.75	4.82	98.93
10.	Borli	119.23	1.94	117.29
11.	Bhavli Kh	151.35	139.75	11.6
12.	Kaluste	209.12	28.31	180.81
13.	Bharwaj	113.25	2.58	110.67
14.	Manjargaon	151.54	2.80	148.74
15.	Nirpan	78.17	2.61	75.56
16.	Gavhande	136.10	8.85	127.25
17.	Jamunde	96.59	1.85	94.74
18.	Kurungwadi	485.10	3.32	481.78
19.	Ambewadi	586.14	6.87	579.27
20.	Taked Kh	117.57	3.53	114.04
21.	Kasara Kh.	729.02	7.64	721.38
22.	Dand	415.94	0.49	415.45
23.	Umbravane	350.74	0.73	350.01
24.	Fugale	260.40	3.00	257.4
25.	Vashala Bk	521.22	4.25	516.97
26.	Vashala Kh	112.50	0.96	111.54
27.	Susarwadi	154.01	3.08	150.93
28.	Pingalwadi	334.91	0.48	334.43
29.	Dhakane	311.54	5.55	305.99
30.	Kothale	480.82	3.64	477.18
31.	Kalbhonde	480.27	2.94	477.33
32.	Julawani	237.64	4.08	233.56
33.	Jambhulwad	357.98	1.96	356.02

34.	Roadvahal	316.39	1.40	314.99
35.	Hinglud	132.27	1.19	131.08
36.	Chondhe Kh.	272.58	1.13	271.45
37.	Chilhar	144.19	1.74	142.45
38.	Ranvihir	303.63	4.33	299.3
39.	Ghatghar	753.12	3.62	749.5
40.	Udadawane	620.19	4.74	615.45
Total		**1373.31**	**8.36**	**1364.95**

As inferred from Table 1 & 2, the total annual groundwater requirement for all purposes is 466.49 ham, while the annual groundwater recharge is 1373.31 ham. This indicates that the villages in the study area have a sufficient groundwater supply, with no signs of water scarcity.

Query 4: Permission for water availability obtained from CWC /concerned department mentioning that rain water is sufficient for filling one time filling reservoir.

Reply: Water availability certificate has been issued by the Chief Engineer, Water Resource Department, Hydrology & Dam Safety, Government of Maharashtra vide letter no. WFR/Ulhas/894 on 21st Nov., 2022.

Query 5: PP shall submit the undertaking stating that no water flow stoppage/blockage shall be done for filling reservoir during monsoon season.

Reply: Copy of undertaking dated 14.04.2025 has been submitted.

Query 6: The PP shall prepare wild life conservation plan in consultation with expert Institutions and submit the wildlife conservation plan approved by Chief Wildlife Warden as Kalsubai Harichandragad Wildlife Sanctuary exists within 10 km of project boundary. As the project cover area is located in Western Ghats, the EAC sub-committee shall conduct site visit for assessing the ground conditions and possible environmental impacts due to project comprehensively before further consideration of the proposal.

Reply: The distance between the project boundary and Kalsubai Harichandragad Wildlife Sanctuary is 2.21 km and 12.5 m from ESZ boundary. The distance of the Wildlife Sanctuary along with Wildlife and Biodiversity Management Plan has been duly approved by PCCF (HoFF), Maharashtra vide letter dated 29th Nov., 2024. Approved budget for Wildlife and Biodiversity Management Plan is Rs. 326.50 Lakhs/-. Copy of Approval letter along with Certified Map has been submitted.

Dr. Ajay Kumar Lal, Member EAC (Hydro & River Valley project) and Dr. P. R. Sakhare

Members & Representative from MoEF&CC visited the Proposed Bhavali Pumped Storage Project" site on 2nd & 3rd Jan., 2025 and the findings of the site visit were discussed amongst the Hon'ble EAC members at Additional Agenda Item 22.4 in the 22nd EAC Meeting held on 10th Jan., 2025

Query 7: Given that 243.74 ha. Forest land are involved, the PP shall provide a detailed classification /land use pattern /vegetation details of the project area including information on forest density, species diversity, and other relevant ecological characteristics.

Reply:

The Forest Clearance application (FP/MH/HYD/153240/2022) is currently under process and has been recommended by the concerned Divisional Forest Officer by filling Part-II for further processing. The details given below are based on the uploaded Form Part - II of FC application and copy of the uploaded Form Part – II has been submitted.

Detail Classification-

The project area is 274.82 ha. and forest land required to be diverted is 243.74 ha of which 181.45 ha in Forest Division Shahapur and 62.29 ha lies in Nasik West Forest Division, Maharashtra. as shown in Table 3

Table 3: Forest Land details and Classification

S.N.	Village /Tehsil/District	Forest Division	Classification	Forest (ha)
1	Kalbhonde/ Shahapur/Thane	Shahapur Forest Division, Maharashtra	Reserved Forest	97.92
2	Kothale/ Shahapur/Thane		Protected Forest	9.68
3	Kothale/ Shahapur/Thane		Private Forest (Deemed RF)	73.85
Forest Area for Diversion				**181.45**
4	Jamunde/Igatpuri / Nasik	Nasik West Forest Division, Maharashtra	Reserved Forest	62.29
Forest Area for Diversion				**62.29**
Grand Total				**243.74**

Land Use Pattern

The dominating classes are Tropical Moist Deciduous Forest (75%) and Tropical Semi-evergreen Forest (25%). The land use pattern of Forest area in study area is given below in Table 4.

Table 4: Land use & Land cover of Forest covered Area in project

S.N.	Land use category	Area in ha.	Area in %
1	Tropical Moist Deciduous Forest (Open & Dense Forest)	181.45	75%
2	Tropical Semi- evergreen Forest	62.29	25%
Total		**243.74**	**100%**

Vegetation details:

Details of Vegetation available in the forest land proposed for diversion as per given in following table:

S. No.	Forest Division	Area(in ha.)	Forest Type	Density	Eco-Class
1	Shahapur Forest Division, Maharashtra	73.85	Private Forest	0.2	Eco- Class 1
2		107.6	Reserved & Protected Forest	0.6	Eco- Class 1
3	Nasik West Forest Division, Maharashtra	62.29	Reserved Forest	0.5	Eco- Class 1

Species diversity:

The details of Species diversity of Shahpur and Nashik Forest division is given below:

A. **The details of Species diversity in Shahpur Forest Division is given in Table 5**

Table 5: Species-wise local/scientific names and girth-wise enumeration of trees at FRL

S. No.	Scientific Name	Local Name	(0-30)cm.	(31-60)cm.	(61-90)cm.	(91-120)cm.	(121-150)cm.	(>150)cm.
1	*Tectona grandis*	Sag	157	102	8	1	0	0
2	Others	other species	18155	13537	3440	938	442	153
3	*Adina cordifolia*	Hedu	90	64	19	9	4	3
4	*Terminalia tomentosa*	Ain	11345	10184	1663	475	163	49
5	*Gmelina arborea*	Shivan	263	265	6	14	2	3

Total	30010	24152	5136	1437	611	208
Sub Total (No of Trees.)	61554					

B. The details of Species diversity in Nashik West Forest Division is given in Table 6

Table 6: Species-wise local/scientific names and girth-wise enumeration of trees at FRL

S. No.	Scientific Name	Local Name	(0-30)cm.	(31-60)cm.	(61-90)cm.	(91-120)cm.	(121-150)cm.	(>150)cm.
1	*Mangifera indica*	Aam	62	140	70	65	63	99
2	*Gomphrena globosa*	Aamantegali	13	4	0	0	0	0
3	*Bauhinia racemosa*	Aapta	0	4	2	0	0	0
4	*Pterocarpus marsupium Roxb*	Aasan	98	85	17	3	1	4
5	*Phyllanthus emblica*	Avala	98	10	0	2	0	0
6	*Terminalia elliptica*	Ain	505	693	98	9	2	0
7	*Albizia odoratissima*	Aiv	15	23	4	0	0	0
8	*Cassia fistula*	Bahava	6	9	0	1	0	0
9	*Bambusa vulgaris*	Bambu	1	0	0	0	0	0
10	*Thespesia populnea*	Bhendi	1	2	1	1	0	0
11	*Mimusops elengi L*	Bogada	16	0	0	0	0	0
12	*Cordia dichotoma*	Bokar	0	2	0	0	0	0
13	*Pterocarpus marsupium*	Bonda	164	212	47	9	2	0
14	*Ziziphus mauritiana*	Borkut	1	0	0	0	0	0
15	*Butea monosperma*	Butuska	0	1	0	0	0	0
16	*Santalum album*	Chanda	4	3	0	0	0	0
17	*Tamarindus indica*	Chinch	0	1	0	0	0	0

18	*Grewia tiliifolia Vahl*	Dhaman	1	0	0	0	0	0
19	*Anogeissus latifolia*	Dhavada	1	0	0	0	0	0
20	*Woodfordia fruticosa L*	Dhayati	5	1	0	0	0	0
21	*Elettaria cardamomum*	Ela	1	4	4	1	3	1
22	*Artocarpus heterophyllus*	Fanas	1	3	1	0	0	0
23	*Dialium ovoideum Thwaites*	Gaal	11	5	0	1	1	0
24	*Psidium guajava*	Gawa	2	0	0	0	0	0
25	*Delonix regia*	Gol	1	1	0	0	0	0
26	*Plumeria rubra L*	Gulchay	257	108	5	1	1	1
27	*Terminalia chebula*	Hirda	139	207	66	31	26	25
28	*Syzygium cumini*	jambhul	472	506	98	54	19	0
29	*Murraya koenigii*	Kadipata	0	1	0	0	0	0
30	*Neolamarckia cadamba*	Kalamb	0	1	0	0	0	0
31	*Bauhinia variegata*	Kanchan	4	4	0	0	0	0
32	*Macaranga peltata*	Kandar	0	1	0	0	0	0
33	*Averrhoa carambola*	Karambi	211	146	39	20	9	9
34	*Carapa guianensis*	karap	28	51	38	4	2	1
35	*Capparis decidua*	Karel	11	7	4	1	0	0
36	*Carissa carandas*	Karval	16	11	0	1	0	1
37	*Murraya koenigii*	Karwa	0	2	0	0	0	0
38	*Carissa carandas*	Kavandar	11	0	0	0	0	0
39	*Grewia villosa*	Kharmati	1	0	0	0	0	0
40	*Glycosmis pentaphylla*	Kirmira	10	0	0	0	0	0
41	*Cyphostemma currorii*	Kobat	0	1	0	0	0	0

42	*Butea monosperma*	Koyakhar	0	5	0	1	0	1
43	*Schleichera*	Koyambal	1	5	0	0	1	0
44	*Holarrhena pubescens*	Kuda	22	6	0	0	0	0
45	*Careya arborea*	Kumbha	34	35	10	1	2	0
46	*Ixora brachiata Roxb*	Lokhandi	6	1	0	0	0	0
47	*Madhuca longifolia*	Moh	27	11	2	0	0	0
48	*Feronia limonia*	Pabha	77	9	1	0	0	0
49	*Butea monosperma*	Palas	11	12	4	0	0	0
50	*Erythrina variegata*	Pangara	3	0	1	1	0	0
51	*Monoon longifolium.*	Patgiri	1	0	0	0	0	0
52	*Ficus amplissima*	Payer	8	18	2	4	0	1
53	*Ficus arnottiana*	Payir	0	8	1	0	1	0
54	*Psidium guajava*	Peru	0	1	0	0	0	0
55	*Cerbera odollam*	Pombal	1	0	0	0	0	0
56	*Bombax ceiba*	Savar	0	1	0	1	0	0
57	*Bixa orellana*	Shendri	16	16	1	1	0	0
58	*Gmelina arborea*	Shivan	10	3	1	0	0	0
59	*Flacourtia indica*	Tambat	1	1	0	0	0	0
60	*Ziziphus rugosa*	Toran	7	6	0	0	0	0
61	*Senna tora*	Tura	0	1	0	0	0	0
62	*Ficus racemosa*	Umbar	17	74	45	51	43	124
63	*Heterophragma quadriloculare*	Varas	68	136	18	7	5	0
64	*Limonia acidissima*	vila	12	11	2	3	0	1
65	*Elettaria cardamomum*	Velvachi	0	1	0	0	0	0
Total			**2489**	**2610**	**582**	**274**	**181**	**268**
Sub Total (No of Trees.)			**6404**					

Relevant Ecological Characteristics:

1. Presence of water bodies such as rivers, lakes, streams, wetlands, etc., has been studied.
2. The project does not involve diversion or disturbance of any major aquatic or wetland ecosystem.
3. The area does not fall under any known migratory routes or wildlife corridors.
4. Biodiversity in the area is typical of the region and does not indicate the presence of any unique or sensitive ecosystems.
5. The project is not located within any Notified Eco- Sensitive Zone (ESZ), National Park, Wildlife Sanctuary, Biosphere Reserve, or Important Bird Area (IBA).
6. No traditional sacred groves, community-conserved areas, or ecologically significant cultural practices have been identified in the study area.

Query 8: Submit details of tree to be removed for construction of the project.

Reply: Total no. of trees are 67958, out of which 64050 trees are affected by the project, out of which at ~ 50% of trees girth size below 30 cm scheduled to be cut down during the construction phase However, there is no need to cut trees that are located in the areas designated for the underground components of the project.

Tree Enumeration Summary Data				
Sr. No.	**Division**	**Village Name**	**Total Tree As per Part-II FC**	**Trees to be felled**
1	Nashik	Jamunde	6404	6235
2	Shahpur	Kothale, Kalbhonde	61554	57646
Total			**67958**	**64050**

32.1.4 The proposal was re-considered by the EAC in its 30th meeting held on 30th April, 2025 and sought certain additional details. Accordingly, PP submitted following additional details sought by the EAC on 18th May, 2025:

Query 1: PP shall revisit the muck management plan along with cost estimate, reclamation plan and requirement/ justification of RCC retaining wall.

Reply: As advised during the 30th EAC meeting, the muck management plan has been revised. As the muck sites are located on sloping ground and muck cannot be placed at its natural angle of repose, Therefore, the need for providing retaining structure has arisen for providing vertical support to the bottom of the muck slope and help against sliding and protecting the toe of the reshaped dump profile. Hard measures to support backfill shall be provided with gabion structures. For facilitating movement of wildlife, 12 number animal ramps with slope 2(h):1(v) has been envisaged at intermediate location. Biological measures shall involve laying of topsoil mixed with compost or vermin-compost amended with bio-fertilizer and covering with Geo-

coir textile. Sprinkler irrigation systems, including pumps and accessories, will be installed to support plantation watering. Provision for maintenance of plantation for six years is also incorporated. It is proposed to plant trees, shrubs & bushes over muck dumping area. The revised budget for Muck Management is Rs. 2390 lakh (Biological reclamation: Rs 1279.83 lakh; Engineering: Rs 1110.00 lakh). Detailed Muck Management Plan has been submitted.

Query 2: Justification for revising the EMP cost from Rs10680 lakh to Rs 9780.76 lakh.
Reply: During the Final EC appraisal of the proposed project, the capital cost under the Environmental Management Plan (EMP) was projected at Rs. 10680 lakh. This was revised to Rs. 9780.76 lakh. The rationale for this revision is detailed below:

- **Compensatory Afforestation**: An initial provision of Rs. 4854 lakh was made for CA scheme including NPV, based on the cost analysis prescribed in the Ready Reckoner sanctioned by the PCCF (HoEF), Maharashtra, vide letter no. क्र-१७/मुळे/अंदाजपत्रक/Ů.Ţ.४०/1127/२०१९-२० dated 4th Oct., 2019. However, the final compensation under CA scheme was later assessed on the basis of proposed CA land and approved by the Divisional Forest Officer(s) of Nashik and Thane through Part-II, Form-A of FC application (uploaded on the PARIVESH Portal), amounting to Rs. 3914.26 lakh resulting in decrease in cost of CA scheme including NPV. This resulted in cost reduction of Rs 939.74 lakh. (-). Copy of approved CA scheme has been submitted.
- **Wildlife Conservation and Biodiversity Management Plan:** A budget of Rs. 286 lakh was initially proposed for the conservation of Schedule- I species recorded in the study area. This has been revised to Rs. 326.50 lakh as per the approval of the Wildlife and Biodiversity Plan by Chief Wildlife Warden, Nagpur, Maharashtra vide letter no. क्र-२३(२)/वन्य/सव१/Ů.Ţ.१६३/४३६६/२०२४- २५ on dated 29th Nov., 2024. This resulted to an increase in cost increase of Rs 40.50 lakh (+).

  Now, the MoM dated 30.04.2025 recommended incorporating additional initiatives within the watershed area to enhance livelihoods and support cultural restoration. In response, these activities have been integrated into the Watershed Development Plan and the Local Area Development Plan. As a result, the cost of the Watershed Development Plan has risen from Rs. 500 lakh to Rs. 980 lakh, while the cost of the Local Area Development Plan has increased from Rs. 100 lakh to Rs. 419 lakh. This increase in expenditure accounts for the earlier shortfall in the Environmental Management Plan (EMP) budget. Accordingly, the revised total EMP cost now stands at Rs. 10680 lakh.

Query 3: Impact on migration of birds because of noise levels, changes in water body, if any should be discussed with experts in ornithology and presented.
Reply: A total of 49 bird species, representing 25 different orders, were recorded during this survey. The migratory status of these species is based on the classification provided by the International Union for Conservation of Nature (IUCN).

The Northern Pintail is the only specie, categorized as a long-range migrant, while 5 species (the Booted Eagle, Grey Heron, Great Egret, Great Cormorant, and Black-winged Stilt) are

considered medium-range migrants. An additional 11 species (Black Kite, Alpine swift, Indian pond heron, Cattle egret, Sykes nightjar, Asian woolly-necked stork, Asian Koel, Black Drongo & Long-tailed shrike) are recognized as short-range or local migrants, moving predominantly within the Indian subcontinent in response to environmental conditions. During the construction phase, various impacts on the wildlife are anticipated in the surrounding areas of the proposed project in terms of increased noise levels. However, these impacts would be temporary in nature and confined to construction phase only and various mitigation measures will be adopted by the company to reduce the possible impacts. However, the commissioning of the proposed Bhavali PSP will result the creation of two water reservoir (waterbodies) and having various positive impact on the Migratory birds. Detail of impacts of noise and change in waterbodies and mitigation measures on the migratory Avi-fauna of the study area has been submitted.

Query 4: Impact of micro seismicity and hazards and recommendations on concrete structures are to be discussed properly.

Reply:

Seismic activity, including micro seismicity, can have significant implications on the integrity and performance of concrete structures, particularly in infrastructure projects such as dams, powerhouses, tunnels, and other civil engineering components. Recognizing this, the Indian Standards have been developed to provide seismic zoning maps and guidelines for structural design considering seismic forces.

To address seismic effects more precisely, particularly at the micro level, the National Committee on Seismic Design Parameters (NCSDP) has been constituted to review and approve site-specific seismic studies for major infrastructure projects. Several expert institutions such as IIT Roorkee, the Institute of Seismological Research (ISR), and other specialized agencies are actively involved in conducting these studies across the country.

Bhavali Pumped Storage Project (Maharashtra) lies in seismic zone III. Therefore, the recommended seismic coefficients to be adopted for preliminary design as per of IS-1893 (1984) are: $\alpha h = 0.12$ and $\alpha v = 0.08$. Detailed site-specific seismic study of the Project was conducted by IIT Roorkee. The study was carried out in accordance with the guidelines issued by NCSDP. Based on the findings, a comprehensive report outlining the site-specific seismic parameters was prepared and submitted to the FE& SA Directorate under the Ministry of Jal Shakti for consideration by the NCSDP.

The Committee (NCSDP), in its 38th meeting held on 10.05.2024, approved the site- specific seismic study report for the Bhavali Pumped Storage Project. However, as per NCSDP guidelines, the horizontal seismic co-efficient obtained (i.e. $\alpha h = 0.09$ and $\alpha v = 0.06$) through site specific study shall be compared with the values arrived through the application of IS-1893 (1984), where the recommended value is 0.12 and 0.08 for Zone III, and the higher of the two values shall be adopted. In view of this, the recommended horizontal seismic co-efficient are $(\alpha h) = 0.12$ and $(\alpha v) = 0.08$. These approved parameters have already been considered in the

design of all civil structures of the project, in line with relevant Indian Standard codes (IS 1893, IS 456 and IS 6512:1984: Criteria for Design of Dams for Earthquake Conditions).

This approach gives very conservative design of the concrete structures including the other project components. This approach ensures that the structures are safe against seismic effects and remain stable and reliable over the long term of their design life. Approval letter of site-specific seismic report has been submitted.

Query 5: A comprehensive watershed management including, surface water flow-scarcity and overflow, climate change impacts, soil erosion, restoration of green cover, enhanced groundwater recharge, impacts on surface and sub-surface spring flow, improvements in livelihood and cultural restoration, and related recommendations must be provided.

Reply:

The watershed management plan have been revised w.r.t. surface water flow-scarcity and overflow, climate change impacts, soil erosion, restoration of green cover, enhanced groundwater recharge, impacts on surface and sub-surface spring flow, improvements in livelihood and cultural restoration, and related recommendations. Copy of revised Watershed Development Plan has been submitted. Nonetheless, the pointwise response is briefed as below:

- **Surface Water Flow- Scarcity and Overflow**: The annual water balance components for the watershed indicated that out of 99169.6 ham of annual precipitation, 31791.6 ham and 48948 ham were lost by evapo-transpiration and surface runoff respectively. The water balance also revealed that 10140.85 ham was net annual contribution to groundwater by percolating into shallow aquifer which was followed by 492.35 ham of base flow but the ground water recharge and storage is very large that accounts to only 10669.42 ham and scarcity of water is not the matter of concern over the micro watershed (Section 3.7.15).
- **Climate Change Impacts:** These have been dealt with in detail in section 5.2 of the report. Due to climate change in study area, temperature and rainfall are projected to increase, which will impact the project in watershed in the following ways:
  - ✓ Increase in surface run off in the month of July. The PSP, based on re-circulation of initial filled water, shall not be impacted by any impacts on hydraulic regime due to any climate change.
  - ✓ Increase in annual mean temperature will result in increase in the vapor pressure deficit resulting from higher temperature and may lead to increased evaporation losses, but the quantum shall be insignificant and will be more than compensated due to increased yield from increased rainfall during monsoon in the lower dam catchment.
  - ✓ The increased surface runoff provides an opportunity to enhance water storage and groundwater recharge for future use.
  - ✓ With the projected increase in precipitation, yield of rainfed crops could improve if the water resources are managed properly.
  - ✓ Generation of GHG emission (50689-ton CO2 equivalent) during construction and 175 tons CO2 equivalent during initial years of reservoir operation.

- **Soil Erosion:** In the watershed the average rate of soil erosion is 32.50 tons/ha/year. About 6192 ha (15.20%) is under very severe erosion. 32812 ha (80.5%) under severe erosion and 1754 ha (4.30%) is under moderate erosion (Section3.7.15)

- **Restoration of Green Cover:** For restoration of forest land (243.75 ha) to be diverted, compensatory plantation shall be raised in 245.735 ha in Ratnagiri District under Compensatory Afforestation Plan. For construction of project, 63881 trees are scheduled to be felled in project area. For restoration of green cover in the project area, about 196070 trees shall be planted. Besides this, under the Watershed Management Plan, it is proposed to carry out host of activities which involves improvement of green cover in the area by planting 284895 trees. Thus, an all-out endeavour has been made to restore green cover in the project area by planting 480965 trees (Section 5.25 and Table 5.4). Thus, nearly 7.50 times of the trees cut shall be planted.

- **Enhanced Groundwater Recharge:** As part of the watershed management plan aimed at enhancing groundwater recharge, various water conservation and storage structures have been proposed. These include 50 Loose Boulder Check Dams, 80 farm ponds measuring 8m x 8m x 2m, 20 farm ponds measuring 12m x 12m x 2m, and 2 stop dams. The implementation of these structures is expected to significantly improve groundwater recharge. According to GEC 2015 guidelines, the estimated recharge from percolation through these ponds is approximately 2.36 ham, as detailed in Section 6.5.6 and Table 5.18)

- **Impacts on Surface and Sub-Surface Spring Flow:** The alignment of the underground water conductor system is neither overlain by any spring nor any spring exists within 1.5 km from the either side of centre line of the WCS .During construction, there shall not be any impact of drilling and blasting and consequent vibrations set on rock mass on spring of the area which are located far away from project area (Section 5.1).

