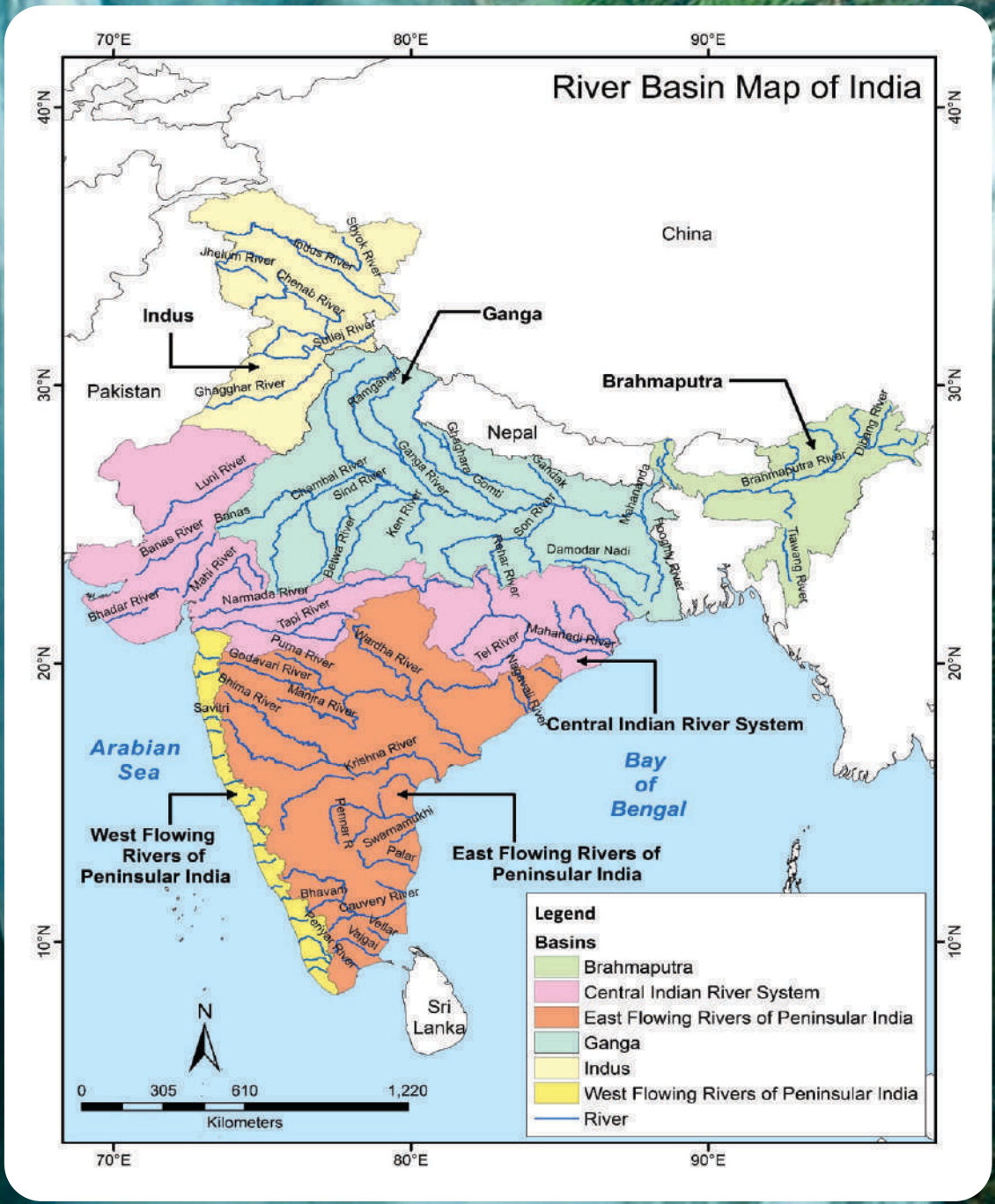
सत्यमेव जयते
Ministry of Power
Government of India

Government of India
Ministry of Power
Central Electricity Authority

REASSESSMENT OF 0N-RIVER PUMPED STORAGE HYDROELECTRIC POTENTIAL IN INDIA



June-2023

घनश्याम प्रसाद
अध्यक्ष तथा पदेन सचिव भारत सरकार
GHANSHYAM PRASAD
Chairperson & Ex-officio Secretary
To the Government Of India

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आज़ादी का अमृत महोत्सव

FOREWORD

India is on the path towards clean energy transition, guided by the Nationally Determined Contribution (NDCs) targets, with an aim to produce 50% capacity from non-fossil sources by 2030.

As a result focus of capacity additions have shifted to large scale development of non-polluting energy sources to meet the increasing energy appetite and this in turn has put spotlight on renewable sources of electricity such as Solar and Wind. The Country has planned for huge capacity additions to the tune of 500 GW by 2030 from these sources of energy. These developments have come as a stimulant for Hydro sector especially Pumped storage Projects to facilitate smooth integration of these projects in the grid.

This document on "Reassessment of On-River Pumped Storage Hydroelectric Potential in the Country'' contains details of On-River Pumped Storage Hydroelectric Projects in the country. It will facilitate Developers/States in taking advance action and in preparation of detailed project reports of these Projects.

I am confident that this document will be useful in speedy development of On-River Pumped Storage Hydro Projects in the country.

(Ghanshyam Prasad)

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PREFACE

The Survey of Pumped Storage Hydroelectric Projects was completed by Central Electricity Authority (CEA) during August, 1984. According to this survey, the pumped storage hydroelectric potential of the country was assessed as about 96,529 MW. This very first attempt of country's Pumped Storage hydro potential assessment was extremely useful for Pumped Storage hydro planning in the country.

Due to the Energy transition from fossil fuel to non-fossil fuel, the focus is on speedy development of time tested and proven pumped storage development for integration of Variable Renewable Energy sources like Solar and Wind to the Grid. The Pumped Storage Projects provide much needed solutions of the necessary scale (large volume of energy storage) with a long life cycle. Hence, the need was felt by the Central Electricity Authority for reassessment of On-River Pumped Storage hydroelectric potential in the Country.

I hope that this document would prove useful not only in assigning proper priorities in investigation and construction of these Projects but would also help in placing the Storage Developmental efforts in proper perspective.

(M.A.K.P SINGH)

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ACKNOWLEDGEMENT

The "Reassessment of On-River Pumped Storage Hydroelectric Potential in the country" involves preparation of Report containing all the Pumped Storage Projects for which both reservoirs are located on any river/stream/nallah.

The Report contains the On-River Pumped Storage Potential, Ranking of these projects and their profiles. The work has been carried out by CEA in association with WAPCOS, CWC, MOEF & CC, GSI, SOI and NRSC and all the State Govts. I am grateful to these Organizations for their co-operation and assistance in accomplishing this important and difficult task.

I am thankful to Officers/Staff of HPPI Division, CEA and WAPCOS who have rendered active assistance in the study and preparation of the Report. The work could not have been possible but for their sincere and sustained effort.

I am also thankful to all the officers of concerned State Governments/CPSUs/ SPSUs and Private Developers for providing information regarding their On-River pumped storage projects in the Finalization of Report.

(Pradeep Kumar Shukla)

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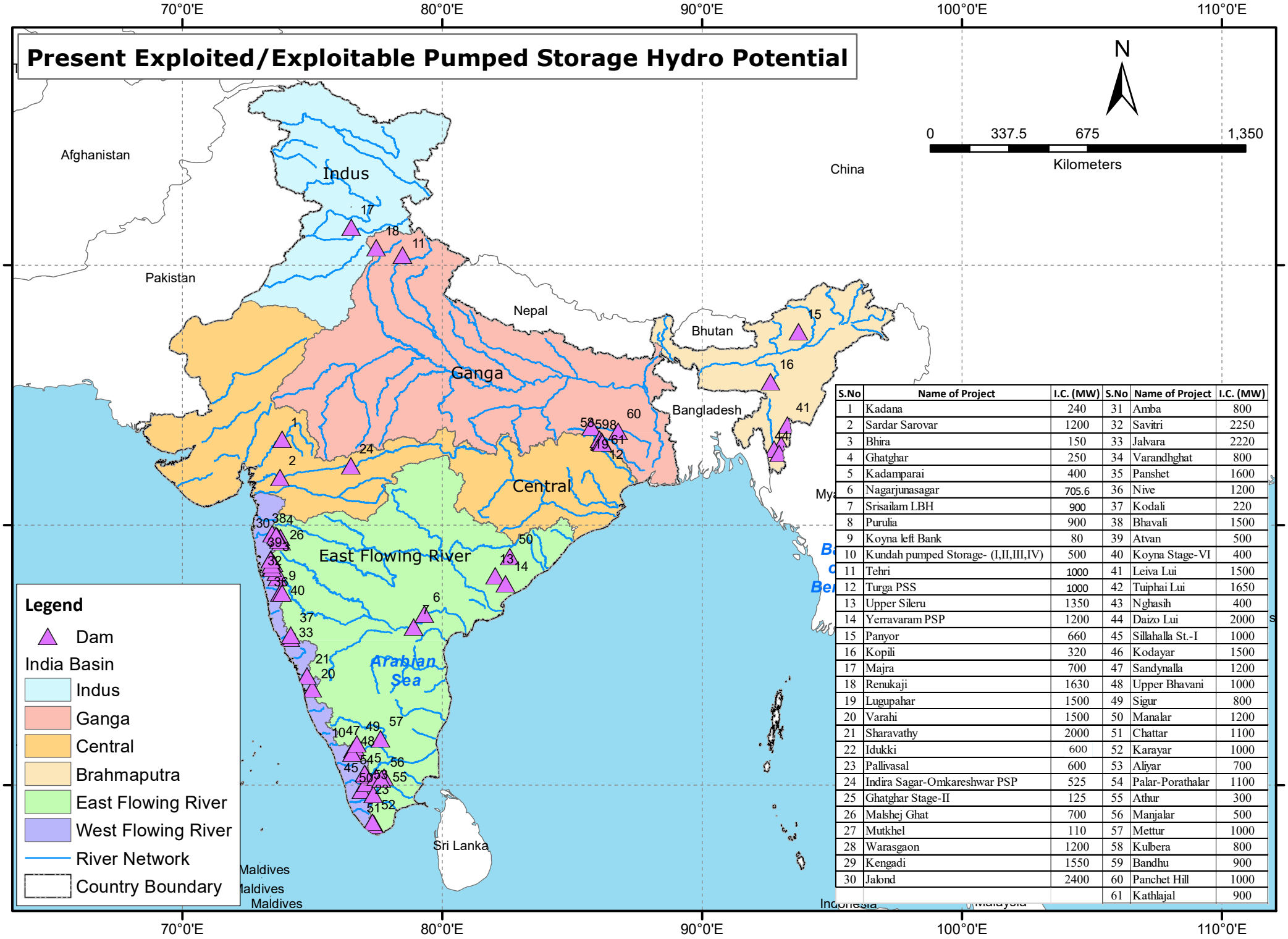
BASIN WISE ON-RIVER PUMPED STORAGE POTENTIAL AT A GLANCE IN THE COUNTRY

S.No.	Description	Nos.	Installed Capacity (MW)
I	**Previous Pumped Storage Hydro Potential (1978-87study)**	63	96529.60
II	**Present Exploited/Exploitable Pumped Storage Hydro Potential (Above 25 MW)**	**61**	**59,035.6**
	Breakup of Present Exploited/Exploitable Pumped Storage Hydro Potential		
	i. Projects In Operation	08	4745.60
	ii. Projects Under Construction	03	1580
	iii. Projects Concurred by CEA/State Govt.	02	2350
	iv. Projects Under Planning Stage which can be taken up for further studies	48	50,360
III	**Pumped Storage Hydro Potential Unexploitable at present**	**34**	**46,375**
IV	**Total Exploited/ Exploitable + Unexploitable Potential**	**95**	**105,410.6**

EXPLOITED/EXPLOITABLE STATE-WISE ON- RIVER PUMPED STORAGE POTENTIAL		
Region/ State	**No of projects**	**Installed capacity (MW)**
NORTHERN		
Himachal Pradesh	2	2330
Uttarakhand	1	1000
Sub Total (NR)	**3**	**3330**
WESTERN		
Madhya Pradesh	1	525
Gujarat	2	1440
Maharashtra	19	18,055
Sub Total (WR)	**22**	**20,020**
SOUTHERN		
Andhra Pradesh	2	2550
Telangana	2	1605.60
Karnataka	2	3500
Kerala	2	1200
Tamil Nadu	15	13300
Sub Total (SR)	**23**	**22155.60**
EASTERN		
Jharkhand	1	1500
West Bengal	6	5500
Sub Total (ER)	**7**	**7000**
NORTH EASTERN		
Assam	1	320

Arunachal Pradesh	1	660
Mizoram	4	5550
Sub Total (NE)	**6**	**6530**
Grand Total	**61**	**59,035.6**

Present Exploited/Exploitable Pumped Storage Hydro Potential



S.No	Name of Project	I.C. (MW)	S.No	Name of Project	I.C. (MW)
1	Kadana	240	31	Amba	800
2	Sardar Sarovar	1200	32	Savitri	2250
3	Bhira	150	33	Jalvara	2220
4	Ghatghar	250	34	Varandhghat	800
5	Kadamparai	400	35	Panshet	1600
6	Nagarjunasagar	705.6	36	Nive	1200
7	Srisailam LBH	900	37	Kodali	220
8	Purulia	900	38	Bhavali	1500
9	Koyna left Bank	80	39	Atvan	500
10	Kundah pumped Storage- (I,II,III,IV)	500	40	Koyna Stage-VI	400
11	Tehri	1000	41	Leiva Lui	1500
12	Turga PSS	1000	42	Tuiphai Lui	1650
13	Upper Sileru	1350	43	Nghasih	400
14	Yerravaram PSP	1200	44	Daizo Lui	2000
15	Panyor	660	45	Sillahalla St.-I	1000
16	Kopili	320	46	Kodayar	1500
17	Majra	700	47	Sandynalla	1200
18	Renukaji	1630	48	Upper Bhavani	1000
19	Lugupahar	1500	49	Sigur	800
20	Varahi	1500	50	Manalar	1200
21	Sharavathy	2000	51	Chattar	1100
22	Idukki	600	52	Karayar	1000
23	Pallivasal	600	53	Aliyar	700
24	Indira Sagar-Omkareshwar PSP	525	54	Palar-Porathalar	1100
25	Ghatghar Stage-II	125	55	Athur	300
26	Malshej Ghat	700	56	Manjalar	500
27	Mutkhel	110	57	Mettur	1000
28	Warasgaon	1200	58	Kulbera	800
29	Kengadi	1550	59	Bandhu	900
30	Jalond	2400	60	Panchet Hill	1000
			61	Kathlajal	900

Status Wise Details of Exploited/Exploitable Pumped Storage Projects

S.No.	Name	Installed Capacity (MW)	State
Projects In Operation			
1.	Kadana Pumped Storage Project	240	Gujarat
2.	Sardar Sarovar Pumped Storage Project	1200	Gujarat
3.	Bhira Pumped Storage Project	150	Maharashtra
4.	Ghatghar Pumped Storage Project	250	Maharashtra
5.	Kadamparai Pumped Storage Project	400	Tamil Nadu
6.	Nagarjuna Sagar Pumped Storage Project	705.60	Telangana
7.	Srisailam LBPH Pumped Storage Project	900	Telangana
8.	Purulia Pumped Storage Project	900	West Bengal
Project Under Construction			
9.	Koyna Left Bank Pumped Storage Project	80	Maharashtra
10.	Kundah (Stage-I, II, III & IV) Pumped Storage Project	500	Tamil Nadu
11.	Tehri St-II Pumped Storage Project	1000	Uttarakhand
Projects Concurred			
12.	Turga Pumped Storage Project	1000	West Bengal
13.	Upper Sileru Pumped Storage Project	1350	Andhra Pradesh
Project Profiles of Projects Taken for Further Studies			
14.	Yerravaram Pumped Storage Project	1200	Andhra Pradesh
15.	Panyor Pumped Storage Project	660	Arunachal Pradesh

Status Wise Details of Exploited/Exploitable Pumped Storage Projects

S.No.	Name	Installed Capacity (MW)	State
16.	Kopili Pumped Storage Project	320	Assam
17.	Majra Pumped Storage Project	700	Himachal Pradesh
18.	Renukaji Pumped Storage Project	1630	Himachal Pradesh
19.	Lugupahar Pumped Storage Project	1500	Jharkhand
20.	Varahi Pumped Storage Project	1500	Karnataka
21.	Sharavathy Pumped Storage Project	2000	Karnataka
22.	Idukki Pumped Storage Project	600	Kerala
23.	Pallivasal Pumped Storage Project	600	Kerala
24.	Indira Sagar-Omkareshwar Pumped Storage Project	525	Madhya Pradesh
25.	Ghatgar Stage-II Pumped Storage Project	125	Maharashtra
26.	Malshej Ghat Pumped Storage Project	700	Maharashtra
27.	Mutkhel Pumped Storage Project	110	Maharashtra
28.	Warasgaon Pumped Storage Project	1200	Maharashtra
29.	Kengadi Pumped Storage Project	1550	Maharashtra
30.	Jalond Pumped Storage Project	2400	Maharashtra
31.	Amba Pumped Storage Project	800	Maharashtra
32.	Savitri Pumped Storage Project	2250	Maharashtra
33.	Jalvara Pumped Storage Project	2220	Maharashtra
34.	Varandhghat Pumped Storage Project	800	Maharashtra

Status Wise Details of Exploited/Exploitable Pumped Storage Projects

S.No.	Name	Installed Capacity (MW)	State
35.	Panshet Pumped Storage Project	1600	Maharashtra
36.	Nive Pumped Storage Project	1200	Maharashtra
37.	Kodali Pumped Storage Project	220	Maharashtra
38.	Bhavali Pumped Storage Project	1500	Maharashtra
39.	Atvan Pumped Storage Project	500	Maharashtra
40.	Koyna Stage-VI Pumped Storage Project	400	Maharashtra
41.	Leiva Lui Pumped Storage Project	1500	Mizoram
42.	Tuiphi Lui Pumped Storage Project	1650	Mizoram
43.	Nghasih Pumped Storage Project	400	Mizoram
44.	Daizo Lui Pumped Storage Project	2000	Mizoram
45.	Sillahalla St.-I Pumped Storage Project	1000	Tamil Nadu
46.	Kodayar Pumped Storage Project	1500	Tamil Nadu
47.	Sandynalla Pumped Storage Project	1200	Tamil Nadu
48.	Upper Bhavani Pumped Storage Project	1000	Tamil Nadu
49.	Sigur Pumped Storage Project	800	Tamil Nadu
50.	Manalar Pumped Storage Project	1200	Tamil Nadu
51.	Chattar Pumped Storage Project	1100	Tamil Nadu
52.	Karayar Pumped Storage Project	1000	Tamil Nadu
53.	Aliyar Pumped Storage Project	700	Tamil Nadu

Status Wise Details of Exploited/Exploitable Pumped Storage Projects

S.No.	Name	Installed Capacity (MW)	State
54.	Palar-Porathalar Pumped Storage Project	1100	Tamil Nadu
55.	Athur Pumped Storage Project	300	Tamil Nadu
56.	Manjalar Pumped Storage Project	500	Tamil Nadu
57.	Mettur Pumped Storage Project	1000	Tamil Nadu
58.	Kulbera Pumped Storage Project	800	West Bengal
59.	Bandhu Pumped Storage Project	900	West Bengal
60.	Panchet Hill Pumped Storage Project	1000	West Bengal
61.	Kathlajal Pumped Storage Project	900	West Bengal

PROJECT PROFILES OF ON-RIVER EXPLOITED/EXPLOITABLE PUMPED STORAGE HYDRO PROJECTS

A. Pumped Storage Projects In Operation

1. KADANA PUMPED STORAGE PROJECT (4X60MW=240MW)

1. INTRODUCTION

Kadana Pumped Storage Project having upper reservoir and lower reservoir (Dolatpura Weir) with installed capacity of 240MW. The project is located in Mahisagar district of Gujarat. The project utilizes water of Mahi River for power generation harnessing gross head of 48.20 m. The powerhouse has 4 units of 60 MW having installed capacity of 240 MW generating annual energy of 337.03 MU in 90% dependable year. The project is In Operation and got commissioned in the year 1990. The project is executed by Gujarat State Electricity Corporation Ltd (GSECL).

2. LOCATION/ACCESSIBILITY

The existing upper dam site of the project is located on Mahi River having latitude at 23°18'30''N and longitude of 73°49'45''E and lower dam site is located on Mahi River at latitude of 23°15'46.6''N and longitude of 73°42'5.8''E. The nearest railway station is Godhara and the Airport is Ahemdabad//Vadodara.

3. PROJECT FEATURES

Kadana Pumped Storage Project involves :

Upper Reservoir (Existing): Upper Dam/Reservoir is constructed across Mahi River with dam Height of 35.98 m. The project has a live storage of 42500 Mc ft between a Full Reservoir Level (FRL) of 127.70 m and Minimum Draw down Level (MDDL) of 114 m.

Lower Reservoir (Existing Dolatpura Weir) : Lower Reservoir (Dolatpura Weir) is constructed across Mahisagar River with dam height of 10.2 m. The project has a live storage of 1502.6 Mc ft between a Full Reservoir Level (FRL) of 85.4 m and Minimum Draw down Level (MDDL) of 79.54 m.

Water Conductor System: The Water Conductor System comprises of a 4 nos. of pressure shaft/penstock of diameter 6 m carrying water to the powerhouse. The Project to be operated under gross head of 48.20 m with installed capacity of 240MW. The discharged water from powerhouse is carried back to the river by the Tail Race Tunnel.

4. HYDROLOGY

The Catchment area of the river is 16585 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Kadana Pumped Storage Project would be 240MW. Utilizing the gross head of 48.20 m. The project generates the Annual Energy of 337.03MU in 90% dependable year.

SALIENT FEATURES

KADANA PUMPED STORAGE PROJECT

GENERAL:

State	Gujarat
District	Mahisagar
River	Mahi
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Godhara
Nearest Airport	Ahmedabad/Vadodara

UPPER RESERVOIR:

Location	Latitude: 23°18'30"N
	Longitude: 73°49'45''E
Full Reservoir Level (FRL) (m)	127.70
Minimum Draw Down Level (MDDL) (m)	114
Length of the Dam at the top(m)	762
Height of Dam (above RBL) (m)	35.98
Live Storage (McFt)	42500
Gross Storage (McFt)	54400

LOWER RESERVOIR:

Location	Latitude: 23°15'46.6''N
	Longitude: 73°42'5.8''E
Full Reservoir Level (FRL) (m)	85.4
Minimum Draw Down Level (MDDL) (m)	79.54
Height of Dam (above RBL) (m)	10.2
Live Storage (McFt)	1502.6

HYDROLOGY:

Catchment Area (Sq. Km)	16585
Flood discharge (Cumec)	38204

WATER CONDUCTOR SYSTEM:

PRESSURE SHAFT/PENSTOCK	
Number	4
Diameter (m)	6

POWER HOUSE:

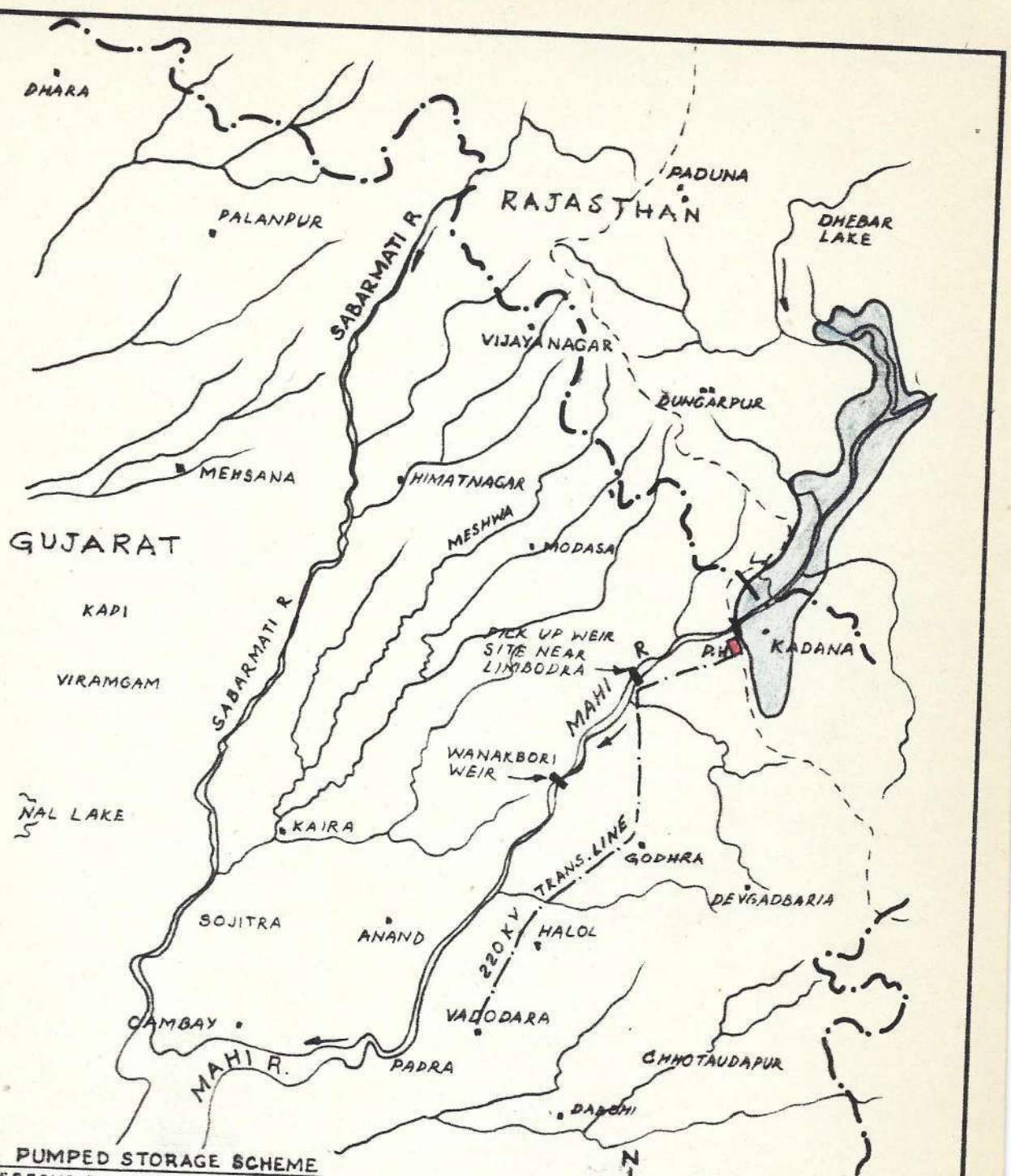
No. of Generating Units	4
Capacity of each Unit (MW)	60
Installed Capacity (MW)	240
Design Head (m)	43.50
Gross Head(m)	48.20
Turbine	Deriaz Kaplan
Annual Energy(MU)	337.03
Design Energy (MU)	131.33

COST ASPECTS:

Estimated Cost (Rs. Crores) (Price Level)	310

COMMISSIONING DETAILS:

Commissioning Year	1990



KADANA PUMPED STORAGE SCHEME

UPPER RESERVOIR

FRL	127.7 M (419')
MDDL	114.3 M (375')
LIVE STORAGE	1300 Mm3

TAIL POND

FRL	96.0 M (315')
MDDL	78.7 M (258')

WATER CONDUCTOR SYSTEM

PENSTOCKS	4 Nos.
DISCHARGE	168.7 Cumecs

POWER HOUSE

INS. CAPACITY	240 MW
DESIGN HEAD	43.5 M

DRN	H. SINGH	HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD	Rsgill	कड़ाना पम्प संचय योजना
SUBMD	MS	KADANA PUMPED STORAGE SCHEME
APPD	[illegible]	
SCALE	1" = 16 MILES	CENTRAL ELECTRICITY AUTHORITY
AUGUST, 1984		DRG. NO. HEPR - PS - CIR - 1023

2. SARDAR SAROVAR PUMPED STORAGE PROJECT (6X200 MW=1200 MW)

1. INTRODUCTION

Sardar Sarovar Pumped Storage Project is located near small town Navagam in Nandod district of Gujarat. The project utilizes water of Narmada River for power generation harnessing gross head of 116.60 m. The powerhouse has 6 units of 200 MW having installed capacity of 1200 MW. The project is executed by Sardar Sarovar Narmada Nigam Limited.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Narmada River having upper reservoir at latitude of 21°49'50.4"N and longitude of 73°44'49.4"E and lower reservoir at latitude of 21°53'00.6"N and longitude of 73°39'29.2"E. The nearest railway station is Ekta Nagar and the Airport is Vadodara.

