MINUTES OF THE 15TH MEETING OF THE EXPERT APPRAISAL COMMITTEE FOR RIVER VALLEY AND HYDROELECTRIC PROJECTS HELD ON 27TH JULY, 2021 FROM 10.00AM - 05:30PM THROUGH VIDEO CONFERENCE.

The 15th meeting of there-constituted 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 27th July, 2021 through video conference, under the Chairmanship of Dr. K. Gopakumar. The list of Members present in the meeting is at **Annexure.**

Agenda No. 15.1

CONFIRMATION OF THE MINUTES OF THE 13th MEETING

The minutes of the 14th EAC (River Valley Hydroelectric Project) meeting held on 7th July, 2021 were confirmed.

Agenda No. 15.2

MP30 Gandhi Sagar Off Stream Pumped Storage Project (1440 MW) in an area of 402.50 ha by M/s Greenko Energies Private Limited in village Khemla Block, Tehsil Rampur, District Neemuch, Madhya Pradesh - Environmental Clearances - Reg.

[Proposal No. IA/MP/RIV/124890/2019; F. No. J-12011/22/2019-IA.I (R)]

15.2.1 The proposal is for grant Environmental Clearances to MP30 Gandhi Sagar Off Stream Pumped Storage Project (1440 MW) in an area of 402.50 ha by M/s Greenko Energies Private Limited in village Khemla Block, Tehsil Rampur, District Neemuch, Madhya Pradesh.

15.2.2 The details of the project submitted by project proponent and ascertained from the document submitted are mentioned below:

i. MP 30 Gandhi Sagar Off-Stream Pumped Storage Project is located in Neemuch District of Madhya Pradesh. It envisages creation of upper reservoir which is located away from all existing natural systems. The project is about 78 Kms from district headquarters Neemuch via MP SH 31A. Nearest railhead and airport are located at Neemuch and Udaipur respectively. The nearest village to the project is Khemla block about 0.5Km, which comes under, Rampura Tehsil, Neemuch district.

ii. The MoEF&CC approved the ToR for the proposed project vide F. No. J-12011/22/2019-IA-I (R) dated 28th February, 2020.

iii. This project envisages non-consumptive re-utilization of 1.22 TMC of water of the Gandhi Sagar reservoir by recirculation. The water in the Gandhi Sagar reservoir (existing lower reservoir) will be pumped up and stored in the

proposed Pumped Storage component of MP30 Gandhi Sagar (upper Reservoir) and will be utilized for power generation.

iv. The Geographical coordinates of the proposed MP30 Gandhi Sagar Off-Stream Pumped Storage Project component of upper reservoir is at latitude 24°31'6.89"North and Longitude is 75°30'56.12"East and that of Gandhi Sagar lower reservoir (existing) are 24°31'5.40" North and 75°32'5.28"East. Proposed rating of Off-Stream Pumped Storage Project is 1440MW.

v. The Off-Stream Pumped Storage Project of MP 30 Gandhi Sagar, herein after referred as MP 30 Gandhi Sagar Off-Stream PSP, envisages construction of upper reservoir (proposed) located in Rampura Tehsil of Neemuch District. The Gandhi Sagar reservoir (existing) is under operation with a gross storage capacity of 258.47 TMC and MP 30 Gandhi Sagar Off Stream PSP is proposed for the live storage capacity of 1.22 TMC.

vi. **Project Components details:**

- The project will involve construction of rock fill embankment of maximum height of 35m for creation of MP 30 Gandhi Sagar Off-Stream PSP upper reservoir of 1.80TMC gross storage and 1.22TMC live storage.
- The upper reservoir is located at EL 491m and the FRL and MDDL of this reservoir is at EL 523.00m & EL 508.00m, respectively.
- 6 nos. each of 683.48m long and 7.5m dia. surface circular steel lined Penstock / Pressure Shaft (i.e., consisting of 181.52m long surface penstock, 140.97m long vertical pressure shaft and 360.99m long Horizontal pressure shaft) in which 5 nos. will feed 5 units each of 240 MW and 1 no. will get bifurcated in to two of 5.3m dia. to feed 2 units each of 120 MW.
- A surface Powerhouse having an installation of Five nos. Reversible Francis turbine each of 240MW capacity (All units are fixed speed turbines) operating under a rated head of 121.70m in generating mode and 127.90m in pumping mode and Two nos. Reversible Francis turbine each of 120 MW capacity (All are variable speed turbines) operating under a rated head of 121.00m in generating mode and 128.70m in pumping mode.
- 85m wide and FSD of 6.0m Tail race channel of about 860.00m long connecting to the Existing Gandhi Sagar reservoir.
- The existing Gandhi Sagar reservoir will be utilized as a lower reservoir to enable MP 30 Gandhi Sagar Off-Stream PSP to operate as a peak station. The FRL & MDDL of existing Gandhi Sagar reservoir is at EL 400.00m & EL 381.00m, respectively. The Gross storage capacity of existing reservoir is 258.47 TMC. Water will be pumped to the proposed upper reservoir through TRC.

vii. **Salient features of MP 30 Gandhi Sagar Off-Stream PSP**

S. No.		NAME OF THE PROJECT	MP30 GANDHI SAGAR OFF-STREAM PSP
1		Location	
	a	Country	India
	b	State	Madhya Pradesh
	c	District	Neemach
	d	Tehsil	Rampura
	e	Village near Power House	Khemla Block
2		**Geographical Co-Ordinates**	
	a	MP30 GANDHI SAGAR OFF-STREAM PSP Upper Reservoir - (Now Proposed)	
		Latitude	24°31'6.89"N
		Longitude	75°30'56.12"E
	b	Gandhi Sagar Reservoir – Lower (Existing)	
		Latitude	24°31'5.4"N
		Longitude	75°32'5.28"E
3		**Access To Project Site**	
	a	Airport	Udaipur, 171Km from project site.
	b	Railhead	Neemach, 67Km from project site
	c	Road	Khemla block, around 5km from SH31A
	d	Port	Mandavi
4		**Project**	
	a	Type	Off-Stream Pumped Storage Project
	b	Storage Capacity	10411.20MWH
	c	Rating	1440MW
	d	Peak operation duration	7.23Hours daily
5		**MP30 GANDHISAGAR OFF-STREAM PSP - Upper Reservoir**	
	a	Live Storage	1.22TMC
	b	Dead Storage	0.58TMC
	c	Gross Storage	1.80TMC
	d	Full Reservoir Level (FRL)	EL +523.00 m
	e	Minimum Draw Down Level (MDDL)	EL +508.00m
	f	Top Bund Level (TBL)	EL +526.00m
	g	Foundation Level	EL +491.00 m
	h	Max Height of Embankment	35.00 m
	i	Length of Embankment	5561.131 m
6		**Gandhi Sagar Reservoir - Lower Reservoir – (Existing)**	
	a	Type of Dam	Masonry Gravity Dam
	b	Full Reservoir Level (FRL)	EL 400.00 m

	c	Minimum Draw Down Level (MDDL)	EL 381.00 m
	d	Height of Dam above deepest bed level	63.70 m
	e	Length of Dam	514.00m
	f	Gross Storage Capacity	258.47 TMC
7		**RCC intake Structure**	
	a	Type	Diffuser Type
	b	Elevation of Intake centre line	EL +495.50 m
	c	Elevation of bell mouth bottom	EL +491.05 m
8		**Penstock /Pressure Shafts**	
	a	Type	Finished steel lined - circular
	b	Number of Penstocks	6 Nos. wherein 1 No. Independent Pressure shaft bifurcated in to 2 for smaller units
	c	Diameter of Penstock	7.5 m - Main Penstock 5.3 m – Branch Penstock
	d	Length of penstock/Pressure Shaft	For 5 nos. – 683.48 m each (Main Penstock) for 5 larger units For 1 no. – 607.23m long (Main Penstock) and 76.25m each Branch Penstock for 2 smaller units
9		**Powerhouse**	
	a	Type	Surface Powerhouse
	b	Dimensions (Excluding Service Bay)	181.20m (L) x 25.50m (W) x 56.10m (H)
10		**Tail Race Channel**	
	a	Type & Shape	Concrete lined & Trapezoidal
	b	Length of the channel	860.00 m
	c	Bed Width	85.00 m
	d	Full supply depth	6.0 m
	e	Bed slope	1 in 7000
11		**Tailrace Outlet Structure**	
	a	Type	Diffuser Type
	b	Elevation of outlet Centre line	EL +370.71 m
12		**Hydro-Mechanical Equipment**	
	a	RCC Intake Structure	
	i	Trash Rack	Vertical with inclination of 15°
	ii	No. of Trash racks	6 nos.
	iii	No. of bays in each trash rack	2 nos. of 7.75m(W) x 10.97m(H) & 1 no. of 8.5m(W) x 10.97m(H) for each unit
	iv	Intake Service Gate	Size – 6.20m (W) x 7.50 m (H) – 6 Nos. With Rope Drum Hoist
	v	Intake Stop log Gate	Size – 6.20m (W) x 7.50 m (H) – 1 No. with

			Moving Gantry
	b	Draft Tube Gates	High pressure steel type slide gates
	i	No. of Service gates per unit	5 Nos. - 7.0 m (W) x 8.5 m (H) for Larger Units & 2 Nos. - 5.1 m (W) x 6.2 m (H) for Smaller Units with Independent Hydraulic Hoist
	ii	No. of Stoplog gates per unit	1 No. – 7.0 m (W) x 8.5 m (H) for Larger Units & 1 No. - 5.1 m (W) x 6.2 m (H) for Smaller Units with Moving Gantry Crane
	c	Tailrace Outlet Structure	
	i	No. of Trash racks	7 nos.
	ii	No. of bays in each trash rack	2 nos. of 6.65m(W) x 10.87m(H) & 1 no. of 6.70m(W) x 10.87m(H) for each larger unit & 2 nos. of 5.20m(W) x 6.73m(H) + 1 no. of 6.60m(W) x 6.73m(H) for each smaller unit
13		**Electro Mechanical Equipment**	
	i	Pump Turbine	Francis type, vertical shaft reversible pump turbine
	ii	Total No of units	7 no's (5 X 240MW & 2 X 120 MW)
	iii	Total Design Discharge (Turbine Mode)	1326.75 Cumec
	iv	Rated Head in Turbine mode	121.70 m for larger unit & 121.00m for smaller unit
	A	240 MW Turbines	
	i	Total No of units	5 Units (Fixed speed)
	ii	Turbine Design Discharge	220.91 Cumec
	iii	Rated Head in Turbine Mode	121.70m
	iv	Pump Capacity	251 MW
	v	Rated Pumping Head	127.90 m
	Vi	Rated Pump Discharge	183.86 Cumec
	vii	Synchronous speed	136.36 rpm
	I	Generator-Motor	
	a	Type	Three (3) phase, alternating current synchronous generator motor semi umbrella type with vertical shaft
	b	Number of units	5 Units
	c	Rated Capacity	Generator – 240 MW; Pump Input – 251 MW
	d	Rated Voltage	18.00 KV
	II	Main Power Transformer	
	a	Type	Three Single Phase Power transformers with Off- Circuit tap changer (OCTC)
	b	Number of units	15 Numbers (ie. 3 Nos./Unit)

	c	Rated Capacity of each unit	Single Phase, 18KV/400 KV, 100 MVA
	d	Rated Voltage	Primary – 18 kV; Secondary - 400 kV adjustable range of the secondary voltage: - 10% to +10% (3kV/tap)
	B	120 MW Turbines	
	i	Total No of units	2 Units (Variable speed)
	ii	Turbine Design Discharge	111.10 Cumec
	iii	Rated Head in Turbine Mode	121.00 m
	iv	Pump Capacity	135 MW
	v	Rated Pumping Head	128.70 m
	vi	Rated Pump Discharge	98.16 Cumec
	vii	Synchronous speed	187.50 rpm
	I	Generator-Motor	
	a	Type	Three(3) phase, alternating current asynchronous generator motor semi umbrella type with vertical shaft
	b	Number of units	2 Units
	c	Rated Capacity	Generator – 120 MW Pump Input – 135 MW
	d	Rated Voltage	18 KV
	II	Main Power Transformer	
	a	Type	Indoor, 3-Ph transformers with Off-Circuit tap changer (OCTC)
	b	Number of units	2 Units
	c	Rated Capacity of each unit	Each 160 MVA, 18KV/400 KV rating power transformers.
	d	Rated Voltage	Primary – 18 KV ; Secondary - 400 kV adjustable range of the secondary voltage: -10% to +10% (3kV/tap)
14		**400 KV Gas Insulated Switchgear**	
	a	Type of GIS	Indoor Type
	b	No. of GIS units	One No.
	c	Location	Inside GIS Building above ground
	d	Scheme	Double Busbar Arrangement with bus coupler
15		**Power Evacuation**	
	a	Voltage Level (KV)	400 KV
	b	No. of Transmission lines	One 400 KV transmission line with double circuit.
	c	Total Length	400 KV Double Circuit Transmission Lines with Moose conductor of length 81 Kms (app) from PSP will be connected to 400/ 220 KV PGCIL substation at Kota of Rajasthan State for evacuation of

			generated Power and for Supply of power during pumping mode
16		**ESTIMATED COST**	
	a	Civil Works	2797.67 Cr.
	b	E&M Works incl. Transmission line	1930.50 Cr.
	c	IDC & Others	2263.08 Cr.
		Total Project Cost with IDC	6991.25 Cr.