- **Improvements in Livelihood and Cultural Restoration**: For improvement in livelihood of the landless, marginal farmers and families headed by female various on farm based non-farm-based livelihood raising opportunities have been incorporated in the plan. For restoration of religious and cultural belief of trial population the project proponent has already made assurance to undertake repairs of local Deities & clan God temples and financially assisting them for restoring their exquisite art and crafts, basketry, pottery, weaving, painting, and sculpture. Activities to be undertaken for Livelihood improvement are dealt with in section 6.2.1; 6.2.3 and 6.3 of the watershed Development Plan and are briefly enumerated in Table below:

S.N.	Main Activities	Amount (Rs)
Allied & Other Livelihood Activities		
(i)	Assistance to 32 families for Mango Orchard @ Rs	5344000

	167000/acre	
(ii)	Assistance to 75 families for Pomegranate Orchard @ Rs 145500/acre	10912500
(iii)	Assistance to 45 families for Guava Orchard Rs126000/acre	5670000
(iv)	Assistance to 40 families for Vermi Compost Unit@ Rs 25000	1000000
Sub Total		**22926500**
Livelihood Activities		
A	**A-On farm-based livelihood activities**	
(i)	Assistance to 243 BPL families for Goat Rearing Rs 24000	5832000
(ii)	Assistance to 24 BPL families for small Poultry @ Rs135600	3254400
(iii)	Assistance to 200 BPL families for backyard Poultry @ Rs3600	720000
(iv)	Assistance to 40 BPL families for Nursery raising Rs 37000	1480000
Sub Total		**11286400**
B	**B-Off farm-based livelihood activities**	
(i)	Assistance to 34 families for Tailoring enterprises Rs 24000/unit	816000
(ii)	Assistance to 19 families for handpump kit @ Rs 6000/unit	114000
(iii)	Assistance to 15 families for Wood carving tools @ Rs 20000/unit	300000
(iv)	Assistance to 30 families for petty handy craft tools @ Rs 4000/unit	120000
(v)	Assistance to 5families for Welder kit @ Rs 24000/unit	120000
Sub Total		**1470000**

32.1.5 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted and as presented in the meeting and observed that the proposal is for grant of Environmental Clearance to the project for Bhavali Pumped Storage Project (1500 MW) in an area of 278.92 Ha in Village Kalbhonde, Kothale and Jamunde Sub District Shahapur and Igatpuri, District Thane and Nashik, Maharashtra by M/s JSW Energy PSP Two Limited.

The proposed project is listed as item no. 1(c) of the Schedule to the Environment Impact Assessment (EIA) Notification, 2006, as amended under category 'A' and are appraised at Central Level by Expert Appraisal Committee (EAC).

Observations by the EAC in its meeting held on 30th August, 2024

- The project proposal was earlier considered by the Expert Appraisal Committee (Hydro River Valley Sector) in its 27th meeting held during 09.05.2022 and recommended for grant of Terms of References (ToR) for the Project. The ToR has been issued by Ministry vide letter No J-12011/08/2022-IA. I(R) dated 27.6.2022.

- The EAC noted that the total land requirement under the project for upper and lower rock fill dam, reservoir & other works, has been assessed as 278.92 ha of which private land is 35.18 ha, forest land 243.74 ha. The EAC also noted that, Kalsubai Harichandragad Wildlife Sanctuary exists within 10 km of project boundary. However, no part of the project lies within Eco-sensitive zone of the Sanctuary. The nearest project boundary is about 12.5m from ESZ boundary. Same has been certified by Deputy Conservator of Forest (Wildlife). Nashik, vide letter O.W. No. Cell-4/Survey/C.N.1/7/ Year 2023-24, Date: 06/4/2023. There are no tiger/elephant corridors within the project area.

- The EAC members expressed serious concerns about the availability of water for filling the reservoir, as the PP indicated that the reservoir would be filled only once during the rainy season. However, based on existing records, rainfall during the rainy season is very limited. Under these conditions, the reservoir cannot be adequately filled during the monsoon season. The EAC also observed that the regular flow of water in the tream/nalah is crucial for mangrove plants, and any blockage may have negative impacts on them. Additionally, the EAC noted that soil sampling analysis revealed a high carbon content in the soil which has no correlation with the topography of the region.

Observations by the EAC in its meeting held on 30th April, 2024

- The EAC noted that the sub-committee of the EAC visited the proposed Bhavali Pumped Storage Project" site on 02.01.2025 and 03.01.2025. and the recommendations of site visit were deliberated by the EAC members in its 22nd EAC Meeting held on 10th January, 2025. The observations and recommendations of the Sub-committee are as follows:

i. The selected location is topologically stable and non-prone to landslides as such. It is not therefore so fragile or sensitive., The proposed project is not likely to cause considerable negative impacts on the geological conditions; rights and interests of people related to water resources of downstream locations if the conditions and safeguards imposed vide the TOR granted are complied with fully and comprehensibly. Further, the Project Proponent is also to ensure strict compliance of the assurances given during public hearing.

ii. The relocation of muck disposal site may not be insisted on while considering the proposal for clearance since the muck disposal site was found to have been selected properly. Further, ecologically better sites did not appear available in nearby areas. Any relocation at this stage might lead to much changes and may lead to more adverse consequences. However, safety measures as contained in EMP and in other documents should be adhered to in toto.

iii. Water for operation of project will be sourced from self-yield from catchment area. There will be no dependency on the nearby streams and already established dams/reservoirs as confirmed and assured by the proponent. As stated above, since

there are not much agricultural or drinking requirements in or nearby areas, the dam intervention should not be a matter of concern. Nevertheless, project proponent, as assured, will ensure maintenance of e-flow and minimum threshold water availability all year around.

iv. Nalla passing through the lower reservoir is a non-perennial and was containing very low level of water at the time of visit. However, as per the discussion held with the PP, natural flow of nallas/streams will not be restricted/diverted. Provision of ungated slipways has been considered to maintain natural flow of non-perineal nallas/streams.

v. Out of total forest area of 243.74ha, 160.21ha is reserved forest,73.85 ha is deemed forest and 9.68 ha is protected forest. The forest density in the proposed forest land involved in the project site is approx. 150 trees/la. A total of around 35000 trees and saplings are likely to be sacrificed. Therefore, it is important to insist on submitting the case under FCA and receive stage-I clearance at the earliest by the Project Proponent.

vi. PP has started the CER/CSR activities in the affected villages which includes the construction of public toilets, classrooms in the Govt. School, Mid-day Meal kitchens, and distribution of study materials, Shoes etc. to the students, blankets to the villagers.

vii. Wildlife conservation and biodiversity management plan has been approved by CWLW on 29.11 .2024 with a cost of Rs. 326.50 Lakhs

The EAC observed that PP has revised EMP budget from Rs10680 lakh to Rs 9780.76 lakh, therefore it was advised not to change the cost of EMP specially under head compensatory afforestation plan. Further, the EAC noted that PP has signed MOU for setting up of the proposed Bhavali Pumped Storage Project (1500MW), which was made on 14th day of September,2021, between the Industries Department, Government of Maharashtra and M/s JSW Neo Energy Ltd.

The EAC noted that the proposed muck disposal site is entirely located within a forest area. Although the sub-committee, during its site visit, recommended that relocating the site may not be necessary, concerns were raised during further discussions. It was observed that the estimated cost for the muck management plan is ₹29.90 crore, with over 80% (₹20.52 crore) allocated to engineering measures, specifically, the construction of a reinforced cement concrete (RCC) retaining wall measuring 6 meters in height, 30 cm in thickness, and approximately 2 kilometers in length. The EAC expressed serious concerns about the suitability of the site and questioned the necessity of the RCC retaining wall. In response, the project proponent explained that the wall is intended to stabilize the muck disposal area. Nevertheless, the EAC further raised concerns about potential restrictions on the free movement of wildlife in the area following construction of the wall.

The EAC noted that the Wildlife Conservation Plan has been duly approved by Chief Wildlife Warden, Nagpur Maharashtra with a cost of INR 326.50 Lakhs vide letter dated 29th November 2024. However, the EAC expressed concern over the absence of a time-bound action plan outlining the implementation strategy. Given that the project area falls within the Western Ghats Eco-Sensitive Zone, the Committee emphasized the need for a well-defined mechanism to ensure the effective execution of the Wildlife Conservation Plan. The EAC also discussed on the utilization of seismicity in the study area and associated seismic hazard zonation mapping related recommendation on the construction of structures. A comprehensive watershed management related recommendations were also not very clear.

Observations of present EAC meeting:

The EAC noted that in the muck management, PP has made adequate muck management plan since muck sites are on sloped ground and can't hold naturally, retaining structures like gabion walls are needed to support the muck and prevent sliding. Protection measures such as 12 number animal ramps, plantation with maintenance of plantation for six years such as trees, shrubs & bushes over muck dumping area has been proposed. The revised budget for Muck Management is Rs. 2390 lakh (Biological reclamation: Rs 1279.83 lakh; Engineering: Rs 1110.00 lakh). Detailed Muck Management Plan has been submitted.

The EAC noted that the final compensation under CA scheme was later assessed on the basis of proposed CA land and approved by the Divisional Forest Officer(s) of Nashik and Thane through Part-II amounting to Rs. 3914.26 lakh resulting in decrease in cost of CA scheme from Rs. 4854 lakh including NPV. This resulted in cost reduction of Rs 939.74 lakh.

Further, EAC observed that the budget Wildlife Conservation and Biodiversity Management Plan of Rs. 286 lakh was initially proposed for the conservation of Schedule- I species recorded in the study area. This has been revised to Rs. 326.50 lakh as per the approval of the Wildlife and Biodiversity Plan by Chief Wildlife Warden, Nagpur, Maharashtra. Due to increase in expenditure accounts for the earlier shortfall in the Environmental Management Plan (EMP) budget. Accordingly, the revised total EMP cost now stands at Rs. 10680 lakh.

The EAC also observed that the public hearing report is satisfactory; however, it was recommended that the concerns raised by the general public should be addressed in time bound manner.

32.1.1 The EAC after examining the information submitted and detailed deliberations recommended the proposal for grant of prior Environmental Clearance by the Ministry to Bhavali Pumped Storage Project (1500 MW) in an area of 278.92 Ha in Village Kalbhonde, Kothale and Jamunde Sub District Shahapur and Igatpuri, District Thane and Nashik, Maharashtra by M/s JSW Energy PSP Two Limited, under the provisions of EIA Notification, 2006 and as amended with subject to compliance of applicable Standard EC conditions with the following specific environmental safeguard conditions:

[A] Environmental management and Biodiversity conservation:

i. The Environmental Management Plan (EMP) shall be strictly adhered to as submitted in the EIA/EMP reports. The budgetary provisions for implementation of EMP, shall be fully utilized and not to be diverted to any other purpose. In case of revision of the project cost or due to price level change, the cost of EMP shall also be updated proportionately.

ii. The contract clause limiting the No. of vehicles to be used during excavation and transportation shall followed scrupulously and the same shall informed to the Ministry.

iii. Ambient Air Quality Monitoring Stations for real time data to be installed at project site before commencement of the construction, shall be displayed at project site and its report to be submitted to IRO, MoEF&CC.

iv. No vehicle purchase shall be allowed from funds earmarked for implementation of Wildlife Conservation plan.

v. 10,000 plants shall be planted around the muck disposal area and the survival of plants shall be submitted with the 6 monthly compliance report.

vi. Plantation of saplings (1000 nos.) shall be carried out as a part of the tree plantation campaign **"Ek Ped Ma Ke Naam"** and the details of the same shall be uploaded in the MeriLiFE Portal (https://merilife.nic.in).

vii. Implementation status of Watershed development plan shall be submitted in the 6 monthly compliance report to the concerned regional office of the Ministry.

[B] Disaster Management:

i. Disposal of the excavated muck and its filling on the low-lying area with proper measures for the stabilization and greenery to minimize the impacts of the generated construction muck shall be taken up pari passu with construction work.

ii. Robust monitoring mechanism for muck disposal along with no. of vehicle used in transportation shall be prepared and details of the same shall be submitted to concerned regional office of the Ministry. Tracking devices should be installed on the muck carrying vehicles so as to ensure it is being dumped at designated site/sites.

iii. Stabilization of muck disposal sites using biological and engineering measures shall be taken up immediately to ensure that muck does not roll down the slopes and does not pollute the natural streams and water bodies in surrounding area. The plantation on muck disposal site with local species for restoration of ecology and environment of the project site area. The stabilization of muck disposal sites shall be carried out in a time bund manner as discussed during EAC meeting.

iv. Necessary control measures such as water sprinkling arrangements, and construction of paved roads leading to muck disposal sites etc. shall be taken up on priority to arrest fugitive dust at all the construction sites.

v. Solid waste generated, especially plastic waste, etc. should not be disposed of as landfill material. It should be treated with scientific approach and recycled. Use of single-use plastics may be discouraged.

[C] Socio-economic:

i. Land acquired for the project shall be suitably compensated in accordance with the prevailing guidelines of the state government and provisions under Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.
ii. RO plant shall be installed in the nearby 5 villages and the maintenance shall be done by the project Authorities.
iii. Solar panel be provided to the families living in rural areas within 10 km radius of project.
iv. School up to 12^{th} Standard with smart lasses shall be established and managed to provide free quality education for children from project affected villages/Tribal villages.
v. 50 bed multi-speciality hospital shall be established to cater the need of tribal population/locals. The tribal population within 10 km radius of the project shall be given free of cost medical facility.
vi. Skill development Centre shall be established within 10 km radius of the project and regular training programmes for development and promotion of traditional art/products of tribal/local population.
vii. The area is ecologically fragile therefore Project Proponent shall ensure that safety measures as mentioned in the EMP shall be fully implemented.

[D] Miscellaneous:

i. After 5 years of the commissioning of the project, a study shall be undertaken regarding impact of the project on the environment. The study shall be undertaken by an independent agency. The study report shall be sent to Ministry and uploaded on company's office website.
ii. The conditions mentioned in the Western Ghats notification (draft notification no. S.O.3060(E) dated 31.07.2024) for development of hydro-power projects issued by the MOEF&CC shall be complied with.
iii. Bio-Gas plant shall be installed in the Project affected villages for Utilizing Cattle waste (Cow Dung) into renewable source of fuel.
iv. PP should establish in house (at project site) environment laboratory for measurement of environment parameter with respect to air quality and water (surface and ground). A dedicated team to oversee environment management shall be setup which should comprise of Environment Engineers, Laboratory chemist and staff for monitoring of air, water quality parameters on routine basis.
v. PP shall procure construction material only from those Organizations having all valid legal/statutory clearances/permissions or necessary permission to be obtained for quarrying construction materials for the project as per the EIA Notification, 2006 and as amended thereof.
vi. An institutional mechanism to be developed to ensure the preference of jobs to PAFs and also a policy for preferential treatment for award of sundry works to the PAFs and

their dependents.

vii. The compliance of above conditions shall be monitored by IRO, MoEF&CC and regularly site visit once in year. The compliance report of IRO shall be regularly submitted to MoEF&CC.

Agenda Item No. 32.2

Construction of Thana Plaun HEP (191 MW) in an area of 432.79 Ha in Guini Village, Mandi District, Himachal Pradesh by M/s Himachal Pradesh Power Corporation Ltd. - Environmental Clearance (EC) - reg.

[Proposal No. IA/HP/RIV/75041/2013; F. No. J-12011/12/2011-IA-I]

32.2.1: The proposal is for grant of Environmental Clearance (EC) to the project for Construction of Thana Plaun HEP (191 MW) in an area of 432.79 Ha in Guini Village, Mandi District, Himachal Pradesh by M/s Himachal Pradesh Power Corporation Ltd.

The project proposal was considered by the Expert Appraisal Committee (Hydro River Valley Sector) in its 20th meeting held during 27.11.2018 and recommended for grant of Environment Clearance subject to submission of FC stage I Clearance to the Ministry.

The Project Proponent submitted the Stage-I Forest Clearance for the diversion of 406.79 Ha of forest land, granted by the MoEF&CC via letter dated 11.01.2024 and uploaded on the Parivesh portal on 03.09.2024, nearly 57 months after the EAC's recommendation. Therefore, as per provisions the proposal was considered by the sectoral EAC in its meeting held on 13.09.2024 wherein the proposal was deferred for want of following information:

i. The Project Proponent shall conduct one season of baseline data collection in accordance with the standard Terms of Reference for the river valley and hydroelectric sector.

ii. The Project Proponent shall prepare a comparison table that outlines the previous baseline data collected in past years alongside the current scenario.

Accordingly, the proposal was submitted along with fresh baseline data on 13th May 2025 on Parivesh Portal.

Background:

i. The proposed Thana Plaun HEP (191 MW) is a storage scheme and the water conductor system of the project is on the left bank of river Beas. The project envisages the construction of concrete gravity dam across river Beas in the Mandi District of Himachal Pradesh, with a

live storage capacity of 44.93 MCM to enhance the peaking benefits during the lean months. The entire catchment comprises mountainous terrain with steep hill slopes and is very thinly populated.

ii. The Terms of Reference for carrying out the EIA studies and preparation of EMP as per the provisions of Environmental Impact Assessment Notification 2006 and subsequent Notification in 2009 was approved and permission for pre- construction activities was accorded vide letter No. J-12011/12/2011-IA-I dated 29.11.2012 for Thana Plaun HEP with installed capacity of 141 MW of Mandi District of Himachal Pradesh by M/s. HPPCL.

iii. M/s HPPCL submitted application dated 12.09.2013 for revalidation of approved ToR for the enhanced installed capacity for the project from earlier 141 MW to revised installed capacity of 191 MW which entailed change in layout also. EAC noted that the capacity of the project has been enhanced from 141 MW to 191 MW and it is not a case of merely extension of the validity of TOR. The scope of the project has been changed as the capacity has been substantially revised to 191 MW. Therefore, the project will be reconsidered by the EAC.

iv. The project proponent submitted Form-1 afresh and the same has been presented before the EAC at its meeting held during 20-21 February, 2014. The EAC recommended for a fresh TOR for Thana-Plaun HEP (191 MW) as per MoEF& CC norms and also recommended to use already collected base line data for the purpose of EIA/EMP studies subject to the condition that the data should not be older than 3 years and with some additional TOR conditions. The ToR was accorded on 05.06.2014 for a period of 3 years, which was further extended for one year. Hence, the validity of the ToR was up to 04.06.2018. Public Hearing for the proposed project has been conducted by the Himachal Pradesh State Pollution Control Board, Himachal Pradesh at villages Mahan, Khalanu, Kotli and Kadakalayan, Tarnosh, Kotli and Gram Panchayat Office at Barhi, Dharampur, Mandi during on 22-23 March, 2018.

v. PP has submitted the application for EC online on 19.05.2018. However, the base line data collected for the EIA / EMP studies is from 1st March 2013 to 31st December, 2013. EAC noted that the data collected for the study is more than three years old and hence could not be considered for appraisal of the project. After detailed deliberation, considering all the facts as presented by the project, EAC in its 15th meeting recommended that PP should collect baseline data for one more season afresh and resubmit the EC application. The following more additional information were also sought:

a. Recommendation of E-flow and maintenance of free flow stretches between two HEPs as per the CIA and CC of Beas River Basin studies to be followed.

b. Resultant pollution loads of all the environmental parameters be derived again for all the possible pollution sources. Based on the findings, mitigative measures be suggested including allocation of capital budgets for different heads.

vi. PP has submitted the details sought in the 15th EAC meeting held on 28.06.2018 to the Ministry, accordingly the proposal has been considered by the EAC in 20th EAC meeting held on 27.11.2018 wherein PP has informed to EAC that base line studies were conducted within 10km radius during monsoon season in the months of July- August-September 2018. Project Proponent committed that, E-flows have to be followed as per recommendation under CIA & CCS of Beas River Basin studies under consideration with MoEF&CC, GOI. Provisions finally approved in respect of environmental flow will be adhered by the project authorities of Thana Plaun HEP. PP also presented before the Expert Appraisal Committee impacts of the proposed project on environmental attributes such as water, air, noise, land & biological environment and social-economic environment along with mitigation measures.

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

i. The proposal is for environmental clearance to the project for the construction of Thana Plaun (191MW) Hydro Power Project on River Beas located in Mandi, District of Himachal Pradesh by M/s. Himachal Pradesh Power Corporation Ltd.

ii. The project proposal was considered by the Expert Appraisal Committee (Hydro River Valley Sector) in its 20th meeting held during 27.11.2018 and recommended for grant of Environment Clearance in favour of the Project subject to conditions.

iii. The geographical co-ordinate of the project are: Latitude (N): 31º49'28.22", Longitude (E): 76º50'20.53".

iv. **Land requirement:** 431.62 Hectares (406.79 Hectares Forest/Govt. Land and 26.1796 Pvt. Land)

v. **Project Cost:** The estimated project cost is Rs 1530.13 Crore excluding existing investment of Rs 48.20 crores. Total capital cost earmarked towards environmental pollution control measures is Rs 302.74 Crore and the Recurring cost (operation and maintenance) will be about Rs 15.27 Crore.

vi. **Project Benefit:** Apart from generating 191 MW of electricity. A work force of about 1000 (skilled/semi skilled/unskilled) will be engaged during the construction period. Road access in the area will be widened as three roads are going to be constructed for project construction and will be later used as public utility. Various socioeconomic developments in the project area are anticipated on establishment of this project. A

bridge connecting Tehsil Jogindernagar and Kotli is also to be constructed for public purpose only. Other development works at village level will be taken up from Local Area Development Fund (i.e.@1.5% of Total Project Cost).

vii. **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.

viii. **Resettlement and rehabilitation:** Private Land is being acquired by the "Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013". The total private land area to be acquired under Thana Plaun HEP is approximately 20.1796 hectares. Social Impact Assessment (SIA) study for acquisition of Private land has been completed and approved byGoHP. As per 'Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013", the project specific R&R Plan will be prepared during the process of land acquisition. Notification under Section 11(1) of RFCTLARR Act, 2013 has been published in the Gazette on dated 20.12.2023. At present proceedings under Section 16 are underway. The R&R Scheme will be notified under Section 19(1) of RFCTLARR Act, 2013, shortly.

ix. **Scheduled–I species:**
Mammal - *Canis aureus*

Birds - *Gyps himalayensis*, *Accipiter badius*, and *Aquila chrysaetos*

Reptile - *Varanus bengalensis*

x. **Alternative Studies:** The alternatives studied have been provided in Chapter-2 of EIA submitted to MoEF&CC.

xi. **Baseline Environmental Scenario:**

SN	**Environmental Component**	**Parameter**	**Previous Scenario (winter 2013-14)**				**Current Scenario (winter 2024-25)**			
1	**Physical Environment**	**Air Quality**	S.N.	Sub-Parameter	Range (µg /m^3)	Limit	S.N.	Sub-Parameter	Range (µg /m^3)	Limit
			1	SPM	29-50	200	1	SPM	38-59	200
			2	RPM	14-23	100	2	RPM	22-35	100

SN	Environmental Component	Parameter	Previous Scenario (winter 2013-14)				Current Scenario (winter 2024-25)			
			3	SO_2	BDL-7.1	80	3	SO_2	5-13	80
			4	NO_2	7.5-16	80	4	NO_2	6-24	80
			● Overall air pollutant (RPM, SPM, SO_2 andNO_2) concentration is within the permissible limit of National Ambient Air Quality Standards.				● Overall air pollutant (RPM, SPM, SO_2 and NO_2) concentration is within the permissible limit of National Ambient Air Quality Standards; however, there is a slight increment in their concentration in the present scenario.			
		Noise Quality	Category- Residential Area				Category- Residential Area			
			Leq (Day) dB(A)		Leq (Night) dB(A)		Leq (day) dB(A)		Leq (Night), d (A)	
			38-46		32-38		42.5-47.4		36.8-39.2	
			● Overall the noise quality levels are within the permissible limit of Noise quality standard- 55 dB (A) during the day time and 45 dB (A) during the night time for residential areas.				Overall the noise quality levels are within the permissible limit of Noise quality standard for residential areas, however there is a slight increment in the noise pollution levels.			
		Water Quality	**Surface Water**							
			● pH- 7.03 –7.97				● pH- 7.36 – 7.68			
			● River water temp.- 18.2 – 19.2 ^{0}C				● River water temp.- 10 – 18 ^{0}C			
			● Conductivity- 258–290 µmhos/cm				● Conductivity- 228–397 µmhos/cm			
			● Alkalinity- 64–98 mg/l				● Alkalinity- 86–126 mg/l			
			● DO- 8.5–8.7 mg/l				● DO- 6.8–9 mg/l			
			● TSS- 10.2 – 14.2 mg/l				● TSS- 20 – 28 mg/l			
			● TDS- 124–170 mg/l				● TDS- 145–228 mg/l			
			● COD – 4.9 – 7 mg/l				● COD – 18 – 24 mg/l			
			● BOD – <2 mg/l				● BOD – 3.4 –7.8 mg/l			
			● Total Hardness- 85–124 mg/l				● Total Hardness- 70–106 mg/l			
			● Nitrate- 0.35–0.55 mg/l				● Nitrate- 0.32–1.2 mg/l			
			● Phosphate- 0.03 – 0.05 mg/l				● Phosphate- 0.03 – 0.26 mg/l			
			● Potassium- 4–7 mg/l				● Potassium- 2–8 mg/l			
			● Total Coliform bacteria- Absent				● Total Coliform bacteria- 940-1410 MPN/100 ml.			