3. PROJECT FEATURES

Sardar Sarovar Pumped Storage Project involves:-

Upper Reservoir (existing): Height of dam on the upper reservoir is 120.68 m with a live storage of 5760 Mcum on river Narmada between a Full Reservoir Level (FRL) of 138.68 m and Minimum Draw down Level (MDDL) of 110.64 m.

Lower Reservoir (existing): Height of dam on the lower reservoir is 19.75 m with a live storage of 32.98 Mcum on river Narmada between a Full Reservoir Level (FRL) of 31.57 m and Minimum Draw down Level (MDDL) of 26.71 m.

Water Conductor System (existing): The proposed Water Conductor System comprises of 6 no. of Penstock of diameter of 7.61 m and length varying for each from 198.40 m to 205.30 m carrying water to the powerhouse. The Project to be operated under gross head of 116.6 m with installed capacity of 1200 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 296 m.

4. HYDROLOGY

The Catchment area of the river upto dam site is 88000 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Sardar Sarovar Pumped Storage Project would be 1200 MW utilizing the gross head of 116.6 m.

SALIENT FEATURES

SARDAR SAROVAR PUMPED STORAGE PROJECT

GENERAL:

State	Gujarat
District	Nandod
River	Narmada
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Ekta Nagar
Nearest Airport	Vadodara

UPPER RESERVOIR (Sardar Sarovar Dam existing):

Location	Latitude: 21°49'50.4"N
	Longitude: 73°44'49.4"E
Full Reservoir Level (FRL) (m)	138.68
Minimum Draw Down Level (MDDL) (m)	110.64
Length of the Dam at the top(m)	1210.02
Height of Dam (above RBL) (m)	120.68
Live Storage (Mcum)	5760
Gross Storage (Mcum)	9460

LOWER RESERVOIR (Gurudeshwar Weir Dam existing):

Location	Latitude: 21°53'00.6"N
	Longitude: 73°39'29.2"E
Full Reservoir Level (FRL) (m)	31.57
Minimum Draw Down Level (MDDL) (m)	26.71
Type of Dam	Concrete Ungated Weir
Height of Dam (above RBL) (m)	19.75
Live Storage (Mcum)	32.98

HYDROLOGY:

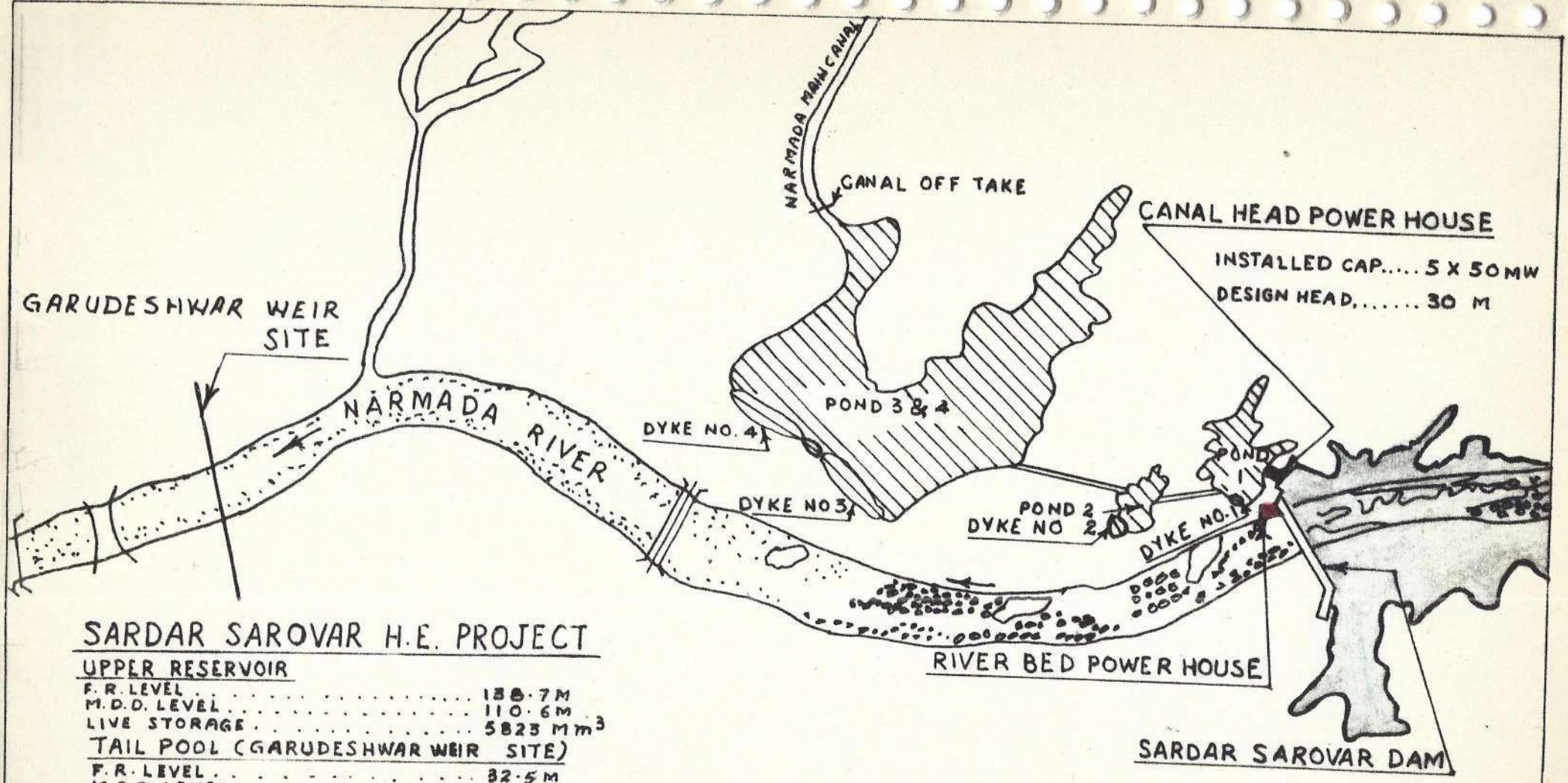
Catchment Area (Sq. Km)	88000
Flood Discharge (Cumec)- Design Flood	86944

WATER CONDUCTOR SYSTEM

PRESSURE SHAFT/PENSTOCK	
Number	6
Diameter (m)	7.61
Length (m)	198.40 to 205.30 (varying for each)
TAIL RACE TUNNEL	
Length (m) (Average)	296
Diameter (m)	12.50

POWER HOUSE

No. of Generating Units	6
Capacity of each Unit (MW)	200
Installed Capacity (MW)	1200
Design Head (m)	100
Gross Head (m) (Max)	116.60
Turbine	Francis vertical Reversible



SARDAR SAROVAR H.E. PROJECT

UPPER RESERVOIR

F.R. LEVEL	138·7 M
M.D.D. LEVEL	110·6 M
LIVE STORAGE	5823 Mm^3

TAIL POOL (GARUDESHWAR WEIR SITE)

F.R. LEVEL	32·5 M
M.D.D. LEVEL	27·3
LIVE STORAGE	34·4 Mm^3

WATER CONDUCTOR SYSTEM

LENGTH	—
DISCHARGE	226·3 cumecs.

POWERHOUSE

INS. CAPACITY	1200 MW
NET (DESIGN) HEAD	100 M

DRN./TRC.		HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD.		सरदार सरोवर जल विद्युत योजना
SUBMD		SARDAR SAROVAR H.E. PROJECT
APPRD.		
T.S. NO		
SCALE	1:63360	CENTRAL ELECTRICITY AUTHORITY
JULY, 1984		DRG. NO. HEPR-PS-CIR-1019

3. BHIRA PUMPED STORAGE PROJECT (1X150 MW=150 MW)

1. INTRODUCTION

Bhira Pumped Storage Project having upper reservoir and lower reservoir with installed capacity of 150MW. The project is located in Raigad district of Maharashtra. The project utilizes water of Mula River for power generation harnessing gross head of 518 m. The powerhouse has 1 unit of 150 MW having installed capacity of 150 MW generating design energy of 300 MU. The project is In Operation and got commissioned in the year 1927.The project is executed by Tata Power Company Limited (TPCL).

2. LOCATION/ACCESSIBILITY

The existing upper dam site of the project is located on Mula River having latitude at 18°31'34.70''N and longitude of 73°30'41.15''E and lower dam site is located on Mula River at latitude of 18°27'50.25''N and longitude of 73°23'1.79''E. The nearest railway station from the project site is Mungaon and nearest Airport is Pune.

3. PROJECT FEATURES

Bhira Pumped Storage Project involves -

Upper Reservoir (Existing): Upper Dam/Reservoir is constructed across Mula River with dam height of 50.60 m. The project has a live storage of 747 Mcum between a Full Reservoir Level (FRL) of 606.10 m and Minimum Draw down Level (MDDL) of 590.09 m.

Lower Reservoir (Existing): Lower Reservoir is constructed across Mula River with dam height of 28 m. The project has a live storage of 5.5 Mcum between a Full Reservoir Level (FRL) of 95.5 m and Minimum Draw down Level (MDDL) of 90 m.

Water Conductor System: The Water Conductor System comprises of Head Race Tunnel HRT) of length 4530 m and combined length of pressure shaft/penstock of length 1709.40 m carrying water to the powerhouse. The project to be operated under gross head of 518 m with installed capacity of 150MW. The discharged water from powerhouse is carried back to the river by Tail Race Tunnel of length 100 m.

4. HYDROLOGY

The Catchment area of the river is 28.49 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Bhira Pumped Storage Project is 150MW. The project generates the Design Energy of MU in 90% dependable year with 95% machine availability utilizing the gross head of 518 m.

SALIENT FEATURES
BHIRA PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Raigad
River	Mula river
Type of Scheme (On-River/Off-River)	On-River
Nearest Railhead	Mangaon
Nearest Airport	Pune

UPPER RESERVOIR:

Location	Latitude: 18°31'34.70"N
	Longitude: 73°30'41.15"E
Full Reservoir Level (FRL) (m)	606.10
Minimum Draw Down Level (MDDL) (m)	590.09
Length of the Dam at the top(m)	1553.38
Height of Dam (above RBL) (m)	50.60
Reservoir area at FRL(sq.km)	38.31
Live Storage (Mcum)	747
Gross Storage (Mcum)	570.76

LOWER RESERVOIR:

Location	Latitude: 18°27'50.25"N
	Longitude: 73°23'1.79"E
Full Reservoir Level (FRL) (m)	95.5
Minimum Draw Down Level (MDDL) (m)	90
Height of Dam (above RBL) (m)	28
Live Storage (Mcum)	5.5

HYDROLOGY:

Catchment Area (Sq. Km)	28.49
Flood Discharge (Cumecs)	911

WATER CONDUCTOR SYSTEM:

HEAD RACE TUNNEL			
Number	1		
Length (m)	4530		
Diameter (m)	4.267		
Design Discharge (Cumecs)	56.06		
PRESSURE SHAFT/PENSTOCK			
Number	**Underground Penstock**	**Surface Penstock**	**Pressure Shaft Inclined**
Length (m)	555	1043.40	111.0
Diameter (m)	3.7	3.5 to 3.3	2.95
TAIL RACE TUNNEL			
Length (m)	100		
Diameter (m)	4.0		

POWER HOUSE:

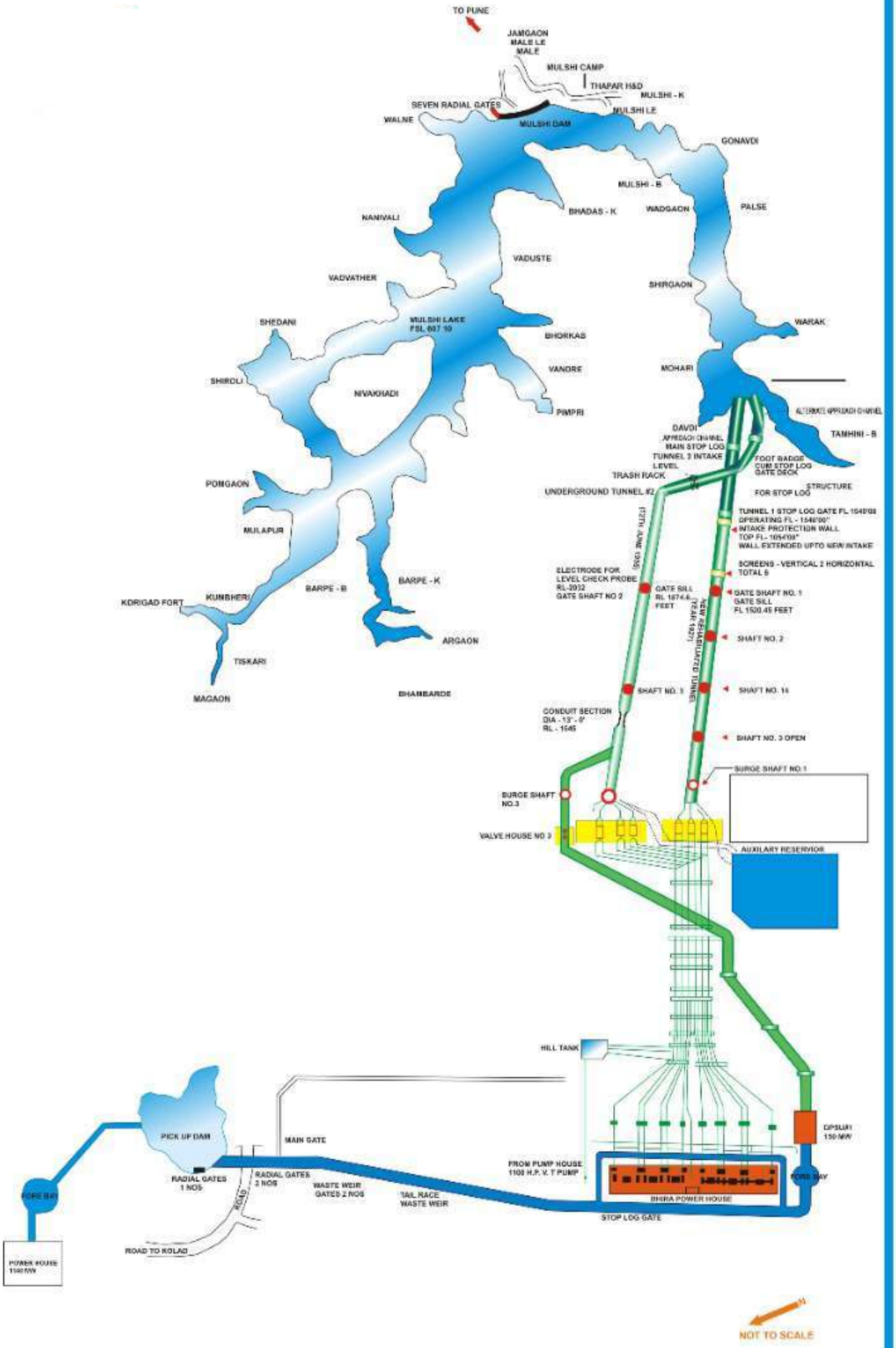
Type	Pit Type
No. of Generating Units	1
Capacity of each Unit (MW)	150
Installed Capacity (MW)	150
Design Head (m)	530
Gross Head (m)	518
Turbine	Pelton and Vertical reversible Francis turbine
Annual Energy(MW)	300
Design Energy (MU)	744.12

COST ASPECTS:

Estimated Cost (Rs. Crores)(Price Level)	272 Cr. Rs (As per Original DPR)

COMMISSIONING DETAILS:

Commissioning Year	1927


TO PUNE
JAMGAON MALE LE MALE
MULSHI CAMP
THAPAR H&D
MULSHI - K
MULSHI LE
SEVEN RADIAL GATES
WALNE
MULSHI DAM
GONAVDI
MULSHI - B
BHADAS - K
WADGAON
PALSE
NANIVALI
VADUSTE
VADVATHER
SHIRGAON
SHEDANI
MULSHI LAKE
BHORKAS
WARAK
VANORE
MOHARI
SHIROLI
NIVAKHADI
PIMPRI
DAVDI
APREDACH CHANNEL
MAIN STOP LOG
TUNNEL 3 INTAKE LEVEL
TAMHINI - B
FOOT BRIDGE CUM STOP LOG GATE DECK
TRASH RACK
STRUCTURE FOR STOP LOG
POMGAON
UNDERGROUND TUNNEL #2
TUNNEL 1 STOP LOG GATE FL 1540'00"
OPERATING FL - 1546'00"
INTAKE PROTECTION WALL
TOP FL - 1654'00"
WALL EXTENDED UPTO NEW INTAKE
MULAPUR
SCREENS - VERTICAL 2 HORIZONTAL TOTAL 6
ELECTRODE FOR LEVEL CHECK PROBE RL-2032 GATE SHAFT NO 2
GATE SILL RL 1874.6 FEET
GATE SHAFT NO. 1
GATE SILL FL 1520.45 FEET
BARPE - B
BARPE - K
KORIGAD FORT
KUMBHERI
SHAFT NO. 2
ARGAON
TISKARI
SHAFT NO. 3
SHAFT NO. 14
MAGAON
BHAMBARDE
CONDUIT SECTION DIA - 13' - 9" RL - 1545
SHAFT NO. 3 OPEN
SURGE SHAFT NO.1
SURGE SHAFT NO.3
VALVE HOUSE NO 3
AUXILARY RESERVIOR
HILL TANK
PICK UP DAM
MAIN GATE
DPSURI 150 MW
FROM PUMP HOUSE 1100 H.P. V. T PUMP
RADIAL GATES 1 NOS
RADIAL GATES 2 NOS
WASTE WEIR GATES 2 NOS
TAIL RACE WASTE WEIR
BHIRA POWER HOUSE
FORE BAY
STOP LOG GATE
ROAD
ROAD TO KOLAD
POWER HOUSE 1140 MW
NOT TO SCALE

4. GHATGHAR PUMPED STORAGE PROJECT (2X125MW=250 MW)

1. INTRODUCTION

Ghatghar Pumped Storage Project having existing upper reservoir and lower reservoir with installed capacity of 250MW. The project is located in Ahemadnagar/Thane district of Maharashtra. The project utilizes water of Pravara/Shai Nalla River for power generation harnessing design head of 680 m. The powerhouse has 2 units of 125 MW having installed capacity of 250 MW generating annual energy of 454.48MU. The Project is In Operation and got commissioned in 2009 & 2010 year. It is executed by Maharashtra State Power Generation CO.LTD (MAHAGENCO).

2. LOCATION/ACCESSIBILITY

The upper dam site of the project is located on Pravara River having upper reservoir at latitude of 19°32'30''N and longitude of 73°40'E and lower dam site is located on Shai Nalla River at latitude of 19°31'54''N and longitude of 73°39'06''E. The nearest railway station is Asangaon and the Airport is Mumbai.

3. PROJECT FEATURES

Ghatghar Pumped Storage Project involves construction of

Upper Reservoir (Existing): Upper Reservoir for this existing with dam Height of 757.50 m with a live storage of 5.15 Mcum on Pravara River between a Full Reservoir Level (FRL) of 756 m and Minimum Draw down Level (MDDL) of 750 m.

Lower Reservoir (Existing): Lower Dam of Ghatghar pumped storage with dam height of 348 m with a live storage of 2.728 Mcum on Shai Nalla River between a Full Reservoir Level (FRL) of 346 m and Minimum Draw down Level (MDDL) of 310 m.

Water Conductor System (Existing): The Water Conductor System comprises of a Head Race tunnel (HRT) of length 600 m ,Pressure shaft/penstock of length 722 m and diameter 4.25m carrying water to the underground powerhouse. The Project to be operated under design head of 680 m with installed capacity of 250 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 590 m.

4. HYDROLOGY

The Catchment area of the river upto the site is 18.43 & 2.5 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Ghatghar Pumped Storage Project is 250 MW. Utilizing the Design head of 680 m, the project generates the Annual Energy of 454.48MU in 90% dependable year. The project will provide peaking of hrs.

SALIENT FEATURES

GHATGHAR PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Ahmednagar/Thane
River	Pravara/Shai Nalla
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Asangaon
Nearest Airport	Mumbai

UPPER RESERVOIR (Existing):

Location	Latitude: 19°32'30"N
	Longitude: 73°40'00''E
Full Reservoir Level (FRL) (m)	756
Minimum Draw Down Level (MDDL) (m)	750
Length of Dam (m)	451
Height of Dam (above RBL) (m)	757.50
Live Storage (Mcum)	5.15
Gross Storage (Mcum)	5.83

LOWER RESERVOIR (Existing)

Location	Latitude: 19°31'54''N
	Longitude: 73°39'6''E
Full Reservoir Level (FRL) (m)	346
Minimum Draw Down Level (MDDL) (m)	310
Height of Dam (above RBL) (m)	348
Live Storage (Mcum)	2.728

HYDROLOGY:

Catchment Area (Sq. Km)	18.43 & 2.5

WATER CONDUCTOR SYSTEM:

HEAD RACE TUNNEL	
Number	1
Length (m)	600
Diameter (m)	4.25
Design Discharge (Cumecs)	40
PRESSURE SHAFT/PENSTOCK	
Number	1
Length (m)	722
Diameter (m)	4.25
TAIL RACE TUNNEL	
Length (m)	590
Diameter (m)	6.0

POWER HOUSE:

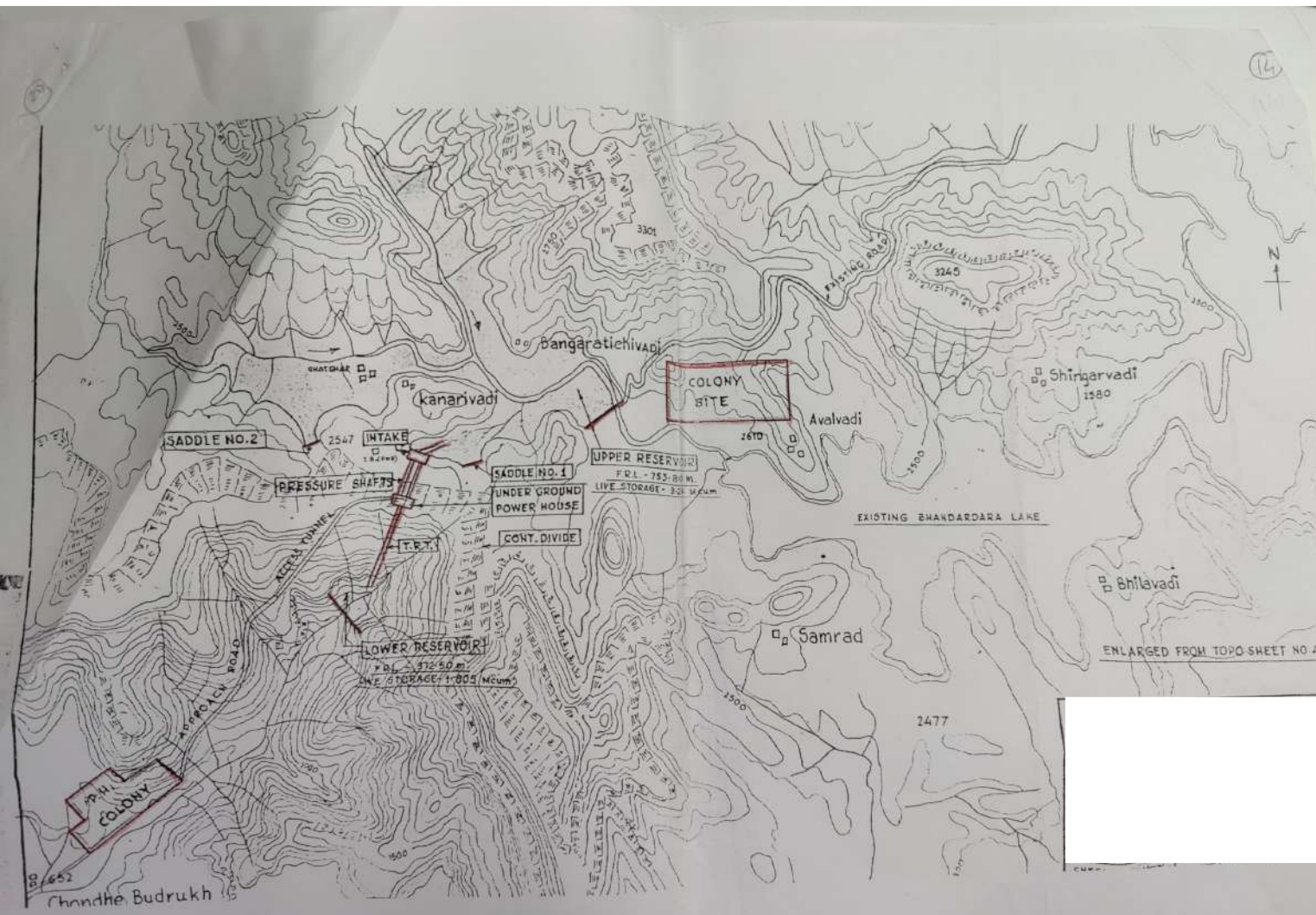
Type	Underground
No. of Generating Units	2
Capacity of each Unit (MW)	125
Installed Capacity (MW)	250
Design Head (m)	680
Turbine	Reversible Vertical Francis
Annual Energy(MU)	454.48
No. of hours of Generation	5
Energy(MU) for Pumping	
No. of hours for Pumping	6.15

COST ASPECT:

Estimated Cost (Rs. Crores) (Price Level) Lakhs	118460

COMMISSIONING DETAILS:

Commissioning Year	2009 & 2010



Bangaratichivadi
kanarivadi
COLONY SITE
Avalvadi
Shingarvadi
1580
3301
3245
EXISTING ROAD
SADDLE NO.2
2547
INTAKE
PRESSURE SHAFTS
SADDLE NO. 1
UNDER GROUND POWER HOUSE
UPPER RESERVOIR
F.R.L. - 753.80 M.
LIVE STORAGE - 3.21 Mcum
CONT. DIVIDE
T.R.T.
ACCESS TUNNEL
LOWER RESERVOIR
F.R.L. - 372.50 m.
LIVE STORAGE - 1.805 Mcum
APPROACH ROAD
P.H. COLONY
EXISTING BHANDARDARA LAKE
Bhilavadi
Samrad
ENLARGED FROM TOPO SHEET NO.
2477
2500
1500
652
Chondhe Budrukh
N

5. KADAMPARAI PUMPED STORAGE PROJECT (4X100MW=400 MW)

1. INTRODUCTION

Kadamparai Pumped Storage Project is located near small town Valparai & Pollachi in Coimbatore district of Tamil Nadu. The project utilizes water of Aliyar River for power generation harnessing head generation (max) of 395 m. The powerhouse has 4 units of 100 MW having installed capacity of 400 MW. The existing Kadamparai Dam is used as the Upper Reservoir and existing Upper Aliyar Dam is used as the Lower Reservoir. The project is executed by Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO).