viii. **Ambient Air Quality:** Ambient Air Quality Monitoring was carried out at 6 locations in the study area. The level of pollutant observed at various sampling stations sites are well within the Residential & Rural area permissible limits of the National Ambient Air Quality Standard notified by CPCB.

ix. **Ambient Noise Levels:** The sound levels on an average value of 45.0 – 59.8 dB (day time observations), 34.1 – 45.1 db (Night time observation), 44.7 – 57.2 db (day and night time observation) at residential area, 58.8 – 60.3 dB (day time observations), 44.4 – 45.5 db (Night time observation), 57.6 – 60.3 db (day and night time observation) at Residential/ Commercial area which are within the Ambient Noise Standards ranging from 55 dB(A) during day time in residential area to 65 dB(A) during day time in commercial area.

x. **Soil:** Soil samples were collected from 6 different locations. Loamy, Kaolinitic, hyperthermic, Lithic Ustorthents is the most dominant Group covering 26.97% of the study area. The soil fertility in general varies from Low to Medium category.

xi. **Water:** Ground Water samples were collected 6 locations & Surface Water samples were collected 3 locations in the study area. According to WQI all the ground water samples fall in excellent ground water quality class and surface Water quality of Gandhi Sagar Reservoir is under Class 'B' i.e., Outdoor bathing (Organised) & Besala Pond sample falls in Class 'D' i.e., Propagation of Wildlife and Fisheries according to Water Quality Criteria of Central Pollution Control Board, Based upon CPCB guidelines as well the WQI calculated above the water of Gandhi Sagar Reservoir and water bodies in the study area is safe for drinking only after conventional treatment and disinfection.

xii. **Flora:** Quadrat sampling was undertaken at 6 different locations for carrying out phyto- sociological surveys of the vegetation in the study area. Total numbers of plant species recorded were 207 including 53 species of trees, 60 species of shrubs, and 94 species of herb and grasses, according to the IUCN Redlist of Threatened Species (Version 2020-2), none of the

plant species found in the study area falls under any Threatened category. The majority of the species have not been evaluated or assessed yet by IUCN (2020-2). Out of 207 plant species recorded from the area, only 26 species have been assessed all the 26 species that have been assessed are under the 'Least Concern' category. *Acacia catechu* and *Ziziphus jujuba* were dominant in scrub forest. *Ziziphus jujuba* is the only species recorded from most of the sampling sites in the study area.*Lantana camara, Calotropis gigantea, Carissa spinarum, Murrayakoenigii, Ipomoea carnea and Ziziphus nummularia*were the dominant shrub species found in the area.

xiii. **Fauna:** As per IUCN Red list of Threatened Species (Version 2018.2) all the mammalian and avifaunal species reported from the area are under Least Concern (LC) category. During field surveys *Boselaphustragocamelu* (Blue bull), *Semnopithecus entellus* (Common Langur), *Herpestesedwardsii* (Indian Grey Mongoose), *Canis aureus* (Jackal), and *Funambuluspennantii* (Five-striped Palm Squirrel) and a total of 46 species of bird belonging to 14 orders was compiled based upon sighting during the field surveys.

xiv. One amphibian species and 3 reptiles are sighted in the study area. During the surveys, stream frog, Indian Monitor lizard, and Garden lizard were commonly sighted species. As per secondary Survey and information gathered from the officials of the Neemuch Forest Division and their forest working plan following faunal/avifaunal species were listed under Schedule-I of the Indian WildlifeProtection Act (1972), viz. Leopard (Panthera pardus), Crocodile (Crocodylus palustris), Indian Peafowl (Pavocristatus), White-rumped Vulture (Gyps bengalensis), Indian Monitor lizard (Varanus bengalensis), and Indian Rock Python (Python molurusmolurus). PCCF-Cum-Chief Wildlife Warden, Bhopal has approved Bio-diversity Conservation and Wildlife Management Plan vide letter dated 21.06.2021 with a budgetary provision of **Rs 166.90 Lakhs**.

xv. **Land Requirement:** The total land requirement for the project is 402.50Ha, out of which 301.96 Ha land would be forest land and 100.54Ha is Non-Forest Land (71.96Ha - Private & 28.58Ha - Government).

xvi. **Ecological Sensitive Area:** Gandhi Sagar Wildlife Sanctuary is the nearest protected area located about 4km from the Project site. Chief Wildlife Warden, Govt of Madhya Pradesh has issued NOC vide dated 12-02-2021 that all project components are located outside the Sanctuary and also away from eco-sensitive zone.

xvii. **Muck Disposal Areas**: The total quantity of muck generated from soil and rock excavation is about 4.56Mcum. About 2.28Mcum of excavated muck are expected to be utilized for Rockfill and aggregate for construction. It is proposed to dispose of remaining quantity, considering 40% swell factor of 3.19Mcum at a pre-identified muck disposal site.

xviii. **Rehabilitation and Resettlement Plan:** The entire private land identified for the project falls in one revenue village namely Khemla Block, under Tehsil Rampura, District Neemuch. The private land proposed for procurement belongs to a total of 138 land owners. All the 138 families will be losing their agricultural land only and none of the families will be losing any house or any other assets.None of them is getting displaced due to the project from the above land procurement. The private land to be procured is un-irrigated agriculture land. The R&R Plan has been prepared in line with The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (RFCT_LARR) and The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (Madhya Pradesh) Rules, 2015.

xix. **Environmental Management Plan:** An amount of **Rs. 11944.74** lakhs have been allocated for the implementation of Environmental Management Plan and Local Area Development Plan for the project is summarized in table as below:

S. No.	Component of EMP	Capital Cost (Rs. in lakh)	Recurring Cost (Rs. in lakh)				Total Cost (Rs. in lakh)
			Year 1	Year 2	Year 3	Year 4	
1	Compensatory Afforestation	7376.89					**7376.89**
2	Biodiversity Conservation & Wildlife Conservation Plan		72.60	39.20	31.80	23.30	**166.90**
3	Muck Dumping and Management Plan		221.87	223.87	168.75	26.5	**640.99**
4	Landscaping, Restoration of Quarry and Construction Sites		14.00	27.00	24.00	15.00	**80.00**
5	Sanitation and Solid Waste Management Plan	190.00	27.14	28.14	29.14	27.14	**301.56**
6	Public Health Delivery System	70.00	39.00	39.00	39.00	39.00	**226.00**
7	Energy Conservation Measures	67.00	42.00	42.00	42.00	42.00	**235.00**
8	Labour Management Plan	55.00	8.00	18.00	18.00	18.00	**117.00**
9	Green Belt Development Plan		14.30	16.30	6.80	4.00	**41.40**
10	Pollution Mitigation Measures		12.50	12.50	12.50	12.50	**50.00**
11	Environmental Monitoring Program		31.25	31.25	31.25	31.25	**125.00**
12	Rehabilitation and Resettlement Plan	809.00					**809.00**
13	Local Area Development Plan		350.00	400.00	400.00	350.00	**1500.00**
14	Disaster Management Plan	200.00	15.00	20.00	20.00	20.00	**275.00**
Total		**8767.89**	**847.66**	**897.26**	**823.24**	**608.69**	**11944.74**

xx. **Project benefit:** The Project is a renewable green source of energy and helps to reduce carbon foot print and create direct and In-direct economic opportunities. It is estimated that project would employ a workforce of about 4800 persons during the 3.5 years construction period and thereafter during project operation, permanent staff of about 200 persons will be employed.The project will create opportunities for skill development, education, better medical and health care, improved local infrastructure, etc. In addition, there are proposals for green belt development, restoration and greening of the project and surrounding area.

xxi. **Public hearing:** Public Hearing was conducted by the Madhya Pradesh State Pollution Control Board, on 30.01.2021 at Panchayat Parisar, Village: Khemla Block, Tehsil: Rampura, District: Neemuch, Madhya Pradesh.

xxii. **Status of other statutory clearances:** For diversion of 301.96 ha of forest land, online application has been submitted to MoEF&CC vide proposal No.: FP/MP/HYD/116943/2020 dated 24.12.2020.The Diversion proposal has been recommended by State Govt and forwarded the same to MOEF&CC vide 28.06.2021 for FAC recommendations and grant of Stage I approval.

15.2.3 The EAC during deliberations noted the following:

The proposal is for Environmental Clearances to MP30 Gandhi Sagar Off Stream Pumped Storage Project (1440 MW) in an area of 402.50 ha by M/s Greenko Energies Private Limited in village Khemla Block, Tehsil Rampur, District Neemuch, Madhya Pradesh. The application for Environmental Clearances was submitted to Ministry on 28th June, 2021.

The EAC in the present meeting (15th meeting) deliberated on the information submitted (Form 2, EIA/EMP report, kml file, etc.) and as presented in the meeting and observed that the proposed project utilizes re-utilization of 1.22 TMC of water of the Gandhi Sagar reservoir by recirculation. The water in the Gandhi Sagar reservoir (existing lower reservoir) will be pumped up and stored in the proposed Pumped Storage component of MP 30 Gandhi Sagar (upper Reservoir) and will be utilized for power generation.

The Total land requirement for the project is 402.50 Ha, out of which 301.96 Ha land would be forest land and 100.54 Ha is Non-Forest Land (71.96 Ha-Private & 28.58 Ha-Government). Public Hearing was conducted by the Madhya Pradesh State Pollution Control Board, on 30.01.2021. Application for the Stage I Forest Clearance has been submitted to MoEF&CC. Gandhi Sagar Wildlife Sanctuary is the nearest protected area located about 4km from the Project site and Chief Wildlife Warden, Govt. of Madhya Pradesh has issued NOC vide letter dated 12-02-2021.

15.2.4 The project proponent provided point–wise response to the issues raised by the EAC during deliberations, which are as under:

Following details:

Query 1: Copy of Public Hearing Video

Reply: Video along with Public Hearing report has been forwarded by MPPCB vide letter No 471/TS/MPPCB/2021 dated 05.02.2021.

Query 2: Impacts on Air, Noise quality during construction to be modelled.

Reply: Air and Noise modelling has been carried out for assessment and quantification of impacts at nearest habitation i.e. Khemla block.

Air

Pump storage schemes do not generate air pollution during the operation phase as these are closed systems for water circulation and there is no source of air pollution. Construction phase is about 4 years, out of which excavation and dumping period is about 2 years. During the initial construction phase of 2 years, muck generation and dumping to the identified muck disposal site will be carried out continually through dumpers/tippers.

Muck requiring dumping has been estimated as 3.19Mcum. The site identified for muck disposal is about 500 m away from the source of generation and a new link road will be constructed to connect the upper reservoir area to the muck dumping site. For transportation of muck from generation site to dumping site for 750 days, an average of 10 trips per hour is envisaged for 16 m^3 capacity per truck. The route of the transport of the muck is considerably away from the habitations. The nearest habitation is village Khemla block, which is about 500m away from the muck dumping area.

The major source of air pollution during construction phase has been identified as movement of about 100-120 truck trips per day from the generation site to the dumping sites. To assess the impact of truck movement on the nearest habitation and surrounding area in general modeling studies have been carried out, as discussed below.