SN	Environmental Component	Parameter	Previous Scenario (winter 2013-14)	Current Scenario (winter 2024-25)
			● Fecal Coliform bacteria –Absent	● Fecal Coliform bacteria- 630-940 MPN/100 ml.
			● Heavy metals (Cu, Zn, Fe, Hg, Cd, Pb, As, Cr) - within the permissible limit specified by CPCB.	● Heavy metals (Cu, Zn, Fe, Hg, Cd, Pb, As, Cr) - within the permissible limit specified by CPCB.
			● Overall surface water quality fulfilled the class-D criteria (Designated for the best use for the propagation of Wildlife & Fisheries) as specified by CPCB.	● Overall surface water quality fulfilled the class-D criteria (Designated for the best use for the propagation of Wildlife & Fisheries) as specified by CPCB. However, there is an increment in most of the water quality parameters during the current scenario as compared to the previous scenario.
			Ground Water	
			● pH- 7.3–7.64	● pH- 7.24 – 7.96
			● Temp.- 18.5 –19.4 ^{0}C	● Temp.- 16 – 20 ^{0}C
			● Conductivity- 205–225 µmhos/cm	● Conductivity- 324–408 µmhos/cm
			● Alkalinity- 85–96 mg/l	● Alkalinity- 128–160 mg/l
			● TDS- 185–198 mg/l	● TDS- 211–258 mg/l
			● Total Hardness- 135–185 mg/l	● Total Hardness- 156–186 mg/l
			● Nitrate- 0.22–0.56 mg/l	● Nitrate- 0.42–1.2 mg/l
			● Phosphate- 0.01 –0.06 mg/l	● Phosphate- 0.12 –0.18 mg/l
			● Potassium- 2.2–8.5 mg/l	● Potassium- 2–4 mg/l
			● Total Coliform bacteria- Absent	● Total Coliform bacteria- <2.0 MPN/100 ml
			● Fecal Coliform bacteria- Absent	● Fecal Coliform bacteria- <2.0 MPN/100 ml
			● Heavy metals (Cu, Zn, Fe, Hg, Cd, Pb, As, Cr) -within the permissible limit specified by BSI.	● Heavy metals (Cu, Zn, Fe, Hg, Cd, Pb, As, Cr) - within the permissible limit specified by BSI.
			● Overall ground water quality was within the permissible limit as specified by BSI for drinking water purposes.	● Overall ground water quality fulfilled the class-A criteria (Designated for the best use for the drinking water source without conventional treatment but after disinfection) as specified by CPCB and the values are within the

<table>
<tr><th>SN</th><th>Environmental Component</th><th>Parameter</th><th>Previous Scenario (winter 2013-14)</th><th>Current Scenario (winter 2024-25)</th></tr>
<tr><td></td><td></td><td></td><td></td><td>permissible limit as specified by BSI for drinking water purposes. However, there is an increment in most of the water quality parameters during the current scenario as compared to the previous scenario.</td></tr>
<tr><td></td><td></td><td>Soil Characteristics</td><td>● pH- 6.89 – 7.86</td><td>● pH- 6.82 – 7.56</td></tr>
<tr><td></td><td></td><td></td><td>● Bulk density- 1-1.5 g /cm^3</td><td>● Bulk density- 1.22-1.42 g /cm^3</td></tr>
<tr><td></td><td></td><td></td><td>● Conductivity – 164.5-1431.5 µmhos/cm</td><td>● Conductivity- 184-552 µmhos/cm</td></tr>
<tr><td></td><td></td><td></td><td>● % Moisture– 2.67 to 10.19 %</td><td>● % Moisture– 4.62 to 6.34 %</td></tr>
<tr><td></td><td></td><td></td><td>● % Porosity– 0.32-0.38 %</td><td>● % Porosity– 0.36-0.48 %</td></tr>
<tr><td></td><td></td><td></td><td>● Sand- 63.5-73.5 %</td><td>● Sand - 60– 75 %</td></tr>
<tr><td></td><td></td><td></td><td>● Clay- 5– 11 %</td><td>● Clay- 10– 14 %</td></tr>
<tr><td></td><td></td><td></td><td>● Silt- 18– 23 %</td><td>● Silt- 15– 28 %</td></tr>
<tr><td></td><td></td><td></td><td>● CEC- 8.16-14.8 mg/100gm</td><td>● CEC- 9.4-13.84 mg/100gm</td></tr>
<tr><td></td><td></td><td></td><td>● Nitrogen- 5.01– 6.63 mg/100gm</td><td>● Nitrogen- 7.93– 9.36 mg/100gm</td></tr>
<tr><td></td><td></td><td></td><td>● Phosphorous- 61.53 – 87.89 mg/100gm
● Potassium- 1.9– 3.2 mg/100gm</td><td>● Phosphorous- 64.4 – 86.2 mg/100gm
● Potassium- 2.6– 4.2 mg/100gm</td></tr>
<tr><td></td><td></td><td></td><td>● % Organic Carbon– 0.83-3.34 %</td><td>● % Organic Carbon– 1.52-3.58 %</td></tr>
<tr><td></td><td></td><td></td><td>● % Organic Matter– 1.83-5.98 %</td><td>● % Organic Matter– 2.62-6.18 %</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Overall there is an increment in the soil physico- chemical parameters during the current scenario as compared to the previous scenario.</td></tr>
<tr><td>2</td><td>Biological Environment</td><td>Floral Diversity</td><td>
<table>
<tr><th>Plant (Habit)</th><th>Family</th><th>Genus</th><th>Species</th></tr>
<tr><td>Tree</td><td>32</td><td>49</td><td>60</td></tr>
<tr><td>Shrub</td><td>18</td><td>30</td><td>36</td></tr>
<tr><td>Herb/Climber /Grass</td><td>35</td><td>67</td><td>73</td></tr>
<tr><td colspan="3">Total</td><td>169</td></tr>
</table>
</td><td>
<table>
<tr><th>Plant (Habit)</th><th>Family</th><th>Genus</th><th>Species</th></tr>
<tr><td>Tree</td><td>31</td><td>54</td><td>65</td></tr>
<tr><td>Shrub</td><td>21</td><td>39</td><td>42</td></tr>
<tr><td>Herb/Climber /Grass</td><td>47</td><td>80</td><td>85</td></tr>
<tr><td colspan="3">Total</td><td>192</td></tr>
</table>
</td></tr>
</table>

SN	Environmental Component	Parameter	Previous Scenario (winter 2013-14)	Current Scenario (winter 2024-25)
		Avifauna	• 37 species • *Gyps himalayensis, Accipiter badius,* and *Aquila chrysaetos* falls under Schedule-I of IWPA and *Gyps himalayensis* listed in IUCN red list 2010 as Near Threatened	• 41 species. • Four new species recorded (*Dendrocittavagabunda, Turdoidesstriata, Paruscinereus* and *Phoenicurusleucocephalus*). • *Gyps himalayensis, Accipiter badius,* and *Aquila chrysaetos* falls under Schedule-I of IWPA and *Gyps himalayensis* listed in IUCN red list 2010 as Near Threatened.
		Butterflies	• 16 species .	• 19 species. • Three new species recorded (Symbrenthialilaea,Papiliopolytesand dEuremabrigitta).
		Reptiles	• 02 species. • *Varanus bengalensis*falls under Schedule-I of IWPA and listed in IUCN red list 2010 as Near Threatened	• 03 (primary source). • *Varanus bengalensis*falls under Schedule-I of IWPA and listed in IUCN red list 2010 as Near Threatened • One new species recorded (*Ablepharushimalayanus*)
		Mammals	• 03 species. • *Canis aureus* falls under Schedule-I of IWPA	• 04 species (primary source). • One new species *Mus musculus* • *Canis aureus* falls under Schedule-I of IWPA
	Aquatic Diversity	**Fish**	• Species richness- 04 • Schizothoraxrichardsonii (VU as per IUCN) • Bariliusbendelisis • Bariliusvagra, • Tor putitora (EN as per IUCN)	• Species richness- 02 • Schizothoraxrichardsonii (VU as per IUCN) • Glyptothoraxconirostris
		Phytoplankton	• Bacillariophyceae – 03 • Chlorophyceae - 02 • Cyanophyceae - 01	• Bacillariophyceae – 08 • Chlorophyceae - 04 • Cyanophyceae - 02

SN	Environmental Component	Parameter	Previous Scenario (winter 2013-14)	Current Scenario (winter 2024-25)
		Zooplankton	• Crustacean - 02 • Rotifers - 01 • Protozoa - 02	• Crustacean - 02 • Rotifers - 02 • Protozoa - 01

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

Solid Waste:

- 600 Kg of dry weight waste per day during construction phase.
- 60 Kg of dry weight waste per day during operation phase.

Total Muck Disposal Area	22,18,709 cum
Estimate Muck to be generated	20,14,969 cum

Detailed Solid Waste Management Plan and Muck Management Plan have been appended as Chapter 11 & 7 of EMP submitted to MOEF&CC.

xiii. Public Hearing for the proposed project has been conducted under the chairmanship of Additional District Magistrate, Mandi organised by the State Pollution Control Board on 22.03.2018 & 23.03.2018.

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

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

1. EAC Meeting Details:

EAC meeting	32nd Meeting of EAC
Date of Meeting	29th May, 2025
Date of earlier EAC meetings	For ToR : ➢ 10th – 11th Feb 2012 ➢ 7th – 8th Sep 2012 ➢ 11th – 12th Nov 2013 ➢ 20th – 21st Feb 2014 For EC: ➢ 28th June 2018

	➢ 27th Nov 2018 ➢ 13th Sep 2024

2. Project details:

Name of the Proposal	Thana Plaun (191MW) Hydro Power Project on River Beas in Mandi, District of Himachal Pradesh by M/s Himachal Pradesh Power Corporation Ltd.
Proposal No.	***IA/HP/RIV/75041/2013***
Location (Including Coordinates)	• The location of the Thana Plaun (191MW) Hydro Power project is about 500 m downstream (d/s) at the confluence of Rana Khad with River Beas near village Thana, Distt. Mandi, Himachal Pradesh. • The dam site is proposed at: Longitude: 76º50'20.53" (E) Latitude: 31º49'28.22" (N)
Company's Name	M/s Himachal Pradesh Power Corporation Ltd.
CIN no. of Company/ user agency	U000010HP2006SGC030591
Accredited Consultant and certificate no.	Environment Management Division (DoE), ICFRE, Dehradun in association with M/s. Mantech Consultants Pvt. Ltd. Noida (U.P.), **(NABET/EIA/23-26/RA 0305_Rev.01)**
Project location (Coordinates/River/ Reservoir)	• The dam site is proposed at: Longitude: 76º50'20.53" (E) Latitude: 31º49'28.22" (N)
Inter-state issue involved	No
Proposed on River/Reservoir	River Beas
Type of Hydro-electric project	Dam to Toe Type
Seismic zone	Zone-V

3. Category details:

Category of the project	Category A
Capacity/Cultural command area (CCA)	191 MW
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	--

4. ToR / EC Details:

EC Proposal No.	***IA/HP/RIV/75041/2013***
EAC meeting date	11th – 12th Nov 2013 and 20th – 21st Feb 2014
ToR Letter No.	Letter No. J-12011/12/2011-IA-I
ToR grant Date	5th June 2014
Cost of project	Rs. 1530.13 crores including IDC and Financing Charges at 2019 price level
Total area of Project	426.97 ha
Height of Dam from River Bed (EL)	106.70 m above deepest foundation level
Details of submergence area	Forest Land: 309.43ha Private/Deemed Forest: 1.34 ha Private Land: 16.29 ha **Total: 327.06 ha**
District to provide irrigation facility (if applicable)	NA
Details of tunnels on upper level & lower Level and length of canal(if applicable)	HRT1– 108.17m HRT2 – 146.89m
No. of affected Village.	23
No. of Affected Families	709
Project Benefits	Apart from generating 191 MW of electricity. A work force of about 1000 (skilled/semi-skilled/unskilled) will be engaged during the construction period. Road access in the area will be widened as three roads are going to be constructed for project construction and will later be used as public utility. Various socioeconomic developments in the project area are anticipated on establishment of this project. A bridge connecting Tehsil Jogindernagar and Kotli is also to be constructed for public purpose only. Other development works at village level will be taken up from Local Area Development Fund (i.e.@1.5% of Total Project Cost).
R&R details	• Private Land is being acquired as per the provisions of the "Right to Fair

Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013".

- The total private land area to be acquired under Thana Plaun HEP is approximately **20.179 ha**.
- Social Impact Assessment (SIA) study for acquisition of Private land has been completed and approved from GoHP.
- Notification under Section 11(1) of RFCTLARR Act, 2013 published in Gazette on dated 20.12.2023.
- Proceedings under Section 16 are underway.
- R&R Scheme will be notified under Section 19(1) of RFCTLARR Act, 2013, shortly.

#	**Description**	**Details**
1	Private Land to be acquired	20.1796 ha
2	No. of Affected Panchayat's	12 (13 now)
3	No. of affected Villages	21
4	No. of affected Landowners	709
5	Families loosing Land and House	08
6	Others (*Gharats and Pashushalas*)	• Out of 38*Gharats* 19 are in working order and 11 have stopped working. • 12 nos.

			Pashushalas.
	7	Total of SC landowners	79
	8	Women SC landowners	37 (31 daughters, 05 wife and 01 widow)
	9	Total Villages of SC Landowners	05
	10	SC family to be displaced	01
	No ST Landowners family is present in the project		
Catchment area/ Command area	7378 Sq. km		
Types of Waste and quantity of generation During construction/ Operation	● 600 Kg of dry weight waste per day during the construction phase. ● 60 Kg of dry weight waste per day during the operation phase. ● Detailed Solid Waste Management Plan has been appended as Chapter 11 of EMP.		
Material used for blasting and its Composition as per DGMS standards.	Material Used for Blasting: ● Gelatin. ● Electric Detonators. ● Ordinary Detonators. ● Safety Fuse Coil. ● Detonating Cord. ● Cordtex.		
E-Flows for the Project			
Is Project earlier studied in Cumulative Impact assessment & Carrying Capacity studies(CIA&CC) for River in	a) The EAC, MoEF&CC, GOI in its 20th meeting on dated 27.11.2018, recommended for grant of Environmental Clearance to the project subject to condition *"Environment Clearance in*		

which the projectlocated? If yes then a) E-flow with TOR/Recommendation by EAC as per CIA&CC study of River Basin. If not, the E-Flows maintain criteria for sustaining the river ecosystem.	*respect of Thana Plaun HEP (191 MW) subject to adhering with the conditions/recommendations under CIA & CCS of Beas River Basin studies under consideration with MoEF&CC, GOI"*. An undertaking in compliance to the recommendations regarding E-Flow of CIA&CCS of Beas Basin has been submitted by HPPCL. **b) Recommended E-flow as % of average discharge in 90% dependable year** Lean Season = 20% Peak Season = 15% Other Months = 15% **c) Recommended E-flow** Lean Season = 05.05cumec Peak Season = 46.62cumec Other Months = 11.64cumec
Details on provision of fish pass	A detailed Fisheries Management Plan has been appended as Chapter 5 of EMP.
Project benefit including employment details (no of employee)	Apart from generating 191 MW of electricity. A work force of about 1000 (skilled/semi-skilled/unskilled) will be engaged during the construction period. Road access in the area will be widened as three roads are going to be constructed for project construction and will be later used as public utility. Various socioeconomic developments in the project area are anticipated on establishment of this project. A bridge connecting Tehsil Jogindernagar and Kotli is also to be constructed for public purpose only. Other development works at village level will be taken up from Local Area Development Fund (@1.5% of Total Project Cost).
Area of Compensatory Afforestation (CA) with tentative no of plantation.	Area for CA = 829.11 ha of Govt. wasteland Plantation = 1100 trees / ha

Previous EC details	NA
EC Compliance Report by R.O, MOEF&CC	NIL

5. Electricity generation capacity:

Power house Installed Capacity	191 MW
Generation of Electricity Annually	Annual Energy in 90% dependable year on 95% machine availability Main units : 522.25 GWh Environmental units : 139.57 GWh
No. of Units	Five Units = 3x50.33 MW +2x20 MW=191 MW

6. Muck Management Details:

No. of proposed disposal area/(type of land-Forest/Pvt land)	2 Nos.
Cross-section of proposed muck area, Height of muck with slope.	Appended in EMP as Annexure-II.
Distance of muck disposal area (location), from muck generation sources (project area)/River, HFL of proposed muck disposal area.	Distance from Project = 6 km Detailed Chapter appended in EMP as Chapter-7.
Total Muck Disposal Area	22,18,709 cum
Estimated Muck to be generated	20,14,969 cum
Transportation	Through Dedicated Road from Project Site.
Monitoring mechanism for Muck Disposal Transportation	The excavated material shall be evacuated from site with suitable usable muck to be utilized in project works by the project proponents and also allowed to be used by private users and the non-usable muck is to be disposed off on designated areas so as not to interfere with either environment/ecology or the

	river flow regime. Thus there is an imperative need to regularly monitor the quantum of muck generated and its disposal, for which purpose the project proponent shall furnish a monthly statement of muck/debris disposal to H. P. State Pollution Control Board.

7. Land Area Breakup:

Private land	20.1796 ha
Government land/ Forest Land	406.79 ha
Submergence area /Reservoir area	Forest Land: 309.43ha Private/Deemed Forest: 1.34 ha Private Land: 16.29 ha **Total: 327.06 ha**
Land required for project components	17.34 Hectares

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	Total of 269.65 ha out of 406.79 ha of Forest Land Proposed for Diversion falls under UPF/DPF.
National Park	No	
Wildlife Sanctuary	No	
Archaeological sites, monuments/historical temples etc.	No	
Additional information(if any)	-	

9. Public Hearing (PH) Details

Advertisement for PH with date	Copies of Advertisement have been appended as Annexure-V of EIA.
Date of PH	22.03.2018 & 23.03.2018
Venue	● Village Mahan, Tehsil Kotli, Distt. Mandi. ● Village Khadkalyana, Tehsil Kotli, Distt. Mandi ● Village Behri, Tehsil Dharampur, Distt. Mandi
Chaired by	Additional District Magistrate, Mandi

Main issues raised during PH	Proceedings of PH have been appended as Annexure-V of EIA.
No. of people attended	307

10. Brief of baseline Environment:

Particulars	**Details**
Period of baseline data collection/Sampling period.	• 1st March 2013 to 31st December 2013 • July 2018- September 2018 • 15th December 2024 to 15th March 2025
Air, noise, water, land (As per one season additional study from 15th December, 2024 to 15th March, 2025)	**Soil :** • The soil in the area is found very shallow with a 10 to 25 cm thick layer. Soil is sandy and loose with pebbles, gravels and weathered stony content. • The pH of soil in the study area varies from 6.82-7.56. • The moisture content was reported in the range of 4.62 to 6.34%. • The Nitrogen content of the soil in the study area ranges from 7.93 mg/100gm to 9.36 mg/100gm. • The Phosphorus was in the range of 64.4 mg/100gm to 86.2 mg/100gm. • The Organic Matter varies from 2.62% to 6.18% and the organic carbon was in the range of 1.52% to 3.58%. **Ambient Air Quality Status:** • Results of ambient air quality show that all the parameters are well within the National Ambient Air Quality Standards for residential, rural and other areas. **Noise Level Status :** • The major source of the noise in the study area is vehicular movement and roadside activities. The study shows that the noise levels are within the prescribed limit in all the monitoring stations.

	Water (Surface and Ground) : • The pH of the water samples in the study area varies from 7.36 to 7.68 indicating slightly alkaline nature. • The alkalinity was recorded in the range of 86 mg/l to 160 mg/l. • Total Dissolved Solids vary from 145 mg/l to 228 mg/l in the surface water samples and 211 mg/l to 258 mg/l in the ground water samples. • The DO was reported in the range of 6.8 mg/l to 9.0 mg/l in the surface water samples and 6.4 mg/l to 8.6 mg/l in the ground water samples. • Presence of Total Coliform and Fecal Coliform are reported in all samples of surface water during winter season indicating the anthropogenic activity in the surrounding area while none in groundwater that may be attributed to anthropogenic activities.
Flora and fauna of the project area (As per one season additional study from 15th December, 2024 to 15th March, 2025)	**FLORA:** **Forest Types** The forests of the tract dealt with are well scattered on the both banks of the river Beas, it can be broadly classified into following groups on the basis of various factors a) Scrub forests, b) Bamboo forests, c) Chir forests. The forests of this division can be further grouped into various forest types as identified by Champion and Seth (1968). Group: 5 Dry Tropical forests includes 5B/C2 Northern dry mixed deciduous forests 5B/DS1/dry deciduous scrub forests 5B/E9 dry bamboo Group: 9 subtropical pine forests includes

9/Cla-Lower or Shivalik chir pine forests

9/Clb-Upper Himalayan chir pine forests

A total of 192 species (Angiosperms-184 species, Gymnosperms- 01 species, Pteridophytes- 06 species and Bryophytes- 01 species) were recorded from the study area. Habit wise there were 65 tree species belonging to 54 genera and 31 families, 42 shrub species belonging to 39 genera and 21 families and 85 herb/climber/grass species belonging to 80 genera and 47 families.

Status of vegetation in the study area :

Plant (Habit)	**Habit**	**Species**	**Genera**
Tree	31	54	65
Shrub	21	39	42
Herb/Climber/Grass	47	80	85
		Total	**192**

FAUNA:

Mammals:

- Four species of mammals belonging to 4 families were recorded from the study.
- One species *Canis aureus* falls under Schedule I of Indian Wildlife Protection Act 1972, amended in 2022 and none were listed as globally threatened under IUCN red list 2010. The *Macaca mulatta, Herpestesedwardsii and Mus musculus* was found common in the study area whereas Indian Jackal *Canis aureus* were found nearby agricultural fields and habitation.

Birds :

- A total of 41 bird species belonging to 26 families were recorded from the study area. Among these 3 species viz. *Gyps*

	himalayensis, Accipiter badius, and *Aquila chrysaetos*fall under Schedule I and 26 species fall under Schedule II of Indian Wildlife Protection Act 1972, amended in 2022. *Gyps himalayensis*(NT) is listed in IUCN red list 2010. • The most commonly occurring birds in the study area are Black-chinned Babbler, Blue-throated Barbet, Jungle Crow, Plumbeous red-start and Oriental White eye. **Butterflies:** • A total of 19 butterfly species belonging to 5 families were recorded from the study area Nymphalidae (8 species) was the dominant family followed by Pieridae (7 species) Hesperiidae (2 species), Riodinidae (1 species) and Papilionidae (1 species). • All species are commonly occurring representing subtropical forest. **Reptiles:** • Three species of reptiles Rock Lizard (*Psammophilus dorsalis*), Himalayan Ground Skink, (*Ablepharushimalayanus)* and Monitor Lizard (*Varanus bengalensis)* were recorded from the study area. • *Psammophilus dorsalis* and *Varanus bengalensis*were common in both the study duration whereas *Ablepharushimalayanus*and *Calotes versicolor* were recorded during present study. *Varanus bengalensis*recorded during both the study duration falls under Schedule-I of Indian Wildlife Protection Act 1972, amended in 2022 and is listed in IUCN red list 2010.
Aquatic ecology, etc. (As per one season additional study from 15th December, 2024 to 15th March, 2025)	**Phytoplankton** • The plankton diversity was studied and a total of 14 genera of phytoplankton were recorded, out of which 4 belong to Chlorophyceae, 2 belong to Cyanophyceae and remaining 8

	genera belong to Bacillariophyceae A total of 11 species of phytoplankton under three categories *i.e*., green algae (Chlorophyceae), diatoms (Bacillariophyceae) and blue-green algae (Cyanophyceae) were recorded from the sampling sites. **Periphytons** • During the present study, a total of 7 genera of periphytons were recorded, out of which 3 genera each belongs to Chlorophyceae and Bacillariophyceae and a single genus of *Oscillatoria* belongs to Cyanophyceae. **Benthic Macroinvertebrates** • During the present study, a total of 7 groups of benthic macroinvertebrates were recorded (Table 5 of Annexure III), out of which order Trichoptera shows maximum diversity having 5 genera and Ephemeroptera has maximum number of individuals recorded **Fish :** • There are more than 16 fish species reported in different studies in river Beas *i.e.* Carps (Catla, Rohu, Mrigal, Grass carp, Silver carp, Common carp and other Minor carp), Catfish (Seenghala, Singhi, Malhi, Pabda catfish). • In bigger fish River Eel, Grey Trout and Mahasheer are found in the river whereas many other small weed fish species such as Chela and Puntius are common in the tributaries (Kumar & Khanna 2014; Dhanze and Dhanze, 1998; Sehgal, 1973). • During present study, only two fish species viz., *Schizothoraxrichardsonii*and *Glyptothoraxconirostris*were recorded from different stretches of the river Beas and its tributaries. Of the two species recorded, single individual of *Glyptothoraxconirostris*was

	recorded in Beas River at Pabo near Dharampur, whereas other species (*Schizothoraxrichardsonii*) was recorded at all the sites except in Beas River near Bari village, Mandi and Arnodi stream at Mahan village. Because of the high altitude, low temperature and torrential water flow, the fish faunal diversity was minimal during the period of present research work.
Brief description on hydrology and water assessment as per the approved Pre-DPR:	Detailed project description along with Hydrology and water assessment are provided in the main EIA report of the project, which has already been submitted to the MoEF&CC.
Additional detail (If any)	---

11. Court case details: NIL

12. Status of other statutory clearances:

Particulars	**Letter no. and date**
Status of Stage-I FC	Stage-I, FC accorded on dated 11.01.2024 vide Letter no. 8-21/2021-FC.
Approval of Central Water Commission	--
Approval of Central Electricity Authority	The Central Electricity Authority (CEA) accorded concurrence to Thana Plaun Hydro Electric Project (3 x 50.33 MW +2 x 20 MW=191 MW) under section 8 of Electricity Act, 2003 on dated 07.09.2021
Additional detail (If any)	--
Is FRA(2006) done for FC-I	Yes (To be submitted in compliance to Stage-I FC conditions).