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Aliyar River having upper reservoir at latitude of 10°23'35.7"N and longitude of 77°02'40.9"E and lower reservoir at latitude of 10°25'06.7"N and longitude of 77°02'29.6"E. The nearest railway station is Pollachi and the Airport is Coimbatore at Coimbatore district.

3. PROJECT FEATURES

Kadamparai Pumped Storage Project involves:-

Upper Reservoir (Kadamparai Dam existing): Upper Reservoir with a Full Reservoir Level (FRL) of 1149 m and Minimum Draw down Level (MDDL) of 1112 m.

Lower Reservoir (Upper Aliyar Dam existing): Lower Reservoir with a Full Reservoir Level (FRL) of 762 m and Minimum Draw down Level (MDDL) of 722 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 2480 m carrying water to the underground powerhouse. The Project to be operated under head generation (max) of 395 m with installed capacity of 400 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 1476 m.

4. POWER & ENERGY BENEFITS

The installed capacity of Kadamparai Pumped Storage Project would be 400 MW utilizing the head generation of 395 m.

SALIENT FEATURES

KADAMPARAI PUMPED STORAGE PROJECT

GENERAL:

State	Tamil Nadu
District	Coimbatore
River	Aliyar
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Pollachi
Nearest Airport	Coimbatore

UPPER RESERVOIR (Kadamparai Dam existing):

Location	Latitude: 10°23'35.7"N
	Longitude: 77°02'40.9"E
Full Reservoir Level (FRL) (m)	1149
Minimum Draw Down Level (MDDL) (m)	1112
Gross Storage (MCFT)	1080

LOWER RESERVOIR (Upper Aliyar reservoir existing):

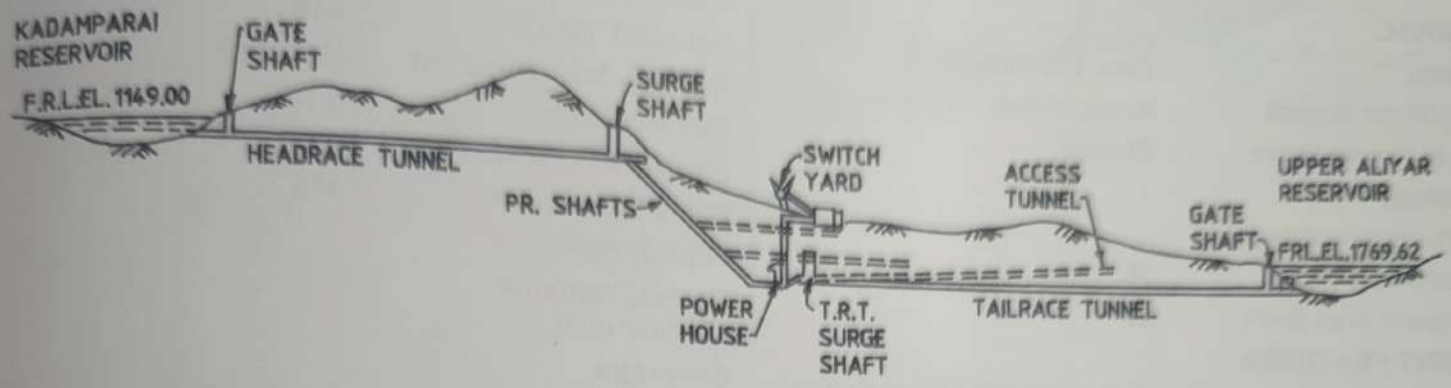
Location	Latitude: 10°25'06.7"N
	Longitude: 77°02'29.6"E
Full Reservoir Level (FRL) (m)	762
Minimum Draw Down Level (MDDL) (m)	722
Gross Storage (MCFT)	938

WATER CONDUCTOR SYSTEM

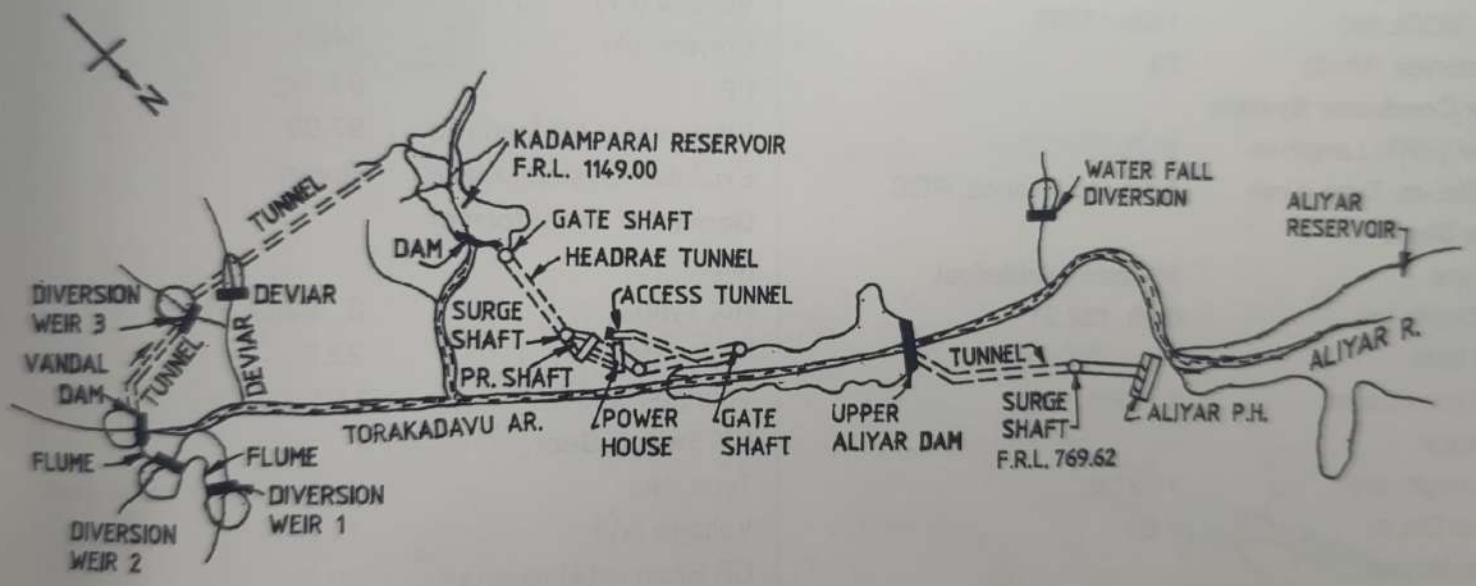
Length (m)	2480
TAIL RACE TUNNEL	
Length (m)	1476

POWER HOUSE

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	100
Installed Capacity (MW)	400
Head Generation (m) (Max)	395
Head Generation (m) (Min)	323
Head Pumping (m) (Max)	413
Head Pumping (m) (Min)	341
Turbine	Francis Reaction Reversible



PROFILE



PLAN

6. NAGARJUNA SAGAR PUMPED STORAGE PROJECT (7X100.8 MW=705.6 MW)

1. INTRODUCTION

Nagarjuna Sagar Pumped Storage Project is located near Vijaypuri town in Nalkonda district of Telangana. The project utilizes water of Krishna River for power generation harnessing rated head of 93 m. The powerhouse has 7 units of 100.8 MW having installed capacity of 705.6 MW. The project will generate the Annual Energy of 4000 MU in 90% dependable year.The project is executed by Telangana State Power Generation Corporation Limited (TSGENCO).

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Krishna River having upper reservoir at latitude of 16°34'24"N and longitude of 79°18'47"E and lower reservoir at latitude of 16°37'35.8"N and longitude of 79°29'23.7"E. There is a proposal of surface type of Power house. The nearest railway station is Macheria & Mirialaguda and the Airport is Hyderabad at Nalkonda district.

3. PROJECT FEATURES

Nagarjuna Sagar Pumped Storage Project involves.

Upper Reservoir (existing): Upper Reservoir is having a dam of Height 124.66 m with a live storage of 5563 Mcum on river Krishna between a Full Reservoir Level (FRL) of 179.83 m and Minimum Draw down Level (MDDL) of 155.45 m.

Lower Reservoir (existing): Lower Reservoir is having a dam of Height 29 m with a live storage of 29.55 Mcum on river Krishna between a Full Reservoir Level (FRL) of 75.50 m and Minimum Draw down Level (MDDL) of 74 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of Penstock/ Pressure Shaft of diameter of 4.88 m and length 123.4 m carrying water to the surface powerhouse. The Project to be operated under rated head of 93 m with installed capacity of 705.6 MW. The discharged water from powerhouse is carried back to the river by Tail race channel of length 148.1 m.

4. HYDROLOGY

The Catchment area of the river upto dam site is 214185 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Nagarjuna Sagar Pumped Storage Project would be 705.6 MW utilizing the Rated head of 93 m. The project will generate the Annual Energy of 4000 MU in 90% dependable year.

SALIENT FEATURES

NAGARJUNA SAGAR PUMPED STORAGE PROJECT

GENERAL:

State	Telangana
District	Nalgonda
River	Krishna
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Miryalaguda
Nearest Airport	Hyderabad

UPPER RESERVOIR (existing):

Location	Latitude: 16°34'24"N
	Longitude: 79°18'47"E
Full Reservoir Level (FRL) (m)	179.832
Minimum Draw Down Level (MDDL) (m)	155.450
Length of the Dam at the top (m)	1449.628
Max Height of Dam above deepest Foundation (m)	124.663
Live Storage (Mcum)	5108
Gross Storage (Mcum)	8837

LOWER RESERVOIR (existing):

Location	Latitude: 16°42'50"N
	Longitude: 80°08'24"E
Full Reservoir Level (FRL) (m)	75.50
Minimum Draw Down Level (MDDL) (m)	74
Type of Dam	Gravity Masonry
Maximum Height above deepest foundation level (m)	Left Side :30.50 Right Side : 31.00
Live Storage (Mcum)	29.55

HYDROLOGY:

Catchment Area (Sq. Km)	2,14,185
Flood Discharge (Cusec)	1060000

WATER CONDUCTOR SYSTEM

PRESSURE SHAFT/PENSTOCK	
Number	8
Length (m)	123.4
Diameter (m)	4.88
TAIL RACE TUNNEL	
Length (m)	148.1
Diameter (m)	5.45

POWER HOUSE

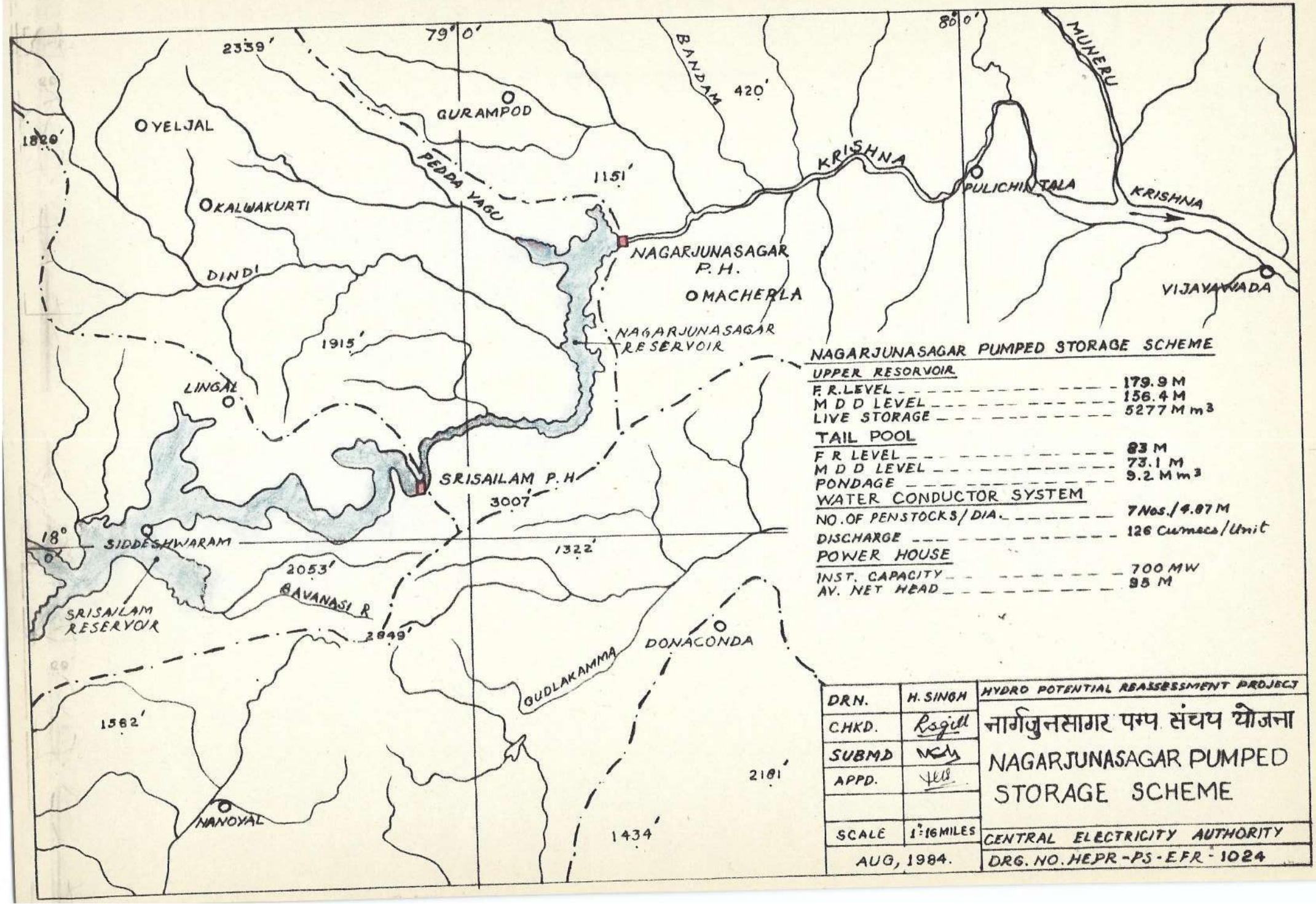
Type	Surface
No. of Units	7
Capacity of each Unit (MW)	7 x 100.8
Installed Capacity (MW)	705.6
Rated Head (m)	97
Average Gross Head (Max) (m)	109
Average Gross Head (Min) (m)	75.5
Turbine	Vertical Francis
Annual Energy	4000
Design Energy	992

Cost Aspects:

Estimated Cost (Rs.Crores) with Price Level	161.60 (Actual Cost)

Commissioning Details

Unit Nos	**Year**
Unit I	1978
Unit II	1980
Unit III	1981
Unit IV	1982
Unit V	1983
Unit VI	1984
Unit VII	1985
Unit VIII	1985


79° 0'
80° 0'
18°
2339'
1820'
YELJAL
GURAMPOD
BANDAM
420'
MUNERU
PEDDA VAGU
1151'
KRISHNA
PULICHINTALA
KRISHNA
KALWAKURTI
NAGARJUNASAGAR P.H.
DINDI
OMACHERLA
VIJAYAWADA
NAGARJUNASAGAR RESERVOIR
1915'
LINGAL
SRISAILAM P.H
3007'
SIDDESHWARAM
1322'
2053'
BAVANASI R
SRISAILAM RESERVOIR
2849'
DONACONDA
GUDLAKAMMA
1562'
2181'
NANOYAL
1434'
NAGARJUNASAGAR PUMPED STORAGE SCHEME
UPPER RESORVOIR
F.R.LEVEL 179.9 M
M D D LEVEL 156.4 M
LIVE STORAGE 5277 M m³
TAIL POOL
F R LEVEL 83 M
M D D LEVEL 73.1 M
PONDAGE 9.2 M m³
WATER CONDUCTOR SYSTEM
NO. OF PENSTOCKS/DIA. 7 Nos./4.87 M
DISCHARGE 126 Cumecs/Unit
POWER HOUSE
INST. CAPACITY 700 MW
AV. NET HEAD 95 M
DRN. H. SINGH
CHKD.
SUBMD
APPD.
SCALE 1" = 16 MILES
AUG, 1984.
HYDRO POTENTIAL REASSESSMENT PROJECT
नागार्जुनसागर पम्प संचय योजना
NAGARJUNASAGAR PUMPED STORAGE SCHEME
CENTRAL ELECTRICITY AUTHORITY
DRG. NO. HEPR-PS-EFR-1024

7. SRISAILAM LEFT BANK POWER HOUSE PUMPED STORAGE PROJECT (6X150MW =900MW)

1. INTRODUCTION

Srisailam left bank power house Pumped Storage Project is located near Lingalagattu town in Nagarkarnool district of Telangana. The project utilizes water of Krishna River for power generation harnessing rated head of 82.8 m. The powerhouse has 6 units of one unit 150 MW having installed capacity of 900 MW. The project is executed by Telangana State Power Generation Corporation Limited (TSGENCO).

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Krishna River having upper reservoir at latitude of 16°5'05"N and longitude of 78°54'00"E and lower reservoir at latitude of 16°34'24"N and longitude of 79°18'47"E. There is a proposal of underground type of Power house. The nearest railway station is Markapuram and the Airport is Hyderabad at Nagarkarnool district.

3. PROJECT FEATURES

Srisailam left bank power house Pumped Storage Project involves.

Upper Reservoir (existing): Upper Reservoir having a dam of Height 275.53 m with a live storage of 5218 Mcum on river Krishna between a Full Reservoir Level (FRL) of 269.75 m and Minimum Draw down Level (MDDL) of 245.37 m.

Lower Reservoir (existing): Height of dam at the lower reservoir is 125 m with a live storage of 5108 Mcum on river Krishna between a Full Reservoir Level (FRL) of 179.8 m and Minimum Draw down Level (MDDL) of 164.5 m.

Water Conductor System: The Water Conductor System comprises of a Head race tunnel (HRT) of length 347 m and diameter of 15 m, 1 no. of Pressure shafts of length 377 m and diameter of 12 m are 2 nos., Penstock Tunnels of length 600 m and diameter of 6 m are 6 nos. carrying water to the Penstock of length 456 m and diameter of 6 m are 6 nos. carrying water to the underground powerhouse. The Project to be operated under rated head of 82.8 m with installed capacity of 900 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 2297 m with a diameter of 15 m.

4. HYDROLOGY

The Catchment area of the river upto dam site is 203600 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Srisailam left bank power house Pumped Storage Project would be 900 MW. Utilizing the Rated head of 82.8 m, the Design Energy of the project comes out to be of 1500 MU in 90% dependable year with 95% machine availability.

SALIENT FEATURES

SRISAILAM LEFT BANK POWER HOUSE PUMPED STORAGE PROJECT

GENERAL:

State	Telangana
District	Nagarkarnool
River	Krishna
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Markapuram
Nearest Airport	Hyderabad

UPPER RESERVOIR (existing):

Location	Latitude: 16°5'05"N
	Longitude: 78°54'00"E
Full Reservoir Level (FRL) (m)	269.75
Minimum Draw Down Level (MDDL) (m)	245.37
Length of the Dam at the top(m)	513.59
Height of Dam (above RBL) (m)	275.53
Live Storage (Mcum)	5218
Gross Storage (Mcum)	6111

LOWER RESERVOIR (existing):

Location	Latitude: 16°34'24"N
	Longitude: 79°18'47"E
Full Reservoir Level (FRL) (m)	179.8
Minimum Draw Down Level (MDDL) (m)	164.5
Type of Dam	Gravity Masonry
Height of Dam (above RBL) (m)	125
Live Storage (Mcum)	5108

HYDROLOGY:

Catchment Area (Sq. Km)	2,03,600
Flood Discharge (Cumecs)	37356

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL/CHANNEL	
Number	1
Length (m)	347
Diameter (m)	15
PRESSURE SHAFT/PENSTOCK	
Number	2
Length (m)	377
Diameter (m)	12-9
TAIL RACE TUNNEL	
Length (m)	2297
Diameter (m)	15

POWER HOUSE

Type	Underground
No. of Generating Units	6
Capacity of each Unit (MW)	150
Installed Capacity (MW)	900
Rated Head (m)	82.8
Average Gross Head Maximum (m)	114.3
Average Gross Head Minimum (m)	66
Turbine	Vertical Shaft Francis
Annual Energy (MU)	1500
Design Energy (MU)	1350

Cost Aspects:

Estimated Cost (Rs.Crores) with Price Level	3440.12

Commissioning Details

Unit Nos	**Year**
Unit I	2001
Unit II	2001
Unit III	2002
Unit IV	2002
Unit V	2003
Unit VI	2003

Domala Penta
Roadway
TAIL RACE TUNNEL
Exit Structure
Road bridge
EEGALA PENTA
INCLINED ADIT TO SURGE CHAMBER
PERMANENT ACCESS ADIT TO POWER HOUSE
KRISHNA RIVER
KRISHNA RIVER
SRISAILAM
PROJECT COLONY
Roadway
LEFT BANK
POWER HOUSE
SPILLWAY TUNNEL
ADIT TO POWER HOUSE TOP
ADIT TO HRT
HEAD RACE TUNNEL
Switch Yard
SRISAILAM DAM
RIGHT BANK
POWER HOUSE
SURGE SHAFT
LEFT BANK
INTAKE STRUCTURE
RIGHT BANK

8. PURULIA PUMPED STORAGE PROJECT (4X225 MW=900MW)

1. INTRODUCTION

Purulia Pumped Storage Project is located near small town Pratappur in Purulia district of West Bengal. The project utilizes water of Kistobazar Nalla for power generation harnessing effective head of 177 m. The powerhouse has 4 units of 225 MW having installed capacity of 900 MW. The project is executed by West Bengal State Electricity Distribution Company Limited (WBSEDCL).

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Kistobazar Nalla having upper reservoir at latitude of 23°11'49"N and longitude of 86°05'50.7"E and lower reservoir at latitude of 23°11'30.6"N and longitude of 86°05'21.7"E. The nearest railway station from the project site is Barabhum and the nearest Airport is Ranchi.

3. PROJECT FEATURES

Purulia Pumped Storage Project involves:-

Upper Reservoir (existing): Height of dam on the upper reservoir is 71 m with a live storage of 13 Mm^3 on river Purulia between a Full Reservoir Level (FRL) of 516 m and Minimum Draw down Level (MDDL) of 494 m.

Lower Reservoir (existing): Height of dam on the lower reservoir is 95 m with a live storage of 13 Mm^3 on river Purulia between a Full Reservoir Level (FRL) of 337 m and Minimum Draw down Level (MDDL) of 300 m.

Water Conductor System (existing): The proposed Water Conductor System comprises of Head Race Tunnel (HRT) of diameter 7.7 m, 2 no. of Penstock of diameter varying for each from 7.7- 7.3 m carrying water to the powerhouse. The Project to be operated under effective head of 177 m with installed capacity of 900 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of diameter varying for each from 8.7- 5.6 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 9.5 Sq.Km. and the lower dam site is 18.75 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Purulia Pumped Storage Project would be 900 MW utilizing effective head of 177 m.

SALIENT FEATURES

PURULIA PUMPED STORAGE PROJECT

GENERAL:

State	West Bengal
District	Purulia
River	Kistobazar Nalla
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Barabhum
Nearest Airport	Ranchi

UPPER RESERVOIR (Ayodhya Dam existing):

Location	Latitude: 23°11'49"N
	Longitude: 86°05'55"E
Full Reservoir Level (FRL) (m)	516
Minimum Draw Down Level (MDDL) (m)	494
Height of Dam (above RBL) (m)	71
Live Storage (Mm^3)	13

LOWER RESERVOIR (P.P.S.P Lower Dam existing):

Location	Latitude: 23°11'15"N
	Longitude: 86°05'30"E
Full Reservoir Level (FRL) (m)	337
Minimum Draw Down Level (MDDL) (m)	300
Height of Dam (above RBL) (m)	95
Live Storage (Mm^3)	13

HYDROLOGY:

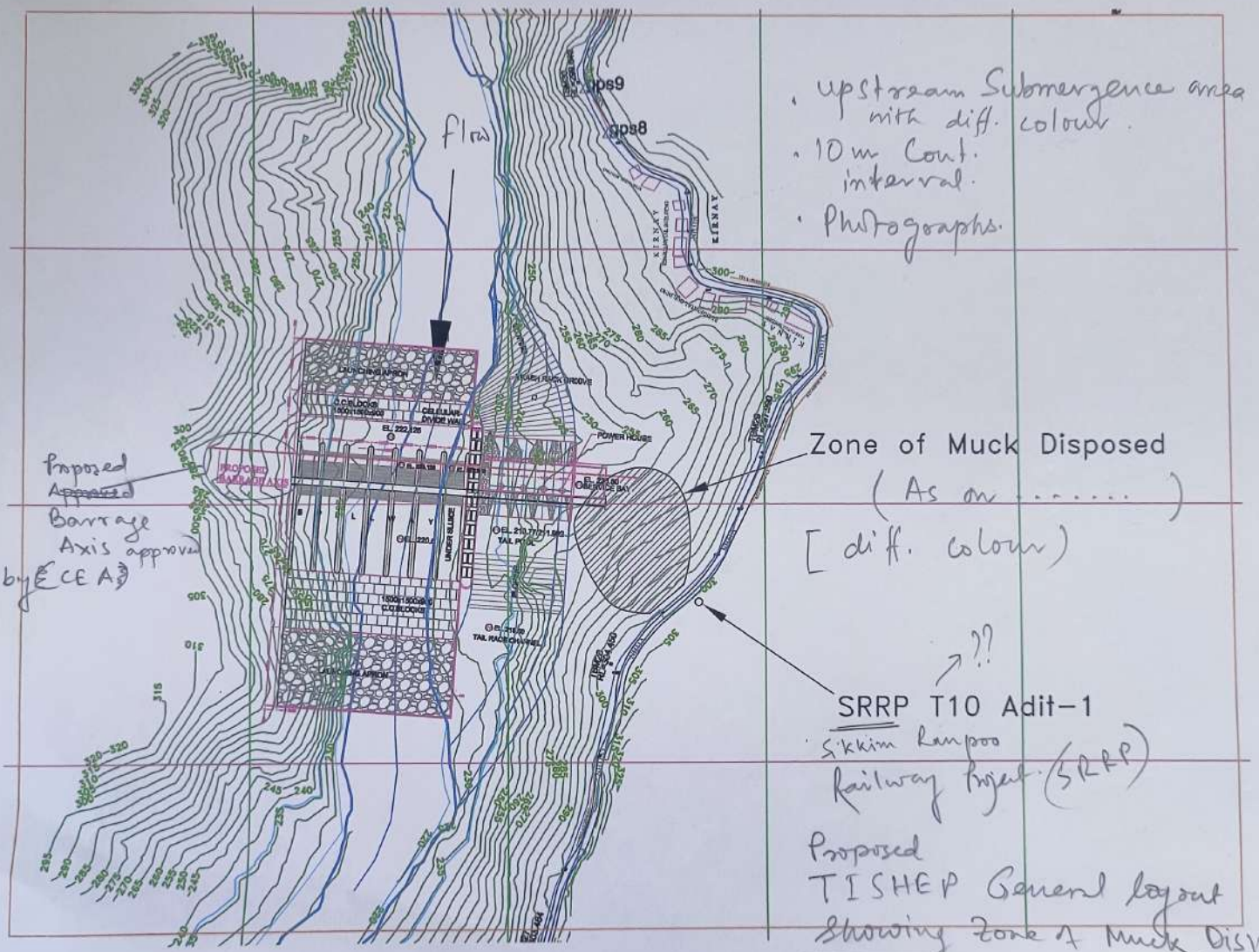
Catchment Area (Sq. Km) (Upper)	9.5
Catchment Area (Sq. Km) (Lower)	18.75

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	2
Diameter (m)	7.7
PRESSURE SHAFT/PENSTOCK	
Number	2
Diameter (m)	7.7- 7.3
TAIL RACE TUNNEL	
Diameter (m)	8.7 to 5.6

POWER HOUSE

No. of Generating Units	4
Capacity of each Unit (MW)	225
Installed Capacity (MW)	900
Effective Head (m)	177
Turbine	Francis



- upstream Submergence area with diff. colour.
- 10 m Cont. interval.
- Photographs.