Fugitive Dust-Modeling: Air quality modeling was done using line source model as published by USEPA "Workbook of Dispersion Modeling" by Turner, for transportation though roads and the empirical emission factor equations from USEPA. Emission factors to be used in Line source Dispersion equation is adopted from formula as given below:

E= k * (1.7) * (s/12)*(S/48) * (W/2.7)0.7 * (w/4)0.5 * (365-p/365) kg/VKT---------- (1)

Where

E = Emission Rate (kg/VKT)

k= Particle size multiplier = (0.36)

s = Silt Content of the Road surface material (%) = 10%

S = Mean Vehicle Speed (km/hr) = 20 km/hr

W=Mean Vehicle Weight (tonnes) = 15 tonnes

w= Mean number of wheels = 8

p= Number of days with at least 0.254 mm of precipitation per year = 50

f = frequency of Vehicle movement (Considering to and fro) =120

Thus using equation (1)

E = 0.61766 kg/VKT

E = 0.0012 g/sec/m

Concentration of the fugitive dust was calculated using the empirical equations for unpaved roads published by USEPA- AP42. The Concentration of the fugitive Dust is given below:

C = (2/π) 1/2 (E / σz υ) Exp- [(h2) / (2 σz2)] x 106 ---------- (2)

Where,

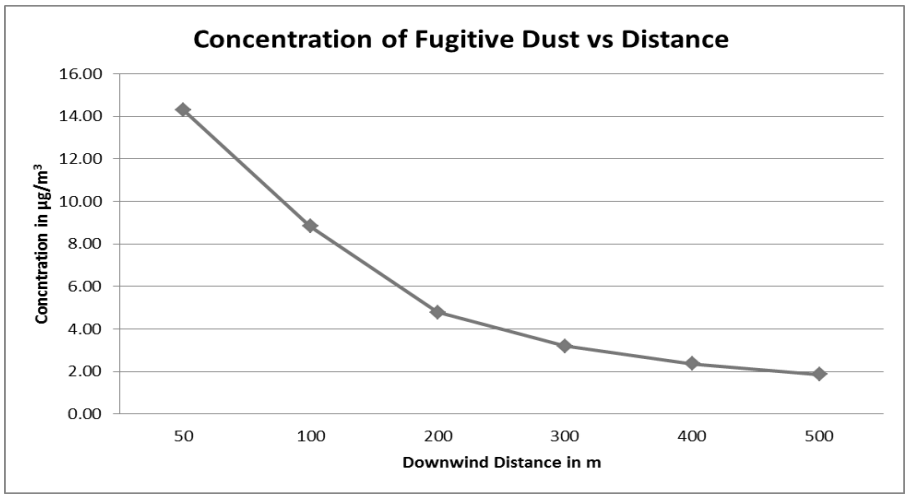
C = Hourly Concentration in microgram/ m3

E = Emission Rate = 0.0012 g/sec/m

υ = Wind Speed =4 m/s

h = 0 m

Modeling was done for an infinite line source assuming unpaved road. For conservative calculation wind was assumed to blow at a velocity of 4 m/s perpendicular to the road. The results for 24 hourly concentration values are given in below:



Graph showing Concentration of Fugitive dust vs Distance

It is observed that the ground level concentration (GLC) decreases from 14.28 µg/m^3 at 50 m from the centre line of the road to 1.87µg/m^3 at 500 m from the centre line of the road. These values have been predicted for a dry unpaved road.

Khemla block, which is located at a distance of 500 m from the source of generation, will get an incremental dust load of about 1.87µg/m^3. Maximum value observed during all the seasons monitoring at Khemla block for PM_{10} is 37.7µg/m^3, therefore incremental value will not have significant impact.

Noise

Sources of noise will be the vehicles and equipment for excavation and stationary equipment, including concrete batch plant located at the construction sites. Other sources of noise will be construction activities, drilling machines and quarrying and crushing activities. No significant noise source during operation phase.

a) Noise due to Construction Equipment

Under the worst case scenario, considered for prediction of noise levels during construction phase, it has been assumed that all these equipment generate noise from a common point. The noise levels due to operation of the different construction equipment are given below.

Noise Levels due to Operation of Construction Equipment

Equipment	**Noise level dB(A)**	**Equipment**	**Noise level dB(A)**
Earth Moving		**Material Handling**	
Compactors	70-72	Concrete mixers	75-85
Front loaders	72-82	Movable cranes	82-84
Backhoes	70-92		
Tractors	76-90		
Scrappers, graders	82-90		
Truck	84-90		
Others			
Vibrators	69-81	Saws	74-81

Under the worst-case scenario, considered for prediction of noise levels during construction phase, it has been assumed that all these equipment generate noise from

a common point.

Average noise level from the above sources has been taken as 90 dB(A) at 1 m from the source and its impact has been modelled on Khemla block village, the nearest habitation at about 500m from the job facility/dumping area by using following logarithmic equation:

$N2 = N1\text{-}20\log_{10}(r2/r1) - A_f$ dBA

Where,

N2 = Sound level at any location at a distance r2 from the source (in this case at Khemla Block 500 m away)

N1 = Sound level at any location at a distance r1 from the source (in this case construction activity generating 90 dB(A) at 1 m distance.

Af = Attenuation factor such as buildings, walls, trees, vegetation, etc, which significantly reduce the transmission of noise. However, for worst case scenario this has been assumed as zero.

Using the above equation, N2 works out to be:

N2 = 90-53.97= 36 dB(A)

Sound levels are generally expressed in decibels, which are logarithmic and therefore to assess the incremental noise levels at Khemla block, they need to be converted to a linear scale i.e. first antilog each number, add or subtract and then log them again in the following way:

$L=10\text{Log}_{10}(\Sigma 10^{(Li/10)})$

Baseline value recorded during daytime at Khemla block is 50.0 dB(A) and incremental value worked out is 36 dB(A). Therefore, noise level at Khemla block during construction phase, when noise levels at source will be of the order of 90 dB(A) are worked out as:

$L_{Khemla}= 10\text{Log}_{10}(10^5+10^{3.6}) = 50.2$ dB(A)

This is not significant.

Query 3: Due to water abstraction for Upper Reservoir, any effects in the downstream of Chambal River and downstream WLS, Downstream study to be needed, if not required, reasons thereof

Reply:

- Water abstraction for the upper reservoir has been worked out as 1.8 TMC or 50.97 MCM (one-time requirement only) for which permission have already been obtained from WRD, Government of Madhya Pradesh.

- This part of water will be recirculated between Gandhi Sagar and Upper Reservoir therefore it remains integral part of the Gandhi Sagar storage capacity only therefore no impact is envisaged on the downstream
- Total storage capacity of Gandhi Sagar reservoir is 7.3 BCM, out of which one time drawl will be 50.97 MCM, which is about 0.7% and therefore will not have any impact on downstream area of Chambal river.

Gandhi Sagar Wildlife Sanctuary is about 4 Km away from the project location and excludes the area of Gandhi Sagar reservoir. As one time drawl of 50.97 MCM is insignificant as compared to total storage volume of reservoir, no impact is anticipated on the wildlife sanctuary.

Query 4: Details of Historical levels (FRL & MDDL) of existing Gandhi Sagar Reservoir

Reply: The FRL of the Gandhi Sagar project is mentioned as El 400.0 m and the MDDL is 381.00 m. Gandhi Sagar Reservoir levels for the period 2012-2020 have been submitted.It was observed that during 9 years' period of data the minimum observed level is 380.57 m of the year 2019 and the maximum observed level is 401.99 m of the year 2019. Thus the MDDL has always been nearly maintained. Since the tail race for the project under consideration is kept at El 375.0 m., it shall be ensured that the design MDDL for Gandhi Sagar project is maintained.

Query 5: Why ambient air quality is compared with 24 hrs why not with yearly data since three season data is already available.

Reply: Three season data is not adequate to be compared with annual average standards which require "*annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals*" as per the National Ambient Air Quality Standards. Minimum 52 weeks data is required to work out the mean values.

Query 7: Details of Land Holding details of PAFs i.e. Total land Holding and acquisition details

Reply: As per information available as on date no PAFs is expected to become land less. However, this aspect will be taken care at the time of acquisition of land and in case there is some case wherein the land loser is becoming land less the suitable compensation/alternative land/house will be provided as per the provisions of State/Govt. of India R&R Act.

Query 8: Longitudinal section of Pressure shaft/Water Conductor System shall be submitted.

Reply: Typical section of Longitudinal section of Pressure shaft/Water Conductor System has been submitted

Query 9: Whether any fish hatcheries/fish catch is allotted by the State fisheries within the project vicinity and NOC/confirmation may be obtained in this regard.

Reply: As per physical survey of the project area in the Gandhi Sagar Reservoir no fish cages have been observed. However, as desired NOC will be obtained in due course of time.

The EAC after examining the information submitted and detailed deliberations ***recommended*** *the proposal for grant of Environmental Clearance by the Ministry to MP30 Gandhi Sagar Off Stream Pumped Storage Project (1440 MW) in an area of 402.50 ha by M/s Greenko Energies Private Limited in village Khemla Block, Tehsil Rampur, District Neemuch, Madhya Pradesh under the provisions of EIA Notification, 2006 and subsequent amendments/circulars with subject to extra information sought by the EAC committee, compliance of applicable Standard EC conditions with the following additional conditions:*

i. *Families those are losing their entire agricultural land or left with <1 Ha of their land, at least one member from such families will be getting job in project as per their qualifications.*
ii. *Safe and secured passage to empty the reservoir in case of leakage or any catastrophic events shall be carried out.*
iii. *Rain water harvesting shall be carried out. Surplus water and harvested rain water shall be used as irrigation in area*
iv. *Compensatory afforestation done by Forest Department, the survival rate of plants shall maintain more than 95%.*
v. *PP shall ensure the Ambient Air Quality Monitoring Stations for real time data display and regularly submit to respective Ro, MoEF&CC.*
vi. *The Environmental Management Plan (EMP) shall be strictly adhered to as submitted in the EIA/EMP report. 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.*
vii. *The status of compliance will be submitted to the regional Office of the Ministry along with six monthly compliance report.*
viii. *A multi-specialty hospital to cater the need of people living within 10 km radius of the project shall be established.*
ix. *Solar lights and associated solar panels be provided to the families living in rural areas within 10 km radius of project*
x. *Computer labs with internet facility shall be established in primary schools within 10 km radius of project.*
xi. *Sport complex with multi- sport facility shall be established. The children's from economically weaker section shall be given free of cost sport facility.*
xii. *The Multi-Disciplinary Committee needs to be reconstituted and the meeting needs to be held at regular interval.*
xiii. *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.

xiv. *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.*

xv. *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.*

xvi. *Necessary permission to be obtained for quarrying construction materials, if any required, for the project as per the EIA Notification, 2006 and as amended thereof.*

xvii. *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 paripassu with construction work.*

xviii. *After detailed geological study of muck, re-utilization of muck during the construction of dam is to be carried out.*

xix. *A detailed ecological monitoring and survey covering forestry, fisheries, wildlife and its habitat shall be done once in two years. Monitoring report shall be uploaded on the Parivesh Portal and a copy of the same be submitted to the Regional Office of MoEF&CC.*

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

AgendaNo.15.3

Rammam Hydroelectric Power Project Stage-III (3x40 MW) is a Run of the River in an area of 74.077 ha by M/s NTPC Limited in Tehsil Soreng & Darjeeling Pulbazar, District Darjeeling of State West Bengal & West Sikkim of StateSikkim - Environmental Clearances - Reg.

[Proposal No. IA/WB/RIV/162957/2020; F. No. J-12011/11/2020-IA.I (R)]

15.3.1 The proposal is for grant of Environmental Clearances to Rammam Hydroelectric Power Project Stage-III (3x40 MW) in an area of 74.077 ha by M/s NTPC Limited in Tehsil Soreng & Darjeeling Pulbazar, District Darjeeling of State West Bengal & West Sikkim of State Sikkim.

15.3.2 The details of the project submitted by project proponent and ascertained from the document submitted are mentioned below:

i. M/s NTPC Limited is constructing Rammam Hydro Electric Power Project (HEPP), Stage III (3x40 MW) in Darjeeling District of West Bengal. The project is located on Rammam River, which flows along the border of West Bengal and Sikkim at about 50 km from Ghoom and 130 km from Siliguri on Siliguri-Darjeeling Road in District Darjeeling of West Bengal.

ii. MoEF&CC accorded the Environmental Clearance (EC) vide letter No. J-12011/42/2007-IA.I dated 17.08.2007 with a validity period of 10 years. Further, MoEF&CC vide its letter dated 13.07.2017, extended the validity of EC for a further period of 3 years i.e. up to 16.08.2020. MOEF&CC vide Notification dated 18.01.2021 has amended the EIA Notification, 2006 and made a provision that period from 01.04.2020 to the 31.03.2021 shall not be considered for the purpose of calculation of the period of validity of prior Environmental Clearance in view of outbreak of Corona Virus (COVID-19) and subsequent lockdowns. Hence, the Environment Clearance for Rammam HEPP is valid till 16.08.2021.

iii. Rammam Stage-III H.E Project is a Run of the River (ROR) scheme utilizing power potential of Rammam River from elevation 900 m to 397 m, in the District of Darjeeling, West Bengal with an installed capacity of 120 MW (3x40 MW). All the major project components are located in the State of West Bengal except the right abutments of the Barrage structure and a portion of submergence area in Siktam Block of West Sikkim.A surface powerhouse is proposed with 03 units of 40 MW capacity each. About 347 families from 6 villages of West Bengal and 3 villages of Sikkim are affected by this project, which have been rehabilitated

iv. Rammam HEPP, which is under advance stage of construction and more than 50% work has been completed, it is exempted from requirement of public hearing as per MoEF&CC Notification S.O. 1247(E) dated 18.03.2021.

v. The MoEF&CC granted the ToR for the proposed project vide F. No. J-12011/11/2020-IA-I (R) dated 12th February, 2021. M/S SV Enviro Labs & Consultants a NABET-QCI Accredited firm has been entrusted to conduct an Environmental Impact Assessment (EIA) for the project.

vi. **Project Components**:

- The project consists of 23 m high Barrage (above u/s apron level) 122.5m long Barrage near Lodhama Village.
- Approximately 10.75km of water conductor system (8.2 km long 3.5m dia horse shoe shape head race tunnel, 1.6 km long Penstock and 0.74 km long tailrace channel etc.).
- It has also a 14.5 m dia 53.75m high surge shaft.
- A deep seated surface power house near Barbatia village on right bank of the Rammam River.
- It envisaged to use water from catchment area of 247sq. km.
- The Full Reservoir Level (FRL) of the pondage behind the Barrage structure has been fixed at EL903m with a view to provide sufficient storage capacity above Minimum Draw Down Level to provide optimum peaking operation of more than 2 hours at a time.
- The Minimum Draw Down Level (MDDL) is fixed at EL 892m.