13. Details of the EMP:

Activities	**Capital cost (Lakhs)**	**Recurring cost (Lakhs /annum)**
Catchment Area Treatment Plan	5600.31	981.04
Compensatory Afforestation Plan	5584.87	0
Green Belt Development Plan	20.00	7.76
Biodiversity Management Plan	160.00	0

Fisheries Management Plan	117.00	59.04
Reservoir Rim Treatment	200.00	0
Muck Management Plan	176.00	10.8
Restoration Plan for Quarry Sites and Landscaping	35.00	0
Plan for Public Health Delivery System	100.00	0
Energy Conservation Plan	140.00	0
Solid Waste Management Plan	161.00	0
Rehabilitation And Resettlement Plan	15043.00	0
Local Area Development Plan*	2296.5*	0
Plan for Air, Water & Noise Quality Management	50.00	0
Disaster Management Plan & Risk Assessment	80.00	60.00
Environment Monitoring Plan	474.30	409
Road Management Plan	36.00	0
Total	**30273.98 or 302.74 crore**	**1527.64 or 15.27 Crore**
***Cost already included in the project establishment cost**		

14. ADS details (If any)

S.No	ADS Point	Reply
1	Project Deferred in 15th EAC held on dated 28.06.2018, Agenda item no. 15.8 with recommendation to collect baseline data for one more season, afresh.	Fresh EC application along with baseline data for one more season, afresh submitted on dated 31.08.2018.
2	Proposal recommended for grant of EC subject to following conditions in 20th EAC held on dated 27.11.2018 as Agenda item 20.7 1. Environment Clearance in respect of Thana Plaun HEP (191 MW) subject to adhering with the conditions/recommendations under CIA & CCS of Beas River Basin studies under consideration with MoEF&CC, GOI.	Stage-I FC granted on 11.01.2024. Request letter in compliance to conditions recommended by EAC sent to MoEF&CC on 11.01.2024. However, the compliance could not be uploaded to PARIVESH 1.0 due to some technical glitch till 03.09.2024.

	2. Submission of FC Stage-I Clearance to the Ministry.	
3	Project Deferred in 15th EAC held on dated 13.09.24, Agenda item no. 15.5 with recommendation: ● *The Project Proponent shall conduct one season of baseline data collection in accordance with the standard Terms of Reference for the River Valley and Hydroelectric sector.* ● *The Project Proponent shall prepare a comparison table that outlines the previous baseline data collected in past years alongside the current scenario.*	Fresh EC application along with baseline data for one more season, afresh and comparison table submitted on dated 13.05.2025.

32.2.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted and presented during the meeting, observing that the proposal is for the grant of Environmental Clearance for the Construction of Thana Plaun HEP (191 MW), covering an area of 432.79 hectares in Guini Village, Mandi District, Himachal Pradesh by M/s Himachal Pradesh Power Corporation Ltd.

The project is listed under S.N.1(c) of the Schedule to the Environmental Impact Assessment (EIA) Notification as a Category 'A' project, which requires appraisal at the Central level by the Expert Appraisal Committee (EAC).

Observations of EAC in its meeting held on 13.09.2024:

The EAC, constituted under the provisions of the EIA Notification, 2006, and comprising expert members/domain experts in various fields, examined the proposal submitted by the Project Proponent, including the EIA/EMP reports prepared and submitted by the Consultant accredited by QCI/NABET on behalf of the Project Proponent.

The EAC noted that the Project Proponent has provided an undertaking affirming that the data and information provided in the application and enclosures are accurate to the best of their knowledge, with no suppression of information in the EIA/EMP reports. The proponent also acknowledged that if any part of the data/information submitted is found to be false or misleading at any stage, the project will be rejected, and any Environmental Clearance granted will be revoked at the risk and cost of the Project Proponent.

The EAC noted that the Terms of Reference (ToRs) were issued by the Ministry via letter No. J-12011/12/2011-IA-I dated 29.11.2012 for the Thana Plaun HEP with an installed capacity of

141 MW in Mandi District, Himachal Pradesh, by M/s HPPCL. Subsequently, a fresh ToR was accorded on 05.06.2014 for a period of three years, as the scope of the project had changed, resulting in a substantial revision of the capacity from 141 MW to 191 MW.

The EAC further noted that in its 20th meeting held on 27.11.2018, it recommended the grant of Environmental Clearance for the proposed project, subject to the following additional conditions:

i. Environment Clearance in respect of Thana Plaun HEP (191 MW) subject to adhering with the conditions/recommendations under CIA & CCS of Beas River Basin studies under consideration with MoEF&CC, GOI.
ii. Submission of FC stage I Clearance to the Ministry.

The Project Proponent submitted the Stage-I Forest Clearance for the diversion of 406.79 Ha of forest land, granted by the MoEF&CC via letter dated 11.01.2024. This was uploaded on the Parivesh portal on 03.09.2024, nearly 57 months after the EAC's recommendation. Therefore, in accordance with the Office Memorandum dated 18.05.2012, read with the Office Memorandum dated 19.06.2014, the proposal is being considered by the sectoral EAC in the present meeting.

The EAC noted that the total land requirement has decreased from 444.29 hectares to 431.62 hectares, while the forest land area remains unchanged at 406.79 hectares.

The EAC observed that the initial baseline data for the EIA/EMP studies was collected from 1st March 2013 to 31st December 2013, with an additional season of data collected in October 2018. The EAC recommended that the Project Proponent to conduct one season of baseline data collection in accordance with the stipulated norms for the proposed project, to accurately assess the environmental scenario, including Scheduled-I species and the river flow data.

Observation of the committee in the present meeting:

The EAC observed that EC application along with baseline data (winter 2024-25) for one more season, afresh and comparison table submitted on dated 13.05.2025. The EAC noted that from previous baselines data collected in winter 2013-14 there is slightly increase in the values of Physical environment such as Air quality, Noise Quality, water quality and Soil Characteristics but found within prescribed limits of Indian Standards.

The EAC noted that the Public Hearing (PH) for the proposed project has been conducted under the chairmanship of Additional District Magistrate, Mandi organised by the State Pollution Control Board on 22.03.2018 & 23.03.2018 and the issues raised during PH were adequately addressed by the PP.

During the deliberation, the committee emphasized on the muck disposal plan and opined that PP shall prepare muck disposal plan using a scientific and environmentally sound approach, ensuring stability, proper containment, and minimal ecological impact. The plan shall also include a robust monitoring mechanism, along with details of the number of vehicles used for transportation, and shall be submitted to the concerned Regional Office of the Ministry for necessary review and compliance.

The committee observed that EIA/EMP has been prepared by the Indian Council of Forestry Research & Education in Association With Mantec Consultants Pvt. Ltd., Noida (A NABET, QCI Accredited EIA Consultant Organization). The representative from Mantec Consultants Pvt. Ltd. owned the data presented in the EIA/EMP report during the meeting.

32.2.4 The EAC after examining the information submitted and detailed deliberations reteriated its recommendations made during its 20th meeting held on 27.11.2018 wherein, the EAC recommended the proposal for grant of prior Environmental Clearance by the Ministry to Thana Plaun HEP (191 MW) in an area of 432.79 Ha in Guini Village, Mandi District, Himachal Pradesh by M/s Himachal Pradesh Power Corporation Ltd. under the provisions of EIA Notification, 2006 subject to compliance of applicable Standard EC conditions along with following specific environmental safeguards:

[A] Environmental management and Biodiversity conservation:

viii. The Environmental Management Plan (EMP) shall be strictly adhered to as submitted in the EIA/EMP reports. The budgetary provisions for implementation of EMP, shall be fully utilized and not to be diverted to any other purpose. In case of revision of the project cost or due to price level change, the cost of EMP shall also be updated proportionately.

ix. The contract clause limiting the No. of vehicles used during excavation and transportation shall followed scrupulously and the same shall informed to the ministry.

x. Ambient Air Quality Monitoring Stations for real time data to be installed at project site before commencement of the construction, shall be displayed at project site and its report to be submitted to IRO, MoEF&CC.

xi. No vehicle purchase shall be allowed from funds earmarked for implementation of Wildlife Conservation plan. Measures for minimizing the human–animal conflict specially for black bear and leopard be suitably incorporated in the wildlife conservation plan in consultation with State Forest Department.

xii. Plantation of saplings (1000 nos.) shall be carried out as a part of the tree plantation campaign **"Ek Ped Ma Ke Naam"** and the details of the same shall be uploaded in the MeriLiFE Portal (https://merilife.nic.in).

xiii. PP shall adhere with the conditions/recommendations under CIA & CCS of Beas River Basin study conducted by MoEF&CC, GOI.

[B] Disaster Management:

vi. Disposal of the excavated muck and its filling on the low-lying area with proper measures for the stabilization and greenery to minimize the impacts of the generated construction muck shall be taken up pari passu with construction work.

vii. Robust monitoring mechanism for muck disposal along with no. of vehicle used in transportation shall be prepared and details of the same shall be submit to concerned regional office of the Ministry.

viii. Stabilization of muck disposal sites using biological and engineering measures shall be taken up immediately to ensure that muck does not roll down the slopes and does not pollute the natural streams and water bodies in surrounding area. The plantation on muck disposal site with local species for restoration of ecology and environment of the project site area shall be done as per instructions of the Forest Department.

ix. Necessary control measures such as water sprinkling arrangements, and construction of paved roads leading to muck disposal sites etc. shall be taken up on priority to arrest fugitive dust at all the construction sites.

x. Solid waste generated, especially plastic waste, etc. should not be disposed of as landfill material. It should be treated with scientific approach and recycled. Use of single-use plastics may be discouraged.

[C] Socio-economic:

viii. Land acquired for the project shall be suitably compensated in accordance with the prevailing guidelines of the state government and provisions under Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.

ix. Solar panel be provided to the families living in rural areas within 10 km radius of project with annual maintenance.

x. School up to 12^{th} Standard with smart classes shall be established and managed to provide free quality education for children from project affected villages/Tribal villages.

xi. 50 bed multi-speciality hospital shall be established to cater the need of tribal population/locals. The tribal population within 10 km radius of the project shall be given free of cost medical facility.

xii. The compliance of above conditions shall be monitored by IRO, MoEF&CC and regularly site visit once in year. The compliance report of IRO shall be regularly submitted to MoEF&CC.

xiii. Skill development Centre shall be established within 10 km radius of the project and regular training programmes for development and promotion of traditional art/products of tribal/local population.

[D] Miscellaneous:

viii. After 5 years of the commissioning of the project, a study shall be undertaken regarding impact of the project on the environment. The study shall be undertaken by an independent agency.

ix. Bio-Gas plant shall be installed in the Project affected area for Utilizing Cattle waste (Cow Dung) into renewable source of fuel.

x. PP should establish in house (at project site) environment laboratory for measurement of environment parameter with respect to air quality and water (surface and ground). A dedicated team to oversee environment management shall be setup which should comprise of Environment Engineers, Laboratory chemist and staff for monitoring of air, water quality parameters on routine basis.

xi. PP shall procure construction material only from those Organizations having all valid legal/statutory clearances/permissions or necessary permission to be obtained for quarrying construction materials for the project as per the EIA Notification, 2006 and as amended thereof.

xii. An institutional mechanism to be developed to ensure the preference of jobs to PAFs and also a policy for preferential treatment for award of sundry works to the PAFs and their dependents.

Agenda Item No. 32.3

Tato-II 700 MW Hydroelectric Project in an area of 278.92 Ha in village Tato Village, Lower Heyo, Tagur, Quing and Tadogita, Sub District Tato, District Shi Yomi, Arunachal Pradesh by M/s North Eastern Electric Power Corporation Ltd. (NEEPCO) – Extension validity of Environmental Clearance (EC) reg.

[Proposal No. IA/AR/RIV/537011/2025; F. No. J-12011/55/2006-IA.I]

32.3.1 The proposal is for grant of extension of validity of Environmental Clearance (EC) granted to the project for Tato-II 700 MW Hydroelectric Project in an area of 278.92 Ha in village Tato Village, Lower Heyo, Tagur, Quing and Tadogita, Sub District Tato, District Shi Yomi, Arunachal Pradesh by M/s North Eastern Electric Power Corporation Ltd. (NEEPCO).

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

i. Tato-II HEP (700 MW) is proposed on the Siyom River in Shi Yomi District of Arunachal Pradesh having a Catchment Area of 2560 Sq. Km. The project envisages construction of a 123 m high (from River bed level) concrete Dam across river Siyom, 3.876 Km long HRT and an Underground Power House on the left bank of the river for generation of 700 MW (4x175 MW) of hydropower.

ii. A total 376 families will be affected due to this project out of which 51 families will

be displaced. No National Park/Sanctuary/Biosphere Reserve/Historical monument exists in the vicinity of the project area. International boundary is 42 Km (aerial dist.) away from project site. The total estimated present-day cost of the project is about Rs. 8130.73 Crores and likely to be completed in 72 months.

iii. The Environmental clearance was accorded by the Ministry on 27.06.2011 to M/s Tato Hydro Power Private Ltd.). However, earlier PP could not commence the project work post EC basically on account of delay in obtaining forest clearance (FC) of the project.

iv. Tato-II H. E Project (700MW) was taken over by NEEPCO (a Govt of India Enterprise) from the earlier PP followed by signing of MOA between Govt of Arunachal Pradesh and NEEPCO on 12-08-2023. The MOEF&CC transferred the EC to NEEPCO (a govt of India Enterprise) from the earlier PP (M/s Tato Hydro Power Private Ltd.) on 01-01-2024.

v. The validity of the EC dated 27-06-2011 will be expiring on 26-06-2025, it will be necessary to extend the validity of the EC suitably thus enabling NEEPCO to commence the project work. In view of above, North Eastern Electric Power Corporation Ltd. (NEEPCO) requested MOEF&CC to kindly extend the validity of the EC accorded vide No. J-12011/55/2006-IA-I dated 27th June 2011 (presently valid upto 26-06-2025) for a period of 2 (two) years beyond 26-06-2025 i.e. upto 26-06-2027.

vi. The earlier PP (M/s Tato Hydro Power Private Ltd.) could not commence their work post EC basically on account of delay in obtaining forest clearance (FC) of the project due to reasons given below:

a) Proposal for diversion of 313.88 Ha of Forest land for the project was under consideration of FAC since 30-31-May, 2011 due to non-submission of Report on Cumulative Impact Assessment/ Carrying capacity study of Siang-Siyom basin.

b) Due to delay in preparation of the Report on Cumulative Impact study, the Hon'ble MOS (independent charge for Environment & Forest), GOI and Hon'ble MOS (independent charge for Power), GOI held a meeting on 06-08-2013 and requested the FAC to consider the proposal on receipt of interim findings on Cumulative Impact Assessment study. Subsequently Ministry of Power, GOI, also requested MOEFF&CC to consider the project for clearance on ground of being first project in the Siang river basin. In the meantime, Final report on Cumulative Impact and Carrying Capacity Study including downstream impacts has also been completed, awaiting acceptance of MOEF&CC. Since reduction in Dam height was suggested in this report, the PP

sought time to study the report and present their case to FAC.

c) PP presented their case before the FAC on 29/30 Apr, 2014 when they informed that the reduction in Dam height was not possible. After detailed deliberation on 29/30 Apr, 2014, the FAC recommended that (i) Final decision of the Ministry about acceptance of the Report may be awaited and (ii) Compliance of the provisions of The Forest Rights Act by the State Govt.

d) Based on the request of State Government and Niti Ayog, the Cumulative Impact Study was re-visited and submitted recommendations which was placed before the EAC on 26-08-2016. The Ministry, based on the recommendation of EAC, conveyed its decision dated 14-10-2016 for development of Tato-II HEP (700 MW) in the present form without any reduction of FRL and to implement release of Environment flow as per the Basin Study Report without any relaxation.

e) As per the decision conveyed through the Ministry's letter dated 14-10-2016 regarding CIA&CCS, the Environmental Flow of Tato-II HEP (700 MW) is to be maintained at 20% of the average flow in the three Seasons (Monsoon, Lean, and Non-monsoon Non-Lean) whereas the e-flow considered in the CEA's concurrence was 10%. In view of the changed scenario, the State Govt asked the earlier PP to provide their future plan of action, however, the Forest diversion proposal was not further persuaded by the earlier PP despite constant persuasion by the State Govt. In the meantime, all activities got suspended during 2020-21 due to Covid-19 pandemic.

vii. Subsequently, in a meeting chaired by Hon'ble Minister of Power and NRE, GOI, dated 22-12-2021, it was felt imperative to enhance significantly the hydro power capacity of the country to achieve energy transition goals set for the country. An indicative list of Hydro Projects (Basin wise) in Arunachal Pradesh were listed out emphasizing pursuance of already identified suitable hydro project sites (allotted earlier to Private companies) for development by CPSEs like NHPC/NEEPCO etc. The above list also included the subject project i.e. Tato-II H. E Project (700MW) in the Siang Basin.

viii. After due diligence process, Govt of Arunachal Pradesh re-allotted Tato-II H. E Project (700MW) to NEEPCO vide MOA dated 12-08-2023.

ix. In the interest of early commissioning and at NEEPCO's request, the State Govt urged the MOEFCC to allow NEEPCO to carry forward the forest diversion proposal (313.88 Ha) submitted by the earlier PP. However, the Ministry advised to submit online application afresh. Accordingly, NEEPCO submitted online application for diversion of 313.88 Ha of forest land through PARIVESH portal. The proposal has been duly processed by the State Govt and forwarded the same to

the MOEFCC with recommendation for approval. Proposal was discussed in the FAC meeting held on 16.04.2025 and raised few EDS for compliance by the State Govt. Replies to the EDS are under preparation by the State Govt.

x. Status of the project:

DPR / TEC	CEA transferred the Concurrence of the project to NEEPCO in October 2023.
EC	EC transferred to NEEPCO on 01.01.2024 with validity up to 26.06.2025. Process for EC extension initiated, hence this presentation.
FC – I	The State Forest Dept. recommended the forest diversion proposal and uploaded on PARIVESH portal on 28.08.2024 for disposal by MOEF&CC HQ.
Land Acquisition	Project land acquired by the State Govt and handed over to NEEPCO by District Authorities on 27.05.2024.
Defence Clearance	Accorded on 14.01.2025
MHA Clearance	Accorded
Clearance of Deptt. of Fisheries, GoAP:	Accorded on 23.09.2024.
Consent to Establish from State Pollution Control Board:	Accorded on 20-11-2011.
Investment Approval:	Final PIB proposal has been submitted to the Department of Expenditure, Ministry of Finance on 28.04.2025 and the same has been recommended in the PIB meeting held on 15-05-2025.
Site visit by IRO, Shillong/Guwahati held from 25.11.2024 to 29.11.2024.	
CAT plan approved by the PCCF, GoAP on 30.01.2025.	
Wildlife Management Plan approved by the Chief Wildlife Warden of Arunachal Pradesh on 08.03.2025.	
Proposal was discussed in the FAC meeting held on 16.04.2025. EDS raised during the FAC meeting have been replied and uploaded by the State Govt in the PARIVESH portal on 19-05-2025.	
The proposal for reimbursement of SGST agreed by the State Govt on 16.01.2025	

xi. Status of Forest Clearance of Tato-II HEP (700 MW) (Proposed diversion area: 313.88

Ha, Category of Forest: USF)

- Forest Diversion proposal uploaded in PARIVESH portal by PP on 13-01-2024 (Proposal No. FP/AR/HYD/IRRIG/458005/2024), Government of Arunachal Pradesh recommended and forwarded the proposal to MOEFCC on 29.08.2024 for disposal by MOEF&CC HQ.
- Site visit by IRO, Shillong/Guwahati carried out from 25.11.2024 to 29.11.2024.
- CAT plan approved by the PCCF, GoAP on 30.01.2025.
- Wildlife Mitigation Plan approved by the Chief Wildlife Warden of Arunachal Pradesh on 08-03-2025.
- Proposal was discussed in the FAC meeting held on 16.04.2025 and raised few EDS for compliance by the State Govt. Replies to the EDS are under preparation by the State Govt.

32.3.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted and presented during the meeting, observing that the proposal is for the grant of Extension validity of Environmental Clearance (EC) to the project for Tato-II 700 MW Hydroelectric Project in an area of 278.92 Ha in village Tato Village, Lower Heyo, Tagur, Quing and Tadogita, Sub District Tato, District Shi Yomi, Arunachal Pradesh by M/s North Eastern Electric Power Corporation Ltd. (NEEPCO).

The project is listed under S.N.1(c) of the Schedule to the Environmental Impact Assessment (EIA) Notification as a Category 'A' project, which requires appraisal at the Central level by the Expert Appraisal Committee (EAC).

The EAC noted that the Environmental clearance was accorded by the Ministry on 27.06.2011 to M/s Tato Hydro Power Private Ltd. Subsequently, the MOEFCC vide letter dated 01-01-2024 transferred the EC to NEEPCO from M/s Tato Hydro Power Private Ltd.

The committee observed that the Memorandum of Agreement has been signed between Government of Arunachal Pradesh and North Eastern Electric Power Corporation Limited (NEEPCO) for execution of Tato-II Hydro Electric Project (700 MW) in Siang basin on 12.08.2023.

The EAC noted that as per the Ministry's Notification S.O. 1807(E) dated 12.04.2022, the environmental clearance granted to River Valley project shall be valid for a period of thirteen years and may be extended in respect of valid Environmental Clearance, by the regulatory authority concerned by a maximum period of two years. Also, the Ministry has issued OM vide dated 11.04.2022, wherein it has mentioned that the time taken for obtaining Stage-II FC, after the grant of EC, may not be considered as part of the EC validity up to a maximum period of two years.

However, as per MoEF&CC notification S.O. 221(E) dated 18.01.2021 the period from the 1st

April, 2020 to the 31st March, 2021 shall not be considered for the purpose of calculation of the period of validity of Prior Environmental Clearances granted under the provisions of this notification in view of outbreak of Corona Virus (COVID-19). Accordingly, the EC dated 27.06.2011 shall be considered as valid till 26.06.2027 and as per the Ministry's Notification S.O. 1807(E) dated 12.04.2022 the validity of EC may be extended for two more years till 26.06.2029 subject to submission of extension of EC validity proposal within the stipulated time.

The EAC after detailed deliberations noted that as the EC dated 27.06.2011 is still valid till 26.06.2027, the project proponent may submit proposal for extension of validity of EC in 2027 before expiring EC. This seems as per regulations, and hence, the proposal was therefore ***returned*** in its present form.

Agenda Item No. 32.4

Saundatti HEP (1260 MW) (Integrated Renewable Energy with Pumped Storage Project) in an area of 213.70 Ha in Village Badli, Mallor And Yekkundi, Sub District Savadatti, District Belagavi by M/s Greenko KA01 IREP Private Limited – Amendment in Environmental Clearance (EC) – reg.

[Proposal No. IA/KA/RIV/537969/2025 ; F. No. J-12011/11/2018-IA.I(R)]

32.4.1 The proposal is for grant of Amendment in Environmental Clearance (EC) to the project for Saundatti HEP (1260 MW) (Integrated Renewable Energy with Pumped Storage Project) in an area of 213.70 Ha in Village Badli, Mallor And Yekkundi, Sub District Savadatti, District Belagavi by M/s Greenko KA01 IREP Private Limited.