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B. Pumped Storage Projects Under Construction

9. KOYNA LEFT BANK PUMPED STORAGE PROJECT (2X40MW=80 MW)

1. INTRODUCTION

Koyna Left Bank Pumped Storage Project comprises of Koyna Dam constructed across River Koyna having upper reservoir and lower reservoir with installed capacity of 80MW. The project is located in Satara district of Maharashtra. The project utilizes water of Koyna River for power generation harnessing design head of 57 m. The powerhouse has 2 units of 40 MW having installed capacity of 80 MW generating Design Energy of 168.39 MU in 90% dependable year with 95% machine availability. The project is in Under Construction Held Up category since 2015.

2. LOCATION/ACCESSIBILITY

The upper dam site of the project is located on Koyna River having upper reservoir at latitude of 17°24’8.57”N and longitude of 73°45'5.46”E and lower reservoir is located on Koyna River barrage at latitude of 17°24'6.85''N and longitude of 73°45'1.34''E. The nearest railway station and the Airport is Karad.

3. PROJECT FEATURES

Koyna Left Bank Pumped Storage Project involves construction of

Upper Reservoir: Upper Dam/Reservoir across Koyna River with dam Height of 85.35 m with a live storage of 2835.20 Mcum between a Full Reservoir Level (FRL) of 657.91 m and Minimum Draw down Level (MDDL) of 618 m.

Lower Reservoir: Lower Dam/Reservoir barrage with dam height of15.10 m with a live storage of 2.8 Mcum on Koyna River between a Full Reservoir Level (FRL) of 586 m and Minimum Draw down Level (MDDL) of 578.50 m.

Water Conductor System (Proposed): The Water Conductor System comprises of a Head race Tunnel (HRT) of length 197.62m & diameter 7.60 m. The Pressure shaft/penstock of length 97.66 m carrying water to the underground powerhouse. The Project to be operated under design head of 57 m with installed capacity of 80MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 291.87m & 305.20 m.

4. HYDROLOGY

The Catchment area of the river upto site is 891.78 sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Koyna Left Bank Pumped Storage Project would be 80MW. Utilizing the Design head of 57 m, the Design Energy of the project is 168.39MU in 90% dependable year with 95% machine availability.

SALIENT FEATURES

KOYNA LEFT BANK PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Satara
River	Koyna
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Karad
Nearest Airport	Karad

UPPER RESERVOIR (Proposed):

Location	Latitude: 17°24’8.57”N
	Longitude: 73°45'5.46”E
Full Reservoir Level (FRL) (m)	657.91
Minimum Draw Down Level (MDDL) (m)	618
Length of the Dam at the top(m)	806
Height of Dam (above RBL) (m)	85.35
Live Storage (Mcum)	2835.20
Gross Storage (Mcum)	2980.30

LOWER RESERVOIR (Proposed)

Location	Latitude: 17°24'6.85''N
	Longitude: 73°45'1.34''E
Full Reservoir Level (FRL) (m)	586
Minimum Draw Down Level (MDDL) (m)	578.50
Height of Dam (above RBL) (m)	15.10
Live Storage (Mcum)	2.8

HYDROLOGY:

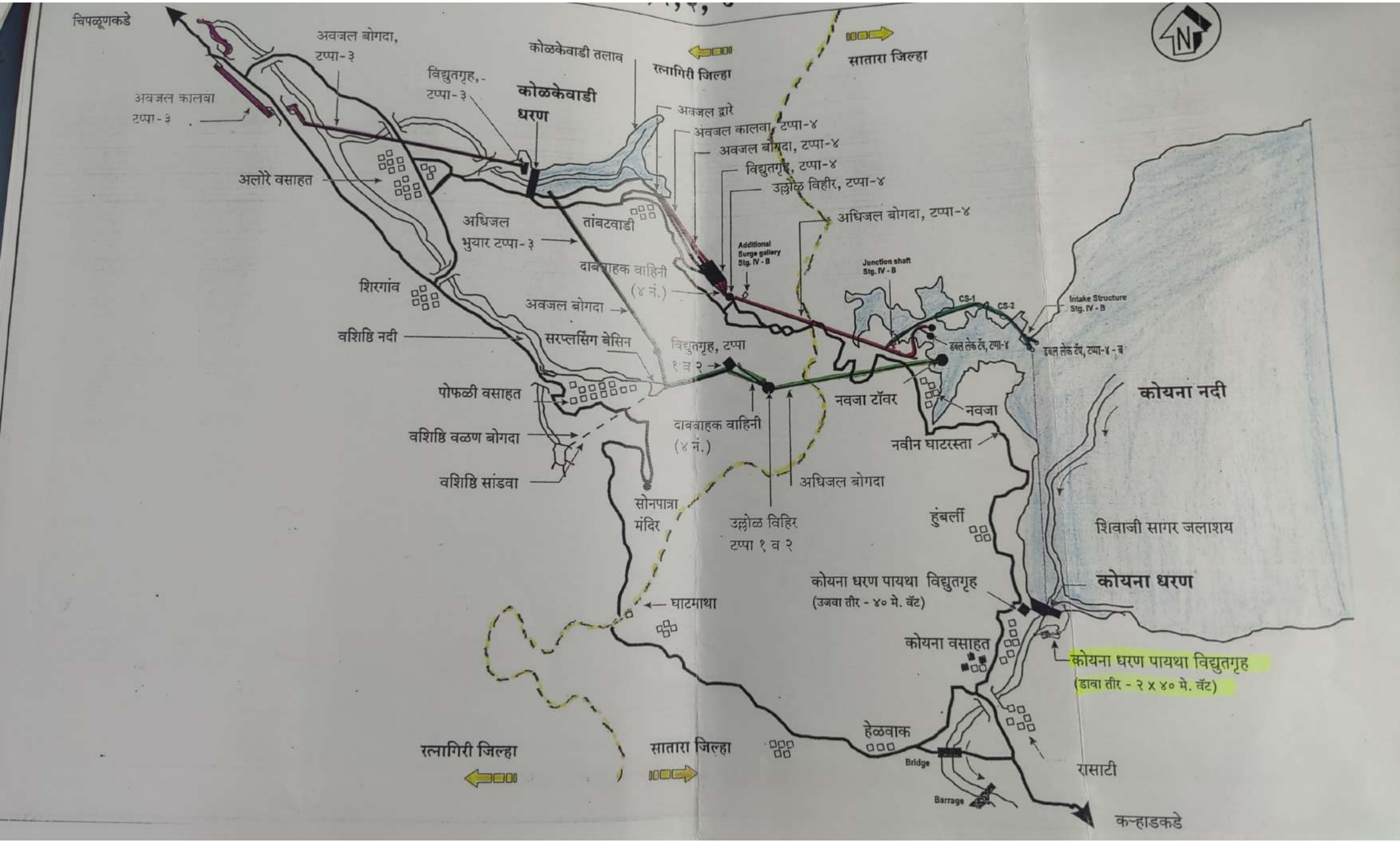
Catchment Area (Sq. Km)	891.78

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	1
Length (m)	197.62
Diameter (m)	7.6
PRESSURE SHAFT/PENSTOCK	
Number	2
Length (m)	97.66
Diameter (m)	7.6 to 3.90
TAIL RACE TUNNEL	
Length (m)	291.87 & 305.20
Diameter (m)	6.5

POWER HOUSE:

Type	Underground
No. of Generating Units	2
Capacity of each Unit (MW)	40
Installed Capacity (MW)	80
Design Head (m)	57
Turbine	Reversible Vertical Francis
Design Energy(MU)	168.39


चिपळूणकडे
अवजल बोगदा, टप्पा-३
अवजल कालवा टप्पा-३
विद्युतगृह, - टप्पा-३
कोळकेवाडी धरण
कोळकेवाडी तलाव
रत्नागिरी जिल्हा
सातारा जिल्हा
अलोरे वसाहत
अवजल द्वारे
अवजल कालवा, टप्पा-४
अवजल बोगदा, टप्पा-४
विद्युतगृह, टप्पा-४
उल्लोळ विहीर, टप्पा-४
अधिजल बोगदा, टप्पा-४
अधिजल भुयार टप्पा-३
तांबटवाडी
Additional Surge gallery Stg. IV - B
Junction shaft Stg. IV - B
दाबवाहक वाहिनी (४ नं.)
शिरगांव
अवजल बोगदा
CS-1
CS-2
Intake Structure Stg. IV - B
वशिष्ठि नदी
सरप्लसिंग बेसिन
विद्युतगृह, टप्पा १ व २
इबत तेक टॅप, टप्पा-४
इबत तेक टॅप, टप्पा-४ - ब
पोफळी वसाहत
नवजा टॉवर
नवजा
कोयना नदी
वशिष्ठि वळण बोगदा
दाबवाहक वाहिनी (४ नं.)
नवीन घाटरस्ता
वशिष्ठि सांडवा
अधिजल बोगदा
सोनपात्रा मंदिर
उल्लोळ विहिर टप्पा १ व २
हुंबर्ली
शिवाजी सागर जलाशय
कोयना धरण पायथा विद्युतगृह (उजवा तीर - ४० मे. वॅट)
कोयना धरण
घाटमाथा
कोयना वसाहत
कोयना धरण पायथा विद्युतगृह (डावा तीर - २ x ४० मे. वॅट)
हेळवाक
Bridge
Barrage
रासाटी
रत्नागिरी जिल्हा
सातारा जिल्हा
कऱ्हाडकडे

10. KUNDAH PUMPED STORAGE PROJECT (4X125 MW=500MW)

1. INTRODUCTION

Kundah Pumped Storage Project is located near small town silambu in Nilgiris district of Tamil Nadu. The project utilizes water of Kundah River for power generation harnessing gross head of 240 m. The powerhouse has 4 units of 125 MW having installed capacity of 500 MW. The existing Porthimund reservoir of Kundah Pumped Storage project is used as the Upper Reservoir and existing Emerald reservoir of Kundah Pumped Storage project is used as the Lower Reservoir. The project is proposed to be executed by Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO)

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Kundah River having upper reservoir at latitude of 11°22'35.4"N and longitude of 76°34'19.2"E and lower reservoir at latitude of 11°19'56.3"N and longitude of 76°37'10.6"E. There is a proposal of underground type of Power house. The nearest railway station is Mettupalayam and the Airport is Coimbatore at Nilgiris.

3. PROJECT FEATURES

Kundah Pumped Storage Project involves.

Upper Reservoir (Porthimund existing): Upper Reservoir involves a dam of Height 56.39 m with a live storage of 20.10 Mcum on river Kundah between a Full Reservoir Level (FRL) of 2220.46 m and Minimum Draw down Level (MDDL) of 2207.55 m.

Lower Reservoir (Emerald existing): Height of dam on lower reservoir is 65 m with a live storage of 130.84 Mcum on river Kundah between a Full Reservoir Level (FRL) of 1985.80 m and Minimum Draw down Level (MDDL) of 1957.98 m.

Water Conductor System (under active construction): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 1267.5 m and diameter of 8.5 m, 2 no. of Penstock of diameter of 5 m carrying water to the underground powerhouse. The Project is to be operated under gross head of 240 m with installed capacity of 500 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 895 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 10.62 Sq.Km. and the lower dam site is 58.53 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Kundah Pumped Storage Project would be 500 MW. Utilizing the gross head of 240 m, the Design Energy of the project comes out to be of 1005 MU in 90% dependable year with 95% machine availability.

SALIENT FEATURES

KUNDAH PUMPED STORAGE PROJECT

GENERAL:

State	Tamil Nadu
District	Nilgiris
River	Kundah
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Mettupalayam
Nearest Airport	Coimbatore

UPPER RESERVOIR (Porthimund existing):

Location	Latitude: 11°22'35.4"N
	Longitude: 76°34'19.2"E
Full Reservoir Level (FRL) (m)	2220.46
Minimum Draw Down Level (MDDL) (m)	2207.55
Length of the Dam at the top(m)	369
Height of Dam (above RBL) (m)	56.39
Live Storage (Mcum)	20.10
Gross Storage (Mcum)	60.12

LOWER RESERVOIR (Emerald existing):

Location	Latitude: 11°19'56.3"N
	Longitude: 76°37'10.6"E
Full Reservoir Level (FRL) (m)	1985.80
Minimum Draw Down Level (MDDL) (m)	1957.98
Type of Dam	Masonry
Height of Dam (above RBL) (m)	65
Live Storage (Mcum)	130.84

HYDROLOGY:

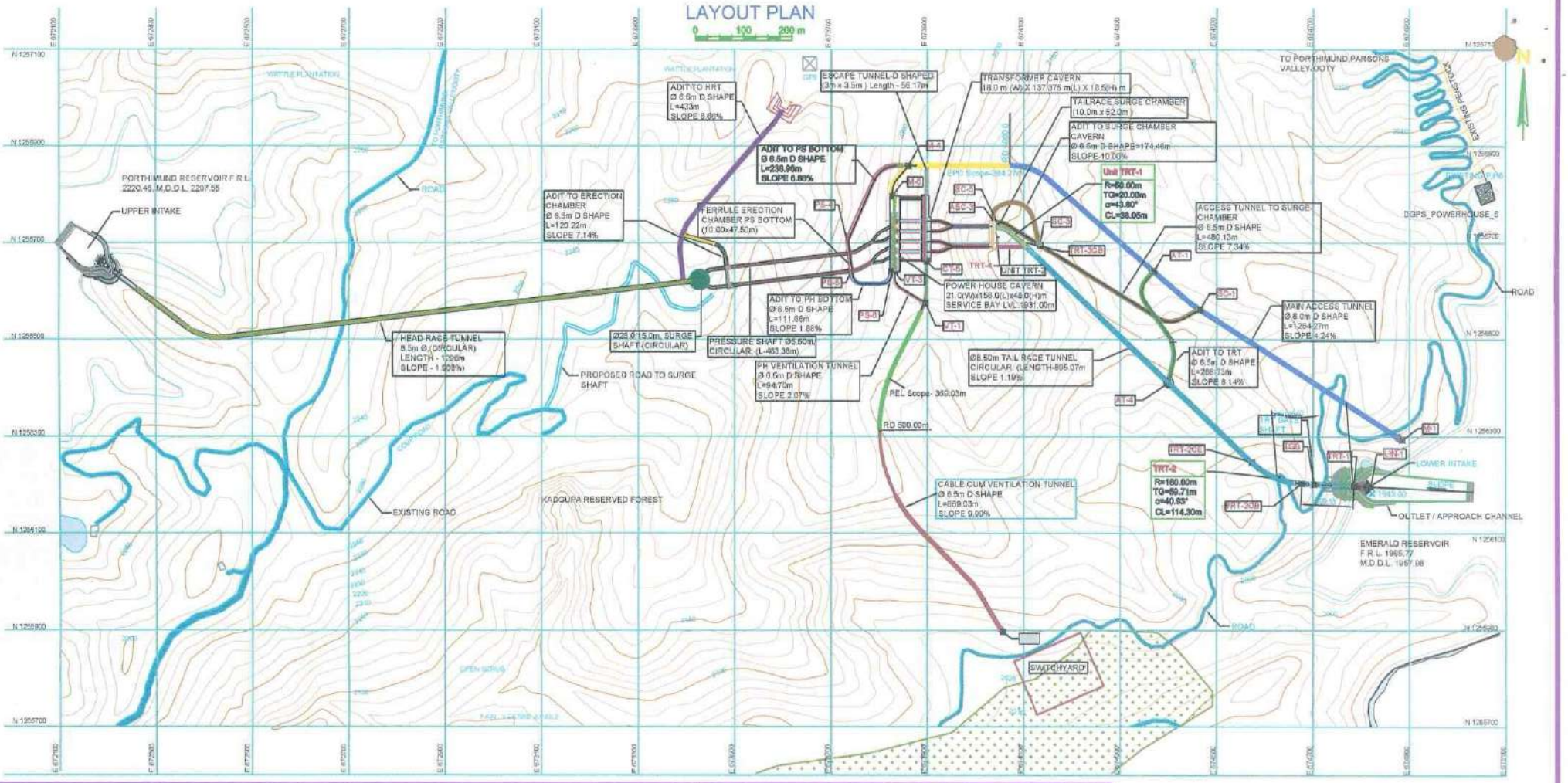
Catchment Area (Sq. Km) Upper Dam	10.62
Catchment Area (Sq. Km) Lower Dam	58.53

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	1
Length (m)	1267.5
Diameter (m)	8.5
PRESSURE SHAFT/PENSTOCK	
Number	2
Length (m)	425
Diameter (m)	5
TAIL RACE TUNNEL	
Length (m)	895
Diameter (m)	8.5

POWER HOUSE

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	125
Installed Capacity (MW)	500
Design Head (m)	230
Gross Head (m)	240
Turbine	Francis
Design Energy(MU)	1005



KUNDAH PUMPED STORAGE HYDRO ELECTRIC PROJECT

11. TEHRI PUMPED STORAGE PROJECT (4X250MW=1000 MW)

1. INTRODUCTION

Tehri Pumped Storage Project has an existing upper reservoir which is Tehri Dam reservoir and lower reservoir which is Koteshwar Dam reservoir with installed capacity of 1000MW. Tehri PSP comprise of four reversible pump turbine units of 250 MW each, involve construction of an Underground Machine Hall on the left bank of river Bhagirathi. The project is located in Tehri district of Uttarakhand. The project utilizes water of Bhagirathi River for power generation harnessing design head of 188 m. The powerhouse has 4 units of 250MW having installed capacity of 1000MW generating annual energy of 1268MU in 90% dependable year.

2. LOCATION/ACCESSIBILITY

The upper dam site of the project is located on Bhagirathi River having upper reservoir which is Tehri Dam Reservoir located at latitude of 30°22'41''N and longitude of 78°28'41''E and lower dam site which is Koteshwar Dam reservoir located at latitude of 30°15'36.2''N and longitude of 73°29'52.6''E. The nearest railway station is Rishikesh and the Airport is Dehradun.

3. PROJECT FEATURES

Tehri Pumped Storage Project involves construction of

Upper Reservoir (Existing) (Tehri dam Reservoir): Upper Reservoir for this pumped storage is already existing with dam Height of 260.5 m with a live storage of 2615 Mcum on Bhagirathi River between a Full Reservoir Level (FRL) of 830 m and Minimum Draw down Level (MDDL) of 740 m.

Lower Reservoir (Exisiting) (Koteshwar Dam Reservoir): Lower Reservoir for this pumped storage is already existing with dam height of 97.5 m with a live storage of 35 Mcum on Bhagirathi River between a Full Reservoir Level (FRL) of 612.5 m and Minimum Draw down Level (MDDL) of 598.5 m.

Water Conductor System: The Water Conductor System comprises of a penstock of length 1514 m and diameter 6.0 m carrying water to the underground powerhouse. The Project to be operated under design head of 188 m with installed capacity of 100 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 2256.85 m.

4. POWER & ENERGY BENEFITS

The installed capacity of Tehrir Pumped Storage Project is 1000 MW. Utilizing the Design head of 188 m, the Annual Energy of the project based on pumping is 1268MU in 90% dependable year.

SALIENT FEATURES

TEHRI PUMPED STORAGE PROJECT

GENERAL:

State	Uttarakhand
District	Tehri
River	Bhagirathi
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Rishikesh
Nearest Airport	Dehradun

UPPER RESERVOIR (Tehri Dam Existing):

Location	Latitude: 30°22'41''N
	Longitude: 78°28'41''E
Full Reservoir Level (FRL) (m)	830
Minimum Draw Down Level (MDDL) (m)	740
Length of the Dam at the top(m)	592
Height of Dam (above RBL) (m)	260.5
Live Storage (Mcum)	2615
Gross Storage (Mcum)	3540

LOWER RESERVOIR (Koteshwar Dam Existing)

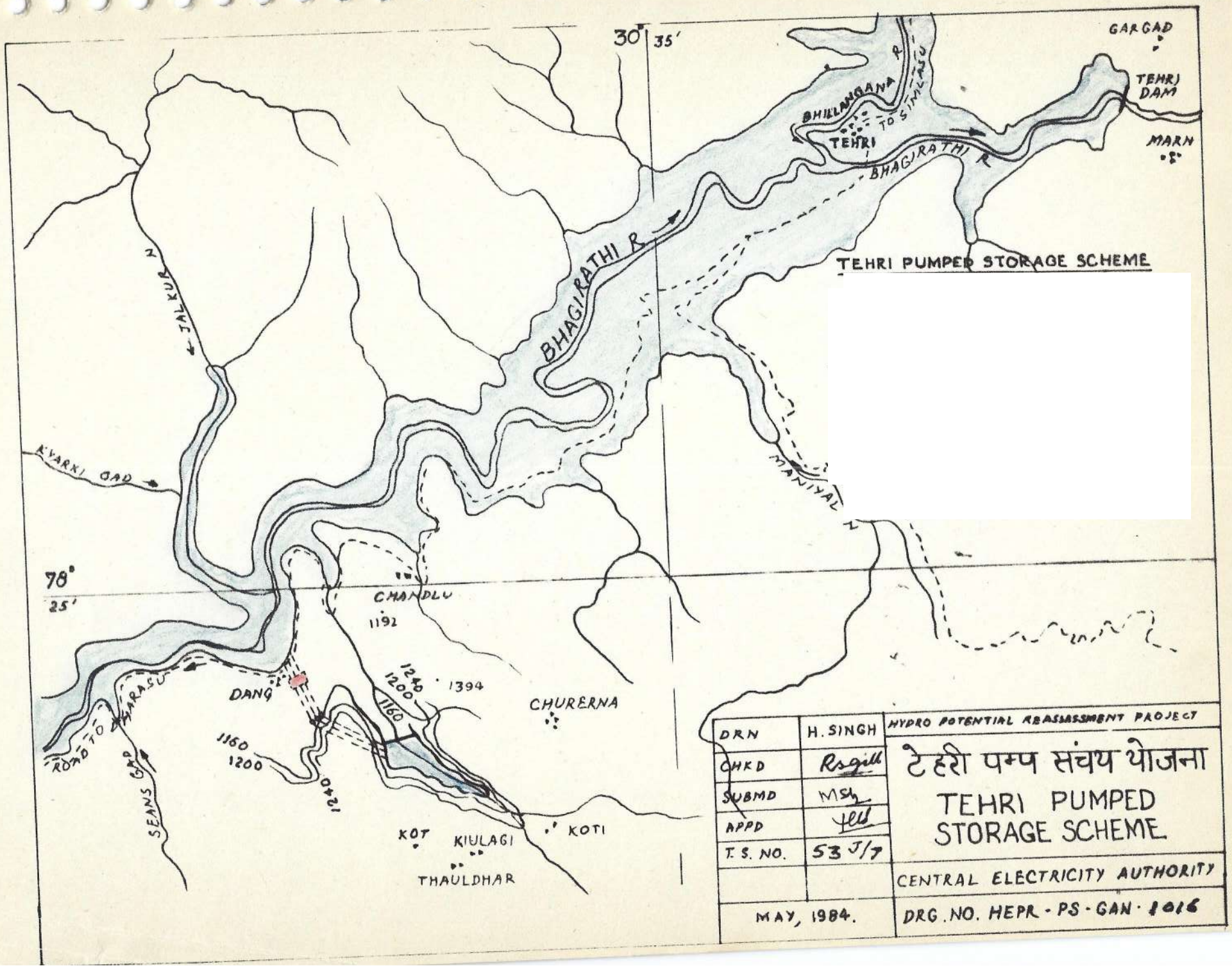
Location	Latitude: 30°15'36.2''N
	Longitude: 73°29'52.6''E
Full Reservoir Level (FRL) (m)	612.5
Minimum Draw Down Level (MDDL) (m)	598.5
Height of Dam (above RBL) (m)	35
Live Storage (Mcum)	88.9

WATER CONDUCTOR SYSTEM:

PENSTOCK	
Number	4
Length (m)	1514
Diameter (m)	6.0
TAIL RACE TUNNEL	
Number	2
Length (m)	2256.85
Diameter (m)	9.0

POWER HOUSE:

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	250
Installed Capacity (MW)	1000
Design Head (m)	188
Turbine	Reversible Vertical Francis
Annual Energy(MU)	1268
No. of hours of Generation	
Energy(MU) for Pumping	1712


TEHRI PUMPED STORAGE SCHEME
30° 35'
78° 25'
GARGAD
TEHRI DAM
MARN
BHILANGANA R
TO SIMLASU
TEHRI
BHAGIRATHI R
BHAGIRATHI R
JALKUR N
KVARKI GAD
MANIYAL N
CHANDLU
1192
1240
1200
1160
1394
CHURERNA
DANG
1160
1200
1240
ROAD TO HARASU
SEANS GAD
KOT
KIULAGI
KOTI
THAULDHAR
DRN H. SINGH
CHKD Rsgill
SUBMD MSh
APPD
T. S. NO. 53 J/7
HYDRO POTENTIAL REASSESSMENT PROJECT
टेहरी पम्प संचय योजना
TEHRI PUMPED STORAGE SCHEME
CENTRAL ELECTRICITY AUTHORITY
MAY, 1984.
DRG. NO. HEPR - PS - GAN - 1016

C. Pumped Storage Projects Concurred

12. TURGA PUMPED STORAGE PROJECT (4 X 250 MW=1000 MW)

1. INTRODUCTION

Turga Pumped Storage Project is located in Purulia district of West Bengal. The project utilizes water of Turga Nala for power generation harnessing effective head of 146.4 m. The powerhouse has 4 units of 250 MW having installed capacity of 1000 MW. The Upper Reservoir and Lower Reservoir are proposed. The project is proposed to be executed by West Bengal State Electricity Distribution Company Limited (WBSEDCL).

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Turga Nala having upper reservoir at latitude of 23°12'47.2"N and longitude of 86°4'19.9"E and lower reservoir at latitude of 23°11'48.8"N and longitude of 86°4'12.5"E. There is a proposal of underground type of Power house. The nearest railway station from the project site is Barabhun and the nearest Airport is Ranchi.

3. PROJECT FEATURES

Turga Pumped Storage Project involves.

Upper Reservoir (Proposed): Upper Reservoir involves construction dam of Height 63.5 m with a live storage of 14.2 Mm^3 on river Subarnarekha River (Turga Nala) between a Full Reservoir Level (FRL) of 464 m and Minimum Draw down Level (MDDL) of 444.40 m.

Lower Reservoir (Proposed): Height of dam on the lower reservoir would be 64 m with a live storage of 14.2 Mm^3 on river Turga Nala between a Full Reservoir Level (FRL) of 316.5 m and Minimum Draw down Level (MDDL) of 280.4 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a 02 nos. of Head race tunnel (HRT) of length 618.11 m and diameter of 9 m, 2 no. of Penstock of diameter of 9 m carrying water to the underground powerhouse. The Project to be operated under rated effective head of 146.4 m with installed capacity of 1000 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 8.29 Sq.Km. and the lower dam site is 12.66 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Turga Pumped Storage Project would be 1000 MW. Utilizing the rated effective head of 146.4 m, the Annual Energy of the project comes out to be of 1814 MU in 90% dependable year with 95% machine availability.