- The storage at FRL is 0.27MCM and at MDDL is 0.05MCM.

vii. **Salient Features of the Project:**

1	**LOCATION**		
	a)	State	West Bengal
	b)	District	Darjeeling
	c)	Latitude & Longitude	Diversion Structure: 27°06'47"N, 88°08'39"E Township: 27°07'47"N, 88°12'55"E Power House: 27°07'25"N,88°13'20"E
	d)	Nearest rail head	New Jalpaiguri (115KM)
	e)	Nearest Airport	Bagdogra (110KM)
	f)	Approach/Access Road	50Km From Ghoom (Siliguri-Darjeeling Road), 130KM From Siliguri
	g)	Name of the River, Tributary	Rammam
	h)	Name of River basin	Teesta Basin
2	**HYDROLOGY AND CLIMATE**		
	a)	Catchment Area up to head works	247sq.km
	b)	Average Annual Yield	686.56 MCM
	c)	Maximum/Minimum Yield	1040.37/ 485.65MCM
	d)	Average annual rainfall	2800 mm
	e)	Design Flood	1825 cumecs
	f)	Ninety percent available discharge	15.43 cumecs
	g)	Max. temperature	30° C
	h)	Min. temperature	3° C
	i)	Max. relative humidity	100%
	j)	Design discharge for barrage/dam	1825 cumecs
3	**BARRAGE/DAM**		
	a)	Length of Barrage	122.5 m
	b)	Height of Barrage	23 m (above u/s apron level)
	c)	Number of gated bays	5
	d)	Type of gate	Radial Gate (operated by hydraulic hoists)
	e)	Crest elevation	884.00 m (4bays)/882.00 m (1bay)
	f)	Width of the top roadway	6.5 m
4	**RESERVOIR**		
	a)	Full Reservoir Level (FRL)	903.00 m

	b)	Maximum Drawdown Level (MDDL)	892.00 m
5	**INTAKE**		
	a)	No of Intake	2
	b)	Design discharge of Intake	33.0 m3/sec
	d)	Center line of Intake	EL 887.50 m
	e)	Nos. and size of Gates	2 (2.60 m x 2.850 m) each
	f)	Type of Gates	Fixed Wheel
	g)	Intake Bulk Head Gate	1 No. 2.60 x 2.85 m fixed wheel type
6	**DESILTING CHAMBER (Underground)**		
	a)	Numbers	2
	b)	Size	140.0 x 7.50 x 12.55m
	c)	Top level of trough	EL. 876.85 m
	d)	Bottom Level of Conduits	EL. 875.85 m
	e)	Design discharge	33.0 cumec
	f)	Discharge (for flushing)	4.69cumec (for both SFT)
	g)	Particle size to be removed	0.2 mm & above
	h)	Efficiency of removal	90 %
7	**HEAD RACE TUNNEL**		
	a)	Alignment	Right bank
	b)	Length	8200 m
	c)	Shape & Diameter	Horseshoe & 3.5 m diameter
	d)	Design discharge	28.31 m3/sec.
	e)	Velocity	1.93m/sec.
	f)	Number of adits	3
8	**SURGE SHAFT**		
	a)	Type	Restricted orifice type
	b)	Dia (m)	14.50
	c)	Height (m)	53.75 m
	d)	Top Elevation (m)	923.0
	e)	Bottom Elevation (m)	869.25
9	**PRESSURE SHAFT / PENSTOCK**		
	a)	Type	Circular
	b)	Number of Pressure Shafts /	One
	c)	Penstocks	Circular
	d)	Maximum discharge through pressure shaft / penstocks (cumecs)	
	e)	Dia. of each pressure shaft / penstock	2.7 m
	f)	Maximum Velocity	4.9 m / sec
	g)	Length of pressure shaft / penstock	1526 m
	a)	Penstock valve (type & dia)	Butterfly, 2.5 m dia

10	**POWER HOUSE**		
	a)	Type	Deep Seated Surface Power House
	b)	Location	Near village Barbatia in West Bengal
	c)	Number of units	3
		Size of Power House	73.50 m x 22.40 m x 41.60 m
	d)	Rated unit capacity	40 MW
	e)	Installed capacity	120 MW
	f)	Max. Gross Head	495.33 m
	g)	Rated Head (m)	484.33 m
	h)	Type of turbine	Vertical shaft pelton
	i)	Maximum flow through each unit	9.33 cumec
	j)	Generator	
		- Type - Power factor, generator voltage - Speed	Synchronous, Vertical Shaft 0.9, 11.0 kV 428.6 rpm
	k)	Size of machine hall	65.0 x 19 x 35m
	l)	Transformers – Type, Nos., No. of Phases, step – up voltage capacity	Single phase, 11 Nos., 16 mVA, 11/132/ √3 kV
	m)	Power House Cranes	
		- Nos. and Capacity (Ton)	1 EOT Crane with 125 T main hook & 25 T auxiliary hook
11	**TAIL RACE CHANNEL**		
	a)	Size	4m x 3m, Rectangular Section
	b)	Length	740 m
	c)	Tail Water Level	397.0 m (max.)
12	**SWITCHYARD**		
	a)	Type of Switchyard	Conventional
	b)	Number of bays in the switchyard	9
	c)	Voltage Level	132 kV
	d)	Location	Outdoor
13	**ENVIRONMENTAL SENSITIVITY**		
	Singalila National Park		None of the project components are within the Eco-sensitive zone of Singlila National Park notified by MOEF&CC notification No. S.O. 3613 (E) dated 16.11.2017 (copy enclosed as Annexure-XV). The nearest boundary of Singalila National Park Eco-Sensitive Zone is located at about 7.1 km from

		the Rammam Stage-III HEPP. However, the Singalila National Park is about 9.0 km from the project components
	9.0 km from the project components.	None of the project components are within the Eco-sensitive zone of Barsey Rhododendron wild life Sanctuary notified by MOEF&CC notification No.S.O.2172 (E) dated 27.08.2014 (copy enclosed as Annexure-XVI). The nearest boundary of Barsey Rhododendron Wildlife Sanctuary Eco-sensitive Zone is about 4.2 km from the Rammam Stage-III HEPP. However, the Barsey Rhododendron Wildlife Sanctuary is about 4.4 km from the project components.
14	**R & R**	• 275 families have lost only land. • 61 families have lost land as well as homesteads. • 11 families have lost only homesteads
15	**TARIFF (As per Investment approval)**	
	Levellised	Rs. 6.51 k Whr
	First years	Rs. 7.88 k Whr
16	**PROJECT COST**	
	Total Cost of the Project	• As per EC: Rs. 633.92 Crores • As per Inv. Approval: Rs. 1,381.84 Crores (2ndQtr, 2014)

viii. **Ambient Air Quality:** The ambient air quality representing PM10, PM2.5 Sulfur Dioxide (SO2), Nitrogen Oxides (NOx), Carbon Monoxide (CO) was monitored at seven different locations for 24 hours twice a week from July' 2020 to September' 2020. Volatile Organic Carbons (VOCs), Methane (CH4), non-methane hydrocarbons (NMHCs), Ozone, Ammonia, Lead (Pb), Benzene (C6H6), Benzo(a) pyrene (BaP), Arsenic (As), Nickel (Ni) were monitored for the same period. All the parameters were found to be below the National Ambient Air Quality Standards (NAAQS), 2009. The average 24 hourly PM10 at monitoring locations ranged between 29.0-66.9 µg/m3 (NAAQS-100 µg/m3). The average 24 hourly PM2.5 at monitoring locations ranged between 8.1-33.0 µg/m3 (NAAQS-60 µg/m3). The average 24 hourly SO2 at monitoring locations ranged between 6.8-13.1 µg/m3 (NAAQS-80 µg/m3). The average 24 hourly NOx at monitoring locations ranged between 7.2-14.6 µg/m3 (NAAQS-80 µg/m3). The average 24 hourly CO at monitoring locations ranged between 0.10-0.30 µg/m3 (NAAQS-4.0 mg/m3). The average 24 hourly O3 at monitoring locations ranged between 9.2-44.2 µg/m3 (NAAQS-180 µg/m3). Ammonia (NH3, Lead (Pb), Benzene (C6H6), Benzo(a) pyrene (BaP), Arsenic (As), Nickel (Ni), HC (methane and non-methane Hydro Carbon), Volatile Organic Carbon (VOC) - are remained below detection limit (BDL) in the study area.

ix. **Ambient Noise Levels:** The noise quality was monitored for 24 hours at seven locations in and around the project site. The ambient noise quality at day and night was in compliance to the Noise Limits set for the residential area as per Noise Pollution (Control and Regulations), 2000. The daytime noise level was found in the range between 50.8-62.5 dB (A) whereas the night time noise level was found in the range between 42.6-55.6 dB(A).

x. **Geology**: Geologically, three important groups of rocks observed in the vicinity of the project area. They are older Daling group, younger Gondwana group and older Daling/Buxa group. No major occurrence of economic deposit has been found in the study area, except materials like boulder, pebbles, sand that bears no economic mineral importance, being utilized as construction material.

xi. **Hydrogeology:**The major water bearing formations are Darjeeling, Daling and Gondwana groups where ground water occurs in weathered zones, joints and fractures. The project area is characterized by hilly terrain - it acts as a recharge area where surface runoff is very high, has limited infiltration in the intermountain valleys. Ground water is harnessed using perennial springs and jhoras. The discharge of most of the springs ranges from 1 to 50 lpm during lean period and a few jhorasikholas give discharge in the range of 50 to 500 lpm. Piedmont zone with high permeability, sloping topography and sub-surface runoff is characterised by poor to moderate yield ranging from 5 to 50 cum per hour. Aquifers in alluvial plain are highly potential with yield prospects ranging from 50 to 150 cum per hour. Aquifers at 200m below ground level with expected yield of 27 litres per second are reported. Water level fluctuation is in the order of 2 to 6 m in the northern foot hill part and less than 2m in the central and southern parts.

xii. **Groundwater Quality:** Groundwater was collected and analyzed as per IS: 10500:2012 from six locations in the study area. All the parameters analyzed were under the acceptable and permissible limit of IS: 10500:2012. Heavy metals were found to be below detection limit.

xiii. **Surface Water Quality:** Surface water was sampled from six representative locations. The water samples were analyzed and compared as per IS 2296. The pH of the surface water samples varied from 6.8-7.2. The DO levels at all the locations exhibited values ranging from 5.1-6.1 mg/l. Nitrate content of all collected surface water sample ranges from 0.14-0.31 mg/l. TDS and Total hardness was found to be 71 mg/l to 86 mg/l and 24 mg/l to 36 mg/l respectively.The total coliform count of the surface water samples varied between440MPN/100 ml to 480MPN/100 ml. All the heavy metals were found to be within below detectable limits. However, the water quality is not coming under any class designated by CPCB Water Use Criteria, but during the field visit, it has been observed that the water is being used for irrigation, bathing, cleaning and for catching fishes

xiv. **Soil:** The pH of the soils is acidic in nature. The electrical conductivity in the study area is varying from 52.3 to 62.9 micro-mhos/ cm (µmhos/cm). This is average for germination. Nitrogen, phosphorus, potassium and organic Carbon are very less sufficient level for crops. Residual soils are well developed on level summits of lesser Himalayas, sub-soils are deep and heavily textured. High contents of organic matter are found in its `A' horizon and are acidic in nature. The soils in the region are average fertile enough for cultivation of crops.