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

i. The proposal is for amendment in the Environmental Clearance granted by the Ministry vide letter dated 19.09.2022 for the project Saundatti HEP Integrated Renewable Energy with Pumped Storage Project located in village Karlakatti & Chakrageri Villages of Yakkundi Gram Panchayat, Saundatti Taluk in Belagavi District, Karnataka in favour of M/s M/s Greenko Ka01 Irep Private Limited.

ii. Saundatti HEP (Integrated Renewable Energy Project with Pumped Storage Project) near village Karlakatti, Tehsil Saundatti in Belagavi District of Karnataka being implemented by M/s Greenko KA01 IREP Private Limited (SPV of Greenko Solar Energy Private Limited) has been granted Environmental Clearance vide letter dated 19-09-2022; corrections/amendment in EC vide 24-03-2023 and Forest Clearance (Stage II) vide letter dated 21-08-2024 by MoEF&CC, New Delhi and Transfer of Environmental Clearance from M/s. Greenko Solar Energy Private Limited to M/s. Greenko KA01 IREP Private Limited was granted on 10.03.2025 and the execution of the project is in progress

iii. Due to the power supply requirements and demand from various State DISCOMs/STUs, to meet Off-peak hrs supply as well as peak supply around 6 hr, on daily basis, M/s Greenko KA01 IREP Private Limited (GKA01) has proposed to change the peak operation hours from 11.60 hours to 5.66 hours, Keeping this in view, the project installed capacity is optimized to 1600 MW, with 5.66 hours of peak operation duration and 9056 MWH as storage capacity.

iv. Irrigation Department of State Govt, while granting water allocation vide GO Number: WRD 23 MPZ 2023, dated March 28, 2024), has mandated the construction of a new lower reservoir as a prerequisite for allocating water to the PSP. Further, as part of the Stage I Forest Clearance, the Environmental Management & Policy Research Institute (EMPRI) of the Government of Karnataka conducted a study on the aquatic fauna of Renuka Sagar Reservoir. EMPRI's report recommended creation of separate lower reservoir to mitigate the impact on fisheries, if any. Accordingly, PP had explored various options and envisaged construction of new lower reservoir.

v. The total capacity of proposed PSP is 1600 MW (9056 MWH) and envisages non-consumptive re-utilization of 0.683 TMC of water for recirculation among the proposed upper reservoir are at latitude 15°51'21.84" N North and longitude is 75°00’19.50" E East and that of lower reservoir are at latitude 15°50'46.62" N North and longitude 75°00'24.67" E East. Water from Renuka Sagar reservoir will be pumped and stored in the lower reservoir which will be used for power generation by re- circulating between Upper Reservoir & Lower Reservoir.

vi. Total land required for construction of various components, including infrastructure facilities is estimated to be around 307.42 Ha, involving 160.40 Ha of forest land and 147.02 Ha of non-forest land. Greenko KA01 IREP Pvt. Ltd envisages to complete the construction of project at an estimated cost of INR **11015.98 Crores**.

vii. Chronology of Approvals/Clearances

Sl. No.	Activity	Date	IC (MW)	Remarks
1	Proceedings of Government of Karnataka for 600 MW PSP and Water Allocation (1 TMC)	12/03/2018	600	In favour of Greenko Solar Energy Pvt. Ltd.
2	Scoping Clearance/TOR	18/05/2018	1200	TOR was issued to Greenko Energies Private Limited
3	Corrigendum in TOR	06/07/2018	1200	Entity Name correction from Greenko Energies Private Limited to Greenko Solar Energy Private Limited (GSEPL)

4	Amendment of TOR	25/09/2018	1260	Due to increase in capacity from 1200 MW to 1260 MW; a surface powerhouse instead of underground and corresponding changes in other project parameters including changes in land requirement.
5	Public Hearing	07/01/2019	1260	PH was conducted at Karlakatti Village, Yakkundi panchayat, Saundatti Hobli Taluk, Belagavi district, Karnataka. Meeting was chaired by District Collector, Belagavi.
6	Proceedings of Govt. of Karnataka for 1260 MW PSP	27/02/2019	1260	Increase in capacity from 600 MW to 1260 MW
7	EC recommendation	25/04/2019	1200	EAC recommendation of environmental clearance subject to certain conditions vide MoEF&CC letter to Greenko Solar Energy Private Ltd.
8	Proceedings of Government of Karnataka for 1260 MW PSP	24/08/2020		Entity Name Change from GSEPL to Greenko KA01 IREP Pvt Ltd
9	Stage I forest Clearance for 160.40 ha of forest land	12/07/2022	1260	In favour of Greenko Solar Energy Pvt. Ltd.
10	Environment Clearance	19/09/2022	1200	In favour of Greenko Solar Energy Private Limited
11	Correction in Environment Clearance	24/03/2023	1260	In favour of Greenko Solar Energy Private Limited
12	GO from Water Resource Department	28/03/2023	1260	Approval of 1 TMC water from Renuka Sagar Dam
13	Proceedings of Govt. of Karnataka for 1600 MW PSP	14/03/2024	1600	In favour of Greenko KA01 IREP Private Limited
14	Renuka Sagar Dam NOC	22/05/2024	1260	
15	Fisheries NOC	23/05/2024	1260	

16	Stage II forest Clearance for 160.40 ha of forest land	21/08/2024	1260	In favour of Greenko Solar Energy Pvt. Ltd.
17	Consent to Establish (CTE)	20/09/2024	1260	In favour of Greenko Solar Energy Pvt. Ltd. Valid for a period of 10 years from the date of issue.
18	IRO Report	30/10/2024	1260	IRO EC compliance verification site report.
19	Transfer of EC in favour of Greenko KA01 IREP Pvt Ltd	10/03/2025	1260	In favour of Greenko KA01 IREP Private Limited
20	Amendment to CTE order (change of name)	17/03/2025	1260	Name changed to Greenko KA01 IREP Private Limited applied
21	Transfer of FC in favour of Greenko KA01 IREP Pvt Ltd	11/04/2025	1260	In favour of Greenko KA01 IREP Private Limited applied

viii. The project proponent has requested for amendment in the EC with the details are as under;

S.No.	Para of EC issued by MoEF&CC	Details as per the EC	To be revised/ read as	Justification/ reasons
1	Subject	Saundatti HEP (1260 MW) Integrated Renewable Energy with Pumped Storage Project at village Karlakatti, Tehsil Saundatti, District Belgaum (Karnataka) by M/s Greenko	Saundatti HEP (1600 MW) Integrated Renewable Energy with Pumped Storage Project at village Karlakatti, Tehsil Saundatti, District Belgaum (Karnataka) by M/s Greenko KA01 IREP Private Limited	Capacity Enhancement

S.No.	Para of EC issued by MoEF&CC	Details as per the EC	To be revised/ read as	Justification/ reasons
		Solar Energy Pvt. Ltd.		
2	Approved EC Point No. 2	Environmental Clearance to the project for Saundatti HEP (1260MW) Integrated Renewable Energy with Pumped Storage Project in an area of 213.70 ha at village Karlakatti, Tehsil Saundatti, District Belgaum (Karnataka) by M/s Greenko Solar Energy Pvt. Ltd.	Environmental Clearance to the project for Saundatti HEP (1600MW) Integrated Renewable Energy with Pumped Storage Project in an area of 307.42 ha at village Karlakatti, Tehsil Saundatti, District Belgaum (Karnataka) by M/s Greenko KA01 IREP Private Limited	Keeping in view the market needs of energy market the configuration of project was changed to 1600 MW for 5.66 hours. Earlier the unit proposed were of 252 MW but now the unit size has been increased to 320 MW based on EM manufacturer.
3	Approved EC Point No. 3	The total land requirement for the proposed development of pumped storage project is about 213.70 ha. Out of the total land requirement around 160.40 ha is forest	The total land requirement for the proposed development of pumped storage project is about 307.42 ha. Out of the total land requirement around 160.40 ha is forest land and 147.02 ha is private land.	New lower reservoir is proposed to be constructed in non-forest land just beside the existing Renuka Sagar reservoir. There is no increase in forest. Muck disposal areas are proposed in company owned Solar Project land.

S.No.	Para of EC issued by MoEF&CC	Details as per the EC	To be revised/ read as	Justification/ reasons
		land, 34.64 ha is private land and 18.66 ha is govt. land		
4	Approved EC Point No.5	The Terms of Reference (TOR) for the project was granted by the Ministry on 18th May, 2018 in favour of M/s Greenko Energies Pvt. Ltd. Further, the name of the firm was corrected as M/s Greenko Solar Energy Pvt. Ltd. vide letter dated 6.07.2018	The Environmental Clearance for the project was granted by the Ministry on 19th Sept. 2022 in favour of M/s Greenko Solar Energy Pvt. Ltd., which was corrected on 24/03/2023. Further, the EC was transferred to M/s Greenko KA01 IREP Private Limited vide letter dated 10.03.2025	
5	Approved EC Point No, 6 (i)	Rockfill embankment of varying from 10 m to 43 m high dam for creation of Saundatti IREP reservoir of 1.00 TMC live storage capacity	GFRD embankment of 42 m (max) height for creation of Saundatti IREP upper reservoir of 0.702 TMC live storage capacity and GFRD embankment of 27 m (max) height for creation of Saundatti IREP lower reservoir of 0.683 TMC live storage capacity	As per the revised type of dam GFRD the maximum height decreased to 42 m due to reduction in the requirement of live storage due to reduced generation hours.
6	Approved EC Point No, 6 (ii)	Power Intake Structure	Diffuser type intake structure	-

S.No.	Para of EC issued by MoEF&CC	Details as per the EC	To be revised/ read as	Justification/ reasons
7	Approved EC Point No, 6 (iii)	Surge Shaft	No Surge Shaft proposed	-
8	Approved EC Point No, 6 (iv)	4 nos. of 856 m long and 6 m dia inclined circular steel lined penstock tunnel/pressure shaft each for each unit of 252 MW	5 nos., 7.1 m dia of each with length varying from 929.55m to 1062.56 m circular steel lined Penstock/ Pressure Shaft	Since the unit capacity is increased to 320 MW, the size of penstock is increased to 7.1m dia. Only the diameter and length. of Penstock is changed otherwise, the no. of penstocks and the layout of the penstock is similar to 1260 MW.
9	Approved EC Point No, 6 (v)	One 804 m long and 6 m dia inclined circular steel lined penstock tunnel/pressure shaft bifurcated to 2 penstocks to feed 2 units of 126 MW	One penstock diameter of 7.10 m and a length of 929.55 m up to the bifurcation point. At this point, it splits into two branch penstocks with a diameter of 5.00 m and an average length of 101.04 m 2 penstocks to feed 2 units of 160 MW.	-
10	Approved EC Point No, 6 (vi)	A surface powerhouse having an installation of 4 nos. of reversible Francis turbine each of 252 MW capacity and two nos reversible Francis turbines each of 126MW	A surface powerhouse having an installation of 4nos. of reversible Francis turbine each of 320MW capacity under a rated head of 193.78m in generating mode and 202.48 m in pumping mode & 2 nos. Reversible Francis turbine each of 160MW capacity	The head losses of the water conductor system have been reworked out and the operating heads have been revised accordingly.

S.No.	Para of EC issued by MoEF&CC	Details as per the EC	To be revised/ read as	Justification/ reasons
		capacity operating under a rated head of 206.22 in generating mode and 217.42 in pumping mode		
11	Approved EC Point No, 6 (vii)	45m wide and FSD of 6.0 m Tail race channel 1749 m long connecting to the Existing Renuka Sagar reservoir	No Tail Race Channel proposed	In the enhanced capacity of 1600 MW, it is proposed to construct new LR instead of using Renuka Sagar reservoir as LR as proposed in 1260 MW. In this, it is proposed to connect the lower intake pool directly to lower reservoir without Tail Race Channel.
12	Approved EC Point No. 7	Private Land 34.64 ha	Private Land 147.02 ha	Due to creation of New Lower Reservoir, which is proposed in Pvt Land, there has been increase in requirement of Private land.
13	Approved EC Point No. 9	1260 MW	1600 MW	Keeping in view the market needs of energy market the configuration of project was changed to 1600 MW for 5.66 hours. Earlier the unit proposed were of 252 MW & 126 MW but now the unit size has been increased to 320

S.No.	Para of EC issued by MoEF&CC	Details as per the EC	To be revised/ read as	Justification/ reasons
				MW & 160MW based on EM manufacturer.
14	Approved EC Point No. 12	1260 MW & 213.70 ha M/s Greenko Solar Energy Pvt. Ltd.	1600 MW & 307.42 ha M/s Greenko KA01 IREP Private Limited	Keeping in view the market needs of energy market the configuration of project was changed to 1600 MW for 5.66 hours. Earlier the unit proposed were of 252 MW but now the unit size has been increased to 320 MW based on EM manufacturer.

ix. The salient features of the proposal is as under:

- **Project Details:**

Name of the Proposal	Saundatti HEP Integrated Renewable Energy with Pumped Storage Project
Proposal No.	IA/KA/RIV/537969/2025
Location (Including Coordinates)	Upper reservoir is at Latitude 15° 51' 21.84" North and Longitude is 75° 00' 19.50" East and lower reservoir at Latitude 15° 50' 46.62" North and at Longitude 75° 00' 24. 67" East.
Company's Name	Greenko KA01 IREP Private Limited (Previously Greenko Solar Energy Private Limited)
CIN no. of Company/user agency	U40300KA2020PTC162661
Accredited Consultant, Validity and certificate no.	R S Envirolink Technologies Private Limited NABET/EIA/2225/RA 0274 Valid till 15/08/2025
Project location (Coordinates /River/ Reservoir)	Karlakatti & Chakrageri Villages of Yakkundi Gram Panchayat, Saundatti Taluk in Belagavi District, Karnataka.
Inter- State Issue involved	No

- **Category Details:**

Category of the project	1 (c)
Capacity / Cultural command area (CCA)	1600 MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	None

- **TOR/EC Details:**

Earlier EC Proposal No.	IA/KA/RIV/74600/2018
Earlier EAC meeting date	27/02/2019
EC Letter No.	F. No. J-12011/11/2018-IA.I (R)
EC grant Date	19/09/2022
Cost of project	5965.33
Total area of Project	213.70
Date of online application for amendment in EC was	19/05/2025
Details of CTE	20/09/2024 valid up to 11 years i.e 18/09/2035

- **Electricity generation capacity:**

Powerhouse Installed Capacity	1600 MW
Generation of Electricity Annually	3139.42MU
No. of Units	4x320 MW+2X160MW

- **Detail reason for amendment in EC:**

Saundatti HEP Integrated Renewable Energy with Pumped Storage Project, boasting an installed capacity of 1260 MW, received environmental clearance on September 19, 2022. This project was initially designed for a peak generation duration of 11.60 hours, aiming to establish a storage capacity of 14616 MWH. However, in accordance with power grid requirements, Pumped Storage Projects (PSPs) are typically designed for approximately 6 hours of peak supply daily. Following a comprehensive engineering and optimization review, the project's installed capacity was increased to 1600 MW, leading to adjustments in various project parameters. The operational duration has been optimized to 5.66 hours per day. The Irrigation Department of the State Government, while approving water

allocation under GO Number: WRD 23 MPZ 2023, dated March 28, 2024, has stipulated the construction of a new lower reservoir as a condition for water allocation to the PSP. Additionally, as part of the Stage I Forest Clearance, the Environmental Management & Policy Research Institute (EMPRI) of the Government of Karnataka conducted a study on the aquatic fauna of the Renuka Sagar Reservoir. EMPRI's findings recommended the establishment of a separate lower reservoir to alleviate any potential impacts on fisheries. Consequently, various options were explored, leading to the proposal for the construction of a new lower reservoir. The revised installed capacity of 1600 MW will provide a storage capacity of 9056 MWH, necessitating the acquisition of an additional 112.38 hectares of private land, along with a reduction of 18.66 hectares of government land for the amendment proposal. During detailed engineering design, keeping in view the further geological investigation, layout has been optimized to achieve 1600 MW installed capacity.

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

S.No		NAME OF THE PROJECT	STANDALONE PUMPED STORAGE COMPONENT OF SAUNDATTI PSP - 1260 MW (AS PER ENVIRONMENTAL CLEARANCE)	STANDALONE PUMPED STORAGE COMPONENT OF SAUNDATTI PSP - 1600 MW (AS PER proposed DPR)
1		**Location**		
	a	Country	India	India
	b	State	Karnataka	Karnataka
	c	District	Belagavi	Belagavi
	d	Village near Powerhouse	Karlakatti	Karlakatti
2		**Geographical Co-Ordinates**		
	a	Saundatti OCPSP Upper Reservoir- (Now Proposed)		
		Latitude	15° 51' 21.84" N	15° 51' 21.84" N
		Longitude	75° 00' 19.50" E	75° 00' 19.50" E
	b	Saundatti OCPSP Lower Reservoir - (Now Proposed)	Renuka Sagar resevoir	
		Latitude	15° 49' 17.15" N	15° 50' 46.62" N
		Longitude	75° 05' 48.23" E	75° 00' 24.67" E

3		**Access to Project Site**		
	a	Airport	Belagavi	Hubli
	b	Rail head	Dharwad	Dharwad
	c	Road	Dharwad (45 Km)	Dharwad (45 km)
	d	Port	Karwar	Karwar
4		**Project**		
	a	Type	Pumped Storage Project	Pumped Storage Project
	b	Storage Capacity	14616 MWH	9056 MWH
	c	Rating	1260 MW	1600 MW
	d	Peak Operation duration	11.60 Hours	5.66 Hours
5	**i**	**Saundatti PSP - Upper Reservoir**		
	a	Live Storage	1.00 TMC	0.702 TMC
	b	Dead Storage	0.03 TMC	0.033 TMC
	c	Gross Storage	1.03 TMC	0.735 TMC
	ii	**Upper Reservoir**		
	a	Full Reservoir level (FRL)	EL +855.00 m	EL + 854.00 m
	b	Min. Draw Down Level (MDDL)	EL +825.00 m	EL + 829.00 m
	c	Top Bund Level (TBL)	EL +858.00 m	EL + 857.00 m
	d	Type of Embankment	Rock fill Dam with central clay core	Geomembrane Faced Rockfill Dam (GFRD)
	e	Max. Height of Embankment	43.00 m	42 m
	f	Weighted Average Height of Embankment	--	28 m
	g	Length at the top of Embankment	5776 m	4605 m
	h	Top width of the Embankment	10.0 m	7 m
	i	Type of Power Block	--	Concrete Gravity Structure
	j	Height of Power Block	--	47.85 m from sill level of intake
	k	Length at the top of Power Block	--	150 m
	l	Top width of the Power Block	--	8 m

6	**i**	**Saundatti PSP - Lower Reservoir**		
	a	Catchment Area	2176 Sq. KM	--
	b	Max. flood discharge	5239 cumecs	--
	c	Live Storage	830.81 MCum (29.34 TMC)	0.683 TMC
	d	Dead Storage	236.46 MCum (8.35 TMC)	0.024 TMC
	e	Gross Storage	1067.27 MCum (37.69 TMC)	0.706 TMC
	ii	**Lower Reservoir**		
	a	Full Reservoir level (FRL)	EL +633.83 m	EL + 654.00 m
	b	Min. Draw Down Level (MDDL)	EL +623.93 m	EL + 631.00 m
	c	Top Bund Level (TBL)	--	EL + 657.00 m
	d	Type of Embankment	Dam	Geomembrane Faced Rock fill Dams (GFRD)
	e	Weighted Average Height of Embankment	40.23 m	16 m
	f	Max. Height of embankment	43.1 m	27 m
	g	Length of Embankment	154.53 m (Dam)	5237
7		**Intake Structure**		
	a	Type	Diffuser Type	Diffuser Type
	b	No. of Intakes	5 nos.	5 nos.
	c	No. of Vents in each Intake	--	3 nos.
	d	Size of Each Intake	23.50m (W) x 7.50 m (H) including piers	27 m (W) X 9.0 m (H) Including intermediate Piers
	e	Length of each Intake	39.55 m (covered with RCC slab at top up toIntake Gate)	43.10m(covered with RCC slab at top up to Intake Gate)
	f	Elevation of Intake center line	--	EL + 812.70 m
	g	Elevation of Intake bottom	EL +811.40 m	EL + 809.15 m
	h	Design Discharge of each Intake (Turbine mode)	136.49 Cumec for units 3 to 6 136.88 Cumec for units 1 & 2	190.14 Cumec

	I	Velocity trough trashrack		1.00 m/s
	j	Trash rack type	--	Vertical with inclination of 15°
	k	Size of Trash Rack	--	3 Nos. of 8.00m (W) X 9.32m (H) for each unit
	l	Numbers & Size of Intake Service Gate	--	5 Nos. of 5.90m (W) X 7.10 m (H) with independent rope drum hoist
	m	Numbers & Size of Intake Stop log Gate	--	1 No. of 5.90 m (W) X 7.10 m (H) with Moving Gantry
8	**I**	**Penstock /Pressure Shafts**		
	a	Type	Steel lined circular	Steel lined - circular
	b	Number of Pressure Shaft	Total 5 No. of Independent Penstocks in which 1 no. will get bifurcated into 2 nos. near powerhouse.	Total 5 No. of Independent Penstocks in which 1 no. will get bifurcated into 2 nos. near powerhouse.
	c	Diameter of Pressure Shaft	6.0 m dia	7.10 m
	d	Length of Penstock/Pressure Shaft	Length of surface penstock-1 from Intake to Vertical Pressure Shaft (VPS) – 173.50 m Length of Vertical Pressure Shaft –235.31 m Length of Horizontal Pressure Shaft (HPS) – 620.69 m	Varies from 929.55 m to 1062.56 m • Length of buried penstock-1 from Intake to Vertical Pressure Shaft (VPS) – 309.62m to 329.62 m • Length of Vertical Pressure Shaft –139.57 m • Length of Horizontal Pressure Shaft (HPS) – 480.36 m (up to bifurcation) to 613.37 m (including MIV reducer length)
	e	Dia. Of Branch Pressure Shaft	4.25 m	5.0m

	f	Length of each branch Pressure Shaft	4 nos. 620.69 m each & 1 No. 502.0 m 2 nos. of 65.85 m (for Unit-1& 2) each	101.04 m (including MIV reducer length)
	g	Design Discharge of each Main Penstock	136.49 Cumec	190.14 Cumec
	h	Design Discharge of each Branch Penstock	68.44 m3/s	95.62 Cumec
	i	Velocity in the Main Penstock	4.83 m/sec	4.80 m/sec
	j	Velocity in the branch Pressure Shaft	4.83 m/sec	4.87 m/sec
	II	**Main Inlet Valve (MIV)**		
	a	Size of MIV	4.2 m Diameter (for Larger unit) 3.15 m diameter (for Smaller unit)	--
9		**Powerhouse**		
	a	Type	Surface Powerhouse	Surface Powerhouse
	b	Centre line of Unit	EL 587.00 m	EL + 595.00 m
	c	Dimensions (Excluding Service Bay)	L 196.50m x B 24.00 m x H 51.10 m	167 m (L) X 25.5 m (W) X 51.20 m(H)
	d	Size of Service Bay	--	40.00 m (L) x 25.5 m (W)
	e	Service bay Level	--	EL + 609.20 m
	f	Size of Unloading Bay	--	25.00 m (L) X 25.5 m (W)
	g	Unloading Bay Level	--	EL + 633.20 m
10		**Tail Race Tunnel**		
	a	Type & Shape	Concrete Lined Circular	Concrete Lined – Circular
	b	Number of Tunnels	6 nos. (4 individual tunnels for Larger units & 2 individual tunnels for Smaller units)	6 Nos. (4 Nos. of Larger units & 2 Nos. of Smaller units)
	c	Dia. of Tunnel	7.0m for larger units & 5.0m for Smaller units	8 m for larger unit 6.65 m for smaller unit
	d	Length of the Tunnel	225.47 m	253.57 m for Larger Unit 344.76 m for Smaller Unit

	e	Design Discharge	--	190.14 Cumec each for larger unit 95.62 Cumec each for smaller unit
	f	Velocity in Tunnels		3.78 m/sec for larger unit 2.75 m/sec for smaller unit
11		**Tailrace Outlet/Intake Structure**		
	a	Type	Diffuser Type	Diffuser Type
	b	No. of Outlets	6 Nos.	6 Nos. (4 Nos. of Larger units & 2 Nos. of Smaller units)
	C	No. of Vents in each Outlets		3 nos. for Larger unit and 3 nos. for Smaller unit.
	d	Size of each outlet	23.50 m (W) x 8.0 m (H) for Larger Unit 20.0m (W) x 5.20m (H) for Smaller Unit	23 m (W) X 9.4 m (H) Including Piers for Larger unit, 16.5 m (W) X 7.0 m (H) Including Piers for Smaller unit
	e	Length of each Outlet	37.40 m (covered with RCC slab at top up to Intake Gate)	32.49 m (H) for larger unit and 35.19 m smaller unit covered with RCC slab at top up to Outlet Gate
	f	Elevation of outlet center line	EL +614.10m	EL +616.30 m for larger unit EL +615.63 m for smaller unit
	g	Elevation of Outlet/intake bottom	EL +610.60m for Larger Unit EL +611.60 for Smaller Unit	EL +612.30 m
	H	Design Discharge of each Outlets (Turbine mode)		179.68 Cumec (Larger Unit) 83.19 Cumec (Smaller Unit)
	I	Velocity trough trashrack		1.00 m/s
	j	Trash rack Type	--	Vertical with inclination of 15°

	k	Size of Trash rack	--	3 nos. of 6.67 m (W) X 9.73m (H) for each larger unit, 3 nos. of 4.5m (W) X 7.25 m (H) m for each smaller unit
	l	Numbers & Size of Tailrace outlet/intake Service Gate.	--	4 nos. of 6.6m (W) X 8.0m (H) for larger unit, 2 nos. of 5.6m (W) X 6.65m (H) for smaller unit
	m	Numbers & Size of Tail Race outlet Stop log Gate/ Intake Bulkhead Gate	--	1 no. of 6.6m (W) X 8.0m (H) for larger unit, 1 no. of 5.6m (W) X 6.65m (H) for smaller unit
12		**Tail Race Channel**	Trapezoidal Unlined	--
	a	Length of the channel	1749 m	--
	b	Bed width	45m	--
13		**Electro-Mechanical Equipment**		
	a	Pump Turbine	Francis type, vertical shaft reversible pump-turbine	Francis type, vertical shaft reversible pump-turbine
	b	Total No. of units	6 nos. (4 X 252MW & 2 X 126 MW)	6 Nos. (4 X 320 MW) + (2 X 160 MW)
	c	Total Design Discharge (Turbine Mode)	--	951.80 Cumec
		Total Design Discharge (Pumping Mode)		885.09 Cumec
	d	Centre line of Unit	EL +587.00m	--
	A	**Turbines**	**252MW**	**320 MW**
	a	Total No. of units	4 Units (All units are Variable speed)	4 Units (All units are Fixed Speed)
	b	Turbine Design Discharge	136.49 Cumec for each unit	190.14 Cumec
	c	Pump Capacity	297 MW	380 MW
	d	Rated Net Head (Turbine Mode)	206.82 m	193.78 m
	e	Rated Pumping Head	216.12 m	202.48 m

	f	Rated Pump Discharge	--	179.68 Cumec
	g	Synchronous speed	--	166.67 rpm
	I	Generator-Motor		
	a	Type	Three phase, alternating current asynchronous,generator motor semi umbrella type with vertical	Three (3) phases, alternating current synchronous generator motor semi umbrella type with vertical shaft
	b	Number of units	4Units	4 units (4 x 320MW)
	c	Rated Capacity	Generator 252 MW Pump Input 297 MW	Generator – 320 MW Pump Input – 380 MW
	d	Rated Voltage	--	18.0 KV
	II	**Main Power Transformer**		
	a	Type	Indoor Single-Phase Power transformers with Off-Circuit tap changer (OCTC)	Outdoor Single-Phase Power transformers with ON Load Tap Changer (OLTC)
	b	Number of units	12 Units i.e 3 Nos. per unit	12 Nos. i.e., 3 nos. per unit + 1 no. Spare Total: 13Units
	c	Rated Capacity of each unit	Single Phase 125 MVA	Single Phase, 18 kV/400kV, 150 MVA
	d	Rated Voltage	--	Primary – 18.0 kV; Secondary - 400 kV adjustable range of the secondary voltage: - 15% to +5% in Steps of 1.25% of steps for HV Variation
	B	**Turbines**	**126MW**	**160MW**
	a	Total No. of units	2 Units (Both are Variable speed)	2 Units (Both are Fixed Speed)
	b	Turbine Design Discharge	68.44 Cumec	95.62 Cumec
	c	Pump Capacity	170 MW	176 MW
	d	Rated Net Head (Turbine Mode)	206.22 m	193.48 m
	e	Rated Pumping Head	217.42 m	202.18 m
	f	Rated Pump Discharge	--	83.19 Cumec
	g	Synchronous speed	--	250 rpm