SALIENT FEATURES

TURGA PUMPED STORAGE PROJECT

GENERAL:

State	West Bengal
District	Purulia
River	Turga Nala
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Barabhum
Nearest Airport	Ranchi

UPPER RESERVOIR (proposed):

Location	Latitude: 23°12'47.47.2"N
	Longitude: 86°4'19.9"E
Full Reservoir Level (FRL) (m)	464
Minimum Draw Down Level (MDDL) (m)	444.40
Length of the Dam at the top(m)	732
Height of Dam (above RBL) (m)	63.5
Live Storage (Mm^3)	14.2

LOWER RESERVOIR (proposed):

Location	Latitude: 23°11'48.8"N
	Longitude: 86°4'12.5"E
Full Reservoir Level (FRL) (m)	316.5
Minimum Draw Down Level (MDDL) (m)	280.4
Type of Dam	Concrete gravity
Height of Dam (above RBL) (m)	64
Live Storage (Mm^3)	14.2

HYDROLOGY:

Catchment Area (Sq. Km) Upper Dam	8.29
Catchment Area (Sq. Km) Lower Dam	12.66

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	2
Length (m)	618.11
Diameter (m)	9
PENSTOCK	
Number	2
Length (m)	824.20
Diameter (m)	9

POWER HOUSE

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	250
Installed Capacity (MW)	1000
Effective Turbine Output Head (m)	146.4
Turbine	Francis type Vertical Reversible Pump
Annual Energy(MU)	1814
No. of hours of Generation	5

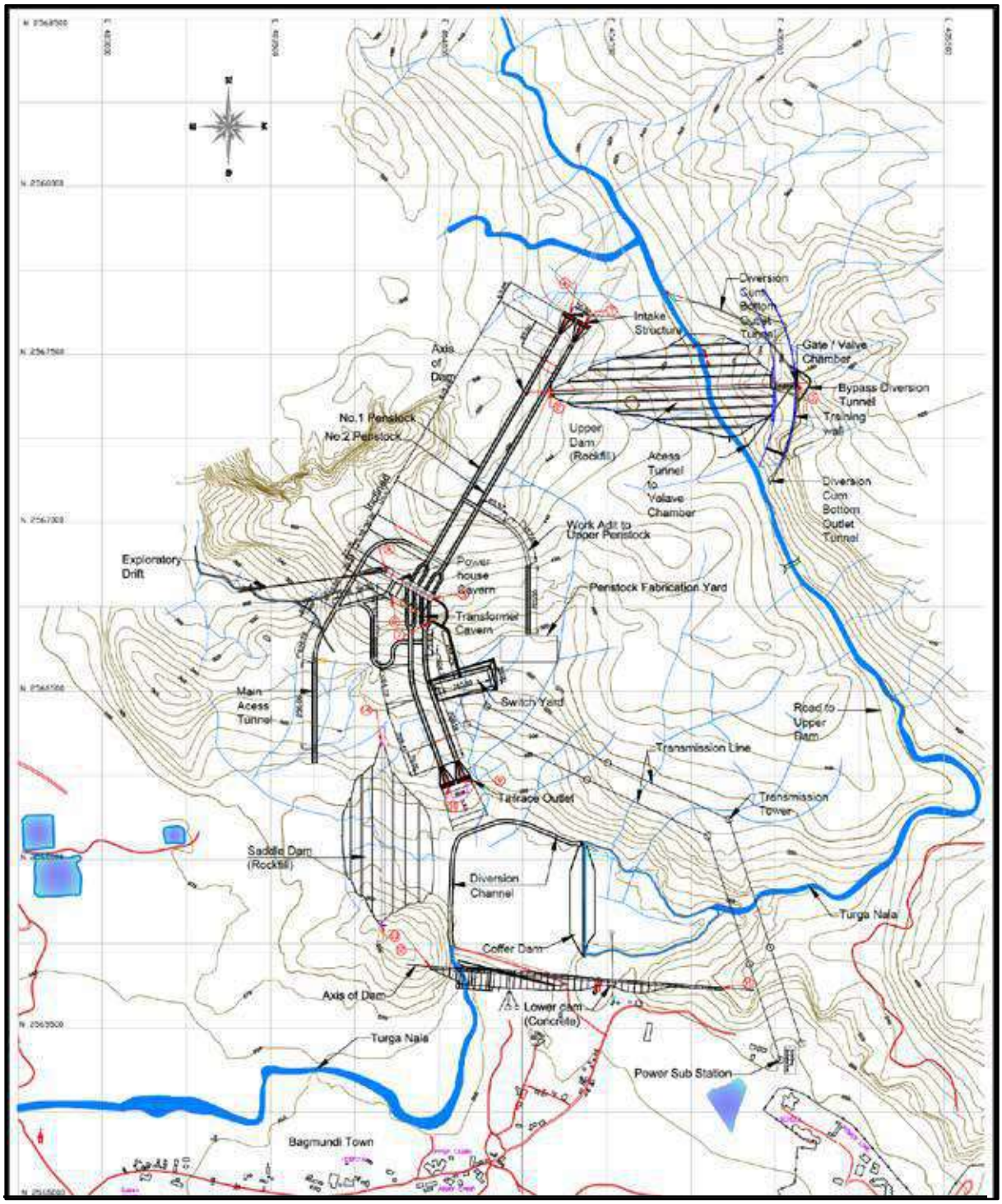


Figure 1-2 Layout of Turga PSP

13. UPPER SILERU PUMPED STORAGE PROJECT (9X150MW=1350 MW)

1. INTRODUCTION

Upper Sileru Pumped Storage Project is located in Visakhapatnam district of Andhra Pradesh. The project utilizes water of Sileru River for power generation harnessing gross head of 108.51 m. The powerhouse has 9 units of 150 MW having installed capacity of 1350 MW. The existing Guntawada Reservoir of Upper Sileru- I & II Hydroelectric project is used as the Upper Reservoir and existing Donkarayi reservoir of Lower Sileru Hydroelectric project is used as Lower Reservoir.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Sileru River having upper reservoir at latitude of 18°03'33"N and longitude of 82°02'15"E and lower reservoir at latitude of 17°56'02"N and longitude of 81°47'46"E. There is a proposal of Surface type of Power house. The nearest railway station from the project site is Narsipatnam and the Airport is Visakhapatnam.

3. PROJECT FEATURES

Upper Sileru Pumped Storage Project involoves use of existing Guntawada Reservoir as Upper Reservoir and existing Donkarayi Reservoir as Lower Reservoir.

Upper Reservoir (Existing Guntawada Reservoir): Upper Reservoir is located on Sileru river of height 19.81 m. The project has a live storage of 102.56 Mcum between a Full Reservoir Level (FRL) of 414.5 m and Minimum Draw down Level (MDDL) of 406.75 m.

Lower Reservoir (Existing Donkarayi Reservoir): Lower reservoir is located on Sileru River of height 58.52 m. The project has a live storage of 375.84 Mcum between a Full Reservoir Level (FRL) of 316.08 m and Minimum Draw down Level (MDDL) of 306.08 m.

Water Conductor System: The Water Conductor System comprises of 3 No. of Head race tunnels (HRT) of length 2768 m each and diameter of 12 m, 9 no. of Penstocks of length 385 m each and diameter of 6 m carrying water to the Semi-underground powerhouse. The Project to be operated under Design head of 91.73 m with installed capacity of 1350 MW. The discharged water from Power house is carried back to the river by 3 No. of Tail race tunnels of length 2465 m each.

4. HYDROLOGY

The Catchment area of the river upto dam site is 5164 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Upper Sileru Pumped Storage Project would be 1350 MW utilising the Design head of 91.73 m.

SALIENT FEATURES

UPPER SILERU PUMPED STORAGE PROJECT

GENERAL:

State	Andhra Pradesh
District	Visakhapatnam
River	Sileru
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Narsipatnam Road
Nearest Airport	Visakhapatnam

UPPER RESERVOIR (Guntawada Reservoir Existing):

Location	Latitude: 18°03'33"N
	Longitude: 82°02'15"E
Full Reservoir Level (FRL) (m)	414.5
Minimum Draw Down Level (MDDL) (m)	406.75
Length of the Dam at the top(m)	765.53
Height of Dam (above RBL) (m)	19.81
Live Storage (Mcum)	102.56
Gross Storage (Mcum)	122.72

LOWER RESERVOIR (Donkarayi Reservoir existing):

Location	Latitude: 17°56'02"N
	Longitude: 81°47'46"E
Full Reservoir Level (FRL) (m)	316.08
Minimum Draw Down Level (MDDL) (m)	306.08
Type of Dam	Masonry cum earthen dam
Height of Dam (above RBL) (m)	58.52
Live Storage (Mcum)	375.84

HYDROLOGY:

Catchment Area (Sq. Km)	5164

WATER CONDUCTOR SYSTEM :

HEAD RACE TUNNEL	
Number	3
Length (m)	2768 m (each)
Diameter (m)	12
Design Discharge (Cumec)	1667 (total for 3 tunnels)
PRESSURE SHAFT/PENSTOCK	
Number	9
Length (m)	385 (each)
Diameter (m)	6
TAIL RACE TUNNEL	
Length (m)	2465 (each)
Diameter (m)	12

POWER HOUSE:

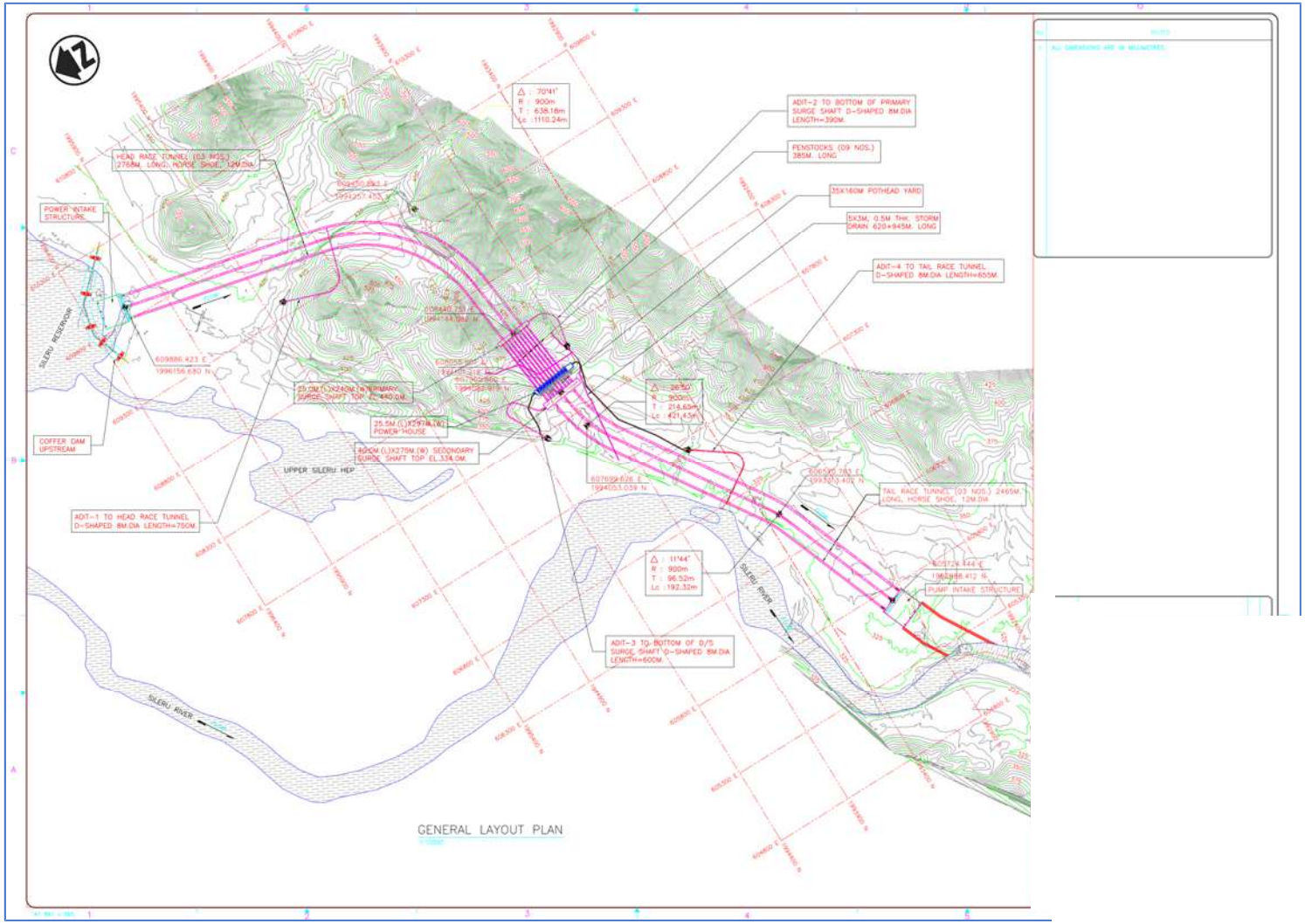
Type	Semi-Under Ground
No. of Generating Units	9
Capacity of each Unit (MW)	150
Installed Capacity (MW)	1350
Design Head (m) (Rated Dynamic Head)	91.73
Gross Head (m)	108.51
Turbine	Vertical-Francis Turbine
Energy (MU) for Pumping	5105.14

COST ASPECTS:

Estimated Cost (Rs. Crores)	10,444 (2019-20 Price level)

COMMISSIONING DETAILS:

Commissioning Year	2027 (Probable)


HEAD RACE TUNNEL (03 NOS.) 2788M. LONG, HORSE SHOE, 12M DIA
POWER INTAKE STRUCTURE
SILERU RESERVOIR
COFFER DAM UPSTREAM
UPPER SILERU HEP
ADIT-1 TO HEAD RACE TUNNEL D-SHAPED 8M.DIA LENGTH=750M.
ADIT-2 TO BOTTOM OF PRIMARY SURGE SHAFT D-SHAPED 8M.DIA LENGTH=390M.
PENSTOCKS (09 NOS.) 385M. LONG
35X160M POTHEAD YARD
5X3M, 0.5M THK. STORM DRAIN 620+945M. LONG
ADIT-4 TO TAIL RACE TUNNEL D-SHAPED 8M.DIA LENGTH=655M.
25.5M.(L)X275M.(W) POWER HOUSE
40CM.(L)X275M.(W) SECONDARY SURGE SHAFT TOP EL.334.0M.
TAIL RACE TUNNEL (03 NOS.) 2465M. LONG, HORSE SHOE, 12M DIA
PUMP INTAKE STRUCTURE
ADIT-3 TO BOTTOM OF D/S SURGE SHAFT D-SHAPED 8M.DIA LENGTH=600M.
SILERU RIVER
GENERAL LAYOUT PLAN

D. Pumped Storage Projects Taken for Further Studies

14. YERRAVARAM PUMPED STORAGE PROJECT (4X300=1200 MW)

1. INTRODUCTION

Yerravaram Pumped Storage Project is located near small village Yerravaram in Visakhapatnam district of Andhra Pradesh. The project utilizes water of Thanvdva River for power generation harnessing design head of 231.10 m. The powerhouse has 4 units of 300 MW having installed capacity of 1200 MW generating annual energy of 2379.80 MU.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Thandva River having upper reservoir at latitude of 17°44'26.67"N and longitude of 82°25'35.82"E and lower reservoir at latitude of 17°43'32.05"N and longitude of 82°24'18.34"E. There is a proposal of underground type of Power house. The nearest railway station is Narsipatam and the Airport is Visakhapatnam International.

3. PROJECT FEATURES

Yerravaram Pumped Storage Project involves construction of Upper Reservoir.

Upper Reservoir (Proposed): Upper Reservoir is proposed to be of Height 62 m with a live storage of 11.58 Mcum on river Thandva between a Full Reservoir Level (FRL) of 500 m and Minimum Draw down Level (MDDL) of 472 m.

Lower Reservoir (Proposed): Height of the lower reservoir is 59 m with a live storage of 11.58 Mcum on river Uttara between a Full Reservoir Level (FRL) of 273 m and Minimum Draw down Level (MDDL) of 242 m.

Water Conductor System: The proposed Water Conductor System comprises of 2 nos. of Head race tunnel (HRT) of length 1496 m and diameter of 10.10 m, 2 nos. of Penstock of length 713.5 m and diameter of 7.70 m carrying water to the underground powerhouse. The Project to be operated under design head of 231.10 m with installed capacity of 1200 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 210.44 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 34.17 Sq.Km and the lower dam site is 50.21 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Yerravaram Pumped Storage Project would be 1200 MW. Utilising the Design head of 231.10m, the Annual Energy of the project comes out to be of 2379.80 MU.

SALIENT FEATURES

YERRAVARAM PUMPED STORAGE PROJECT

GENERAL:

State	Andhra Pradesh
District	Visakhapatnam
River	Thandva
Type of Scheme (On-River/Off-River)	Off River
Nearest Railhead	Narsipatanam
Nearest Airport	Visakhapatanam

UPPER RESERVOIR:

Location	Latitude: 17°44'26.67"N
	Longitude: 82°25'35.82"E
Full Reservoir Level (FRL) (m)	500
Minimum Draw Down Level (MDDL) (m)	472
Length of the Dam at the top(m)	369
Height of Dam (above RBL) (m)	62
Live Storage (Mcum)	11.58
Gross Storage (Mcum)	13.06

LOWER RESERVOIR:

Location	Latitude: 17°43'32.05"N
	Longitude: 82°24'18.34"E
Full Reservoir Level (FRL) (m)	273
Minimum Draw Down Level (MDDL) (m)	242
Type of Dam	RCC Dam
Height of Dam (above RBL) (m)	59
Live Storage (Mcum)	11.58

HYDROLOGY:

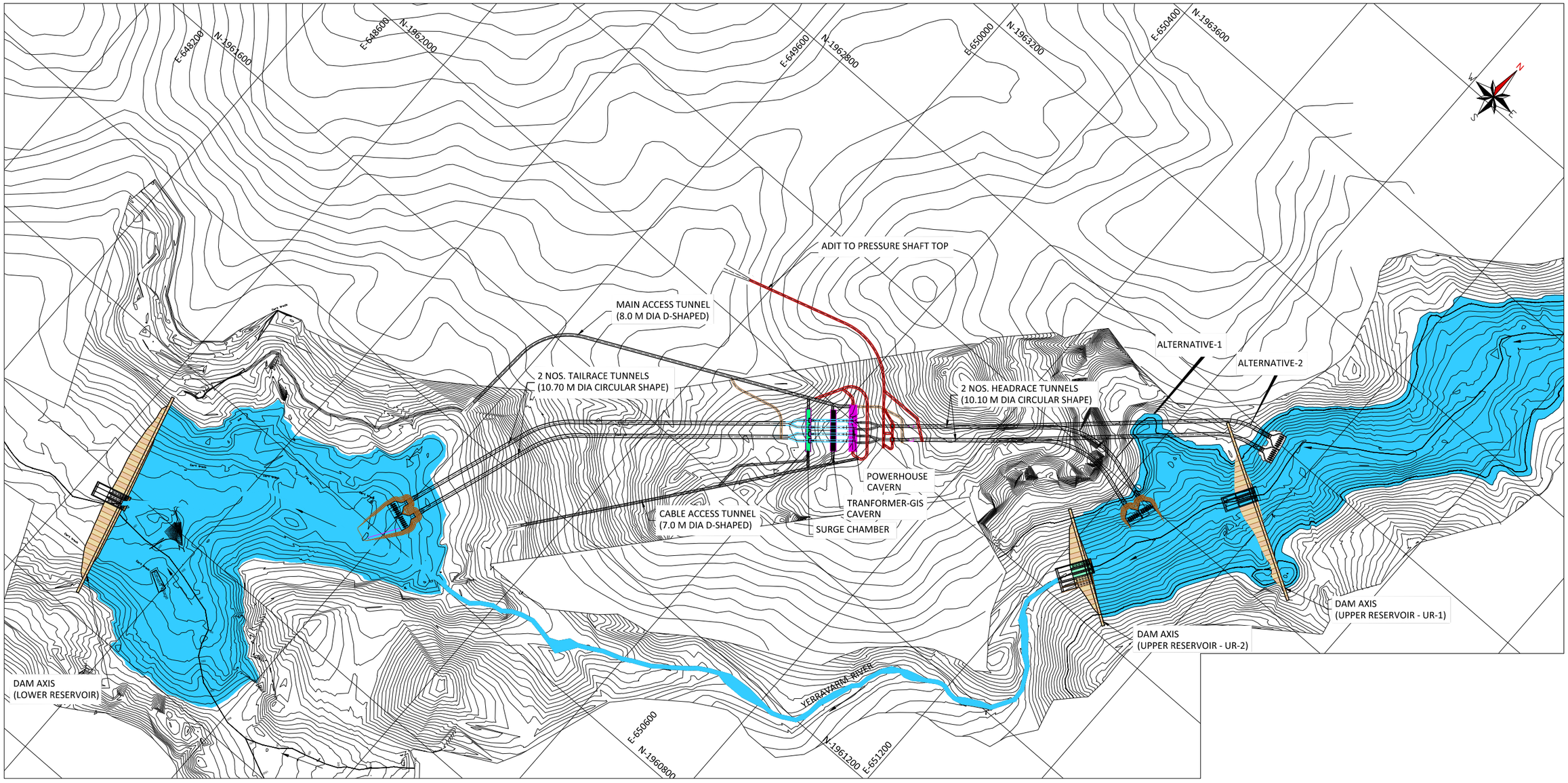
Catchment Area (Sq. Km) Upper Dam	34.17
Catchment Area (Sq. Km) Lower Dam	50.21

WATER CONDUCTOR SYSTEM :

HEAD RACE TUNNEL	
Number	2
Length (m)	1496
Diameter (m)	10.10
Design Discharge (Cumec)	146.17
PRESSURE SHAFT/PENSTOCK	
Number	2
Length (m)	713.50
Diameter (m)	7.7
TAIL RACE TUNNEL	
Length (m)	201.44
Diameter (m)	10.7

POWER HOUSE:

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	300
Installed Capacity (MW)	1200
Design Head (m)	231.10
Turbine	Reversible Vertical Francis
Annual Energy (MU)	2379.80



YERRAVARAM PUMPED STORAGE PROJECT

15. PANYOR PUMPED STORAGE PROJECT (4X165MW=660MW)

1. INTRODUCTION

Panyor Pumped Storage Project is located near small town yazali in Lower Subansiri district of Arunachal Pradesh. The project utilizes water of Panyor River and Ranganadi River for power generation harnessing rated net turbine head of 545.67 m. The powerhouse has 4 units of 165 MW having installed capacity of 660 MW. The existing Panyor Dam of Panyor Hydroelectric project is used as the Upper Reservoir and existing Ranganadi Dam of Ranganadi Hydroelectric project is used as the Lower Reservoir.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Panyor River having upper reservoir at latitude of 27°26'20.72"N and longitude of 93°42'18.79"E and lower reservoir at latitude of 27°20'31.89"N and longitude of 93°49'0.18"E. There is a proposal of underground type of Power house. The nearest railway station is North Lakhimpur and the Airport is Lilabari at North Lakhimpur.

3. PROJECT FEATURES

Panyor Pumped Storage Project involves.

Upper Reservoir (Panyor Dam existing): Upper Reservoir would involve construction of dam of Height 37.5 m with a live storage of 2.5 Mcum on river Panyor between a Full Reservoir Level (FRL) of 1135.5 m and Minimum Draw down Level (MDDL) of 1128 m.

Lower Reservoir (Ranganadi Dam existing): Height of dam on the lower reservoir is 68 m with a live storage of 3.48 Mcum on river Panyor between a Full Reservoir Level (FRL) of 567 m and Minimum Draw down Level (MDDL) of 560 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 5395 m and diameter of 6.5 m, 1 no. of Penstock of diameter of 5.5 m carrying water to the underground powerhouse. The Project to be operated under rated net turbine head of 545.67 m with installed capacity of 660 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 500 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 0.61 Sq.Km. and the lower dam site is 1894 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Panyor Pumped Storage Project would be 660 MW. Utilizing the rated net turbine head of 545.67 m. The project has peak operation duration of 5 hrs.

SALIENT FEATURES

PANYOR PUMPED STORAGE PROJECT

GENERAL:

State	Arunachal Pradesh
District	Lower Subansiri
River	Panyor/ Ranganadi
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	North Lakhimpur
Nearest Airport	Lilabari at North Lakhimpur

UPPER RESERVOIR (Panyor):

Location	Latitude: 27°26'20.72"N
	Longitude: 93°42'18.79"E
Full Reservoir Level (FRL) (m)	1135.5
Minimum Draw Down Level (MDDL) (m)	1128
Length of the Dam at the top(m)	201
Height of Dam (above RBL) (m)	37.5
Live Storage (Mcum)	2.5
Gross Storage (Mcum)	6.45

LOWER RESERVOIR (Ranganadi Dam):

Location	Latitude: 27°20'31.89"N
	Longitude: 93°49'0.18"E
Full Reservoir Level (FRL) (m)	567
Minimum Draw Down Level (MDDL) (m)	560
Type of Dam	Concrete gravity
Height of Dam (above RBL) (m)	68
Live Storage (Mcum)	3.48

HYDROLOGY:

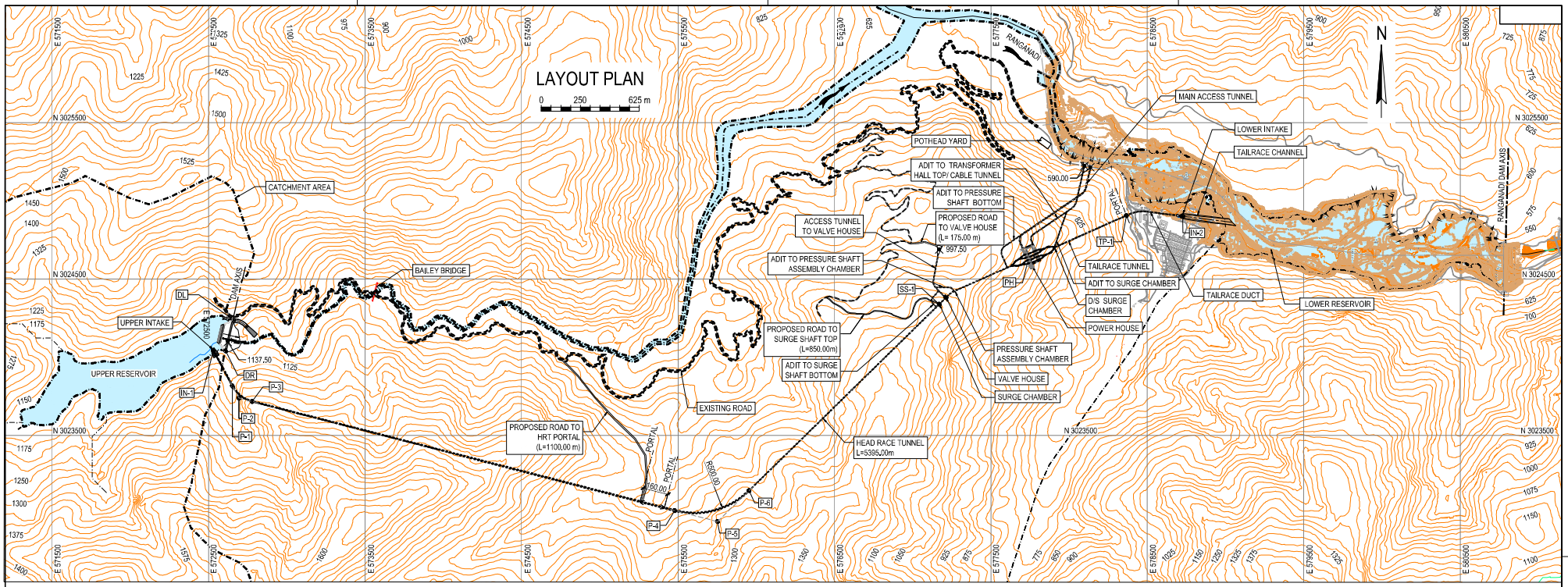
Catchment Area (Sq. Km) Upper Dam	0.61
Catchment Area (Sq. Km) Lower Dam	1894

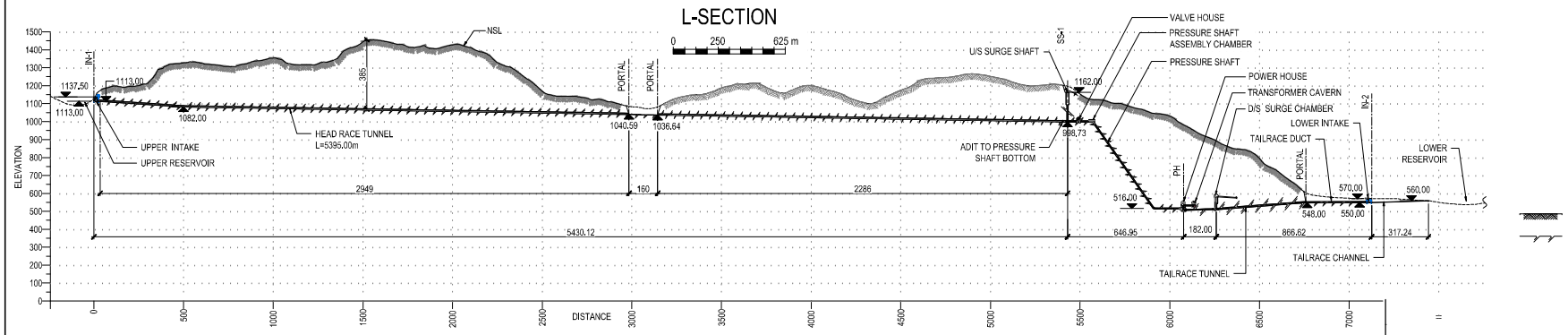
WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	1
Length (m)	5395
Diameter (m)	6.5
PRESSURE SHAFT/PENSTOCK	
Number	1
Diameter (m)	5.5
TAIL RACE TUNNEL	
Length (m)	500
Diameter (m)	6.5

POWER HOUSE

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	165
Installed Capacity (MW)	660
Rated Net Turbine Head (m)	545.67
Rated Net Pump Head (m)	585.67
Turbine	Vertical Reversible Pump





FOR FEASIBILITY STUDY

16. KOPILI PUMPED STORAGE PROJECT (4X80 MW=320MW)

1. INTRODUCTION

Kopili Pumped Storage Project is located near small town umrangso in Dima Haso district of Assam. The project utilizes water of Kopili River for power generation harnessing rated turbine head of 106.60 m. The powerhouse has 4 units of 80 MW having installed capacity of 320 MW. The existing Khandong Dam of Khandong Hydroelectric project is used as the Upper Reservoir and existing Umrong Dam of Umrong Hydroelectric project is used as the Lower Reservoir.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Kopili River having upper reservoir at latitude of 25°31'42.7"N and longitude of 92°37'58.4"E and lower reservoir at latitude of 25°31'42.8"N and longitude of 92°42'45.2"E. There is a proposal of surface type of Power house. The nearest railway station is Guwahati-Lumding and the Airport is Lilabari at Shillong.