xv. **Biological Environment:** Baseline Survey (Primary data through site visit) and Secondary data received from Forest Department's Website and other published and unpublished document regarding sensitive ecological habitat and sensitive flora and fauna in the study area. The study area has an undulating topography characterized by hills, hillocks (Locally known as tillah), wide plains, and low-lying waterlogged areas (locally known as beels). The vegetation is mixed evergreen and deciduous forest and in this region, forests are degraded due to development of Tea Estates and Rubber plantations.

xvi. **E-flow**: Environmental clearance for Rammam HEPP the projects was accorded with a condition that "*iv) A minimum flow of 1 cumec shall always be released from the barrage. The minimum flow to be released is about 22% of the minimum flow of 4.47 cumec recorded in the river*." The change in minimum flow as per Standard TOR at this stage shall drastically reduce the power generation from the project and render the project commercially unviable. In view of the above, NTPC Rammam HEPP will maintain the minimum Environmental flow of 1 cumecs as stipulated in the original environmental clearance.

xvii. **Fish pass:** Snow trout (Schizothoraxrichardsonii) is the endemic species. The barrage of the project will act as a barrier to the free movement of fish species. There are no satisfactory fish passes available for snow trout. A comprehensive fish management plan including construction of a hatchery is proposed to be

implemented in consultation with Fisheries Department, Govt. of West Bengal and Fisheries Department of Sikkim.

xviii. **Land Requirement:** The total land required for the project is 74.077 Ha of which 66.77 Ha is acquired in West Bengal and the balance 7.3 Ha is acquired in Sikkim. The entire land for the project has already been acquired.The submergence area is 3.852 Ha, which is located in upstream of confluence of Rammam River near Lodhama Village in the Darjeeling district.

xix. **Ecological Sensitive Area:** There is no wildlife corridors in study area. Singalila National Park is located at about 9 km from the Rammam Stage-III HEPP. The nearest distance between the project and the boundary of eco-sensitive zone in 7.1 km. The nearest boundary of Barsey Rhododendron Wildlife Sanctuary Eco-sensitive Zone is about 4.2 km from the Rammam Stage-III HEPP. However, the Barsey Rhododendron Wildlife Sanctuary is about 4.4 km from the project components.

xx. **Muck Disposal Areas**: Muck of 0.99 Mm^3 is expected to be generated from construction of project. Out of which 0.40 Mm^3 is being utilized as construction material. At the present the dumping sites are already identified for muck disposal. The balance 0.59 Mm^3 muck shall be disposed at designated/identified site in a planned manner so that it takes a least possible space and is not hazardous to the environment. An area of 6.66 Ha has been earmarked which can cater the entire quantity of muck to be disposed. About 0.132 Mm^3 of aggregate is utilized for filling and construction works from muck generated during excavation of underground works like HRT and desilting chamber. A toe wall has been created around the muck disposal site and more landscaping to be done in the muck site.

xxi. **Rehabilitation and Resettlement Plan:** Acquiring the stretches of hilly agricultural as well as homestead land for its project is likely to affect/displace number of people. Accordingly, as per the R&R Policy of NTPC as well as Government of West Bengal and Sikkim, NTPC initiated measures to resettle and rehabilitate Project Affected Persons (PAPs) with the objective that the PAPs will improve or at least regain their previous standard of living.The Rehabilitation Action Plan (RAP) is formulated so that after a reasonable transition period, the displaced/affected persons improve, or at least regain their previous standard of living, earning capacity and production levels. The transition gap also is to be reduced to a minimum.

xxii. **Environmental Management Plan:** The total amount cost for implementation of Environmental Management Plan (EMP) is Rs. 3269.1 lakh (excluding cost required for cost of trees and NPV of forest land acquired).

S. No.	Item	Cost (Rs. lakh)
1.	Sanitary facilities in labour camps	41.0
2.	Solid waste management	53.5

3.	Provision for free fuelwood distribution	78.6
4.	Environmental Management in road construction	99.0
5.	Management of muck disposal sites	103.1
6.	Landscaping and restoration of construction sites	20.0
7.	Greenbelt development	15.0
8.	Compensatory afforestation	15.9
9.	Public Health Delivery System	250.0
10.	Construction of settling tanks	20.0
11.	Sustenance of riverine fisheries	65.0
12.	Wildlife Conservation	83.7
13.	Setting up Environmental Laboratory	30.0
14.	Catchment Area Treatment Plan	320.8
15.	Resettlement & Rehabilitation Plan including CD	1903.0
16.	Cost of noise meter	0.5
17.	Env. Monitoring Programme during construction	70.0
18.	Contingencies	100.0
	Total	**3269.1**

xxiii. **Project benefit:** The project will provide impetus to the development of the area and also provide green energy i.e. hydro-electric power. Various infrastructure like roads, bridges, schools buildings, community center has been developed by project. Various welfare and development activities are being implemented as per CD/CER/CSR plan. The estimated no. of employees during operation phase of the project is estimated to be about 50. Considering the staff of CISF and support services, it is estimated that about 100 families will reside in the project township during operation stage. However, during construction stage, the number of workers are about 1000.

xxiv. **Public hearing:** PH was conducted in WB on 27.04.2007 and in Sikkim on 04.05.2007, based on which EC was accorded on 17.08.2007. As the project is under advance stage of construction and more than 50% has been completed, it is exempted from requirement of fresh public hearing as per MoEF&CC Notification S.O. 1247(E) dated 18.03.2021.

xxiii. **Status of other statutory clearances:** The construction of the project was started after obtaining all statutory clearances, such as Techno Economic Clearance (TEC) by CEA (dated 12.09.2006, re-validated on 01.08.2013), NOC from Ministry of Defense (20.01.2006), EC by MOEF&CC (vide letter No. J-12011/42/2007- IA.I dated 17.08.2007, extended up to 16.08.2020 and then up to 16.08.2021), Wildlife Clearance by Directorate of Forest, GoWB (01.02.2008), Final Forest Clearance by MOEF&CC (23.05.2008), Consent to Establish from West Bengal Pollution Control Board and SPCB, Sikkim. The project site was inspected by Integrated Regional Office, MOEF&CC Kolkata on 23.03.2021 and 24.03.2021. Certified Report No:

102-166/07/EPE dated 06.04.2021 from MoEF&CC, Integrated Regional Office, Kolkata.

15.3.3 The EAC in the present meeting (15th meeting) deliberated on the information submitted (Form 2, EIA/EMP report, kml file, etc.) and as presented in the meeting. The EAC during deliberations noted that the proposal is for grant of Environmental Clearances to Rammam Hydroelectric Power Project Stage-III (3x40 MW) in an area of 74.077 ha by M/s NTPC Limited in Tehsil Soreng & Darjeeling Pulbazar, District Darjeeling of State West Bengal & West Sikkim of State Sikkim.

MoEF&CC accorded the Environmental Clearance (EC) vide letter no. J-12011/42/2007-IA.I dated 17.08.2007 with a validity period of 10 years. Further, MoEF&CC vide its letter dated 13.07.2017, extended the validity of EC for a further period of 3 years i.e. up to 16.08.2020. MOEF&CC vide Notification dated 18.01.2021 has amended the EIA Notification, 2006 and made a provision that period from 01.04.2020 to the 31.03.2021. PP has requested for grant of Environmental Clearances as project could not commence in stipulated time.

The MoEF&CC granted the ToR for the proposed project vide letter dated 12th February 2021. The total land required for the project is 74.077 Ha of which 66.77 Ha is acquired in West Bengal and the balance 7.3Ha is acquired in Sikkim. The entire land for the project has already been acquired. PH was conducted in WB on 27.04.2007 and in Sikkim on 04.05.2007, based on which EC was accorded on 17.08.2007. As the project is under advance stage of construction and more than 50% has been completed, it is exempted from requirement of fresh public hearing as per MoEF&CC Notification S.O. 1247(E) dated 18.03.2021.

The project site was inspected by Integrated Regional Office, MOEF&CC Kolkata on 23.03.2021 and 24.03.2021. Certified Report No: 102-166/07/EPE dated 06.04.2021 from MoEF&CC, Integrated Regional Office, Kolkata. The Ro, MoEF&CC recommended that "*No non-compliances detected. No any further action is required"*

15.3.4 *The EAC after deliberations recommended the proposal for grant of Environmental Clearance by the Ministry to Rammam Hydroelectric Power Project Stage-III (3x40 MW) in an area of 74.077 ha by M/s NTPC Limited in Tehsil Soreng & Darjeeling Pulbazar, District Darjeeling of State West Bengal & West Sikkim of State Sikkim with subject to compliance of applicable Standard EC conditions with the following additional conditions:*

i. *The Environmental Management Plan (EMP) shall be strictly adhered to as submitted in the EIA/EMP report. 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. *Environment matrix provided in EMP be revised if any data change. Number and period of stocking of Fish be incorporated in EMP.*
iii. *Pasture Development Plan be revised in terms of Rate of plantation and their Cost.*

iv. *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.*

v. *Certain geological changes or catastrophic event within 10km region, every two year data shall be submitted to RO, MoEF&CC.*

vi. *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.*

vii. *PP shall ensure the Ambient Air Quality Monitoring Stations for real time data display and regularly submit to respective Ro, MoEF&CC.*

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

ix. *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.*

x. *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.*

xi. *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.*

xii. *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 shall be disposed safely and that it does not pollute the natural streams and water bodies in surrounding area. Report of the same to be submitted to Ministry and its Regional office.*

xiii. *A multi-specialty hospital to cater the need of people living within 10 km radius of the project shall be established.*

xiv. *Solar panel be provided to the families living in rural areas within 10 km radius of project.*

xv. *The e-flow shall continue to be released as per the previous EC granted to the project. Additionally, as committed.*

xvi. *Computer labs with internet facility shall be established in primary schools within 10 km radius of project.*

xvii. *Sport complex with multi-sport facility shall be established. The children's from economically weaker section shall be given free of cost sport facility.*

xviii. *A time bound action plan for compliance of each of the above condition will be submitted to RO, MoEF&CC within 3months.*

xix. *The Multi-Disciplinary Committee needs to be reconstituted and the meeting needs to be held at regular interval.*

xx. *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.*

xxi. *All the specific conditions mentioned in the EC dated 17.08.2007 shall be complied within stipulated time.*

xxii. *In view of proximity of the project from Singalila National Park, Barsey Rhododendron Wildlife Sanctuary the PP shall obtain necessary permissions from NBWL, if applicable.*

xxiii. *Keeping in view the rich bio-diversity of the area, the PP shall establish a herbal park in the project area in consultation with the Forest department and carry out its maintenance for at least for 5 years after completion of the project.*

AgendaNo.15.4

Vishnugad-Pipalkoti Hydro-Electric Project of 444 MW in an area of 141.568 ha by M/s THDC India Limited in Thesil Joshimath, District Chamoli, Uttarakhand-Environmental Clearances - Reg.

[Proposal No. IA/UK/RIV/164607/2020; F. No. J-12011/10/2020-IA.I (R)]

15.4.1 The proposal is for grant of Environmental Clearance to Vishnugad-Pipalkoti Hydro-Electric Project of 444 MW in an area of 141.568 ha by M/s THDC India Limited in Thesil Joshimath, District Chamoli, Uttarakhand.