	I	Generator-Motor		
	a	Type	Three (3) phases, alternating current Synchronous generator motor semi umbrella type with vertical shaft	Three (3) phases, alternating current Synchronous generator motor semi umbrella type with vertical shaft
	b	Number of units	2 Units	2 units (2 x 160MW)
	c	Rated Capacity	Generator126MW; Pump Input - 170MW	Generator – 160 MW Pump Input – 176 MW
	d	Rated Voltage	--	18.0 kV
	II	**Generator Motor Transformer**		
	a	Type	Indoor, 1-Ph transformers with Off-Circuit tap changer (OCTC)	Outdoor Three-Phase Power transformers with On Load Tap Changer (OLTC)
	b	Number of units	6 Units i.e. 3 Nos. per unit	2 Nos.
	c	Rated Capacity of each unit	Single Phase 70 MVA	Three Phase, 210 MVA
	d	Rated Voltage	--	Primary – 18kV; Secondary - 400 kV adjustable range of the secondary voltage: - 15% to +5% in Steps of 1.25% of steps for HV Variation
14		**420 KV Gas Insulated Switchgear**		
	a	Type of GIS	Indoor Type	Indoor Type
	b	No. of GIS units	One No. with bus sectionaliser	One No.
	c	Location	Inside GIS Building above ground	Inside GIS building above ground
	d	Scheme	Double Busbar Arrangement with bus sectionaliser	Double Busbar Arrangement with bus coupler and with Bus Sectionaliser
15		**Power Evacuation**		
	a	Voltage Level (KV)	400 kV	420 KV

	b	No. of Transmission Lines	One Double Circuit Transmission Line	• One 400 kV Double Circuit Transmission Line on Lattice Towers from Saundatti PSP Pothead Yard to Saundatti CPSS and further • CPSS to 400/220 kV ISTS Gadag Substation, Karnataka State. • CPSS to 400/220 kV STU/KPTCL Substation located at Dhoni of Karnataka State.
	c	Conductor	--	ACSR Quad Moose
	d	Total Length	Central Pooling Substation (CPSS)	Transmission Lines are ➢ 5 km (approx.) length for evacuation of Stored Power from Saundatti PSP to CPSS ➢ 130 km (approx.) length for evacuation from CPSS to 400/220 kV ISTS Gadag substation, Karnataka State. ➢ 140 Km (approx) length for evacuation from CPSS to 400/220 kV STU/KPTCL Substation located Dhoni of Karnataka State during Generating mode and for input power to PSP during pumping mode.
16		**Estimated Project Cost**	**June 2019 Price Level**	**June 2023 Price Level**
	a	Civil and Other Works	3294.94 Cr	6508.11 Cr
	b	E&M Works including transmission	2031.25 Cr	3466.74 Cr
		Sub-Total	5326.19 Cr	9974.85 Cr
	a	IDC & Others	639.14 Cr	1041.13 Cr

	b	Total Project Cost	5965.33 Cr	11015.98 Cr

- **Court case details: Nil**

32.4.3 The EAC during deliberations noted the following:

The Expert Appraisal Committee (EAC) deliberated on the information submitted and as presented in the meeting and observed that the proposal is for grant of amendment in Environmental Clearance to Saundatti HEP (1260 MW) (Integrated Renewable Energy with Pumped Storage Project) in an area of 213.70 Ha in Village Badli, Mallor And Yekkundi, Sub District Savadatti, District Belagavi by M/s Greenko KA01 IREP Private Limited.

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

The EAC noted that Environmental Clearance to Saundatti HEP Integrated Renewable Energy with Pumped Storage Project granted by the Ministry vide letter dated 19.09.2022, corrections/amendment in EC vide 24-03-2023, Stage-II Forest Clearance vide letter dated 21-08-2024 by MoEF&CC, New Delhi and Transfer of Environmental Clearance from M/s. Greenko Solar Energy Private Limited to M/s. Greenko KA01 IREP Private Limited was granted on 10.03.2025.

The EAC noted that as per SECI requirement, irrespective of the Energy Storage Systems (ESS) technology being implemented in the Project, the developer shall be responsible for meeting Off-peak Hrs supply as well as minimum 6 Hrs. of Peak supply on daily basis. Consequently, the Saundatti IRESP generation hours have been reduced to 5.66 Hrs from 11.60 hr by enhancing the installed capacity to 1600 MW from 1260 MW by changing the unit capacities the project is being reconfigured and optimized to 1600 MW.

It was further observed by the committee that the total capacity of proposed PSP is 1600 MW (9056 MWH) and envisages non-consumptive re-utilization of 0.683 TMC of water for recirculation among the proposed upper reservoir are at latitude 15°51'21.84" N North and longitude is 75°00'19.50" E East and that of lower reservoir are at latitude 15°50'46.62" N North and longitude 75°00'24.67" E East. Water from Renuka Sagar reservoir will be pumped and stored in the lower reservoir which will be used for power generation by re- circulating between Upper Reservoir & Lower Reservoir.

The EAC noted that the total land requirement for the project has increased from 213.70 hectares to 307.42 hectares. It was observed that there is no increase in the forest land component, which remains unchanged at 160.40 hectares. However, the non-forest land area has increased from 53.30 hectares to 147.02 hectares, primarily due to the inclusion of an additional project component, namely the construction of the Lower Reservoir. The PP

informed that private land required for the project falls in two revenue villages viz. Chakrageri and Karlakatti Villages under Savadatti Tehsil. There is no change in project villages from where private land is purchased for 1260 MW open loop project and revised 1600 MW closed loop project and more than 70% of total private land has been aquired.

The Committee observed that the Regional Office, MoEF&CC submitted the Certified Compliance Report of the Environmental Clearance (EC) conditions on 30.10.2024. The report indicated that no major non-compliance with EC conditions was observed, and that the construction work is currently at a preliminary stage.

The EAC was of the view that the proposed amendment qualify the criteria to be considered under the provisions of the Para 7 (ii) of the EIA Notification, 2006, as amended. The PP has already submitted the revised EIA/EMP based on Standard TOR with an additional one-season baseline data conducted during April–May 2024, in light of the proposed change in project capacity from 1260 MW to 1600 MW, as well as other project modifications, including an increase in the land area. The EAC felt no requirement of fresh public hearing as PP has already conducted public hearing before grant of earlier Environmental Clearance on 07/01/2019. The additional land required for proposed components is adjescent to the earlier components of the project and falls within the same study area for which EC was granted. However, the EAC recommended that a time bound action plan for implementing the commitments made during the Public hearing and the measures suggested by the EAC be submitted to the IRO within 6 months for effective monitoring.

The EAC noted that the project cost has been escalated from 5965.333 Cr to 11015.98 Cr therefore PP has revised EMP budget from 87.62 Cr to 144.6332 Cr. Activity wise Budget allocation in EMP mentioned as under:

S. No.	Component of EMP	Total Cost (Rs. In Lakh)
1	Catchment Area Treatment Plan	47.65
2	Compensatory Afforestation and NPV	6901.20
3	Biodiversity Conservation & Wildlife Conservation Plan	410.00
4	Fisheries Development Plan	86.00
5	Muck Dumping and Management Plan	729.57
6	Landscaping, Restoration of Construction Sites	45.00
7	Green Belt Development Plan	110.30
8	Sanitation and Solid Waste Management Plan	346.00
9	Public Health Delivery System	301.00

10	Energy Conservation Measures	386.00
11	Labour Management Plan	130.00
12	Disaster Management Plan	275.00
13	Pollution Control and Mitigation Measures	100.00
14	Environmental Monitoring Program	208.60
15	Rehabilitation and Resettlement Plan**	891.50
16	Local Area Development Plan	3495.50
	Total	**14463.32**

32.2.5 The EAC after detailed deliberation on the information submitted and as presented during the meeting, recommended the proposal for grant of amendment in Environmental Clearance dated 19.09.2022 for Saundatti HEP (1260 MW) (Integrated Renewable Energy with Pumped Storage Project) in an area of 213.70 Ha in Village Badli, Mallor And Yekkundi, Sub District Savadatti, District Belagavi by M/s Greenko KA01 IREP Private Limited, under the provisions of EIA Notification, 2006, as amended subject to the standard EC conditions along with following specific conditions:

[A] Environmental management and Biodiversity conservation:

i. All the conditions mentioned in the EC letter dated 19.09.200, subsequent corrections/amendment in EC letter dated 24.03.2023 and Transfer of EC dated 10.03.2025 shall remain unchanged.

ii. The updated Environmental Management Plan (EMP) shall be strictly adhered to as submitted in the EIA/EMP reports. The budgetary provisions for implementation of EMP, shall be fully utilized and not to be diverted to any other purpose. In case of revision of the project cost or due to price level change, the cost of EMP shall also be updated proportionately.

iii. 10000 plants shall be planted around the muck disposal area and the survival of plants shall be submitted with the 6 monthly compliance report.

iv. Plantation of saplings (1000 nos.) shall be carried out as a part of the tree plantation campaign "Ek Ped Ma Ke Naam" and the details of the same shall be uploaded in the MeriLiFE Portal (https://merilife.nic.in).

[B] Muck Management:

i. Stabilization of muck disposal sites using biological and engineering measures shall be taken up immediately to ensure that muck does not roll down the slopes and does not pollute the natural streams and water bodies in surrounding area. The plantation on muck disposal site with local species for restoration of ecology and environment of the project site area.
ii. Necessary control measures such as water sprinkling arrangements, and construction of paved roads leading to muck disposal sites etc. shall be taken up on priority to arrest fugitive dust at all the construction sites.
iii. Solid waste generated, especially plastic waste, etc. should not be disposed of as landfill material. It should be treated with scientific approach and recycled. Use of single-use plastics may be discouraged.

[C] Socio-economic:

i. The compliance of above conditions shall be monitored by IRO, MoEF&CC and regularly site visit once in year. The compliance report of IRO shall be regularly submitted to MoEF&CC.
ii. Skill development Centre shall be established within 10 km radius of the project and regular training programmes for development and promotion of traditional art/products of tribal/local population.

[D] Miscellaneous:

i. Bio-Gas plant shall be installed in the Project affected area for Utilizing Cattle waste (Cow Dung) into renewable source of fuel.
ii. PP shall procure construction material only from those Organizations having all valid legal/statutory clearances/permissions or necessary permission to be obtained for quarrying construction materials for the project as per the EIA Notification, 2006 and as amended thereof.

Agenda Item No. 32.5

Ambegaon Open-loop Pumped Storage Project in an area of 69.41 Ha in village Kanase, Mahalunge Tarf Ghoda and Phulvade, Sub – District Ambegaon, District Pune, Maharashtra by M/s Renew Hydro Power Private Limited – Terms of Reference (ToR) – reg

[Proposal No. IA/MH/RIV/538345/2025; F. No. J-12011/22/2025-IA.I(R)]

32.5.1 The proposal is for grant of Terms of References (ToR) to the project for Ambegaon Open-loop Pumped Storage Project in an area of 69.41 Ha in village Kanase, Mahalunge Tarf Ghoda and Phulvade, Sub – District Ambegaon, District Pune, Maharashtra by M/s Renew Hydro Power Private Limited.

32.5.2 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 Ambegaon Pumped Storage Project is proposed with an installed capacity of 600 MW (2 units of 200 MW and 2 units of 100 MW). The proposed project is intended to meet the power demands during peaking time, and the reversible turbines would function as pumps during non-peaking time to pump the water from lower reservoir to upper reservoir.

ii. The project is envisaged to meet the peak demand of about 6 hours with an estimated daily generation of 3.60 GWh. The scheme will utilize 660 MW (110% of Generation Rating) to pump 5.66 MCM of water to the upper reservoir in 6.97 hours. The cycle efficiency of the scheme will be 76.22%.

iii. The proposed upper reservoir is located near Chaptewadi Kanas village and the existing lower reservoir near Ambegaon village. The existing Dimbhe Dam reservoir, which is under operation, will act as a lower reservoir, while proposed upper reservoir will be created by constructing a concrete dam all around on a nearby high-level plateau at about 1000 masl. Since only the lower reservoir is located on the river, the schemes will be an off-stream open loop Pumped Storage scheme.

iv. The geographical co-ordinate of the project are Lower Reservoir (existing): 73° 44' 30" E; 19° 05' 45" N; Upper Reservoir : 73° 45' 45" E; 19° 06' 10" N.

v. **Land requirement:**

Forest Land	: 3.59 ha
Non-forest Land	: 65.82 ha
Total Land	: 69.41 ha

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

- The proposed project area is located near the villages of Ambegaon, Kanase, Mahalunge Tarf Ghoda, and Phulvade, which fall under Ambegaon Tehsil of Pune district. The surrounding area of the project includes seven villages: Ambegaon, Kanase, Mahalunge Tarf Ghoda, Phulvade, Dimbhe Budruk, Dimbhe Khurd, and Chaptewadi Kanas, all of which are situated in Ambegaon Tehsil of Pune district.

- The villages around the project consist of scattered small settlements with both pucca and kutcha houses. Villages like Dimbhe BK and Dimbhe Kh. benefit partially from irrigation provided by the Dimbhe dam, while villages located at higher altitudes depend on rainwater and tanker supplies during summer.

- Agriculture is the main livelihood in the project area, with rice, millet, sorghum and pulses being the primary crops. Some villagers also practice animal husbandry, and poultry farming is also common. In addition, villagers depend on the surrounding forest and local tourism in the Dimbhe area.

- In the surrounding project villages, the tribal population includes the Thakar and Mahadev Koli communities, both recognized as Scheduled Tribes. These tribal groups engage in forest produce collection, agricultural labor, and seasonal migration.

- The literacy rate in these villages is approximately 70%.

- According to Mission Antyodaya 2020, the total population of the villages in the project surrounding area is 5543, comprising 2795 males (50.42%) and 2748 females (49.57%). There are 1755 households in total, with an average household size of 3 to 4 members. The sex ratio is 983 females per 1,000 males. Village-wise demographic details are provided in the table below.

- The Scheduled Caste (SC) population constitutes 4.17% of the total population, whereas the Scheduled Tribe (ST) population accounts for 54.88%. This indicates that the majority of the population in the project surrounding area belongs to Scheduled Tribes, with only a small proportion belonging to Scheduled Castes.

Demographic Profile of the Project Surrounding area Villages

Village Name	No_ T.P	TOT_M	TOT_F	TOT_HH	P_SC%	P_ST%
Ambegaon	715	342	373	140	-	90.77
Phulvade	1152	606	546	518	0.38	95.86
Mahalunge Tarf Ghoda	254	126	128	68	0.00	0.79
Dimbhe Bk.	771	403	368	165	14.84	26.74
Dimbhe Kh.	758	390	368	200	9.76	25.20
Chaptewadi kanas	463	208	255	108	-	100
Kanase	1430	720	710	556	2.49	19.07
Total	**5543**	**2795**	**2748**	**1755**	**4.17**	**54.88**

(Source Mission Antyodaya 2020)

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

vii. **Water requirement:** 5.66 MCM (approx.. 6 MCM) of water will remain in circulation between existing lower reservoir (Dimbhe reservoir) and newly constructed upper reservoir and thereafter annual Evaporation losses from upper reservoir has been estimated as 0.80 MCM.

viii. **Project Cost:** The estimated project cost is Rs 2940.55 crore. Total capital cost earmarked towards environmental pollution control measures will be worked out during EIA study as well as the Recurring cost (operation and maintenance).

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

x. **Environmental Sensitive area**: There is no Protected Area in the vicinity of the proposed project. Bhimashankar WLS is 16.0 kms far from the proposed project area. River/ water body, Water will be pumped from Dimbhe reservoir.

xi. MOU has been signed between Government of Maharashtra and M/s Renew Hydro Power Pvt. Ltd. to build PSP with a capacity of 600 MW vide MoU dated September 03, 2024.

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

Details of Land Requirement

S. No.	PROJECT COMPONENT	ALTERNATIVE 1			ALTERNATIVE 2			ALTERNATIVE 3		
		FOREST	NON FOREST	TOTAL	FOREST	NON FOREST	TOTAL	FOREST	NON FOREST	TOTAL
1	Site Office	0	0.1	0.1	0	0.1	0.1	0	0.1	0.1
2	Concrete Batching Plant, Crusher, Cement	0	2.6	2.6	0	2.6	2.6	0	3.2	3.2
3	Stacking Area	0	1.07	1.07	0	1.07	1.07	0	2.9	2.9
4	Magazine Area	0	0.5	0.5	0	0.5	0.5	0	0.5	0.5
5	Labour Camp	0	0.4	0.4	0	0.4	0.4	0	0.4	0.4
6	Colony Area	0	1.75	1.75	0	1.75	1.75	0	1.96	1.96

7	Muck Disposal Area	0	8.69	8.69	0	7.57	7.57	0	9.6	9.6
8	Upper Reservoir	0	42.85	42.85	0	27.37	27.37	0	30.03	30.03
9	Lower Reservoir	0	0	0	0	0	0	0	0	0
10	Approach Roads	0.51	1.01	1.52	0.32	0.65	0.97	0	0.53	0.53
11	WCS, PH , Adit, MAT	2.78	6.85	9.63	8.32	3.86	12.18	15.63	33.31	48.94
12	Pothead Yard	0.3	0	0.3	-	-	-	-	-	-
TOTAL		**3.59**	**65.82**	**69.41**	**8.64**	**45.87**	**54.51**	**15.63**	**82.53**	**98.16**

Comparison of Alternative Layouts

S.No.	Parameters		Units	Alt-1	Alt-2	Alt-3
1	Project Capacity		MW	600	600	300
2	Upper Reservoir	FRL/MDDL	El in m	1000/976	990/966	932/910
3		Dam Type	-	Concrete Gravity Dam	Concrete Gravity Dam	Concrete Gravity Dam
4		Dam Crest Length	m	2101.0	2260.0	480.0
5		Max Height of Dam from ground level	m	33.60	35.40	52.00
6		Live Storage	MCM	5.66	5.87	3.70
7		Dead Storage	MCM	0.08	0.10	0.21
8		Gross Storage	MCM	5.74	5.97	3.91
9	Lower Reservoir (Existing)	FRL / MDDL	El in m	719.65 / 682.75		
10		Dam Type	-	Masonry Dam		
11		Dam Crest Length	m	852.0		
12		Max height of Dam from ground level	m	72.10		
13		Live Storage	MCM	366.66		
14		Dead Storage	MCM	28.34		
15		Gross Storage	MCM	395.00		
16	Wt. Average gross Head		m	284.00	274.00	217.00
17	WCS	Total Length of WCS (L)	m	1150	1850	3015
18	L / H		-	4.04	6.75	13.89
19	MAT Length		m	505	-	995

20	Type of Powerhouse		-	Under Ground	Deep Pit	Under Ground
21	R & R Aspects	Affected House	No.	None	Few Houses	None
22		Farmlands etc.	-	None	Many	Few

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

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

- **Project details:**

Name of the Proposal	Ambegaon Open Loop Pumped Storage Project
Location (Including coordinates)	Upper Reservoir : Latitude: 19° 06' 10" N Longitude: 73° 45' 45" E; Lower Reservoir (Dimbhe Dam-Existing): Latitude: 19° 05' 45" N Longitude: 73° 44' 30" E
Inter- state issue involved	No
Seismic zone	Zone-III

- **Category details:**

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

- **Electricity generation capacity:**

Powerhouse Installed Capacity	600 MW
Generation of Electricity Annually	1248.3 MU
No. of Units	4 nos. (2 x 200 MW + 2 x 100 MW)
Additional information (if any)	Nil

- **ToR/EC Details:**

Cost of project	2940.55 Cr.
Total area of Project	69.41 ha
Height of Dam from River Bed (EL)	Upper Dam –33.60 m Lower Dam – 72.10 m (Dimbhe Dam-Existing)
Length of Tunnel/Channel	1150.0 m
Details of Submergence area	42.85
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 Open Loop Pumped Storage Project.
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

- **Muck Management Details:**

No. of proposed disposal area/ (type of land-Forest/Pvt. land)	8.69 ha (Non-Forest Land)
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

- **Land Area Breakup:**

Private Land	65.82 ha
Government land	-
Forest Land	3.59 ha
Total Land	69.41 ha
Submergence area/Reservoir area	42.85 ha

Additional information (if any)	Nil

- **Presence of Environmentally Sensitive areas in the study area**

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Detailsof Certificate / letter/ Remarks**
Reserve Forest/Protected Forest Land	--	There is no Protected Area in the vicinity of the proposed project. Bhimashankar WLS is approx. 16.0 km as per the PFR far from the proposed project area.
National Park	--	
Wildlife Sanctuary	--	

- **Miscellaneous**

Particulars	**Details**
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (NABET Accredited Consultant Organization) Certificate No : NABET/EIA/2225/RA0274 Validity : August 15, 2025 Contact Person : Mr. Ravinder Bhatia Name of Sector : River Valley and Hydroelectric Projects Category : A MoEF Schedule : I(C) Address : 403, Bestech Chambers, Block-B, Sushant Lok Phase I, Sector 43, Gurugram, Haryana - 122009

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

	Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.
Status of other statutory clearances	Forest Clearance - Online application seeking forest diversion for around 3.59 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

32.5.3 The EAC during deliberations noted the following:

The Expert Appraisal Committee (EAC) deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR for conducting EIA/EMP and Public hearing for Ambegaon Open-loop Pumped Storage Project in an area of 69.41 Ha in village Kanase, Mahalunge Tarf Ghoda and Phulvade, Sub – District Ambegaon, District Pune, Maharashtra by M/s Renew Hydro Power Private Limited.

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

The EAC noted that the total land required for the proposed project is about 69.41 Hectares, which includes 3.59 Hectares of forest land and 65.82 Hectares of Non- forest area. 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 committee observed that the proposed upper reservoir is located near Chaptewadi Kanas village and the existing lower reservoir near Ambegaon village. The existing Dimbhe Dam reservoir, which is under operation, will act as a lower reservoir, while proposed upper reservoir will be created by constructing a concrete dam all around on a nearby high-level plateau at about 1000 masl. Since the lower reservoir is located on the river, the schemes will be an open loop Pumped Storage scheme. The water required for proposed project would be 5.66 MCM (approx.. 6 MCM) will remain in circulation between existing lower reservoir (Dimbhe

reservoir) and newly constructed upper reservoir and thereafter annual Evaporation losses from upper reservoir has been estimated as 0.80 MCM.

It has been observed that Memorandum of Understanding has been signed between signed between Government of Maharashtra and M/s Renew Hydro Power Pvt. Ltd. to build PSP with a capacity of 600 MW vide MoU dated September 03, 2024.

32.5.4 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 Ambegaon Open-loop Pumped Storage Project in an area of 69.41 Ha in village Kanase, Mahalunge Tarf Ghoda and Phulvade, Sub – District Ambegaon, District Pune, Maharashtra by M/s Renew Hydro Power Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

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

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

iii. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 3.59 ha of forest land involved in the project shall be submitted within stipulated time.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

be prepared.

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

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

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

[B] Socio-economic Study

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

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

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

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

[C] Muck Management

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

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

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

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

[D] Disaster Management

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

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

[E] Miscellaneous

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

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

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

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

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

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

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

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

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

Additional Agenda Item 32.6

Consideration of EAC Sub-Committee Site Visit Report of 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 Member Secretary, EAC informed to the committee that the Ministry of Environment, Forest and Climate Change (MoEF&CC) granted Terms of Reference (ToR) to 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 on 30.04.2025. At the 28th Meeting of the River Valley and Hydroelectric Projects Sector, held on 15.04.2025 in relation to the aforementioned proposal, it was recommended to a Site visit shall be conducted by a sub-committee of the EAC before considering the proposal for Environmental Clearance.

2. In accordance with the Ministry's directive vide letter No. J-12011/08/2025-IA.I(R) [E-264896] dated 5th May 2025, a sub-committee was constituted to carry out a site inspection of the Upper Bhavani Open loop Pumped Storage Project (1000 MW). The committee was tasked with assessing the environmental safeguard measures in place and recommending any additional conditions, if necessary. The sub-committee comprised Prof. G.J. Chakrapani (Chairman), Dr. J.A. Johnson (Expert Member), and Shri Yogendra Pal Singh, Member Secretary (EAC)/representative MoEF&CC. The site visit was conducted from 9th to 12th May 2025.