3. PROJECT FEATURES

Kopili Pumped Storage Project involves.

Upper Reservoir (Khandong Dam existing): Upper Reservoir involves a dam of Height 66 m with a live storage of 170.02 Mcum on river Kopili between a Full Reservoir Level (FRL) of 725 m and Minimum Draw down Level (MDDL) of 707.4 m.

Lower Reservoir (Ranganadi Dam existing): Lower reservoir has a live storage of 151.54 Mcum on river Kopili between a Full Reservoir Level (FRL) of 609.6 m and Minimum Draw down Level (MDDL) of 594.4 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 3875 m and diameter of 7.6 m, 2 no. of Penstock of diameter of 7.6 m carrying water to the surface powerhouse. The Project to be operated under rated net pump head of 119.70 m with installed capacity of 320 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 498 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 1241 Sq.Km. and the lower dam site is 0.76 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Kopili Pumped Storage Project would be 320 MW. Utilizing the rated turbine head of 106.60 m, The project has peak operation duration of 6 hrs.

SALIENT FEATURES

KOPILI PUMPED STORAGE PROJECT

GENERAL:

State	Assam
District	Dima Haso
River	Kopili
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Guwahati- Lumding
Nearest Airport	Shillong

UPPER RESERVOIR (Khandong Dam existing):

Location	Latitude: 25°31'42.7"N
	Longitude: 92°37'58.4"E
Full Reservoir Level (FRL) (m)	725
Minimum Draw Down Level (MDDL) (m)	707.4
Length of the Dam at the top(m)	243.3
Height of Dam (m)	66
Live Storage (Mcum)	170.02
Gross Storage (Mcum) at FRL	200.99

LOWER RESERVOIR (Ranganadi Dam existing):

Location	Latitude: 25°31'42.8"N
	Longitude: 92°42'45.2"E
Full Reservoir Level (FRL) (m)	609.6
Minimum Draw Down Level (MDDL) (m)	594.4
Type of Dam	Concrete gravity
Live Storage (Mcum)	151.54
Gross Storage (Mcum) at FRL	172.2

HYDROLOGY:

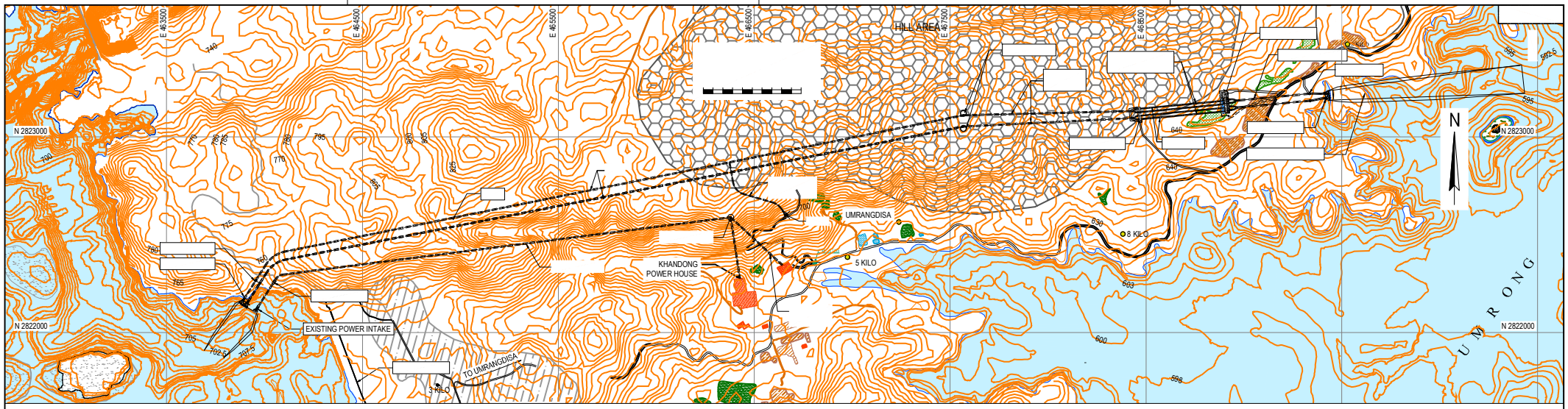
Catchment Area (Sq. Km) Upper Dam	1241
Catchment Area (Sq. Km) Lower Dam	0.76

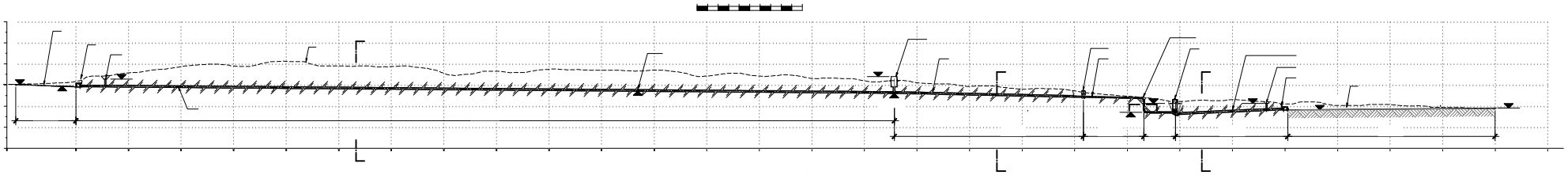
WATER CONDUCTOR SYSTEM

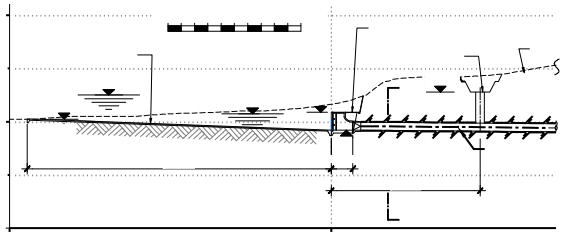
HEAD RACE TUNNEL	
Number	1
Length (m)	3875
Diameter (m)	7.6
PRESSURE SHAFT/PENSTOCK	
Number	2
Diameter (m)	7.6
TAIL RACE TUNNEL	
Length (m)	498
Diameter (m)	7.6

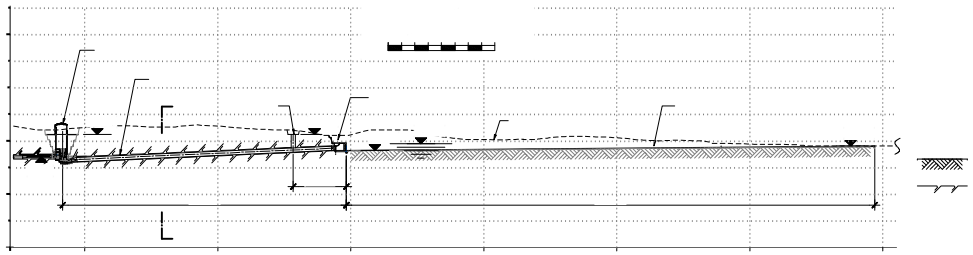
POWER HOUSE

Type	Surface
No. of Generating Units	4
Capacity of each Unit (MW)	80
Installed Capacity (MW)	320
Rated Turbine Head (m)	106.60
Rated Net Pump Head (m)	119.70
Turbine	Vertical Reversible Pump

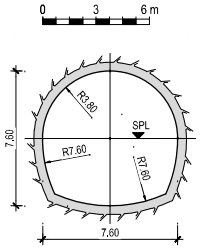




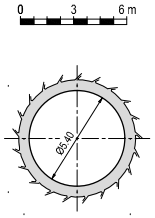




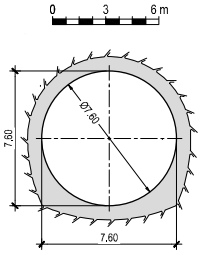
SECTION 1-1
(HEAD RACE TUNNEL)



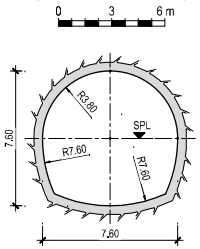
SECTION 2-2
(PRESSURE SHAFT)



SECTION 3-3
(PRESSURE TUNNEL)



SECTION 4-4
(TAIL RACE TUNNEL)



17. MAJRA PUMPED STORAGE PROJECT (7X100MW =700MW)

1. INTRODUCTION

As per Reassessment studies done by Central Electricity Authority (CEA) (1978-87), the project was identified as Majra Pumped Storage Project utilising storage available in Govind Sagar (Bhakra Dam). The studies revealed that peaking capacity to the extent of 1800 MW can be made available near village Majra in District Kangra (Himachal Pradesh).

Now the project will be developed for 700 MW. The project utilizes water of Satluj River for power generation harnessing gross head of 226.15 m. The powerhouse has 7 units of 100 MW having installed capacity of 700 MW. The existing Govind Sagar reservoir created by construction of Bhakra Dam is used as the Lower Reservoir and upper reservoir is proposed to be developed. The project is proposed to be executed by Bhakra Beas Management Board (BBMB).

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Sarhyali Khad (Tributary of Satluj River) having upper reservoir at latitude of 31°28'7.59"N and longitude of 76°29'45.60"E and lower reservoir at latitude of 31°27'00.86"N and longitude of 76°29'15.95"E. There is a proposal of Semi underground/underground type of Power house. The nearest railway station is Kangra and the Airport is Kangra - Gaggal.

3. PROJECT FEATURES

Majra Pumped Storage Project involves:-

Upper Reservoir (proposed): Upper Reservoir is proposed to be of Height 40 m with a live storage of 8.50 Mm^3 on river Satluj between a Full Reservoir Level (FRL) of 720 m and Minimum Draw down Level (MDDL) of 690 m.

Lower Reservoir (Govind Sagar Reservoir Bhakra Dam existing): Height of the lower reservoir is 225.55 m with a live storage of 7437.78 Mm^3 on Govind Sagar reservoir between a Full Reservoir Level (FRL) of 512.07 m and Minimum Draw down Level (MDDL) of 445.62 m.

Water Conductor System (proposed): The proposed length of Water Conductor System is 2200 m carrying water to the powerhouse. The Project to be operated under gross head of 226.155 m. The discharged water from powerhouse is carried back to the river.

4. POWER & ENERGY BENEFITS

The installed capacity of Majra Pumped Storage Project would be 700 MW. Utilising the gross head of 226.15 m the project will provide peaking of hrs.

SALIENT FEATURES

MAJRA PUMPED STORAGE PROJECT

GENERAL:

State	Himachal Pradesh
District	Kangra
River	Satluj River
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Kangra
Nearest Airport	Kangra-Gaggal

UPPER RESERVOIR (proposed):

Location	Latitude: 31°28'7.59"N
	Longitude: 76°29'45.60"E
Full Reservoir Level (FRL) (m)	720
Minimum Draw Down Level (MDDL) (m)	690
Length of the Dam at the top(m)	499
Height of Dam (above RBL) (m)	40
Live Storage (Mm^3)	8.50

LOWER RESERVOIR (Govind Sagar Reservoir Bhakra Dam existing):

Location	Latitude: 31°27'00.86"N
	Longitude: 76°29'15.95"E
Full Reservoir Level (FRL) (m)	512.07
Minimum Draw Down Level (MDDL) (m)	445.62
Type of Dam	Straight Gravity Type Concrete Dam
Height of Dam (above RBL) (m)	225.55
Live Storage (Mm^3)	7437.98

HYDROLOGY:

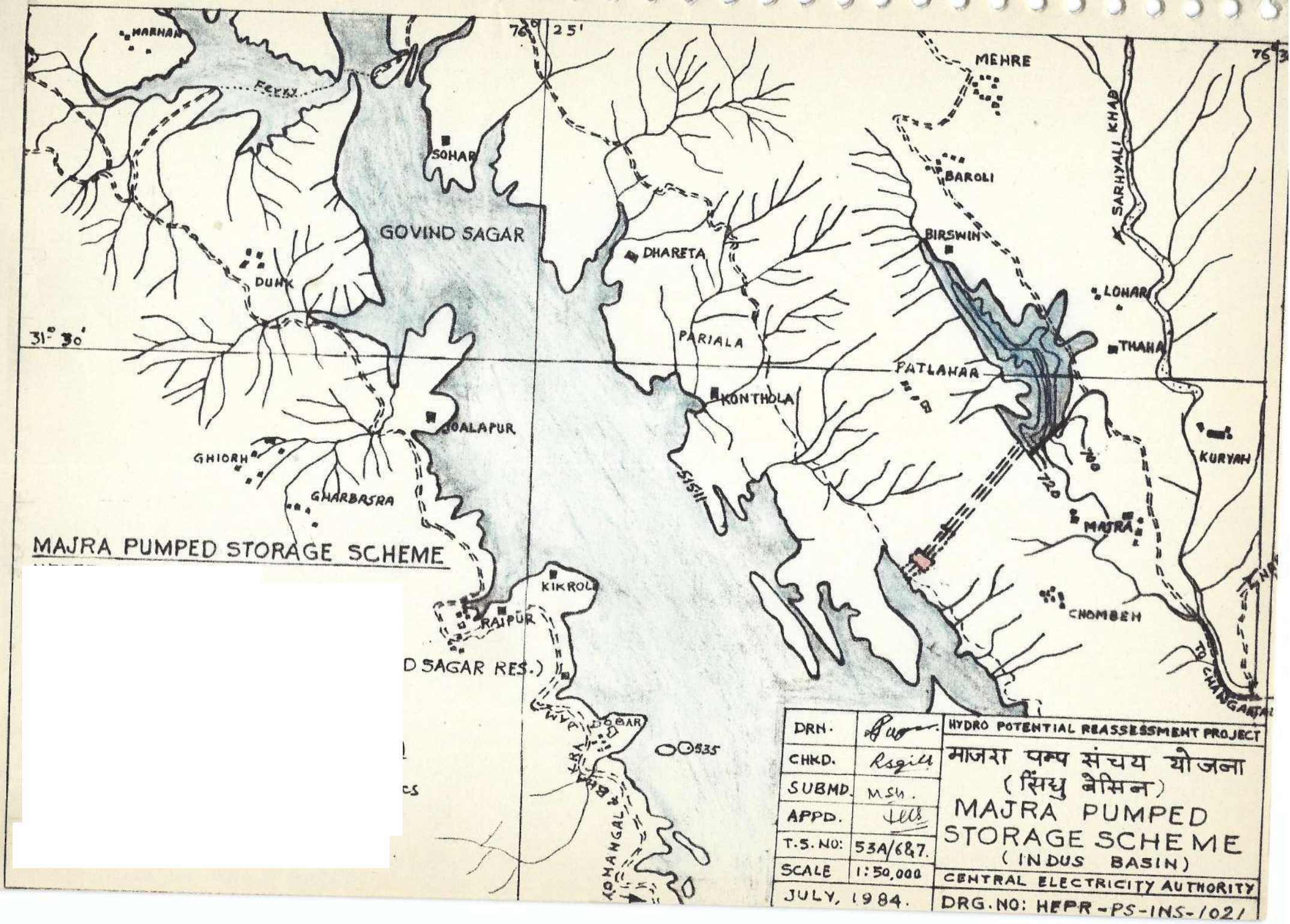
Catchment Area (Sq. Km)	

WATER CONDUCTOR SYSTEM (proposed):

Length (m)	2200

POWER HOUSE :

Type	
No. of Generating Units	7
Capacity of each Unit (MW)	100
Installed Capacity (MW)	700
Design Head (m)	
Gross Head (m)	226.155


MARHAN
Ferry
SOHAR
GOVIND SAGAR
DUHK
31° 30'
76° 25'
MEHRE
BAROLI
SARHYALI KHAD
BIRSWIN
DHARETA
LOHARI
THANA
PARIALA
PATLAHAR
KONTHOLA
JOALAPUR
GHIORH
GHARBASRA
KURYAH
MAJRA
CHOMBEH
KIKROLI
RAIPUR
D SAGAR RES.)
535
TO CHANGAR
MAJRA PUMPED STORAGE SCHEME
DRN.
CHKD.
SUBMD.
APPD.
T.S. NO: 53A/6&7.
SCALE 1:50,000
JULY, 1984.
HYDRO POTENTIAL REASSESSMENT PROJECT
माजरा पम्प संचय योजना
(सिंधु बेसिन)
MAJRA PUMPED
STORAGE SCHEME
(INDUS BASIN)
CENTRAL ELECTRICITY AUTHORITY
DRG. NO: HEPR-PS-INS-1021

18. RENUKAJI PUMPED STORAGE PROJECT (10X163MW=1630 MW)

1. INTRODUCTION

Renukaji Pumped Storage Project is located in District Sirmour (Himachal Pradesh) on Giri River. The project utilizes water of Giri River for power generation by harnessing Gross head of 380 m. The powerhouse has 10 units of 163 MW having installed capacity of 1630 MW generating design energy of (Generation) 2602 MU. The existing Renukaji Dam Project is used as the Lower Reservoir and Upper reservoir is proposed to be developed. The Project is proposed to be executed by Himachal Pradesh Power Corporation Limited (HPPCL).

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Giri River having upper reservoir at latitude of 30°39'48"N and longitude of 77°27'13"E and lower reservoir at latitude of 30°36'53.31"N and longitude of 76°26'15.95"E. There is a proposal of underground type of Power house. The nearest railway station is Dehradun (28 Km) and the Airport is Jolly Grant Airport (70 Km). The project is proposed to be executed by Himachal Pradesh Power Corporation Limited (HPPCL).

3. PROJECT FEATURES

Renukaji Pumped Storage Project involves:-

Upper Reservoir (proposed): Upper Reservoir is proposed to be of Height 110 m with a live storage of 9.23 Mcum on river Giri between a Full Reservoir Level (FRL) of 1090 m and Minimum Draw down Level (MDDL) of 1060 m.

Lower Reservoir (Renukaji Dam Project existing): Height of the lower reservoir is 148 m with a live storage of 498 Mcum on Renukaji Dam between a Full Reservoir Level (FRL) of 766 m and Minimum Draw down Level (MDDL) of 710 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a 2 nos. of Head race tunnel (HRT) with length of 2530.4 m and diameter of 9.2 m, 4 nos. of Penstock of length 706.7 m and diameter of 5.571 m carrying water to the underground powerhouse. The discharged water from underground powerhouse is carried back to the river Tail race tunnel of length 596.73 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 44.42 Sq. Km and the lower reservoir site is 2175 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Renukaji Pumped Storage Project would be 1630 MW Utilising the Gross head of 380 m. The design energy (Generation) is 2602 MU in 90% dependable year at 95% machine availability.

SALIENT FEATURES

RENUKJAI PUMPED STORAGE PROJECT

GENERAL:

State	Himachal Pradesh
District	Sirmour
River	Giri
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Dehradun
Nearest Airport	Jolly Grant Airport

UPPER RESERVOIR (proposed):

Location	Latitude: 30° 39’ 48” N
	Longitude: 77° 27’ 13” E
Full Reservoir Level (FRL) (m)	1090
Minimum Draw Down Level (MDDL) (m)	1060
Length of the Dam at the top(m)	287.6
Height of Dam (above RBL) (m)	110
Live Storage (Mcum)	9.23
Gross Storage (Mcum)	12.6

LOWER RESERVOIR (Renukaji Dam existing):

Location	Latitude: 30° 36’ 53.31” N
	Longitude: 77° 26’ 32.51” E
Full Reservoir Level (FRL) (m)	766
Minimum Draw Down Level (MDDL) (m)	710
Type of Dam	Earth cum Rockfill dam
Height of Dam (above RBL) (m)	148
Live Storage (Mcum)	498

HYDROLOGY:

Catchment Area (Sq. Km) Upper Dam	44.42
Catchment Area (Sq. Km) Lower Dam	2175

WATER CONDUCTOR SYSTEM:

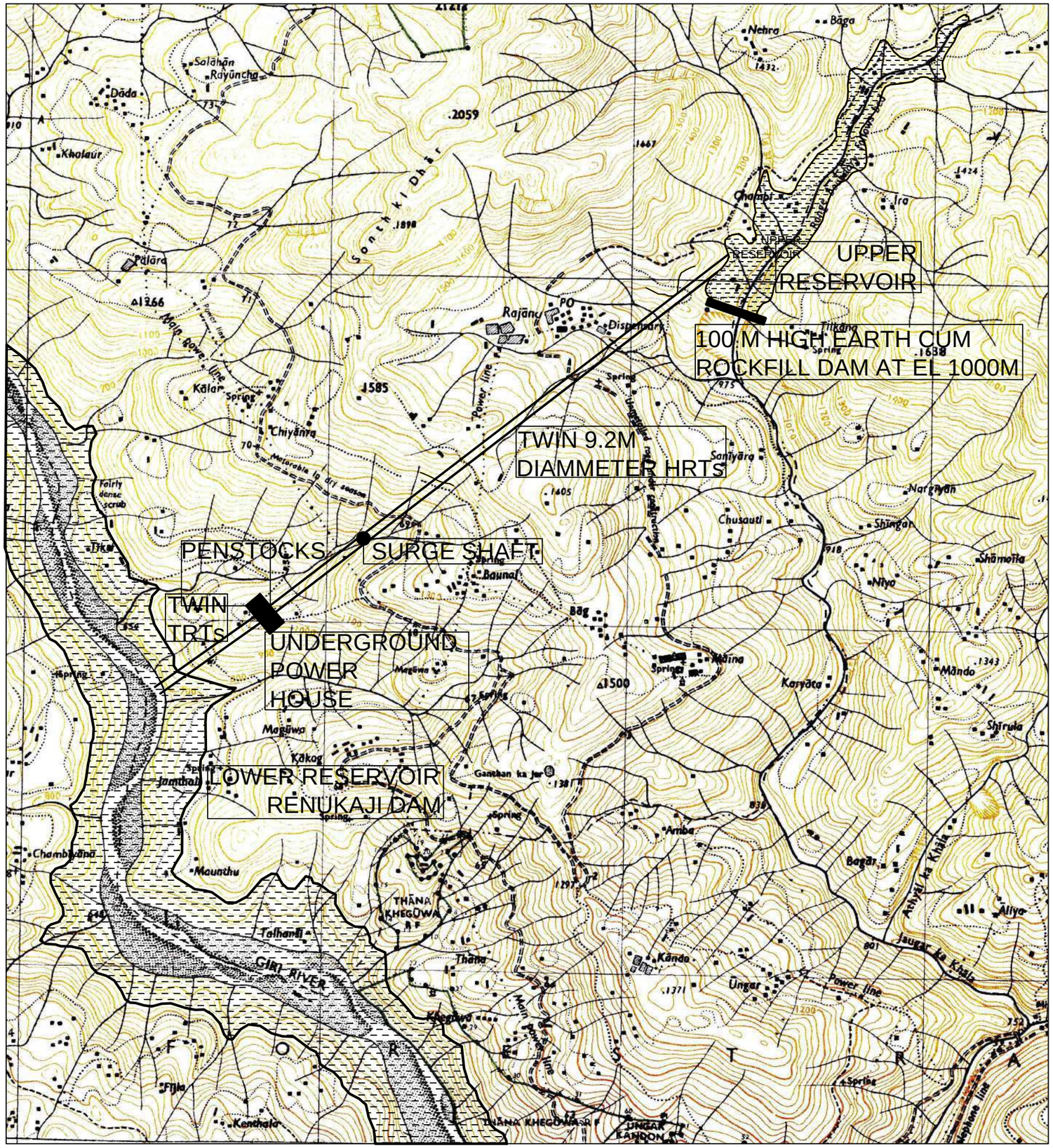
HEAD RACE TUNNEL	
Number	2
Length (m)	2530.4
Diameter (m)	9.2
Design Discharge (Cumecs)	293
PRESSURE SHAFT/PENSTOCK	
Number	4
Length (m)	706.7
Diameter (m)	5.571
TAIL RACE TUNNEL	
Length (m)	596.73
Diameter (m)	10.5

POWER HOUSE:

Type	Underground
No. of Generating Units	10
Capacity of each Unit (MW)	163
Installed Capacity (MW)	1630
Design Head (m)	370/314
Gross Head (m)	380/324
Design Energy (MU) (Generation/Pumping)	2602/3570

COST ASPECTS:

Estimated Cost (Rs.Crores)	5154 Cr (October-2018 Price Level)



RENUKAJI
PUMP STORAGE SCHEME
1630 MW

SALIENT FEATURES

Upper reservoir	
FRL	1090
MDDL	1060
Live Capacity	9.23 MCM
Lower reservoir	
FRL	766
MDDL	710
Live Capacity	498 MCM
HRT	
No.	02
Shape	Circular
Diameter	9.2m
Length	2530.4m
Penstock/Pressure Shaft	
No.	02
Shape	Circular
Diameter	5.571m
Length	706.7m
Power House	
Type	Underground
Installed capacity	1630 MW
No. of Units	10
Type of unit	Single Speed
TRT	
No.	02
Shape	D-Shape
Diameter	10.5m
Length	596.73m

RENUKAJI PSP (1630 MW)
LAYOUT PLAN

DESN	CHDK	RECM
DRWN	SUBM	APPVD.

19. LUGUPAHAR PUMPED STORAGE PROJECT (6X250 MW=1500 MW)

1. INTRODUCTION

Lugupahar Pumped Storage Project is located in Bokaro district of Jharkhand. The project utilizes water of Damodar/Bokaro River for power generation utilizing rated turbine head of 362 m. The powerhouse has 6 units of 250 MW having installed capacity of 1500 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Damodar River having upper reservoir at latitude of 23°46'30.32''N (Left Bank); 23°46'14.4''N (Right Bank) and longitude of 85°43'45.12''E (Left Bank); 85°43'29.52''E (Right Bank) and lower reservoir at latitude of 23°48'06.87''N (Left Bank); 23°47'34.12''N (Right Bank) and longitude of 85°44'39.47''E (Left Bank); 85°44’25.9''E (Right Bank).