15.4.2 The details of the project submitted by project proponent and ascertained from the document submitted are mentioned below:

i. M/s THDC India Limited, a schedule-A mini-Ratna PSU under the administrative control of Power Ministry, has signed a MoU with Govt. of Uttarakhand for the construction of 444MW Vishnugad-Pipalkoti Hydro-Electric project (VPHEP) in District Chamoli, Uttarakhand. VPHEP (4 x 111 MW) is located on river Alaknanda, a major tributary of river Ganga, in district Chamoli in the state of Uttarakhand.

ii. It is a run-of-the river hydro power project & envisages construction of a diversion dam of 65 m height near village Helong (79°29'30" E and 30°30'50" N). An underground power house is being constructed at village Haat (79°24'56" E and 30°25'31"N), 3 km from Pipalkoti. The nearest railway station is at Rishikesh about 225 km from project site.

iii. The project and all its major components are located on right bank of the river Alaknanda. Project is accessible through National Highway NH-58 (Ghaziabad-Rishikesh Pipalkoti-Joshimath) which is located on the left bank of the river.

iv. VPHEP is suited to help in providing peaking power to the national grid. Once commissioned, the project will provide 1657.09 million units (with 95% machine availability) of electricity each year to the Northern Region to meet India's growing energy needs.

v. Environmental Clearance was granted to Vishnugad-Pipalkoti Hydro-Electric Project by MoEF&CC vide letter no. J-12011/29/2007-IA-I dated 22nd August 2007 for 10 years which was further extended vide letter no. J-12011/29/2007-IA-I dated 25th April 2018 and was valid upto 21st August, 2020. Also, MoEF&CC issued notification dated 18.01.2021 specified that the period from 1st April, 2020 to 31st March, 2021 shall not be considered for the purpose of calculation of the period of validity of Environmental Clearance in view of outbreak of Corona Virus (COVID-19). The validity of above notification is extended upto 31.12.2021 vide MoEF&CC notification dated 16.06.2021. Accordingly, Validity of Environmental Clearance of the project is extended upto 31.12.2021 (fact submitted need to be checked)

vi. The Terms of Reference (ToR) for the Rapid EIA study based on one season has been issued vide MoEF&CC letter no. J-12011/10/2020-IA-I(R) dated 02nd March, 2021. In ToR Public hearing was exempted as project is in advanced stage of construction.

vii. **Salient features of the project:**

1. LOCATION	
State	Uttarakhand
Distt.	Chamoli
River	Alaknanda
Damsite	Near Village Helong (E- 79˚29'30", N-30˚30'50")
PowerHouse(PH)site(underground)	NearVillageHat(E-79˚24'56", N-30˚25'31")
2.HYDROLOGY	
Catchment Area at Dam Site	4672km^2
Annual mean flow	5682.6Mcum
Submergence area	24.5ha
Design Flood	SPF6700m^3/sec (For Design) PMF10840m^3/sec (For Checking)
Diversion Flood (1:25yr Non-monsoon flood)	725m^3/sec
3. RESERVOIR	
Full reservoir level	EL1267m
Maximum Water Level	EL1269.5 m(PMF)
Minimum Draw Down Level	EL1252.5 m
Gross storage at FRL	3.63Mcum
Storage at MDDL	1.16Mcum
Live storage	2.47Mcum
Surface Area at FRL	24.5ha
4.DIVERSION ARRANGEMENT	
A. Diversion Tunnel	
Location	Left bank

Length	559m (494m tunnel and 65m cut & cover)
Diameter	10.5 m,Circular
Design Discharge	725m^3/sec
Gates	4mx10.5m,Vertical lift fixed wheel
Invert level at Entry	1224m
B.U/S Coffer Dam	
Type	Colcrete
Length	60m
Height	24m
Top Elevation	EL1242m
C. D/SC offer dam	
Type	Rockfill
Length	40m
Height	7.5m
TopEL.	EL.1222.5 m
5.DIVERSION DAM	
Type of dam	Concrete, gravity dam
Height of dam above deepest foundation level	65m
Top of dam	EL1270m
River bed level	EL1225m
Foundation level	EL1205 m
Length	98.85m(NOF31.85 m, OF67m)
6.SPILLING ARRANGEMENT	
A. Sluices:	
Nos.	5
Design Flood	10840m^3 /sec
Size of sluice	7.8m (W) x 16m (H)
Type of gate	Radial Stoplog (1no. 7.8m x 22.5m)
Crest level of sluice	1233m
B. Diversion cum Spillway Tunnel	Diameter10.5m (Φ) ,Circular
Invert level at Entry	1249m
Length	100m
Design Discharge	1578m^3/sec
Gate	2+1no., 4 mx10.5(Vertical lift fixed wheel Gate)
C. Spill Tunnel (12mΦ)	
Size	12mΦ, Circular
Invert level at Entry	1245m
Length	250m
Design Discharge	1618m^3/sec
Gate	2+1no.,4.8mx12m(Vertical lift fixed wheel Gate)
6. POWER INTAKE	
Location	Right bank

Nos.	3
Type	Straight intake with bellmouth
Maximum discharge	274.63m^3/sec
Intake invert level	EL1242.5m
Size	3+3nos.5.20mx 6.2 Horseshoe type
Gates	Vertical lift fixed wheel gate (service gate + emergency gate)
Silt Flushing Tunnel (Below Intake)	
Size of Intake	3nos. of 3m x 3m
Size of SFT ducts	3 nos.of 2m x 5m
Gate	3+3nos. of 3m x 3m
Design Discharge Capacity	378cumec
7.DESILTINGCHAMBER	
Nos.	3
Size	390m (L) x 16m (W) x 21.25m (H)
Particle size to be removed	0.2 mm & above
Gates	3nos.5.24m x 6 m (H),Vertical lift fixed wheel
Gate chamber	6m (W) x 9m (H) x 155 m (L)
Operation level	EL1270m
Silt Flushing Tunnel:	
Size	3.6mx4.0m (D shaped)
Flushing discharge	45.8m^3/sec
Length	680m
Gates	3nos.1.8 m x 2.12m,(Vertical lift slide Gate)
Gate chamber	4.8mx 4.8m x 118m
Operation level	EL1233.5 m
8. HEAD RACE TUNNEL	
Length	13.4km(1.4km by DBM & 12.0km TBM)
Diameter	8.8 m Circular
Design discharge	228.86m^3/sec
Velocity	3.76m/sec
Bed slope(average)	1:222 (upstream of Maina River) 1:321(Downstream of Maina River)
No. of adits	2
9.UPSTREAM SURGE SHAFT	
Type	Restricted Orifice type
Diameter	15/22mΦ (15mΦ from EL.1165m to EL.1236m) (22mΦ from EL.1236m to EL.1309m)
Height (from HRT invert)	154m
Top EL	1309m
Orifice level	1165m
Orifice diameter	1.5m,3nos

Tunnel invert	EL1155m
Maximum surge level	1307.42 m
Minimum surge level	1209.24m
Pressure shaft gates	2nos.,4.2m x 5.2m
10. BUTTERFLY VALVE CHAMBER	
Size	50m (L) x 9.8m (W) x 19m (H)
Butterfly Valve	2nos.,5.2m
11.PRESSURE SHAFT	
Nos.	2/4
Type	Circular-vertical
Diameter	5.2m/3.65m
Length of each PS	466.4m/51m
Design velocity	5.39m/sec
12. POWERHOUSE	
Type	Underground
Size of P/H cavern	146m x 20.3m x 48m
Size of Transformer cavern	140.3m x15m x 25.5m
Nos. of units	4
Rated unit capacity	111MW
Installed capacity	4x 111 MW=444MW
Gross Head	237.0 m
Rated Head	212.46m
Centre line of unit	EL1022.0 m
Service bay level	EL1036m
Maximum flow through each unit	57.22m^3/sec
Generator:	
Synchronous speed of Generator	250rpm
Power factor, Generator voltage	0.9,13.8 kV
Excitation system	Quick response static
Transformers-Type, Nos., No. of Phases,	OFWF, 4, 3, single phase, 46MVA, 13.8/420/3kV.
Step-up voltage, Capacity	400kV
14.D/S SURGE TANK	
Type	Underground
Size	150m (L) x 13m (W) x 27m (H)
Maximum Surge level	1040.8m
Minimum Surge level	1022.37 m
15. TAIL RACE TUNNEL	
a)Size	9.1 m Φ, (circular)
b)Length	3.07km
c)Max.TWL	1030.0m(with all M/C running)
d)Min.TWL	1028.2 m(with 10% load)
e)TRTinvertlevel	EL1020.6 (at Outlet) crest level of weir at outlet is1027m.
16.SWITCH YARD	

a)Type of Switch yard	GIS
b)No. of bays in the switch yard	7 bays
c)Voltage level	420kV
d)Size of pot yard	40mx84m
17. POWER GENERATION	
a)Firm power	74.69MW
b)Annual Energy	1677.40GWh
c)Load factor(lean flow)	16.82%
d)Design Energy	1657.09GWh
18.PROJECT COST	
Total cost	Rs.3860.35Cr
19.TARIFF	
First year tariff	Rs.4.71 *I*kWh
Levelised tariff	Rs.4.52/ kWh

viii. **Ambient Air Quality:** The average concentration of PM10 at various monitoring stations ranged from 52.6 to 57.1□g/m3 in post-monsoon season. The highest PM10 value was recorded as 61.7µg/m3 at Fabrication Yard, Near Dam Site and lowest value of 47.5□g/m3 was recorded at Siyasain Club House. The average concentration of PM2.5 at various monitoring stations monitored ranged from 33.5 to 38.9µg/m3 in post-monsoon season. The highest PM2.5 value was recorded as 47.4µg/m3 at Durgapur Village, Near TRT Point and lowest value of 30µg/m3 was recorded at Gulabkoti Village, Near Dump Yard and Fabrication Yard, Near Dam Site. The average concentration of SO2 at various stations monitored ranged from 7.9 to 10.4.

ix. **Ambient Noise Levels:** The noise levels were monitored continuously from 6AM to 9PM at each location and hourly equivalent noise level was measured. The day time equivalent noise level at various sampling stations ranged from 51.32 to 54.82 dB(A) and night time equivalent noise level at various sampling stations ranged from 43.50 to 40.25 in post-monsoon season. The noise levels were observed to be well within permissible limit (55 dB(A)) specified for residential area.

x. **Soil:** The pH in various soil samples ranged from 6.98 to 7.84 in post-monsoon season, which indicates that neutral range having slight alkalinity. The low EC values ranging between 225 - 351 µS/cm indicate lower salt content in soils. It is an important indicator of soil health as it affects crop yields, crop suitability, plant nutrient availability, and activity of soil microorganisms. Excess salts in soil hinder plant growth by disturbing the soil-water Balance. The texture of soil in the area is sandy loam.

xi. **Surface Water Quality:** The Electrical Conductivity (EC) in water samples ranged from 154 to 338□S/cm in the post-monsoon season. Overall, surface water has low electrical conductivity which is reflected from the low concentration of most of the ionic species which are well within the permissible limit used for drinking water. Hardness ranged from 52 to 115 mg/l in the post- monsoon season.The BOD and COD levels are quite low, which indicate the absence of organic pollution loading.

This is mainly due to the low population density and absence of industries in the area. The heavy metal concentration in the study area is below the permissible limit used for drinking purposes. It can be concluded that water quality was observed to be quite good, as parameters are well below the permissible limits specified for meeting drinking requirements.

xii. **Flora:** During the floristic survey in the Post-Monsoon Season, a total of 247 plant species were recorded from the VPHE Project, Uttarakhand. Of these, Herbs (104), Tree (66), Shrubs (58), Climbers (12), Ferns (2), Grass (2), Bamboo (2) and Epiphyte (1) species recorded from the study area. While investigating VPHE Project, Uttarakhand, several Floristic compositions documented.

xiii. **Fauna:** The mammals encountered while surveying and discussion with local people include Jackal (Canis aureus), Rhesus monkey (Macaca mulatta), Serow (Capricornissumatraensis), Sambar (Cervus unicolor), Himalayan Marten (Martes flavigula), Himalayan Musk Deer (Moschus chrysogaster), Himalayan Hoary bellied squirrel (Callosciuruspygerythrus), etc. The commonly observed bird species include Indian Myna, Indian Cuckoo, Chukor Patridge, House Crow, Black Drongo, Black Kite, Wood pecker, Grey Shrike, Pariah Kite etc.The commonly observed amphibians reported from the study area include Toad (Bufo himalayanus), Frog (Rana species), Ornamented Pygmy Frog (Microhylaornata) and Common Toad (Duttaphrynusmelanostictus). The commonly observed butterfly species in the study area were Tailed Punch (Dodona eugenes), Silverstripe (Lathe baladeva), Golden Emperor (Dilipamorgiana), Pale Green Sailor (Neptiszaida), Broadstick Sailor (Neptisnarayana), etc. The reptiles reported in the study area include Asian house Gecko (Hemidactylus frenatus), Common Indian Lizard (Varanus bengalensis), Indian giant squirrel (Ratufa indica), Green Pit Viper (Trimeresurusalbolabris), Himalayan Pit Viper (Gloydiushimalayanus) and Cobra (Bungarus caeruleus).Phytoplankton species of different groups of community recorded to be growing in the study area is Bacillariophyceae, Chlorophycaeae and Myxophyceae. A total of 23 species of different groups of Phytoplanktons were recorded to be growing in the Project area. Taxa of zooplanktons mainly comprised of Rotifers and Cladocera in the study area. Asplanchna species, Epiphanes species, Chydorus species, Macrothrix species, Eucyclops species were the common zooplanktons reported in the study area. The common macro-zoobenthos recorded from the study area were of order Ephemeroptera, Trichoptera, Diptera, Plecoptera and Neuropterans.

xiv. **Land Requirement:** The total land requirement for the project is 141.568 ha, out of which 100.390 forest land, 9.521 ha of Govt. land (PWD), and 31.639 ha of private land has already beenacquiredforthe project requirements. Total area under submergence is about 24.5ha is mostly uninhabited forest land (already acquired) with very little or no vegetation.

xv. **Ecological Sensitive Area:** The dam site is about 5.20 Km from Kedarnath Wild Life Sanctuary (KWLS) boundary and its elevation is approximately 1900m above the dam. The horizontal distance of the powerhouse from sanctuary border is

approximately 2km, the elevation of the sanctuary is about 2000m above Power house site. The sanctuary is inaccessible from project sites.

xvi. **Hydrology:** The catchment area is around 4672 sq. Km at Dam site with annual mean flow of 5680.6Mcum. The project is designed for SPF of 6700 cumec and PMF of 10840 cumec.

xvii. **Muck Disposal Areas**: Out of the 40.00 L cum (lakh cubic meter) of the total muck likely to be generated from the construction works of the project at least 14.00 L cum will be utilized for construction purposes of different project components, filling works and other infrastructure works. For dumping of the remaining muck i.e. 31.20 Lcum, four dump yards areas viz. (i) Haat, (ii) Jaisaal, (iii) Gulabkoti and (iv) Siyasain, have been earmarked adjacent to project components and are operational. In these 4 identified sites dumping will be done and further they will be restored and vegetated with proper landscaping.

xviii. **Rehabilitation and Resettlement Plan:** THDCIL has formulated a Rehabilitation & Resettlement policy (R&R Policy) for the Vishnugad-Pipalkoti Hydro Electric Project. For effective implementation of R&R policy, Rehabilitation Action Plan (RAP) has been formulated so that after reasonable transitionperiod, the affected families improve, at least regain their previous standard of living, earning capacity and production levels. Rehabilitation & Resettlement policy (R&R Policy) for the Vishnugad-Pipalkoti Hydro Electric Project is approved by District Magistrate, Chamoli.