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

The Upper Bhavani Pumped Storage Project utilises existing Upper Bhavani and Avalanche Reservoirs and there is no construction of new reservoirs. This project may prove to be a model project that strikes a balance between development and environmental conservation due to its location in the ecological hotspot of Nilgiris. Going by the selection and design of the project, this is going to have minimum impact on the environment.

- **Muck Management**: The EAC members suggested that the project proponent may draw a detailed muck management plan for the project. They should explore reuse of the excavated muck of the project to reduce land requirement. The EAC suggested that alternative options for muck management may be explored in consultation with the forest department.

- **Ecological Sensitivity and Hydrology:** The EAC members appreciated the planning made by the project proponent to avoid Shola forests as well as minimise deforestation by adopting underground components. The PPs shall ensure in EIA studies on non-disappearance of underground springs, surface nallahs and other water bodies.

The site visit report is annexed at **Annexure –I**

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

Additional Agenda Item 32.7

Consideration of EAC Sub-Committee Site Visit Report of Malshej Ghat Bhorande Pumped Storage Project of capacity 1500 MW at Adoshi village, Junnar Taluka, Pune District and Bhorande village, Murbad Taluka, Thane District, (Maharashtra)

In compliance of the MoEF&CC Office Order No. J-12011/21/2022-IA.I (R) dated 22.04.2025 (Annexure-I) the EAC (Sub-committee) comprising of Shri Kartik Sapre, Member EAC (Hydro & River Valley project), Shri Rakesh Goyal, Member EAC & Representative of CEA and Dr. P. R. Sakhare, Scientist E, Representative of MoEF&CC conducted site visit of the proposed "Malshej Ghat Bhorande Pumped Storage Project of capacity 1500 MW " on 26.04.2025. The sub-committee visited the proposed upper reservoir and lower reservoir of Malshej Ghat Bhorande Pumped Storage Project.

The EAC (Sub-Committee) has made following observations/recommendations:

Specific Observations and Recommendations:

1. The upper reservoir is located on the plateau and lower reservoir is located in the valley. The selected location topologically is stable and non-prone to landslides as such. It is not therefore so fragile or sensitive. The proposed project is not likely to cause considerable negative impacts on the geological conditions; rights and interests of people related to water resources of downstream locations if the conditions and safeguards imposed vide the TOR granted are complied with fully and comprehensively.

2. As per the PP, minor resistance due to lack of understanding about project and its impact etc is there in upper reservoir. The same was noticed during the discussion held with few nearby local residents. However, the PP has assured that they will be engaging with local people to clarify such misunderstanding about the project.

3. It was observed that public hearing has not been conducted yet. Thus it is recommended to get it done as soon as possible and present the details before EAC.

4. The quantum of water required for initial/one time filling of reservoirs (i.e. 9.88 MCM) shall be pumped from nearby Kalu River. As proposed, the project lower reservoir will be filled once during monsoon season and the annual evaporation losses will be recouped annually during monsoon period. To maintain the downstream discharge in the natural course of the river, inflows and outflows at same level are maintained.

5. The upper reservoir is proposed on seasonal minor rivulet/stream draining into Kukadi river having a catchment area of 0.8 km2and the lower reservoir is proposed on seasonal minor rivulet/ stream draining into Kalu River having a catchment area of 3.0 km2. It is necessary to monitor the inflow of the stream, both at upper and lower reservoir and ensure the provisions of release arrangements. Same shall be incorporated in EIA report.

6. Out of 166.26 ha, 105.55 ha is private land, 0.22 ha is government land and 60.49 ha is forest land. The forest density in the proposed forest land involved in the project site is approx. 600 trees/ha. A total of around 35000 trees and saplings are likely to be sacrificed. Therefore, it is important to insist on submitting the case under FCA and receive stage-I clearance at the earliest by the Project Proponent. Details of the tree species (number and nomenclature) required to be felled for reservoir creation and other project components need to be incorporated in EIA report.

7. Wildlife conservation and biodiversity management plans have been approved by CWLW vide their letter dated 09.08.2024 with a Cost of Rs. 209.00 Lakhs(Annexure-VI)

8. It was told by PP that they have submitted some application in 'MITRA' - an initiative of State Government. The purpose of this application and the proceedings/reply of the MITRA should be presented before the EAC committee.

9. During the visit the committee also suggested considering the following:

   (a) Dam Break Analysis and Its Impact:

   During the visit committee member stressed on the importance of dam break analysis and its impact on the surrounding area, it was explained by the project team that the dam break analysis in the proposed project involves concrete gravity dams for upper and lower reservoirs based on the vulnerability assessment, breach in upper and lower concrete gravity dam/reservoir has been modelled for a length of about 17517m (17.5km) downstream upto Manikdoh Dam and for a length of 12508m (12.5km) downstream confluence of Kalu river with Joland Nadi respectively.

   The study for both the reservoirs comprises of: (a) Prediction of outflow hydrograph due to dam breach; (b) Routing of dam breach flood hydrograph through the

downstream valley to get the maximum water level and discharge along with time of travel at different locations of the valley downstream of the dam.

It is clear from the inundation map that in case of Dam break scenario, five villages, Adoshi, Nanaghat, Ghatghar, Talechiwadi and Jalwandi are likely to be affected in case of upper reservoir and dam break flood completely subside at Manikdoh dam location, so impact is envisaged at dam.

None of the village settlements will get directly impacted due to dam breach flood in case of lower reservoir, however, land of villages Awalegaon, Meroshi, Nyahadi, Vakalwadi, Dhaswadi and Chaole is likely to get affected.

(b) Wildlife Conservation Plan/ issues/Wildlife Action Plan:

The details of biodiversity in the study area collected during field survey and from Forest Working Plan of Pune and Thane Forest Divisions, 12 species of mammals, 2 species of avifauna and 5 species of herpetofauna reported from the study area are listed as Schedule-I under The Wildlife (Protection) Amendment Act, 2022. The total budget allocated focusing on Biodiversity and Wildlife Conservation and Management Plan including conservation and management measures for Schedule-I species is Rs 209.00 lakh. The State Forest Department shall be the executing agency for implementation of the proposed mitigation measure under Biodiversity Conservation and Wildlife Management Plan in the study area. The Biodiversity Conservation and Wildlife Management Plan is approved by CWLW, Nagpur.

(c) Catchment area of Kalu river:

Kalu river originates in the Harishchandragad mountain in Murbad Taluk of Thane district at an elevation of 1,200m above mean sea level. The catchment area of Kalu river upto pump house is 133.8 km2. The Kalu river further flows for a length of about 83km and joins Bhatsa river near Baneli village. After its confluence with Bhatsa river, Kalu river further flows for a length of about 4 km and joins Ulhas River near Kalyan on its right bank.

(d) Geological Survey/investigation at upper reservoir:

The geotechnical investigation on upper reservoir could not be conducted due to hinderance caused by 25 houses of tribal habitant rehabilitated/relocated from Manikdoh dam. More interaction of project proponent with local inhabitants is required to appraise them about the size, scale and benefit of the proposed project. The inhabitants also informed that Adani needs to initiate the CSR activities for drinking water, deepening of wells and minor irrigation for proximate villages. The drone video of the project site shall be presented during EAC meeting.

(e) Archaeological site:

There is no archaeological site located in proximity to proposed project site. Therefore, no NOC may be obtained from the National and State Archaeological Department.

(f) High tension line:

High tension line is traversing through the project area and need to be shifted prior to start of construction if it fails to meet the safety crietria as specified by CEA (Measures relating to Safety and Electric Supply) Regulations, 2023. The PP to submit the closest horizontal and vertical distance of structures from High tension line/towers to CEA/Transmission service provider for their perusal and obtain NOC if required under intimation to EAC.

(g) Studies:

Proper Social Impact Assessment Study needs to be carried out by the PP. Also, R&R plan need to be developed and presented before EAC meeting. A detailed LAD and CSR initiatives need to be taken up, as it was observed that there is a need for supporting water conservation initiatives, skill development and capacity building.Drone Videography and Photography should be done and presented before EAC

The site visit report is annexed at **Annexure –II**

The EAC after deliberation accepted the site visit report and recommended that PP should prepare EIA/EMP report providing appropriate information on the issues/aspects examined by the Sub-committee.

The meeting ended with vote of thanks to the Chair.

ANNEXURE

ATTENDANCE

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

APPROVAL OF THE CHAIRMAN

========== Forwarded message ==========
From: chakrapani govind <chakrapani.govind@gmail.com>
To: "Yogendra Pal Singh"<yogendra78@nic.in>
Cc: "govind chakrapani"<govind.chakrapani@es.iitr.ac.in>
Date: Sun, 08 Jun 2025 18:25:23 +0530
Subject: Re: Draft MOM of 32 nd EAC (RVHEP) meeting held on 29.05.2025
========== Forwarded message ==========

Approved.
Chakrapani

On Sun, 8 Jun, 2025, 6:00 pm Yogendra Pal Singh, <yogendra78@nic.in> wrote:

> Dear Sir,
>
> The draft MOM of the 32nd EAC (RVHEP) meeting was circulated to all EAC members. No comments received so far. Your corrections in the Agenda item 32.3 have been incorporated **(highlighted in yellow)**.
>
> Accordingly, the draft MOM of the above mentioned EAC meeting is attached herewith for your approval please.
>
> With Regards,
>
> **Yogendra Pal Singh**
> **Scientist 'F'**
> **Government of India**
> **M/o Environment, Forest and Climate Change**
> **Room No. 236, 2nd Floor, Vayu Wing**
> **Indira Paryavaran Bhawan**
> **Jor Bagh, New Delhi-110003**
> **Tele-fax: 011-20819364**

ANNEXURE I

Cover Picture: ***View of Upper Bhavani Reservoir from the Upper Intake***

REPORT ON THE SITE VISIT

OF

UPPER BHAVANI PUMPED STORAGE PROJECT (1000 MW), NILGIRIS DISTRICT, TAMIL NADU

BY

THE EXPERT APPRAISAL COMMITTEE (EAC) MEMBERS FROM 9TH TO 12TH MAY 2025

TABLE OF CONTENTS

1. INTRODUCTION

In line with the decision taken during the 28th Meeting of the Expert Appraisal Committee (EAC) for River Valley & Hydroelectric Projects held on 15th April 2025, a field visit was conducted on 10th May 2025 to the proposed Upper Bhavani Pumped Storage Project (1000 MW) in Nilgiris District, Tamil Nadu. The visit aimed to evaluate the ecological, geological, and environmental characteristics of the site prior to considering the proposal for Environmental Clearance. Given that the project is located in the Nilgiris within the Western Ghats, a designated biodiversity hotspot, the committee undertook a detailed field inspection to better understand the implications of the proposed Upper Bhavani PSP and to provide guidance for the preparation of the Environmental Impact Assessment (EIA)/Environmental Management Plan (EMP).

2. PARTICIPANTS

The site visit included the following representatives from the EAC and associated project stakeholders:

1. **Dr. GJ Chakrapani** – Chairman, EAC (RV&HP), MoEF&CC and Professor, Department of Earth Sciences, Indian Institute of Technology, Roorkee, Uttarakhand
2. **Dr. J.A. Johnson** – Member, EAC (RV&HP), MOEF&CC and Representative of Wildlife Institute of India (WII), Dehradun, Uttarakhand
3. **Dr. Y.P. Singh** – Member Secretary, EAC (RV&HP), MOEF&CC and Scientist F, MOEF&CC
4. **Mr. J.C. Kakoti** – NTPC
5. **Mr. K. Shanmukhi Gupta** – NTPC
6. **Mr. S. Chandrasekhar** – NTECL
7. **Mr. Milinda Chakma** – NTECL
8. **Mr. Aryan Dhiman** – NTECL
9. **Mr. Ramesh** – TANGEDCO
10. **Mr. Hardip Singh Panesar** – Energy Infratech
11. **Mr. B. Vijayan** – Energy Infratech
12. **Mr. Sukrit Joshi** – Energy Infratech
13. **Mr. R.K. Singh** – Voyants
14. **Mr. Ankur Agarwal** – Voyants

3. SITES VISITED AND OBSERVATIONS

The Upper Bhavani Pumped Storage Project envisages to utilise the existing Upper Bhavani Reservoir as the upper reservoir and the existing Avalanche-Emerald Reservoir System as the lower reservoir. All major project components are proposed to be underground. By the virtue of being underground, the entire area of the project from upper intake to lower intake will have least impact on the existing forest and environment.

3.1 The EAC visited the HRT alignment at drill hole (DH-7) location. It was appraised that HRT passes at about 130m below NGL at the location. The committee members studied the project components passing under the existing forest and understood that the activities inside the tunnel will have minimal impact on the outer environment on the surface. The geotechnical investigations at this site are going on, with drilling operations actively being carried out to evaluate the rock mass characteristics and the sub-surface conditions.

3.2 The EAC members were appraised on the regional geology, comprising of high-grade metamorphic rocks, such as Charnockite, and the early findings of the core of the borehole samples. The site demonstrated excellent rock mass quality indicated by high core recovery and

Rock Quality Designation (RQD) values. The presence of strong, competent rock with minimal weathering and fracturing will favour the underground excavation works like HRT, TRT, Powerhouse etc. The sample of the core material are given in Figure 1 and 2.

3.3 In addition, the EAC members also discussed about groundwater conditions, available nallahs, presence of natural springs, and aquifer directions which impact the environmental and design aspect of the project.

Figure 1: Core sample of length ~3m recovered from Powerhouse location

Figure 2: Core Sample from Powerhouse

Figure 3: Field Discussion at HRT alignment.

3.4 Geotechnical investigation of the project is underway, and drilling is going on at location DH-7 as given in Figure 4 and DH-11. Rocks were encountered at a depth of 6m at DH-11, and 9 metres at DH-7. This is a high-grade metamorphic rock characterized by its granoblastic texture and the presence of orthopyroxene, where the core recovery is as high as 100% and the RQD is ~80 to 100%, indicating "Excellent" rock quality. The rock is very favourable for tunnelling and underground works, with minimal risk of instability.

Figure 4: View of the drill rig setup as part of the ongoing geotechnical investigations at DH – 7.

3.5 The committee observed various parameters of the existing Upper Bhavani Dam and the different water levels which are considered for the Pumped Storage Project. The abundant water available during the monsoon will bring additional benefits.

3.6 The project proponent apprised muck management and reuse potential of excavated material, thus reducing the land requirement for dumping sites.

Figure 5: Technical discussion involving review of the water conductor system and Upper Reservoir viz, Upper Bhavani Dam.

3.7 The EAC members reviewed the intake alignment of the upper reservoir from *Lakdi* Intake (Upper Intake of Kundah Powerhouse – 5). This location provided a perspective on how water would be drawn from the reservoir for the pumped storage system. It was appraised that total intake channel construction shall be in the reservoir area without any disturbance to the forest. Further, intake shall be under submergence during operational stage and shall have no impact on the environment.

Figure 6: Group Discussion at *Lakdi* Intake

3.8 Shola Forest (cauliflower forest)**:** The EAC members observed the precious cauliflower shaped *Shola Forests* which are revered by the local populace. It is considered as an ecological treasure and help in preserving the natural aquifers of the Nilgiris. The committee was appraised by the project proponent that the project alignment was finalised avoiding the Shola Forest. These forests act as "water towers" of the region, and their protection was noted as a positive decision while planning the project alignment.

Figure 7: Shola Forests

3.9 The powerhouse location was viewed and EAC members opined that underground works of the project will not impact the surface environment as well as shall not create much noise after project has been commissioned.

4. RECOMMENDATIONS

The Upper Bhavani Pumped Storage Project utilises existing Upper Bhavani and Avalanche Reservoirs and there is no construction of new reservoirs. This project may prove to be a model project that strikes a balance between development and environmental conservation due to its location in the ecological hotspot of Nilgiris. Going by the selection and design of the project, this is going to have minimum impact on the environment.

- **Muck Management**: The EAC members suggested that the project proponent may draw a detailed muck management plan for the project. They should explore reuse of the excavated muck of the project to reduce land requirement. The EAC suggested that alternative options for muck management may be explored in consultation with the forest department.

- **Ecological Sensitivity and Hydrology:** The EAC members appreciated the planning made by the project proponent to avoid Shola forests as well as minimise deforestation by adopting underground components. The PPs shall ensure in EIA studies on non-disappearance of underground springs, surface nallahs and other water bodies.

Site visit Report on "Proposed 1500 MW Malshej Ghat Bhorande Pumped Storage Project" at Adoshi village, Junnar Taluka, Pune District and Bhorande village, Murbad Taluka, Thane District, (Maharashtra)

In compliance to the MoEF&CC Office Order No. J-12011/21/2022-IA.I (R) dated 22.04.2025 **(Annexure-I)** the Sub-committee comprising of **Shri Kartik Sapre, Member EAC (Hydro & River Valley project)**, **Shri Rakesh Goyal, Member EAC & Representative of CEA** and **Dr. P. R. Sakhare, Scientist E, Representative from MoEF&CC** undertook site visit to the proposed "**Malshej Ghat Bhorande Pumped Storage Project of capacity 1500 MW**" on 26.04.2025. The sub-committee visited the proposed upper reservoir and lower reservoir of **Malshej Ghat Bhorande Pumped Storage Project**. The attendees of the site visit included project proponent authorised representatives, their consultants, local staff and a few locals is enclosed as **(Annexure-II)**

Background:

The proposed 1500MW Malshej Ghat Bhorande Pumped Storage Project (4x300 + 2x150) is a self-identified, green field project by the M/s Adani Green Energy Limited. The need for Malshej Ghat Bhorande Pumped Storage Project of capacity 1500 MW in Pune and Thane districts of Maharashtra, has been considered in context of the focus of State Government to stabilize the grid by installation of Pumped Storage Project which leads to increase the share of renewable energy which is available in plenty within the state in general and in the country as whole. The project is an off-stream closed loop project, where water will be recycled between the proposed upper and lower reservoirs in one daily cycle of peaking (6.0 hour) and one daily pumping cycle (6.74 hour). The total land requirement for the project has been assessed as 166.26 ha of which non-forest land is 105.77 ha and forest land is 60.49 ha.

In this background, Project was appraised and recommended for grant of TOR in 41st meeting of EAC held on 15.02.2023. TOR was issued by MoEF&CC vide letter no. J-12011/21/2022-IA.I (R), 24.03.2023 for 1440 MW **(Annexure-III)**. After TOR, during Survey and Investigation, the project layout was rationalized based on actual contours and dam height and length of Lower & Upper Reservoir is reduced. In order to maintain the unit size combination in all our projects at 300 MW and 150 MW; the worked out installed capacity is 1500MW instead of 1440MW. Based on the above stated fact the application for amendment of ToR was made to MoEF&CC and the amendment to ToR was granted vide File No. J-12011/21/2022-IA.I (R), dated 27.05.2024 for change in capacity from 1440MW to 1500MW and change in land requirement from 116.50ha to 166.26ha **(Annexure-IV)**

General Observations:

Topography: The proposed PSP site is located on the western margin of Western Ghats of Indian Peninsula, which are occupied by thick pile of Thoilitic Basalt Flows, which are stratigraphically termed as 'Deccan Traps'.Topography indicates that 40.58% of the area is Slightly Sloping (2-8degree) category, followed by Moderately Sloping (8-15 degree) and Moderately Steep (15-30 degree), whichare about 26.34% and 19.52%, respectively, of the total study area. The proposed upper reservoir is mainly slightly sloping, whereas the site proposed for water conducting system is falling under Slightly Sloping to Moderately Steep category.

Vegetative cover: The tree cover in the study area is mostly covered with mixed dry deciduous and semi-evergreen vegetation. The composition of the tree community is characterized by the dominance of *Terminalia elliptica* (Indian laurel) in association with *Tectona grandis* (Teak), *Haldina cordifolia* (Haldu Yellow teak), *Terminalia paniculata* (Kindal), *Sterculia urens* (Ghost Tree), *Anogeissus latifolia* (Axlewood), *Lagerstroemia macrocarpa* (Ben Teak Bentek), *Pterocarpus marsupium* (Malabar kino or Indian kino), *Falconeria insignis* (Tiger's Milk Spruce) etc.

The area around upper reservoir was mostly characterised by grassland and scrub land where tree growth is absent. The associated shrub species were *Carissa carandas* (Karvand), *Gnidia glauca* (Datpadi), *Strobilanthes heyneanus* (Akra), etc. growing in a very few patches. Other part of the reservoir is comprised of fallow and agriculture land owing to existence of Adoshi village (a small hamlet of Ajanawale village). On the other hand, lower reservoir was characterised mostly by densely vegetated semi-evergreen and mixed deciduous forest which is bisected by a seasonal stream flowing to the Kalu River. ***Plants like Jackfruit (Artocarpus heterophyllus), Karonda (Carissa carandas), Arjun Tree (Terminalia arjuna) are present in Lower reservoir area*** . The forest in this area is comprised of species like *Terminalia elliptica* (Indian laurel), *Tectona grandis* (Teak), *Terminalia paniculata* (Kindal), *Lagerstroemia macrocarpa* (Ben Teak Bentek), *Haldina cordifolia* (Haldu Yellow teak), etc.

The ground cover in the scrub lands and barren rocks was mostly characterized by the grass species like *Themeda quadrivalvis* (Grader grass), *Arundinella setosa* (Giant Reed), Heteropogon contortus (Black Speargrass), *Dichanthium annulatum* (Marvel grass), *Andropogon contortus* (Spear grass), *Eragrostis tremula* (Lovegrass) and *Aristida adscensionis* (Common Needle Grass) with a few herb species like *Leucas aspera* (Thumbai), *Blumeaoxyodonta* (Spiny Leaved Blumea), Argemone mexicana (Mexican poppy) and *Chromolaena odorata* (Siam weed).

The herb species was mostly dominated by the species like *Chromolaena odorata* (Siam weed), *Leucas aspera* (Thumbai), *Cynarospermum asperrimum* (Dikna), *Senna tora* (Takla- tarvad), Goniogyna hirta (Godhadi), *Urena lobata Blumea oxyodonta* (Caesar weed), *Rungia crenata* (Toothed

Rungia), *Flemingia strobilifera* (Luck Plant), *Chenopodium album* (Bathua), *Echinops echinatus* (Indian globe thistle), *Argemone Mexicana* (Pivala Dhotra), *Commelina benghalensis* (Kanchat), Celosia argentea (Kurdu), etc.

Water availability and impact on flow of water: As the scheme is off-stream closed loop, the catchment yield will be released downstream through the provision of spillway/ bottom outlet in dam. To meet the annual makeup water requirement, which comprises of evaporation and other transmission losses shall be done from the nearby water source Kalu River. ***NOC for taking water from Kalu River need to be obtained from concerned government agencies.*** The proposed 1500 MW Malshej Ghat Bhorande Pumped Storage Project envisages utilizing 7.04 MCM of water for operation purposes. Annual evaporation losses have been worked out as 1.14 MCM. The annual losses of 1.14 MCM shall be pumped from the Kalu River annually into the lower reservoir. Gross storageof lower reservoir is 8.97 MCM which will be sources from nearby water source Kalu River. Estimated 90% dependable yield and average annual yield at pumping station is about 41.75 MCM and 74.35 MCM respectively. Water availability certificate has been issued by Water Resources Department, Government of Maharashtra **(Annexure-V)**.

Proposed project is standalone closed loop pumped storage scheme with newly constructed upper and lower reservoir. The Upper reservoir is proposed on hilltop across seasonal minor rivulet / nallah draining into Kukadi River and lower reservoir is proposed across seasonal minor rivulet / nallah draining into Kalu river. The quantum of water required for initial/one time filling of reservoirs (i.e. 9.88 MCM) shall be pumped from nearby Kalu River. As proposed, the project lower reservoir will be filled once during monsoon season and the annual evaporation losses will be recouped annually during monsoon period. To maintain the downstream discharge in the natural course of the river, inflows and outflows at same level are maintained. The release arrangements will be designed during the engineering stage of the project and will be duly executed after approval from the competent authority.

Human Settlement and Habitation: For the development of Malshej Ghat Bhorande PSP, land requirement has been worked out as 166.26 ha. Out of 166.26 ha, 105.55 ha is private land, 0.22 ha is government land and 60.49ha is forest land. The entire private land identified for the project falls in three revenue villages namely Bhorande in Murbad taluka of Thane district and Anjanavale and Ghatghar villages of Junnar taluka of Pune District. The private land identified for the projects belongs to landowner families who will be losing their partial agricultural land holding and twenty households will be losing house and other assets in upper reservoir in Junnar taluka of Pune district. The Project Displaced Household will be resettled on the land identified proximate to the existing villages. Private land identified for the project will be acquired as per Section 2 and Part (a) of Sub- Section 3 of The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act (RFCTLARR), 2013.

Specific Observations and Recommendations:

1. The upper reservoir is located on the plateau and lower reservoir is located in the valley. The selected location topologically is stable and non-prone to landslides as such. It is not therefore so fragile or sensitive. The proposed project is not likely to cause considerable negative impacts on the geologicalconditions; rights and interests of people related to water resources of downstream locations if the conditions and safeguards imposed vide the TOR granted are complied with fully and comprehensively.