There is a proposal of underground type of Power house. The nearest railway station is Gomia and the Airport is Ranchi (107.4 Km).

3. PROJECT FEATURES

Lugupahar Pumped Storage Project involves construction of Upper and Lower Reservoirs.

Upper Reservoir (proposed): The height of the dam of Upper Reservoir is proposed to be 104.5 m with a live pondage of 10.07 Mm^3 on river Damodar between a Full Reservoir Level (FRL) of 640 m and Minimum Draw down Level (MDDL) of 630 m.

Lower Reservoir (proposed): The height of the dam of Lower Reservoir is proposed to be 31.5 m with a live Pondage of 11.5 Mm^3 on river Bokaro between a Full Reservoir Level (FRL) of 269 m and Minimum Draw down Level (MDDL) of 262 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a 2 Nos. of Head race tunnel (HRT) of length 740 m and diameter of 8.0 m, 2 Nos. of Penstock of length 564 m and diameter of 7 m. The Project is utilizing rated turbine head of 362 m with installed capacity of 1500 MW. The discharged water from powerhouse is carried back to the river by 2 Nos. of Tail race tunnel of length 900 m and diameter 8.0 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 4.0 Sq.Km and the lower dam site is 556.0 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Lugupahar Pumped Storage Project would be 1500 MW utilizing rated turbine head of 362 m.

SALIENT FEATURES

LUGUPAHAR PUMPED STORAGE PROJECT

GENERAL:

State	Jharkhand
District	Bokaro
River	Bokaro
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Gomia
Nearest Airport	Ranchi

UPPER RESERVOIR (proposed):

Location	Latitude: (Left Bank): 23°46'30.32", (Right Bank): 23°46'14.4"
	Longitude:(Left Bank): 85°43'45.12''E, (Right Bank) 85°43'29.52''E
Full Reservoir Level (FRL) (m)	640
Minimum Draw Down Level (MDDL) (m)	630
Length of the Dam at the top(m)	660
Height of Dam (above RBL) (m)	104.50
Live Pondage (Mm^3)	10.8

LOWER RESERVOIR (proposed):

Location	Latitude: (Left BanK): 23°48'06.87", (Right BanK): 23°47'34.12"
	Longitude:(Left Bank): 85°44'39.47''E, (Right Bank) 85°44'25.9''E
Full Reservoir Level (FRL) (m)	269
Minimum Draw Down Level (MDDL) (m)	262
Type of Dam	Rock Fill
Height of Dam (above RBL) (m)	31.5
Live Pondage (Mm^3)	11.5

HYDROLOGY:

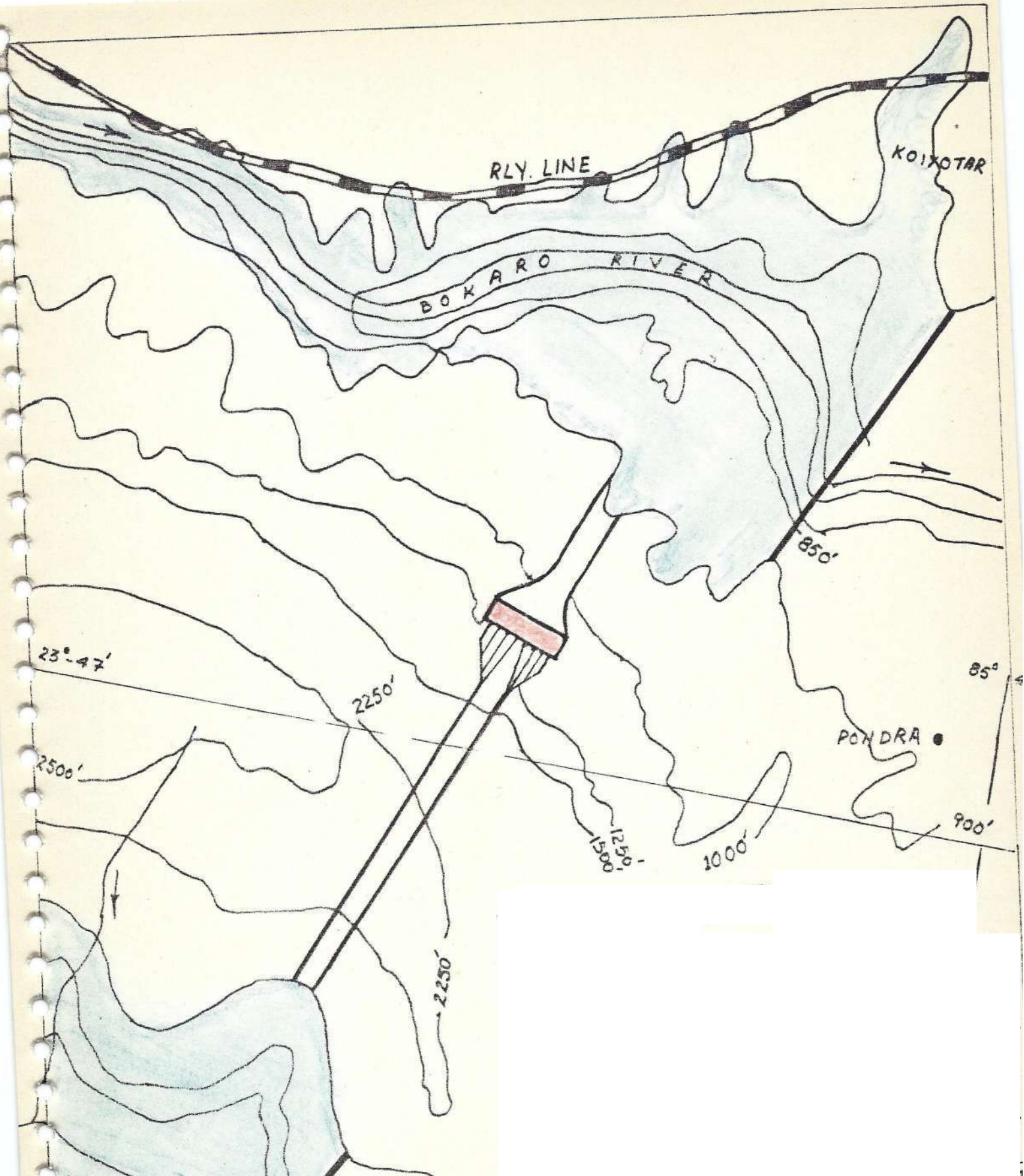
Catchment Area (Sq. Km) Upper Dam	4.04
Catchment Area (Sq. Km) Lower Dam	556.0

WATER CONDUCTOR SYSTEM :

HEAD RACE TUNNEL	
Number	2
Length (m)	740
Diameter (m)	8.0
PENSTOCK	
Number	2
Length (m)	564
Diameter (m)	7.0
TAIL RACE TUNNEL	
Number	2
Length (m)	900
Diameter (m)	8.0

POWER HOUSE:

Type	Underground
No. of Generating Units	6
Capacity of each Unit (MW)	250
Installed Capacity (MW)	1500
Design Head (m)	
Rated Head (Turbine) m	362 m
Rated Head (Pump) m	378 m
Turbine	Francis Type, vertical shaft reversible pump-turbine



DRN.		HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD.		LUGUPAHAR PUMPED STORAGE SCHEME
SUBTD.		
APPD.		
SCALE:-	1" = 1320'	CENTRAL ELECTRICITY AUTHORITY
JUNE,	1984	DRG. NO HEPR-PS-GAN-507

20. VARAHI PUMPED STORAGE PROJECT (6X250 MW=1500MW)

1. INTRODUCTION

Varahi Pumped Storage Project is located in Shivamogga & Udupi district of Karnataka. The project utilizes water of Varahi River for power generation harnessing gross head of 496.62 m. The powerhouse has 6 units of 250 MW having installed capacity of 1500 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Varahi River having upper reservoir at latitude of 13°42'46.26"N and longitude of 75° 0'6.50"E and lower reservoir at latitude of 13°41'05''N and longitude of 74°58'50''E. There is a proposal of underground type of Power house. The nearest railway station is Kundapur and the Airport is Mnangaluru.

3. PROJECT FEATURES

Varahi Pumped Storage Project involves construction of

Upper Reservoir (existing): The height of the dam of Upper Reservoir is proposed to be 39.6 m with a live storage of 94.85 Mm^3 on river Varahi between a Full Reservoir Level (FRL) of 563.88 m and Minimum Draw down Level (MDDL) of 562.1 m.

Lower Reservoir (proposed): The height of the dam of Lower reservoir is proposed to be 27.25m with a live storage of 7.76 Mcum on river Varahi between a Full Reservoir Level (FRL) of 80 m and Minimum Draw down Level (MDDL) of 60 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a 2 Nos of Head race tunnels (HRT) of length 45.7 and diameter of 6.25 m, 2 nos of Penstock/pressure shaft of length 744.25m and diameter of 6.25 m carrying water to the underground powerhouse. The Project would be operated under design head of 492.62 m with installed capacity of 1500 MW. The discharged water from powerhouse is carried back to the river by 2 nos of Tail race tunnel of length 1911.2 and of diameter 6.25m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 204.84 Sq.Km and the lower dam site is 210 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Varahi Pumped Storage Project would be 1500 MW utilising the Design head of 492.62m.

SALIENT FEATURES

VARAHI PUMPED STORAGE PROJECT

GENERAL:

State	Karnataka
District	Shivamogga & Udupi
River	Varahi
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Kundapur
Nearest Airport	Mnangaluru.

UPPER RESERVOIR (existing):

Location	Latitude: 13°42'46.26"N
	Longitude: 75° 0'6.50"E
Full Reservoir Level (FRL) (m)	563.88
Minimum Draw Down Level (MDDL) (m)	562.1
Length of the Dam at the top(m)	244
Height of Dam (above RBL) (m)	39.6
Live Storage (Mm^3)	94.85
Gross Storage (Mm^3)	97.25

LOWER RESERVOIR (proposed):

Location	Latitude: 13°41'05''N
	Longitude: 74°58'50''E
Full Reservoir Level (FRL) (m)	80
Minimum Draw Down Level (MDDL) (m)	60
Height of Dam (above RBL) (m)	27.25
Live Storage (Mcum)	7.76

HYDROLOGY:

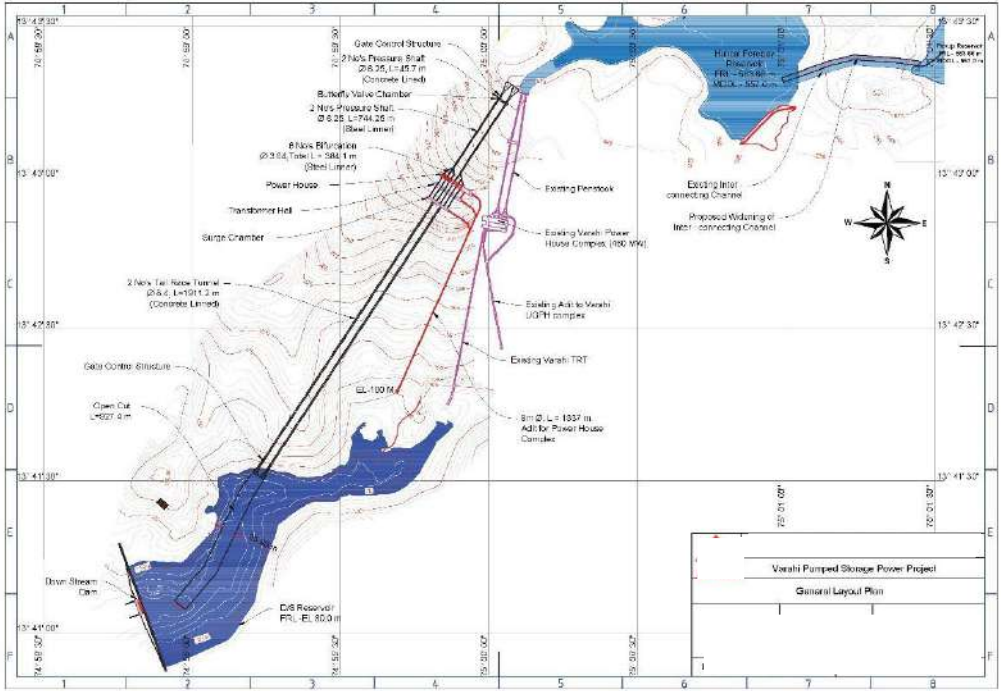
Catchment Area (Sq. Km) Upper Dam	204.84
Catchment Area (Sq. Km) Lower Dam	210

WATER CONDUCTOR SYSTEM (proposed):

HEAD RACE TUNNEL	
Number	2
Length (m)	45.7
Diameter (m)	6.25
Design Discharge (Cumecs)	171.99
PRESSURE SHAFT/PENSTOCK	
Number	2
Length (m)	744.25
Diameter (m)	6.25
TAIL RACE TUNNEL	
Length (m)	1911.2
Diameter (m)	8.4

POWER HOUSE:

Type	Underground
No. of Generating Units	6
Capacity of each Unit (MW)	250
Installed Capacity (MW)	1500
Design Head (m)	492.62
Gross Head(m)	496.62
Turbine	Reversible Francis Turbine



Gate Control Structure
2 No's Pressure Shaft
Ø 6.25, L=45.7 m
(Concrete Lined)
Butterfly Valve Chamber
2 No's Pressure Shaft
Ø 6.25, L=744.25 m
(Steel Lined)
8 No's Bifurcation
Ø 3.64, Total L = 384.1 m
(Steel Lined)
Power House
Transformer Hall
Surge Chamber
2 No's Tail Race Tunnel
Ø 6.4, L=1911.2 m
(Concrete Lined)
Gate Control Structure
Open Cut
L=927.4 m
Down Stream
Dam
D/S Reservoir
FRL-EL 80.0 m
EL-100 M
Existing Penstock
Existing Varahi Power
House Complex (160 MW)
Existing Adit to Varahi
UGPH complex
Existing Varahi TRT
8m Ø, L = 1337 m
Adit for Power House
Complex
Existing Inter
connecting Channel
Proposed Widening of
Inter - connecting Channel
Hunter Forebay
Reservoir
Pump Reservoir
N
S
E
W
Varahi Pumped Storage Power Project
General Layout Plan

21. SHARAVATHY PUMPED STORAGE PROJECT (8X250MW=2000 MW)

1. INTRODUCTION

Sharavathy Pumped Storage Project is located in Shivamogga & Uttara Kannada district of Karnataka. The project utilizes water of Sharavathy River for power generation harnessing gross head of 478.60 m. The powerhouse has 8 units of 250 MW having installed capacity of 2000 MW. The project is proposed to be executed by Karnataka Power Corporation Limited (KPCL).

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Sharavathy River having upper reservoir at latitude of 14°11'41.44"N and longitude of 74°46'55.18"E and lower reservoir at latitude of 14°15'0.96"N and longitude of 74°40'32.67"E. There is a proposal of underground type of Power house. The nearest railway station is Honnavar and the Airport is Mnangaluru.

3. PROJECT FEATURES

Upper Reservoir (existing): The height of the dam of Upper Reservoir is proposed to be 59.436 m with a live storage of 13.90 Mm^3 on river Sharavathy between a Full Reservoir Level (FRL) of 522.12 m and Minimum Draw down Level (MDDL) of 520.59 m.

Lower Reservoir (exisiting): The height of the dam of Lower reservoir is proposed to be 53 m with a live storage of 58.21 Mm^3 on river Sharavathy between a Full Reservoir Level (FRL) of 55 m and Minimum Draw down Level (MDDL) of 43.50 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a 2 nos of Head race tunnels (HRT) of length 2230 & 2397 m respectively and diameter of 9 m, 1 no. of Penstock of length 745 m and diameter of 5.25 m carrying water to the underground powerhouse. The Project would be operated under design head of 469.22 m with installed capacity of 2000 MW. The discharged water from powerhouse is carried back to the river by 2 nos of Tail race tunnel of length 3527 & 3480 m and diameter of 10 m each.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 44.62 Sq.Km and the lower dam site is 151.50 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Sharavathy Pumped Storage Project would be 2000MW utilising the design head of 469.22m. The Annual Design Energy of the project comes out to be of 4380 GWh in 90% dependable year.

SALIENT FEATURES

SHARAVATHY PUMPED STORAGE PROJECT

GENERAL:

State	Karnataka
District	Shivamogga & Uttara Kannada
River	Sharavathy
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Honnavar
Nearest Airport	Mnangaluru.

UPPER RESERVOIR (existing):

Location	Latitude: 14°11'41.44"N
	Longitude: 74°46'55.18"E
Full Reservoir Level (FRL) (m)	522.12
Minimum Draw Down Level (MDDL) (m)	520.59
Length of the Dam at the top(m)	515.11
Height of Dam (above RBL) (m)	59.436/62.48
Live Storage (Mcum)	13.90
Gross Storage (Mcum)	129.65

LOWER RESERVOIR (existing):

Location	Latitude: 14°15'0.96"N
	Longitude: 74°40'32.67"E
Full Reservoir Level (FRL) (m)	55
Minimum Draw Down Level (MDDL) (m)	43.50
Height of Dam (above RBL) (m)	53
Live Storage (Mcum)	58.21

HYDROLOGY:

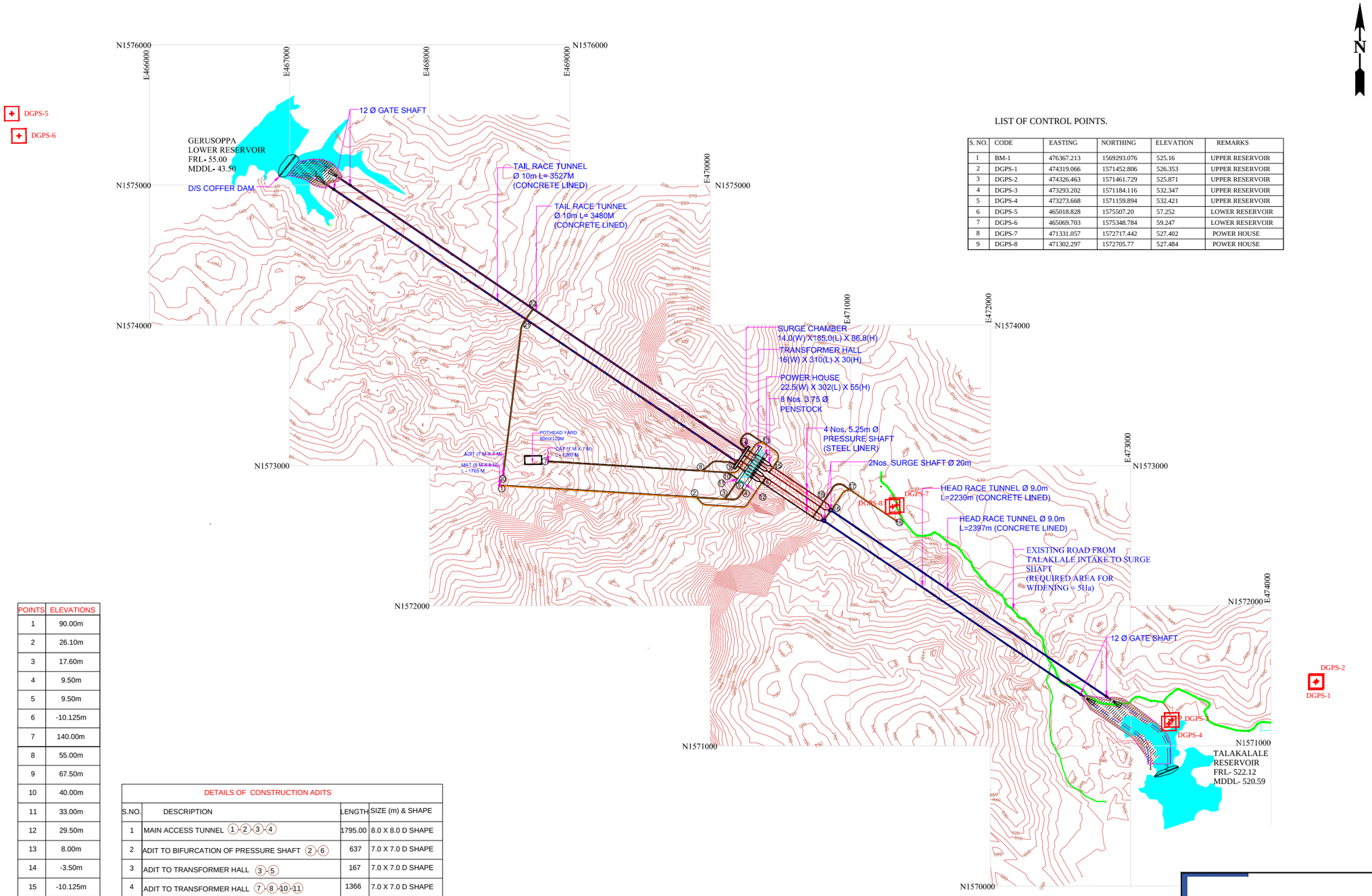
Catchment Area (Sq. Km) Upper Dam	44.62
Catchment Area (Sq. Km) Lower Dam	151.50/2148

WATER CONDUCTOR SYSTEM :

HEAD RACE TUNNEL	
Number	2
Length (m)	2230 & 2397
Diameter (m)	9
Design Discharge (Cumecs)	249.41
PRESSURE SHAFT/PENSTOCK	
Number	1
Length (m)	745
Diameter (m)	5.25
TAIL RACE TUNNEL	
Number	2
Length (m)	3527 & 3480
Diameter (m)	10

POWER HOUSE:

Type	Underground
No. of Generating Units	8
Capacity of each Unit (MW)	250
Installed Capacity (MW)	2000
Design Head (m)	469.22
Gross Head(m)	478.60
Turbine	Reversible Francis Turbine



LIST OF CONTROL POINTS.

S. NO.	CODE	EASTING	NORTHING	ELEVATION	REMARKS
1	BM-1	476367.213	1569293.076	525.16	UPPER RESERVOIR
2	DGPS-1	474319.066	1571452.806	526.353	UPPER RESERVOIR
3	DGPS-2	474326.463	1571461.729	525.871	UPPER RESERVOIR
4	DGPS-3	473293.202	1571184.116	532.347	UPPER RESERVOIR
5	DGPS-4	473273.668	1571159.894	532.421	UPPER RESERVOIR
6	DGPS-5	465018.828	1575507.20	57.252	LOWER RESERVOIR
7	DGPS-6	465069.703	1575348.784	59.247	LOWER RESERVOIR
8	DGPS-7	471331.057	1572717.442	527.402	POWER HOUSE
9	DGPS-8	471302.297	1572705.77	527.484	POWER HOUSE

POINTS	ELEVATIONS
1	90.00m
2	26.10m
3	17.60m
4	9.50m
5	9.50m
6	-10.125m
7	140.00m
8	55.00m
9	67.50m
10	40.00m
11	33.00m
12	29.50m
13	8.00m
14	-3.50m
15	-10.125m
16	530.00m
17	497.00m
18	479.00m
19	479.00m
20	100.00m
21	10.90m
22	11.10m

DETAILS OF CONSTRUCTION ADITS

S.NO.	DESCRIPTION	LENGTH	SIZE (m) & SHAPE
1	MAIN ACCESS TUNNEL 1-2-3-4	1795.00	8.0 X 8.0 D SHAPE
2	ADIT TO BIFURCATION OF PRESSURE SHAFT 2-6	637	7.0 X 7.0 D SHAPE
3	ADIT TO TRANSFORMER HALL 3-5	167	7.0 X 7.0 D SHAPE
4	ADIT TO TRANSFORMER HALL 7-8-10-11	1366	7.0 X 7.0 D SHAPE
5	ADIT TO POWER HOUSE 11-12	45	7.0 X 7.0 D SHAPE
6	ADIT TO SURGE CHAMBER 8-9	281	7.0 X 7.0 D SHAPE
7	ADIT TO BIFURCATION OF PRESSURE SHAFT 10-13-15	603	7.0 X 7.0 D SHAPE
8	ADIT TO SURGE CHAMBER 13-14	292	7.0 X 7.0 D SHAPE
9	ADIT TO BOTTOM OF SURGE SHAFT 16-17-18	591	7.0 X 7.0 D SHAPE
10	ADIT TO PRESSURE SHAFT 17-19	278	7.0 X 7.0 D SHAPE
11	ADIT TO TAILRACE TUNNEL 20-21-22	1216	7.0 X 7.0 D SHAPE

LEGENDS:-

1		MAJOR CONTOUR
2		EXISTING RESERVOIR
3		MAT & ADITS
4		EXISTING ROAD
5		CONTROL POINTS

NOTE:

1. ALL DIMENSIONS AND LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED
2. THE DRAWING SHOWS THE TOPOGRAPHICAL SURVEY MAP OF PROJECT AREA

SHARAVATHY PUMPED STORAGE PROJECT (2000 MW)

INDEX MAP WITH CONTROL POINT

DEGN.	CHKD.	SUBM.
DRAWN.	REV. NO.	APPRD.
DATE: JULY-2021	DRG. NO. WAP/SPSP/CIVIL/TOPO/101	

As per the information received from Govt. of Karnataka.The following projects are mentioned by the Govt. of Karnataka Letter No. ENERGY 33 PPT 2023 dated 17.05.2023. However, these projects are found in Wild Life Sanctuary and not found feasible at present.

S.No	Name of the Project	Proposed Installed Capacity	Energy Generation (One Cycle)	Reservoir	River Basin
1	Cauvery Basin Location 01-	450	985	Upstream-New Downstream-New	Cauvery
2	Cauvery Basin Location 02-	600	1314	Upstream-New Downstream-New	Cauvery
3	Bomanahalli PSP-Alternate 01	760	1664.4	Upstream-Bomanhalli Downstream-New	Kali
4	Bomanahalli PSP-Alternate 02	1100	2409	Upstream-Bomanhalli Downstream-Kodasalli	Kali
5	Tatihalla PSP	850	1861.5	Upstream-Tatihallai Downstream-New	Kali
6	Kodsalli PSP	1350	2956.5	Upstream-Bomanhalli Downstream-Kodasalli	Kali
7	Kadra PSP	1500	3285	Upstream-New Downstream-New	Kali
9	Upper Kaneri PSP	600	1314	Upstream-New Downstream-Upper Kaneri	Kali
10	Savehaklu PSP	1600	3504	Upstream-Savehaklu Downstream-New	Varahi
11	Chakra PSP	1600	3504	Upstream-Chakra Downstream-New	Netravathy

22. IDUKKI PUMPED STORAGE PROJECT (4x150MW=600MW)

1. INTRODUCTION

Idukki Pumped Storage Project is located in Idukki district of Kerala. The project utilizes water of Periyar, Kilivallithodu & Cheruthoni River for power generation harnessing design head of 501.06 m. The powerhouse has installed capacity of 600 MW generating annual energy of 792 MU in 90% dependable year.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Periyar, Kilivallithodu & Cheruthoni River having upper reservoir at latitude of 9°48'11.4"N and longitude of 76°53'10"E and lower reservoir proposed at latitude of 9°48'54.7"N and longitude of 76°52'6.6"E. There is a proposal of underground type of Power house. The nearest railway station is Aluva and the Airport is Cochin International.

3. PROJECT FEATURES

Idukki Pumped Storage Project involves construction of

Upper Reservoir (Idukki, Cheruthoni & Kulamavu Dams existing): Upper Reservoir is of Height 99.97 m with a live storage of 1459.5 Mcum on river Periyar, Kilivallithodu & Cheruthoni between a Full Reservoir Level (FRL) of 372 m and Minimum Draw down Level (MDDL) of 357 m.