Present Status: The Implementation of Rehabilitation Action Plan (RAP) and R&R related Activities are presently under progress. Compensation has been provided by SLAO to PAFs whose land, assets etc. has been acquired for the project under LA Act 1894. Additional R&R grants/ Assistance have been provided by THDCIL as per the approved R&R policy.
Around 94% of Compensation amount has been disbursed by Special Land Acquisition Officer (SLAO) and approx. 88% R&R grant have been disbursed by THDCIL.

xix. **Environmental Management Plan:** Different aspects of the EMP of VPHEP are under implementation by Three Agencies such as Forest Department, GoUK, THDCIL, and M/s HCC-the Contractor responsible for construction of VPHEP.

Items	**EMP Cost (A+B+C)**	**Capital (lakh)**	**Total Recurring Cost (Lakh)**
Bio-diversity Management Plan (A)	6267.51	6087.51	180
Under contractors Scope (B)	1528.09	1508.09	20
Other (C)	1227.56	331.46	896.1
Total	9023.16	7927.06	1096.1
Total Recurring Cost per Month			219.22

xx. **Catchment Area Treatment (Cat) Plan:** The CAT plan highlights the management techniques to control erosion in the catchment area. The Catchment Area Treatment Plan for VPHEP has been prepared by the Badrinath Forest Division, Gopeshwar; Garhwal Circle, Pauri, Uttarakhand. As various CAT plans are already under implementation in this catchment particularly Tapovan Vishnugad CAT plan, only 18 micro watershed in 2 sub watersheds namely Budhiganga and Nagoigad has been selected for treatment. The total area of selected catchment is 84085.00ha. Out of which, 12964.00 ha (15.42%) is rocky and snowbound. The remaining area of 71121.00 ha (84.58%) is treatable.The initial provision for the CAT plan that was kept under 2007 EMP of VPHEP was Rs. 271.7 lakhs. However, the provision was revised by the forest department in 2012 and demanded Rs. 47.00 Crore. This includes financial provision for the CAT plan of Rs. 234.3 Lakh and for the Eco-restoration plan the provision is Rs. 4466.6 lakh.

xxi. **Fish Management Plan**: Snow trout (Schizothoraichthysprogastus and Schizothoraxrichardsonii) is found in the project stretch. The fish management plan involves various options for management of Mahseer and Snow trout.Mahseer is a migratory fish and comes in the Alaknanda and its tributaries in search of feeding and breeding grounds. The catchment of Birahi River can be improved by plantation along the bank. The anthropogenic activity like extraction of sand, pebbles, gravels, stones and fishing activity in the river should be completely banned. A capital cost provision of Rs.10 lakhs were kept in 2009 EMP towards habitat restoration of Mahseer through improvement of the catchment of Birahi River and conservation of fish stock in the study stretch of Alaknanda. The Mahseer hatchery already constructed at the Tehri Dam on the Bhagirathi River is used for propagation of the Mahseer and will be utilized for VPHEP.For the management of the Snow trout (Schizothoraichthysprogastus), THDC has been prepared a Fish management plan with consultation of Directorate of Cold Water Fisheries (DCFR), ICAR, Bhimtal. The budget provision kept under 2007 EMP was only Rs. 65 lakhs. The same is proposed to be revised upto to Rs. 429.0 lakh, out of that 279 lakhs has already been incurred till date

xxii. **Environmental Cost and Benefits:** The environment cost and benefits of the project has been carried out. It is manifest that the cost to environment is Rs 18020.84 lakh whereas the annual benefits are Rs 83499.83 lakh and for useful life of project these are projected as Rs 2490595.8 lakh, with benefit cost ratio of 138.20:1.

xxiii. **E-flow:** The Environmental flow (E-flow) at VPHEP shall be governed by the latest Gazette Notification dated 09th Oct, 2018 of GoI, regarding maintaining a minimum environmental flow in River Ganga up to Unnao, (UP). In dry season i.e. Nov to March 20 % of average flow of preceding 10 daily period will be maintained. During Lean season i.e. Oct, April and May 20 % and in High flow

i.e. June to September 30% of average flow of preceding 10 daily period will be maintained.

xxiv. **Project benefit:** The Project benefits of VPHEP are as follows:

- Capacity addition of 444 MW in the Northern Region, reducing peaking power shortage in the region. Annual Design Energy of 1657.09 MU (with 95% machine availability).
- Integrated Development of Chamoli/ Garhwal region in the areas of employment, communication, education, health, tourism, development of flora & fauna etc.
- Out of 13% free power to the home state Uttarakhand, 1% shall be utilized for contribution towards local area development.

xxv. **Public hearing:** The commitments made by the Project during Public Hearing held on 09.01.2007 are all fulfilled by the project and compliance of the same is being shared with the MoEF&CC through six monthly compliance report. Also, MoEF&CC vide its letter dated 01.06.2021 grant exemption to under construction VPHEP project from any repeat Public Hearing.

xxv. **Status of other statutory clearances:** The forest clearance (Stage I and Stage 2) has been granted to VPHEP vide letter dated 03.06.2011 and 28.05.2013 respectively. TheWildlife Clearance (WC) was accorded by NBWL vide letter F. No. 6-43/2007 WL-I (27th Meeting) dated 20.12.2012. Consent to Establishment (CTE) has been obtained from UKPCB vide letter No. UEPPSB/HO/NOC-CH-15/07/13 dt. 10.04.2007.

15.4.3 The EAC during deliberations noted the following:

The proposal is for Environmental Clearances to Vishnugad-Pipalkoti Hydro-Electric Project of 444 MW in an area of 141.568 ha by M/s THDC India Limited in Tehsil Joshimath, District Chamoli, Uttarakhand.

The EAC in the present meeting (15th meeting) deliberated on the information submitted (Form 2, EIA/EMP report, kml file, etc.) and as presented in the meeting and observed that the proposed project is located on river Alaknanda, a major tributary of river Ganga, in district Chamoli in the state of Uttarakhand.

The Total land requirement for the project is 141.568 ha, out of which 100.390 forest land, 9.521 ha of Govt. land (PWD), and 31.639 ha of private land has already been acquired for the project requirements. Total area under submergence is about 24.5 ha is mostly uninhabited forest land (already acquired) with very little or no vegetation. The dam site is about 5.20 Km from Kedarnath Wild Life Sanctuary (KWLS) boundary. The horizontal distance of the powerhouse from sanctuary border is approximately 2 km. The commitments made by the Project proponent during Public Hearing held on

09.01.2007 are all fulfilled by the project and compliance of the same is being shared with the MoEF&CC through six monthly compliance report. Also, MoEF&CC vide its letter dated 01.06.2021 grant exemption to under construction VPHEP project from any repeat Public Hearing

The forest clearance (Stage I and Stage 2) has been granted to VPHEP vide letter dated 03.06.2011 and 28.05.2013 respectively. The Wildlife Clearance (WC) was accorded by NBWL vide letter F. No. 6-43/2007 WL-I (27th Meeting) dated 20.12.2012. Consent to Establishment (CTE) has been obtained from UKPCB vide letter No. UEPPSB/HO/NOC-CH-15/07/13 dated 10.04.2007.

15.4.4 *The EAC after deliberations recommended the proposal for grant of Environmental Clearance by the Ministry to Vishnugad-Pipalkoti Hydro-Electric Project of 444 MW in an area of 141.568 ha by M/s THDC India Limited in Thesil Joshimath, District Chamoli, Uttarakhand under the provisions of EIA Notification, 2006 and subsequent amendments/circulars with subject to compliance of applicable Standard EC conditions with the following additional conditions:*

i. *The Environmental Management Plan (EMP) shall be strictly adhered to as submitted in the EIA/EMP report. 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. *Environment matrix provided in EMP be revised if any data change. Number and period of stocking of Fish be incorporated in EMP.*
iii. *Separate budget shall be allocated for fish hatcheries and herbal and the same shall be implement in stipulated time period.*
iv. *The contract clause limiting the No. of vehicles used during excavation and transportation shall followed scrupulously and the same shall informed to the ministry.*
v. *Pasture Development Plan be revised in terms of Rate of plantation and their Cost.*
vi. *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.*
vii. *Geological changes or catastrophic event within 10km region, every two year data shall be submitted to RO, MoEF&CC. The same shall be obtained from Geological Survey of India. If any major events which can effect the dam, management plan shall be prepared and submit to the RO, MoEF&CC.*
viii. *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.*
ix. *PP shall ensure the Ambient Air Quality Monitoring Stations for real time data display and regularly submit to respective Ro, MoEF&CC.*
x. *Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.*

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.*

xiii. *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.*

xiv. *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 shall be disposed safely and that it does not pollute the natural streams and water bodies in surrounding area. Report of the same to be submitted to Ministry and its Regional office.*

xv. *A multi-specialty hospital to cater the need of people living within 10 km radius of the project shall be established.*

xvi. *Solar lights for illumination alongwith associated Solar panels to be provided to the families living in rural areas within 10 km radius of project.*

xvii. *The e-flow shall continue to be released as per the previous EC granted to the project.*

xviii. *Computer labs with internet facility shall be established in primary schools within 10 km radius of project.*

xix. *Sport complex with multi- sport facility shall be established. The children's from economically weaker section shall be given free of cost sport facility.*

xx. *A time bound action plan for compliance of each of the above condition will be submitted to RO, MoEF&CC within 3months.*

xxi. *Observations raised by RO, MoEF&CC in certified compliance report shall be complied with and if not done in stipulated time/ before commencement of Project, Environmental Clearance will be withdrawn.*

xxii. *The Multi-Disciplinary Committee needs to be reconstituted and the meeting needs to be held at regular interval*

xxiii. *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.*

xxiv. *All the specific conditions mentioned in the EC dated 22nd August 2007 shall be complied within stipulated time.*

Agenda No. 15.5

Teesta Low Dam-I & II (Combined) Hydro-Electric Project 71 MW (2x30+1x11MW) in an area of 170 ha by M/s West Bengal State Electricity Distribution Company Limited in Triveni town, Tehsil Rangli Rangliot, Dsitrict Darjeeling, West Bengal - Terms of Reference - Reg.

[Proposal No. IA/WB/RIV/219929/2021; F. No. J-12011/11/2021-IA.I (R)]

15.5.1 The proposal is for grant of Terms of Reference (ToR) to Teesta Low Dam -I & II (Combined) Hydro-Electric Project 71 MW (2x30+1x11MW) in an area of 170 ha by M/s West Bengal State Electricity Distribution Company Limited in Triveni town, Tehsil Rangli Rangliot, District Darjeeling, West Bengal

15.5.2 The details of the project submitted by project proponent and ascertained from the document submitted are mentioned below:

(i) Teesta Low Dam I & II (combined) HE Project (TLDP I & II HEP) envisaged as a Run-of-River (R-o-R) project on Great Rangit River (a Tributary of Teesta River in Brahmaputra basin) and is proposed to harness the hydro-power potential available between the TWL of Jorethang loop HEP (in operation) on Rangit River and the confluence of Rangit withTeesta.