2. As per the PP, minor resistance due to lack of understanding about project and its impact etc is there in upper reservoir. The same was noticed during the discussion held with few nearby local residents. However, the PP has assured that they will be engaging with local people to clarify such misunderstanding about the project.

3. It was observed that public hearing has not been conducted yet. Thus it is recommended to get it done as soon as possible and present the details before EAC.

4. The quantum of water required for initial/one time filling of reservoirs (i.e. 9.88 MCM) shall be pumped from nearby Kalu River. As proposed, the project lower reservoir will be filled once during monsoon season and the annual evaporation losses will be recouped annually during monsoon period. To maintain the downstream discharge in the natural course of the river, inflows and outflows at same level are maintained.

5. The upper reservoir is proposed on seasonal minor rivulet/stream draining into Kukadi river having a catchment area of 0.8 $km^2$and the lower reservoir is proposed on seasonal minor rivulet/ stream draining into Kalu River having a catchment area of 3.0 km^2. It is necessary to monitor the inflow of the stream, both at upper and lower reservoir and ensure the provisions of release arrangements. Same shall be incorporated in EIA report.

6. Out of 166.26 ha, 105.55 ha is private land, 0.22 ha is government land and 60.49 ha is forest land. The forest density in the proposed forest land involved in the project site is approx. 600 trees/ha. A total of around 35000 trees and saplings are likely to be sacrificed. Therefore, it is important to insist on submitting the case under FCA and receive stage-I clearance at the earliest by the Project Proponent. Details of the tree species (number and nomenclature) required to be felled for reservoir creation and other project components need to be incorporated in EIA report.

7. Wildlife conservation and biodiversity management plans have been approved by CWLW vide their letter dated 09.08.2024 with a Cost of Rs. 209.00 Lakhs**(Annexure-VI)**

8. It was told by PP that they have submitted some application in 'MITRA' - an initiative of State Government. The purpose of this application and the proceedings/reply of the MITRA should be presented before the EAC committee.

9. During the visit the committee also suggested considering the following:

   (a) Dam Break Analysis and Its Impact:

   During the visit committee member stressed on the importance of dam break analysis and its impact on the surrounding area, it was explained by the project team that the dam break analysis in the proposed project involves concrete gravity dams for upper and lower reservoirs based on the vulnerability assessment, breach in upper and lower concrete gravity dam/reservoir has been modelled for a length of about 17517m (17.5km) downstream upto Manikdoh Dam and for a length of 12508m (12.5km) downstream confluence of Kalu river with Joland Nadi respectively.

The study for both the reservoirs comprises of: *(a) Prediction of outflow hydrograph due to dam breach; (b) Routing of dam breach flood hydrograph through the downstream valley to get the maximum water level and discharge along with time of travel at different locations of the valley downstream of the dam.*

It is clear from the inundation map that in case of Dam break scenario, five villages, Adoshi, Nanaghat, Ghatghar, Talechiwadi and Jalwandi are likely to be affected in case of upper reservoir and dam break flood completely subside at Manikdoh dam location, so impact is envisaged at dam.

None of the village settlements will get directly impacted due to dam breach flood in case of lower reservoir, however, land of villages Awalegaon, Meroshi, Nyahadi, Vakalwadi, Dhaswadi and Chaole is likely to get affected.

(b) Wildlife Conservation Plan/ issues/Wildlife Action Plan:

The details of biodiversity in the study area collected during field survey and from Forest Working Plan of Pune and Thane Forest Divisions, 12 species of mammals, 2 species of avifauna and 5 species of herpetofauna reported from the study area are listed as Schedule-I under The Wildlife (Protection) Amendment Act, 2022. The total budget allocated focusing on Biodiversity and Wildlife Conservation and Management Plan including conservation and management measures for Schedule-I species is Rs 209.00 lakh. The State Forest Department shall be the executing agency for implementation of the proposed mitigation measure under Biodiversity Conservation and Wildlife Management Plan in the study area. The Biodiversity Conservation and Wildlife Management Plan is approved by CWLW, Nagpur.

(c) Catchment area of Kalu river:

Kalu river originates in the Harishchandragad mountain in Murbad Taluk of Thane district at an elevation of 1,200m above mean sea level. The catchment area of Kalu river upto pump house is 133.8 km^2. The Kalu river further flows for a length of about 83km and joins Bhatsa river near Baneli village. After its confluence with Bhatsa river, Kalu river further flows for a length of about 4 km and joins Ulhas River near Kalyan on its right bank.

(d) Geological Survey/investigation at upper reservoir:

The geotechnical investigation on upper reservoir could not be conducted due to hinderance caused by 25 houses of tribal habitant rehabilitated/relocated from Manikdoh dam. More interaction of project proponent with local inhabitants is required to appraise them about the size, scale and benefit of the proposed project. The inhabitants also informed that Adani needs to initiate the CSR activities for drinking water, deepening of wells and minor irrigation for proximate villages. The drone video of the project site shall be presented during EAC meeting.

(e) Archaeological site:

There is no archaeological site located in proximity to proposed project site. Therefore, no NOC may be obtained from the National and State Archaeological Department.

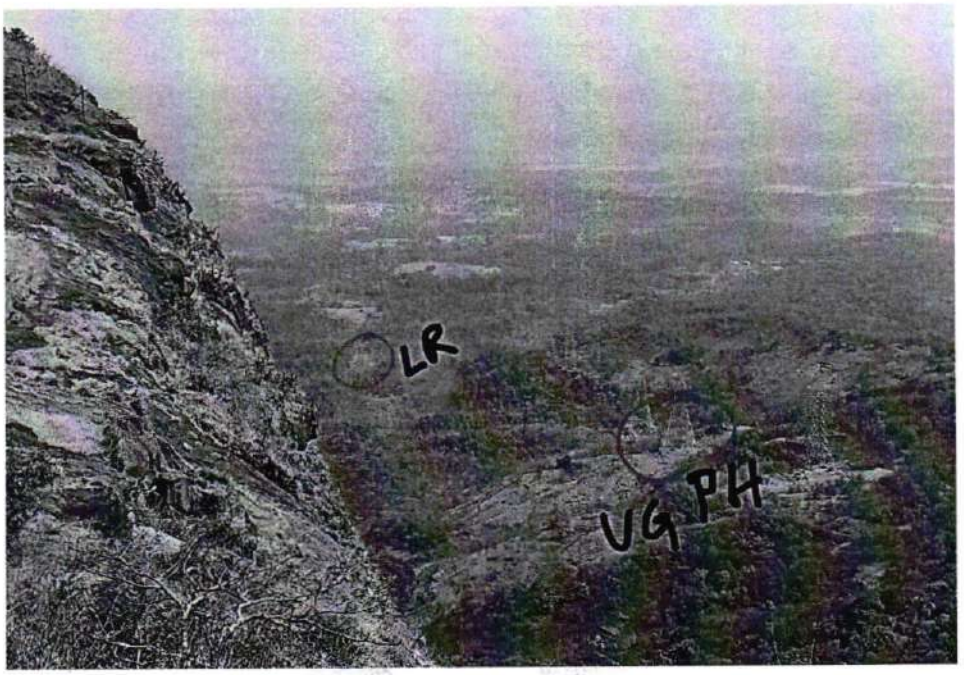
(f) High tension line:

High tension line is traversing through the project area and need to be shifted prior to start of construction if it fails to meet the safety crietria as specified by CEA (Measures relating to Safety and Electric Supply) Regulations, 2023. The PP to submit the closest horizontal and vertical distance of structures from High tension line/towers to CEA/Transmission service provider for their perusal and obtain NOC if required under intimation to EAC.

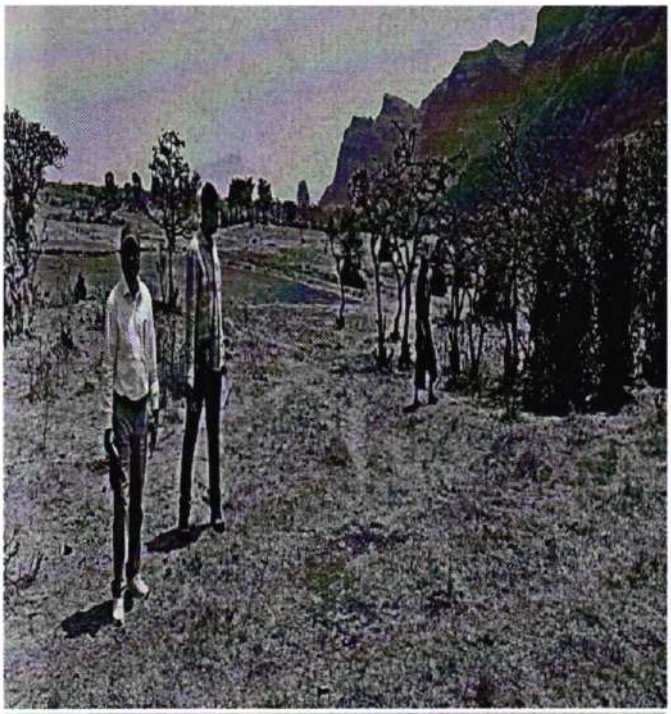
(g) Studies:

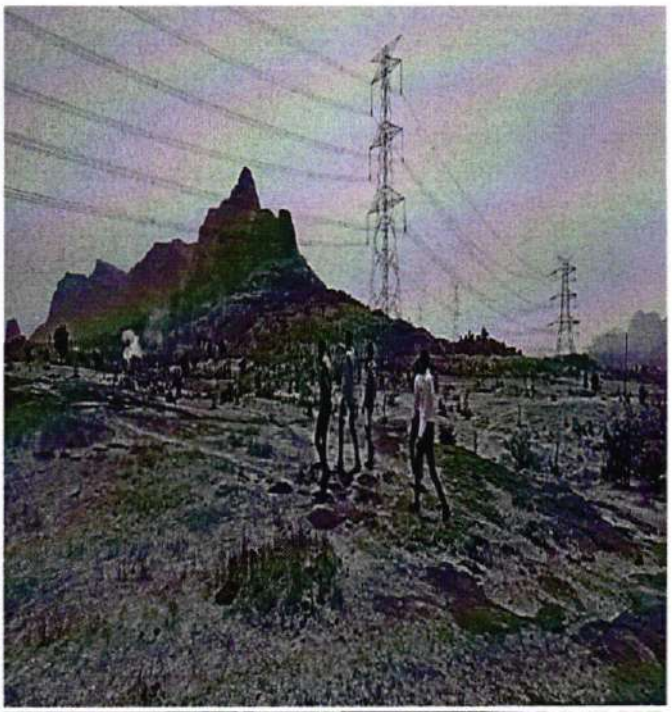
Proper Social Impact Assessment Study needs to be carried out by the PP. Also, R&R plan need to be developed and presented before EAC meeting. A detailed LAD and CSR initiatives need to be taken up, as it was observed that there is a need for supporting water conservation initiatives, skill development and capacity building.Drone Videography and Photography should be done and presented before EAC

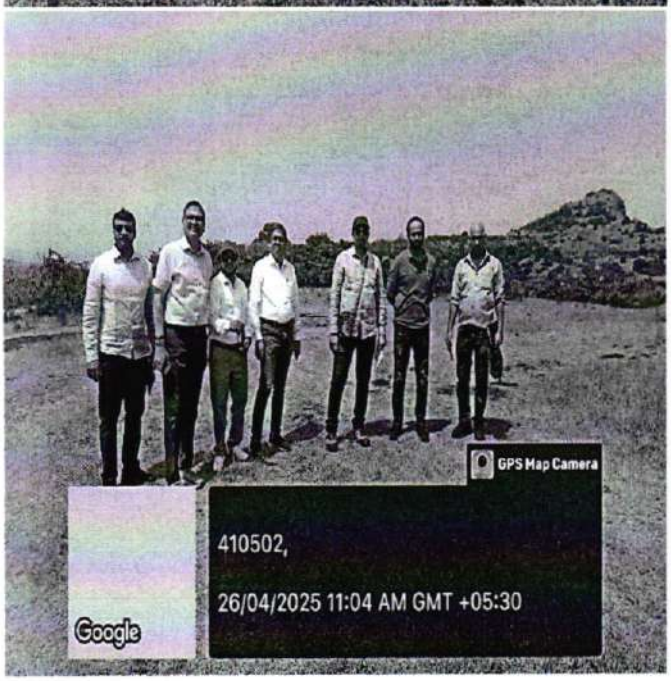
Site Photos



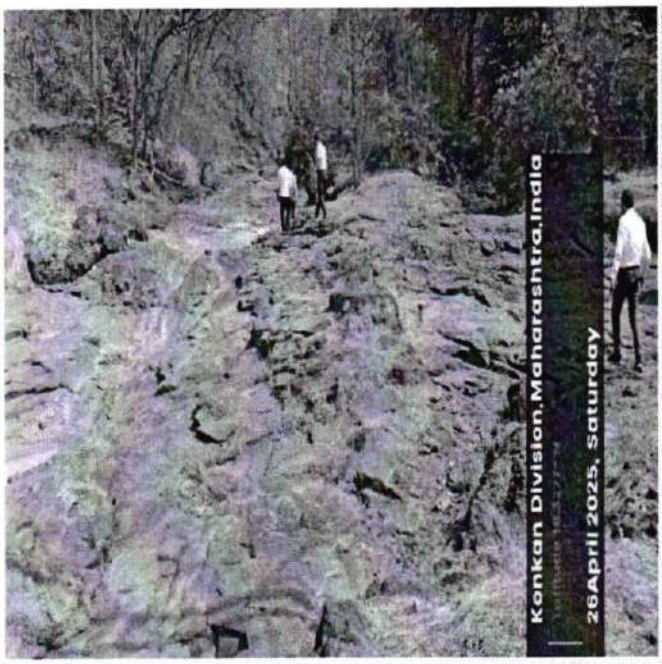
Upper Reservoir (26th April 2025)

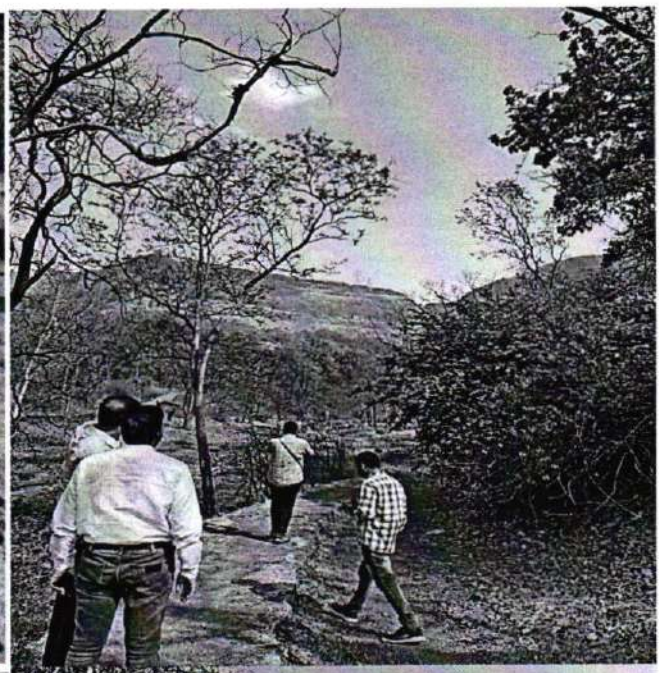


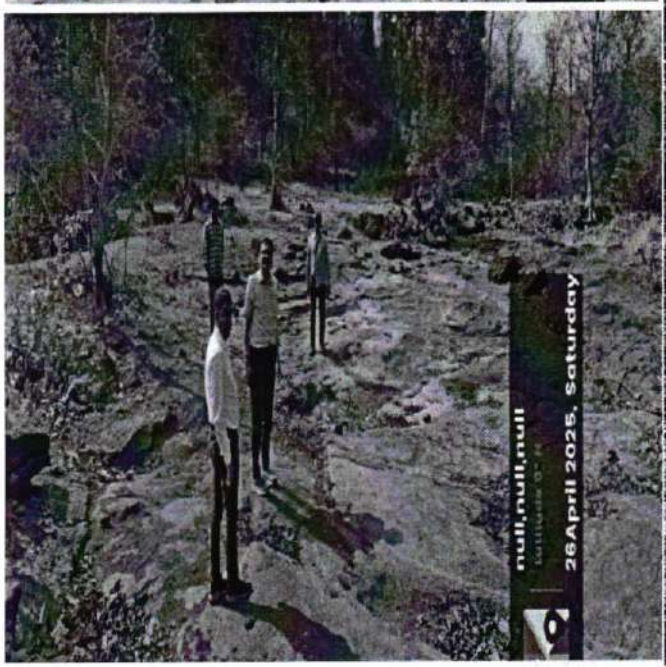


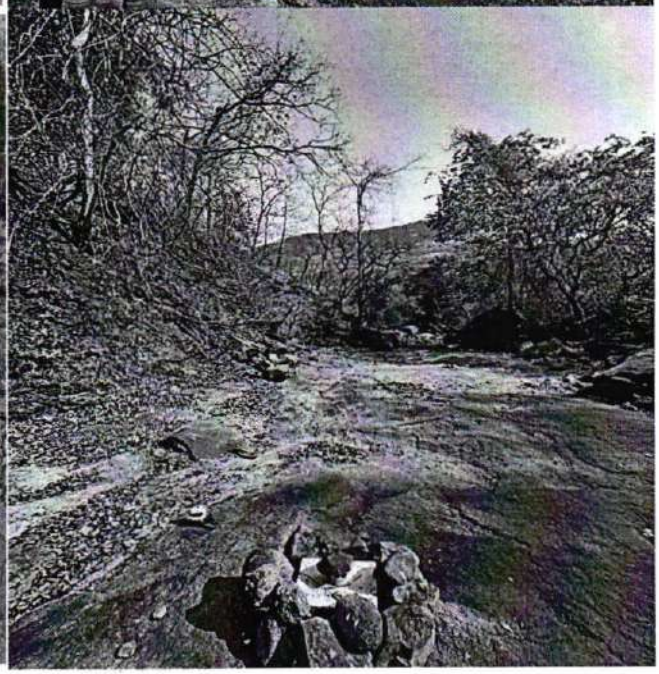


Lower Reservoir (26th April 2025)

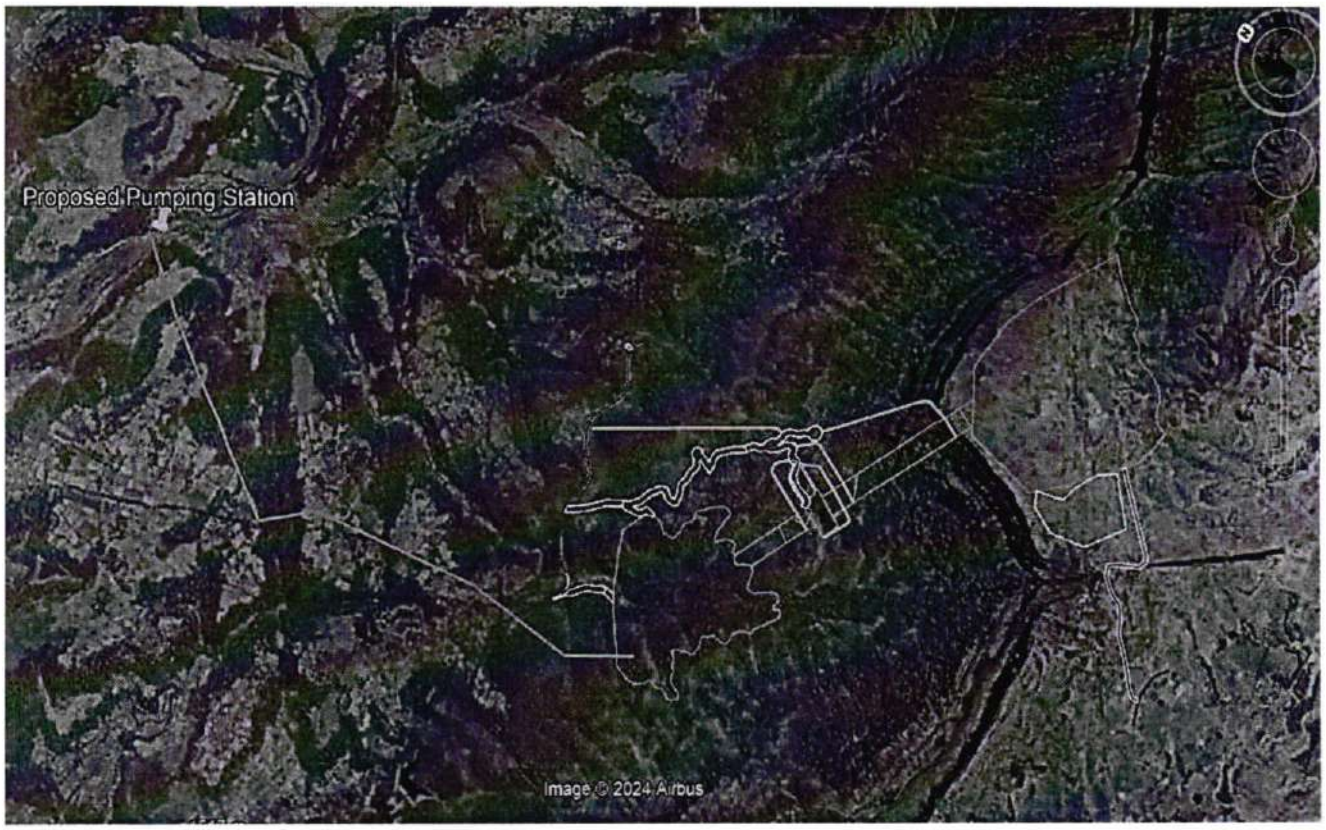








Google imagery



Shri Kartik Sapre	Shri Rakesh Goyal	Dr. P R Sakhare, Scientist E
EAC Member	Representative of CEA	Representative of MoEF&CC

Signatures of Sub-Committee Members

Google Imagery

Shri Kartik Sapre EAC Member	Shri Rakesh Goyal Representative of CEA	Dr. P R Sakhare, Scientist E Representative of MoEF&CC

Signatures of Sub-Committee Members

ANNEXURE-I

No. J-12011/21/2022-IA.I(R)
Government of India
Ministry of Environment, Forest & Climate Change
Impact Assessment Division

Indira Paravaran Bhawan,
Vayu Wing, 3rd Floor,
Jor Bagh Road, Aliganj,
New Delhi - 110 003
Dated: 22nd April, 2025

OFFICE ORDER

Subject: Site Visit in respect of the Malshej Ghat Bhorande Pumped Storage Project of capacity 1500 MW in an area of 166.26 ha at village Adoshi & Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra) by M/s Adani Green Energy Limited -reg-

It has been decided to conduct a site visit of the proposed project by a sub-committee of the EAC comprising following EAC (River Valley & Hydroelectric Sector) members :-

S.No.	Name	Role
1.	Shri Rakesh Goyal	Representative of CEA
2.	Shri Kartik Sapre	EAC Member
3.	Representative of MoEF&CC	

2. In accordance with the mandate given, the Sub-Committee shall carry out a site inspection during **25th to 27th April, 2025** .Therefore, it is requested to make necessary arrangements to facilitate the scheduled site visit.

3. This issues with the approval of competent authority.

Encl. as above

(**Yogendra Pal Singh**)
Director/ Scientist 'F'
Impact Assessment Division
Email: yogendra78@nic.in

To,

Santosh Kumar Singh, Head - AESG, Environment
M/s ADANI GREEN ENERGY LIMITED
Adani Corporate House, Shantigram Near Vaishno Devi Circle, S G Highway, Khodiyar, Ahmedabad ,
AHMADABAD, GUJARAT, , 382421
E-mail: agel.psp@adani.com

Copy to:

1. Deputy Director General of Forests (C), Ministry of Environment, Forest and Climate Change, Integrated Regional Office , Ground Floor, East Wing, New Secretariat Building, Civil Lines, Nagpur – 440001; E-mail: apccfcentral-ngp-mef@gov.in
2. District Collector, District Collector Office, Opposite Sassoon Hospital, Station Road, Pune-411001. E-mail: rdc.pune-mh@gov.in
3. All the Members of the Sub-Committee as per Office Order – By email; and
4. Sanction Folder/ Guard file

ANNEXURE-II

Attendance Sheet of Meeting and Site Visit by RVHEP EAC Sub-Committee for Bhorande (Malshejghat) PSP, Thane and Pune District, Maharashtra	Date 26.04.2025

ATTENDANCE SHEET

Bhorande (Malshejghat) Pumped Storage Project (1500 MW) in an area of **166.26ha** with Upper Reservoir located in **Adoshi village in Junnar Taluka, Pune District** and **Bhorande village, Murbad Taluka, Thane District** of Maharashtra by M/s Adani Green Energy Limited **Proposal No IA/MH/RIV/462841/2024; F.No. J-12011/21/2022-IA.I (R)**

S.No.	Name	Organization	Designation
A.1	Dr. Purushottam R. Sakhare	Representative of MoEF&CC	Scientist- E, IRO, Nagpur
A.2	Shri. Kartik Sapre	MoEF&CC	Member of EAC committee of RVP
A.3	Shri. Rakesh Goyal	Representative of CEA	Member of EAC committee of RVP
A.4	Dr. Rrahhul Singh	AGEL	Head, AESG
A.5	Mr. Sunny Kumar Singh	Adani Group	Head Corporate Affairs
A.6	Mr. Arpit Madame	AGEL	Project Team
A.7	Mr. Vivek Jhaldiyal	RSET	Consultant