(ii) The scheme is located in between Latitude 27°05' 18" North and 27°05' 5" North and Longitude 88°24' 46" East and 88° 25' 06" East. The Barrage site is well connected by State Highway. Barrage Axis is proposed at 80 m upstream of the earlier dam axis

(iii) The final DPR was prepared as per CEA earlier guidelines and submitted by WAPCOS to WBSEDCL in the year 2013.However, not much development could take place, now WBSEDCL has taken up the project for development and involved WAPCOS for Updating of PFR/DPR in line with the latest guidelines of CEA and other statutory organizations.

(iv) **Principal components:**

- R.C.C. raft type barrage 32 m high, and 200m long at top.
- 10m wide Cellular type divide wall between barrage and Intake Area.
- Water conductor system comprising of gated intake structures with two nos.5.5m diameter steel penstock and one no. 4 m dia. Steel penstock to feedwater to the Power House units of two nos. 30 MW and one no. 11 MWrespectively.
- Surface powerhouse of size 86(L) X 21(W) X 41(H) m housing 3 francis units of 30 MW of two nos. and 11MW of one no.
- Tail Race Conduit is 115 m long.

(v) **Salient Features:**

1.	**LOCATION**	
a)	Project Area	WestBengal
b)	River	Rangitin West Bengal

c)	Barrage Site	2kmU/s of Teesta & Rangit confluence
d)	Power House	1.725kmU/s of Teesta & Rangit confluence
e)	District	Darjeeling
f)	Latitude	N27º05'14.05"
g)	Longitude	E88º24'51.65"
2.	**HYDROLOGY**	
a)	Catchment Area	2132km2
b)	Design Flood	PMF 20127m3/sec SPF 15392m3/sec
3.	**RESERVOIR**	
a)	Full Reservoir Level	E.L.248m
b)	Minimum Draw-Down Level	E.L.245m
c)	Surface Area at FRL	1.25 km^2
d)	Reservoir extent along the river	7.3 Km
4.	**BARRAGE**	
a)	Type	RC CRAFT
b)	Top elevation of barrage	E.L.249m
c)	Average river bed elevation	E.L.217m
d)	Height	32 m
e)	Length of Barrage	117.5 m
f)	Length of Raft	200m, (Straight)
g)	Barrage Axis Orientation	N 23^OE to S 67^OW
h)	Spillways:	
i)	Barrage Bays	
	-No. -Size (Radial Gates) -Crest EL	6 15m (W) x 15m (H) 218 m
j)	Energy Dissipater	Stilling Basin
k)	Stilling Basin Invert	216m
5.	**INTAKE**	
a)	Location	Right Bank
b)	Number	3 (Three)
c)	Type	Straight intake with bell mouth.

d)	Maximum total design discharge	256 m3/sec (With10% Overload)
6.	**DIVERSION ARRANGEMENT**	
a)	Diversion Flood (25 year Non- monsoon)	1764.47 m3/sec
7.	**POWER HOUSE**	
a)	Power house	Surface Power House (3 Units)
b)	Alignment	N 23o E to S 67o W
c)	Size (LxWxH) of Main Installed capacity	L- 86 m W- 21 m H- 41 m
d)	Centre Line of Turbine	E.L. 210.50 m
8.	**TAIL RACE CONDUIT**	
a)	Nos. & Size	2 nos. & 6 m dia.
b)	Length of Tail Race Channel	115 m
c)	Type of flow	Submerged flow
9.	**GENERATING PLANT TURBINE**	
a)	Type	Francis Type Vertical Axis
b)	Number	Three (3)
c)	Capacity	2x 30 MW + 1x11 MW
d)	Design Net Head	33.5 m
e)	Rated Discharge/Machine	98.16 m3/sec for 30 MW 35.99 m3/sec for 11 MW
f)	Speed	150.00 rpm for 30 MW

		250.00 rpm for 11 MW
10.	**GENERATOR**	
a)	Type	Vertical Shaft Synchronous
b)	Number	Three (3)
c)	Capacity	30000 kW & 11000 kW
d)	Voltage	11 kV ±5%
11.	TRANSFORMER	
a)	Type	Three Phase
b)	Number	3+1(Spare)
c)	Capacity	50 MVA, 7.5 MVA
d)	Rated Voltage	11/132kV
12.	**ENERGY GENERATION**	
a)	Annual Energy Generation (90% Dependable year)	290.77 GWh
b)	Load factor (lean period)	16.11 %
c)	Load factor (90%)	46.77 %
13.	**TRANSMISSION**	
a)	132KV Lines	1 No. Double Circuit
14.	**PROJECT COST**	
a)	Civil works	572.49 Cr
b)	Electro mechanical works	162.75 Cr
c)	Total Cost	735.24 Cr
d)	IDC	84.46 Cr
e)	Total Cost including IDC	819.70 Cr
15.	**TARIFF**	

a)	Levellized Tariff (Rs. / Kwh)	Rs.5.72 (without Free Power & LAD) - CERC Rs. 6.59 (with Free Power & LAD) - CERC Rs.4.56 (without Free Power & LAD) - WBERC Rs. 5.25 (with Free Power & LAD) - WBERC
b)	First Year Tariff (Rs. / Kwh)	Rs.6.56 (without Free Power & LAD) - CERC Rs. 7.55 (with Free Power & LAD) - CERC Rs.5.86 (without Free Power & LAD) - WBERC Rs. 6.75 (with Free Power & LAD) - WBERC

(vi) The catchment area of the river is about 2132 sq.km and the length is 86 km. The SPF and PMF values estimated by taking IMD design Storm depths, temporal distribution and two bells per day are 15392 cumecs and 20127 cumec respectively. The diversion flood of 1764.47 cumec for 25 year return period is also considered for the project.

(vii) Annual Energy Generation90% dependable Year will be 290.77 GWh and Design Energy (90% dependable Year) will be 276.23 GWh.

(viii) **Land requirement:** Total land required for construction of various components, including infrastructure facilities and muck disposal area is estimated to be around 170 Ha, entire Land to be acquired is Forest Land. The submergence area at FRL is 125.2 ha. The project is proposed to be completed in 5 years. Total cost of the project is estimated to be 819.7 crores.

(ix) **Ecological Sensitive Area:** There is no National Park, Wildlife sanctuary, Tiger/Elephant reserve, biosphere reserve etc in and around the project catchment.

(x) **E Flow**: Environmental Flow recommended for Teesta Low Dam (I&II) Combined by Teesta Basin Report (West Bengal portion) shall be released. In Monsoon Season (June-September) shall be 20%, during Non-Monsoon non lean season (October-November) shall be 23% Lean season (December-March) shall be 15% and during Non-Monsoon non lean season (April-May) shall be 20%.

(xi) **R&R Details**: As per the present level of investigation, no private land is to be acquired. If during DPR and EIA study preparation, any private land is to be acquired, then Resettlement and Rehabilitation (R&R) Plan shall be prepared in due consultation with Project Affected Families (PAFs) Families losing land, homestead on account of acquisition of land

for various project appurtenances shall be identified. Socio Economic Survey of Project Affected Families using structured questionnaire shall be conducted. Report shall include list of all the Project Affected Families with their names, education, land holdings, other properties, occupation etc. Formulation of Resettlement & Rehabilitation (R&R) Plan as per the Land Acquisition Act, 2013. Socio-cultural aspects based on study on Ethnography of the area will also be covered.

(xii) **Project Benefit:** Project is very much essential to fulfil peak power demand and justified in consideration with the requirement of excess 15746 MW peak electricity demand at Eastern Zone in 2036-37 in comparison to 2026-27. The construction of the proposed project would invariably create a large number of direct and indirect employment opportunities in the area. Various types of businesses establishment such as shops, food-stalls, tea stalls, restaurants, workshops, etc. would come-up. Local entrepreneur will come up for such business. The improved road access will bring an improvement of food security situation and overall economic and social stability.Improvement in the education centers, health post, market etc will take place during construction phase. It is likely that some economic activities will continue or be further promoted in these areas because of the relatively good accessibility to cities and urban areas.

(xiii) **Status of other statutory clearances**: The proposed project attracts Forest Clearance. The application for the same is yet to be submitted.

15.5.3 The EAC during deliberations noted the following:

i. The proposal is for Terms of Reference to Teesta Low Dam -I & II (Combined) Hydro-Electric Project 71 MW (2x30+1x11MW) in an area of 170ha by M/s West Bengal State Electricity Distribution Company Limited in Triveni town, Tehsil Rangli Rangliot, Dsitrict Darjeeling, West Bengal.

ii. EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the project is a Run-of-River scheme which envisages utilization of discharge of River Rangit River (a Tributary of Teesta River in Brahmaputra basin).

iii. Total land required for construction of various components, including infrastructure facilities and muck disposal area is estimated to be around 170 Ha, entire Land to be acquired is Forest Land. The submergence area

at FRL is 125.2 ha. The project is proposed to be completed in 5 years. Total cost of the project is estimated to be 819.7 crores.

15.5.4 *The EAC after detailed deliberation observed that information on the following deficiencies which required for further consideration of the project. It was desired that PP may submit the below mentioned information:*

i. *Detailed report on Environmental Cost Benefit analysis shall be done due to project location in dense forest area with high biodiversity and accordingly a site suitability study shall be carried out in terms of viability of the project.*
ii. *PP should ensure that entire land coming under the project have been acquired.*

The proposal was deferred on the above lines.

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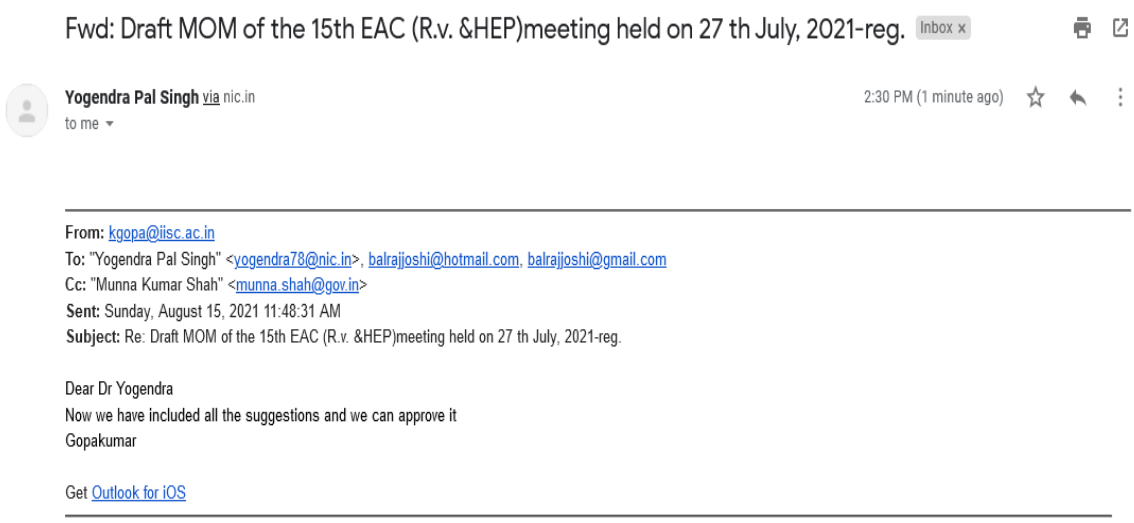
Annexure

ATTENDANCE LIST

Sr. No.	Name & Address	Role	Attendance
1	**Dr. K. Gopakumar**	**Chairman**	**P**
2	Dr. N. Lakshman	Member	**P**
3	Dr. Mukesh Sharma	Member	**P**
4	Dr. B. K. Panigrahi	Member	**A**
5	Dr. Chandrahas Deshpande	Member	**P**
6	Dr. A. K. Malhotra	Member	**P**
7	Dr. Uday Kumar R. Y.	Member	**P**
8	Dr. Narayan Shenoy K	Member	**P**
9	Shri Balraj Joshi	Member	**P**
10	Shri Sharvan Kumar	Member (Representative of CEA)	**A**
11	Shri A. K. Singh	Representative of CWC	**P**
12	Dr. J. A. Johnson	Representative of WII	**P**
13	Dr. A. K. Sahoo	Representative of CIFRI	**P**
14	Dr. Vijay Kumar	Representative of Ministry of Earth Sciences	**A**
15	Shri Yogendra Pal Singh	Member Secretary	**P**

APPROVAL OF THE CHAIRMAN



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Subject: Re: Draft MOM of the 15th EAC (R.v. &HEP)meeting held on 27 th July, 2021-reg.

Dear Dr Yogendra
Now we have included all the suggestions and we can approve it
Gopakumar

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