Lower Reservoir (proposed): Height of the lower reservoir is 50 m with a live storage of 4.58 Mcum on river Periyar, Kilivallithodu & Cheruthoni between a Full Reservoir Level (FRL) of 220 m and Minimum Draw down Level (MDDL) of 180 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 250 m and diameter of 7 m, 4 no. of Penstock of length 200 m and diameter of 3 m carrying water to the underground powerhouse. The Project to be operated under design head of 501.06 m with installed capacity of 600 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel.

4. HYDROLOGY

The Catchment area of the river upto the upper dam site is 649.3 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Idukki Pumped Storage Project would be 600 MW. Utilising the Design head of 501.06 m, the Annual Energy of the project comes out to be of 792 MU imn 90% dependable year.

SALIENT FEATURES

IDUKKI PUMPED STORAGE PROJECT

GENERAL:

State	Kerala
District	Idukki
River	Periyar, Kilivallithodu & Cheruthoni
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Aluva
Nearest Airport	Cochin International

UPPER RESERVOIR (proposed):

Location	Latitude: 9°48'11.4"N
	Longitude: 76°53'10"E
Full Reservoir Level (FRL) (m)	732.62
Minimum Draw Down Level (MDDL) (m)	694.94
Length of the Dam at the top(m)	384.96
Height of Dam (above RBL) (m)	99.97
Live Storage (Mcum)	1459.5
Gross Storage (Mcum)	1996.3

LOWER RESERVOIR (Idamalayar Dam existing):

Location	Latitude: 9°48'54.7"N
	Longitude: 76°52'6.6"E
Full Reservoir Level (FRL) (m)	220
Minimum Draw Down Level (MDDL) (m)	180
Type of Dam	Concrete gravity overflow type
Height of Dam (above RBL) (m)	50
Live Storage (Mcum)	4.58 (Gross)

HYDROLOGY:

Catchment Area (Sq. Km) Upper Dam	649.3
Catchment Area (Sq. Km) Lower Dam	

WATER CONDUCTOR SYSTEM :

HEAD RACE TUNNEL	
Number	1
Length (m)	250
Diameter (m)	7
Design Discharge (Cumec)	150
PRESSURE SHAFT/PENSTOCK	
Number	4
Length (m)	200 (Total)
Diameter (m)	3

POWER HOUSE:

Type	Underground
Installed Capacity (MW)	600
Design Head (m)	501.06
Gross Head(m)	539.62
Turbine	Reversible Vertical Francis
Annual Energy(MU)	792

SCHEMATIC DIAGRAM

SALIENT FEATURES

23. PALLIVASAL PUMPED STORAGE PROJECT (4X150= 600MW)

1. INTRODUCTION

The project utilizes water of Muthuripuzha River for power generation harnessing design head of 700 m. The powerhouse has 4 units of 150 MW having installed capacity of 600 MW generating annual energy of 1260 MU. The project uses reservoirs formed by existing Pothamedu reservior as the Upper Reservoir and Pullumala reservior Dam as the Lower Reservoir.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Kuttiyadi River having upper reservoir at latitude of 10°3'45.9"N and longitude of 77°03'45.9"E and lower reservoir at latitude of 10°2'1.7"N and longitude of 77°03'21.2"E. There is a proposal of underground type of Power house. The nearest railway station is Koliandi and the Airport is Karipur International.

3. PROJECT FEATURES

Upper Reservoir (Pothamedu Reservior): Upper Reservoir is of Height 80 m with a live storage of 6.27 Mcum on river Kuttiyadi between a Full Reservoir Level (FRL) of 1440 m and Minimum Draw down Level (MDDL) of 1380 m.

Lower Reservoir (Pullumala Reservior): Height of the lower reservoir is 50 m with a live storage of 2.58 Mcum on river Kuttiyadi between a Full Reservoir Level (FRL) of 900 m and Minimum Draw down Level (MDDL) of 860 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 1250 m and diameter of 5 m the underground powerhouse. The Project to be operated under design head of 514.33m with installed capacity of 600 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 2000 m.

4. HYDROLOGY

The Catchment area of the river upto the upper dam site is 12 Sq.Km

5. POWER & ENERGY BENEFITS

The installed capacity of Pallivasal Pumped Storage Project would be 600 MW. Utilising the Design head of 514.33 m, the Annual Energy of the project is 792 MU in 90% dependable year.

SALIENT FEATURES

PALLIVASAL PUMPED STORAGE PROJECT

GENERAL:

State	Kerala
District	Idukki
River	Muthirapuzha
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Aluva
Nearest Airport	Kochi

UPPER RESERVOIR (Pothamedu Reservior):

Location	Latitude: 10°3'45.9"N
	Longitude: 77°3'42.9"E
Full Reservoir Level (FRL) (m)	1440
Minimum Draw Down Level (MDDL) (m)	1380
Length of the Dam at the top(m)	400
Height of Dam (above RBL) (m)	80
Live Storage (Mcum)	6.27
Gross Storage (Mcum)	6.50

LOWER RESERVOIR (Pullumala Reservior):

Location	Latitude: 10°2'1.7"N
	Longitude: 77°3'21.2"E
Full Reservoir Level (FRL) (m)	900
Minimum Draw Down Level (MDDL) (m)	860
Height of Dam (above RBL) (m)	50
Live Storage (Mcum)	2.58

HYDROLOGY:

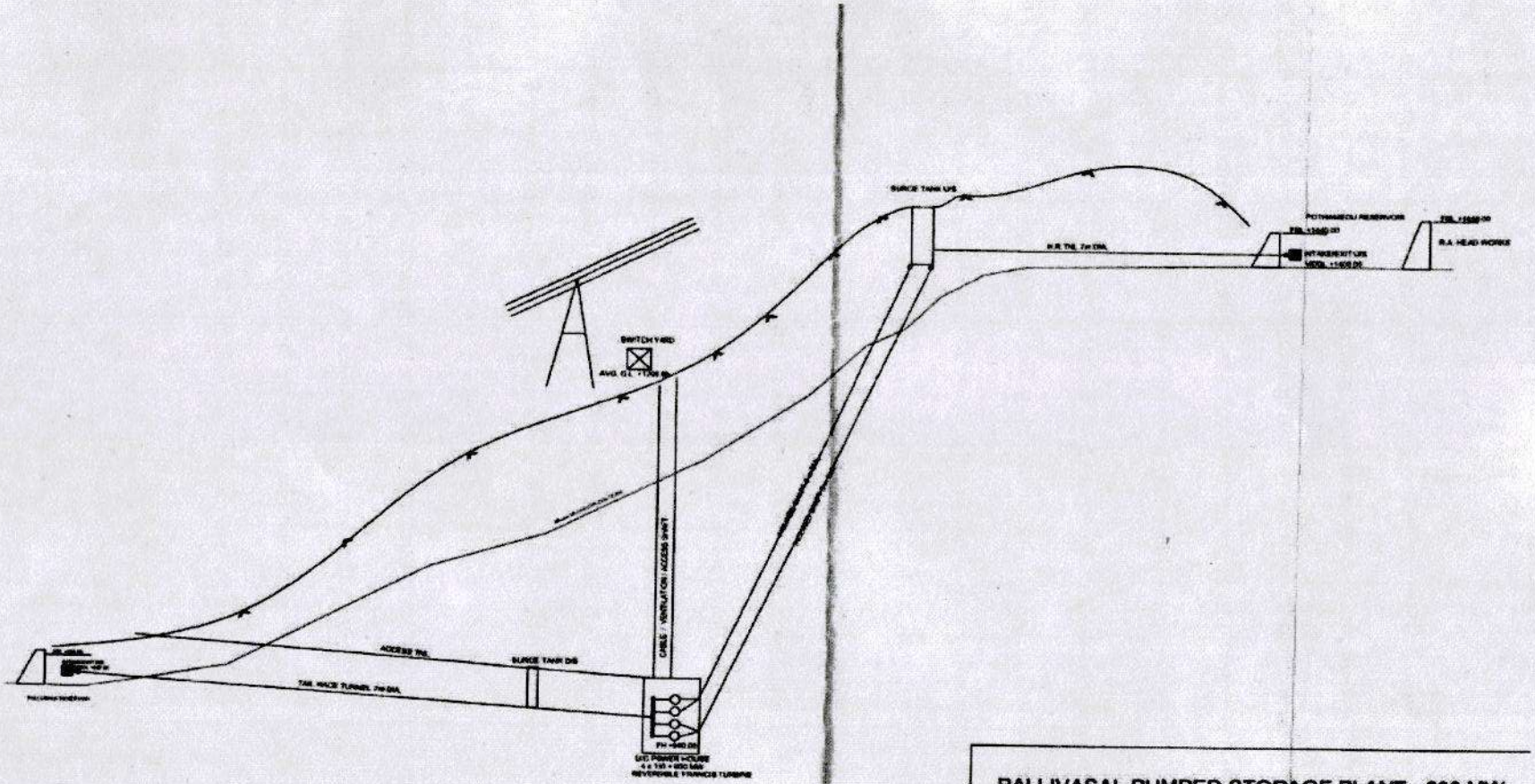
Catchment Area (Sq. Km) Upper Dam	12

WATER CONDUCTOR SYSTEM :

HEAD RACE TUNNEL	
Number	2
Length (m)	1250
Diameter (m)	5
Design Discharge (Cumec)	148
TAIL RACE TUNNEL	
Length (m)	2000
Diameter (m)	7.40

POWER HOUSE (proposed):

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	150
Installed Capacity (MW)	600
Design Head (m)	514.33
Gross Head(m)	533.33
Turbine	Reversible Vertical Francis
Annual Energy(MU)	792



PALLIVASAL PUMPED STORAGE PLANT - 600 MW

SCHEMATIC DIAGRAM - LEFT BANK PROPOSAL

24. INDIRA SAGAR-OMKARESHWAR PUMPED STORAGE PROJECT (525MW)

1. INTRODUCTION

Indira Sagar Omkareshwar Pumped Storage Project having existing upper reservoir and lower reservoir with installed capacity of 525 MW. The project is located in Khandwa district of Madhya Pradesh. The project utilizes water of Narmada River for power generation harnessing gross head of 68.59 m. The powerhouse having installed capacity of 525 MW generating Annual Energy of 1047.38MU in 90% dependable year with 95% machine availability.

2. LOCATION/ACCESSIBILITY

The upper dam site of the project is located on Narmada River having upper reservoir at latitude of 22°17'5.13"N and longitude of 76°28'19.45"E and lower dam site is located on Narmada River at latitude of 22°14'25.63"N and longitude of 76° 9'39.31"E. The nearest railway station is Indore and the Airport is Indore.

3. PROJECT FEATURES

Indira Sagar Omkareshwar Pumped Storage Project involves construction of

Upper Reservoir (Indirasagar Existing): Upper Reservoir for this existing with dam on Narmada River between a Full Reservoir Level (FRL) of 262.13 m and Minimum Draw down Level (MDDL) of 243.23 m.

Lower Reservoir (Omkareshwar Existing): Existing Lower Dam with dam on Narmada River between a Full Reservoir Level (FRL) of 196.6 m and Minimum Draw down Level (MDDL) of 193.54 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a 7 nos. of Pressure shaft of length 309 m carrying water to the underground powerhouse. The Project to be operated under gross head of 68.59 m with installed capacity of 525MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 331m.

4. POWER & ENERGY BENEFITS

The installed capacity of Indira Sagar Omkareshwar Pumped Storage Project would be 525 MW. Utilizing the gross head of 68.59 m, the Annual Energy of the project is 1047.38 MU in 90% dependable year.

SALIENT FEATURES

INDIRA SAGAR OMKARESHWAR PUMPED STORAGE PROJECT

GENERAL:

State	Madhya Pradesh
District	Khandwa
River	Narmada
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Indore
Nearest Airport	Indore

UPPER RESERVOIR (Existing):

Location	Latitude: 22°17'5.13"N
	Longitude: 76°28'19.45"E
Full Reservoir Level (FRL) (m)	262.13
Minimum Draw Down Level (MDDL) (m)	243.23

LOWER RESERVOIR (Existing)

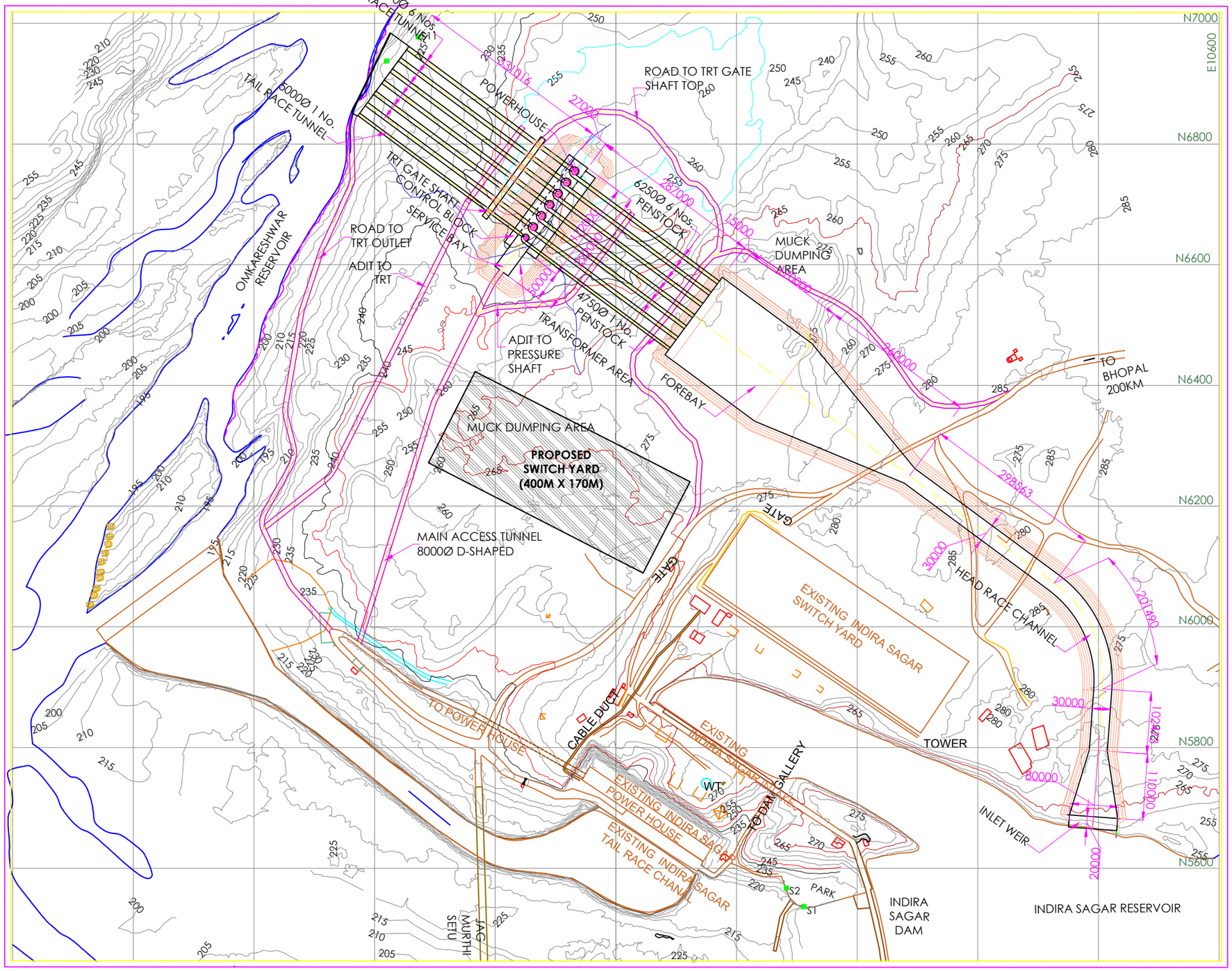
Location	Latitude: 22°14'25.63"N
	Longitude: 76° 9'39.31"E
Full Reservoir Level (FRL) (m)	196.6
Minimum Draw Down Level (MDDL) (m)	193.54

WATER CONDUCTOR SYSTEM

PRESSURE SHAFT/PENSTOCK	
Number	7
Length (m)	309
TAIL RACE TUNNEL	
Length (m)	331

POWER HOUSE:

Type	Underground
Installed Capacity (MW)	525
Design Head (m)	410
Gross Head(m)	68.59
Turbine	Reversible Vertical Francis
Annual Energy(MU)	1047.38
No. of hours of Generation	6
No. of hours for Pumping	6.7



NOTES:-

1) ALL ELEVATIONS ARE IN METRES.

SCALE:

0 70 140 210 280 350M

(1:7000)

PFR DRAWING

DATE	NO.	REVISION OR ISSUES	BY.	CH.	APP.

DESIGN MEMO NO.-
डिजाइन मेमो संख्या

इन्दिरा सागर पम्प स्टोरेज प्लांट
INDIRA SAGAR PUMP STORAGE PLANT

INDIRASAGAR-OMKARESHWAR PSP
GENERAL LAYOUT
PLAN

DRAWN अंकित	SUBMITTED प्रस्तुत	RECOMMENDED अनुशंसित		APPROVED अनुमोदन

DATE दिनांक	DRG. NO. ड्रेइंग संख्या					
JUNE 2022	NHIS	1AF	41	GA	001	00

25. GHATGHAR-II PUMPED STORAGE PROJECT (1X125MW=125 MW)

1. INTRODUCTION

Ghatghar-II Pumped Storage Project having existing upper reservoir and lower reservoir with installed capacity of 125MW. The project is located in Ahemadnagar and Thane district of Maharashtra. The project utilizes water of Pravara/Shai Nalla River for power generation harnessing design head of 410 m. The powerhouse has 1 units of 125 MW having installed capacity of 125 MW generating Design Energy of 193.28MU in 90% dependable year with 95% machine availability.

2. LOCATION/ACCESSIBILITY

The upper dam site of the project is located on Pravara River having upper reservoir at latitude of 19°32'30''N and longitude of 73°40'00''E and lower dam site is located on Shai Nalla River at latitude of 19°31'54''N and longitude of 73°39'06''E. The nearest railway station is Asangaon and the Airport is Mumbai.

3. PROJECT FEATURES

Ghatghar-II Pumped Storage Project involves construction of

Upper Reservoir (Ghatghar Existing): Upper Reservoir for this additional unit is already existing with dam Height of 15.165 m. The project with a live storage of 5.14 Mcum on Pravara River between a Full Reservoir Level (FRL) of 756 m and Minimum Draw down Level (MDDL) of 750.26 m.

Lower Reservoir (Ghatghar Existing): Existing Lower Dam of Ghatghar pumped storage with dam height of 86.14 m with a live storage of 3.21 Mcum on Shai Nalla River between a Full Reservoir Level (FRL) of 346 m and Minimum Draw down Level (MDDL) of 310 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Pressure shaft/penstock of length 660 m and diameter 3.20 m carrying water to the underground powerhouse. The Project to be operated under design head of 410 m with installed capacity of 125 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 568 m.

4. POWER & ENERGY BENEFITS

The installed capacity of Ghatghar Pumped Storage Project would be 125 MW. Utilizing the Design head of 410 m, the Design Energy of the project is 193.28MU in 90% dependable year with 95 % machine. The project will provide peaking of 6.15 hrs.

SALIENT FEATURES

GHATGHAR-II PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Ahmednagar/Thane
River	Pravara/Shai Nalla
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Asangaon
Nearest Airport	Mumbai

UPPER RESERVOIR (Existing):

Location	Latitude: 19°32'30''N
	Longitude: 73°40'00''E
Full Reservoir Level (FRL) (m)	756
Minimum Draw Down Level (MDDL) (m)	750.25
Length of the Dam at the top(m)	503
Height of Dam (above RBL) (m)	15.165
Live Storage (Mcum)	5.14
Gross Storage (Mcum)	5.82

LOWER RESERVOIR (Existing)

Location	Latitude: 19°31'54''N
	Longitude: 73°39'06''E
Full Reservoir Level (FRL) (m)	346
Minimum Draw Down Level (MDDL) (m)	310
Height of Dam (above RBL) (m)	86.14
Live Storage (Mcum)	3.21

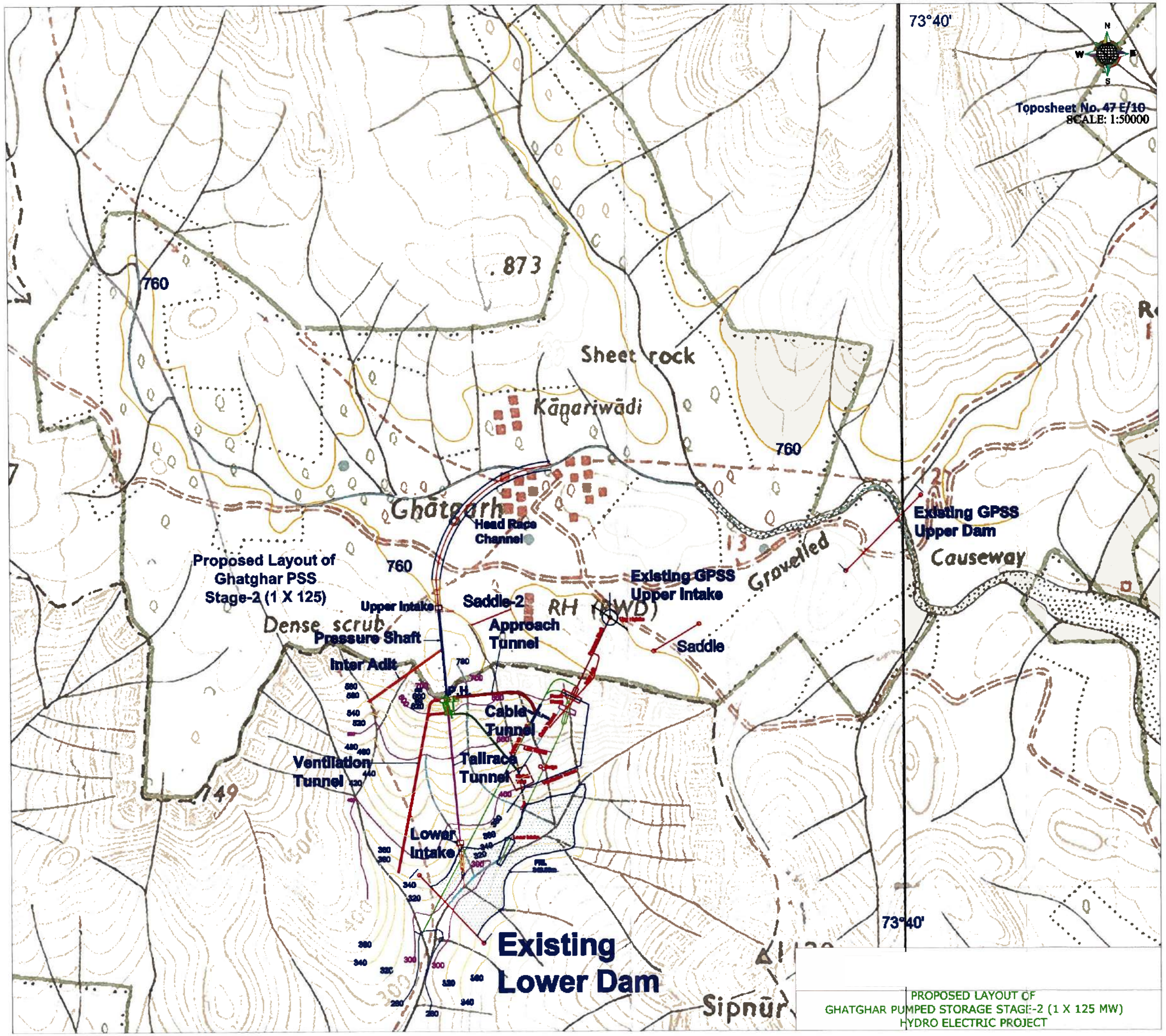
WATER CONDUCTOR SYSTEM:

PRESSURE SHAFT/PENSTOCK	
Number	1
Length (m)	660
Diameter (m)	3.20
TAIL RACE TUNNEL	
Length (m)	568
Diameter (m)	4.1

POWER HOUSE:

Type	Underground
No. of Generating Units	1
Capacity of each Unit (MW)	125
Installed Capacity (MW)	125
Design Head (m)	410
Gross Head(m)	420.08
Turbine	Reversible Vertical Francis
Annual Energy(MU)	125
No. of hours of Generation	5
No. of hours for Pumping	6.15

1a


73°40'
Toposheet No. 47 E/10
SCALE: 1:50000
873
760
Sheet rock
Kāgariwādi
Ghatgarh
Head Race Channel
Proposed Layout of Ghatghar PSS Stage-2 (1 X 125)
Upper Intake
Saddle-2
Approach Tunnel
Existing GPSS Upper Intake
Gravelled
Existing GPSS Upper Dam
Causeway
Saddle
Dense scrub
Pressure Shaft
Inter Adit
Cable Tunnel
Tailrace Tunnel
Ventilation Tunnel
Lower Intake
Existing Lower Dam
Sipnūr
PROPOSED LAYOUT OF
GHATGHAR PUMPED STORAGE STAGE-2 (1 X 125 MW)
HYDRO ELECTRIC PROJECT

26. MALSHEJ GHAT PUMPED STORAGE PROJECT (2X350MW=700 MW)

1. INTRODUCTION

Malshej Ghat Pumped Storage Project having proposed upper reservoir and lower reservoir with installed capacity of 700MW. The project is located in Pune/Thane district of Maharashtra. The project utilizes water of Kalu River for power generation harnessing design head of 396 m. The powerhouse has 2 units of 350 MW having installed capacity of 700 MW generating Design Energy of 1680 MU in 90% dependable year with 95% machine availability.

2. LOCATION/ACCESSIBILITY

The proposed upper dam site of the project is located on Kalu River having upper reservoir at latitude of 19°21'39''N and longitude of 73°47'46''E and lower dam site is located on Kalu River at latitude of 19°21'11''N and longitude of 73°46'18''E. The nearest railway station from the project site is Kalyan and nearest airport is Pune/Mumbai.

3. PROJECT FEATURES

Malshej Ghat Pumped Storage Project involves:

Upper Reservoir (Proposed): Upper Dam/Reservoir is proposed across Kalu River with dam Height of 34 m. The project with a live storage of 23.75 Mcum between a Full Reservoir Level (FRL) of 686.8 m and Minimum Draw down Level (MDDL) of 679 m.

Lower Reservoir (Proposed): Lower Dam/Reservoir is proposed with dam height of 59 m with a live storage of 15.56 Mcum on Kalu River between a Full Reservoir Level (FRL) of m and Minimum Draw down Level (MDDL) of 263 m.

Water Conductor System (Proposed): The proposed Water Conductor System comprises of a Head race Tunnel (HRT) of length 350 m & diameter 8.0 m. The Pressure shaft/penstock of length 650 m and diameter 6.5 m carrying water to the underground powerhouse. The Project to be operated under design head of 396 m with installed capacity of 700MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 1110 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 10.53 Sq.Km and the lower dam site is 26.03 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Malshej Ghat Pumped Storage Project would be 700MW. Utilizing the Design head of 396 m, the project generates the Design Energy of 1680MU in 90% dependable year with 95% machine availability. The project will provide peaking of 8 hrs on week days.

SALIENT FEATURES

MALSHEJ GHAT PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Pune/Thane
River	Kalu
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Kalyan
Nearest Airport	Pune/Mumbai

UPPER RESERVOIR (Proposed):

Location	Latitude: 19°21'39''N
	Longitude: 73°47'46''E
Full Reservoir Level (FRL) (m)	686.8
Minimum Draw Down Level (MDDL) (m)	679
Length of the Dam at the top(m)	565
Height of Dam (above RBL) (m)	34
Live Storage (Mcum)	23.75
Gross Storage (Mcum)	26.85

LOWER RESERVOIR (Proposed)

Location	Latitude: 19°21'11''N
	Longitude: 73°46'18''E
Full Reservoir Level (FRL) (m)	
Minimum Draw Down Level (MDDL) (m)	263
Height of Dam (above RBL) (m)	59
Live Storage (Mcum)	15.56

‘

HYDROLOGY:

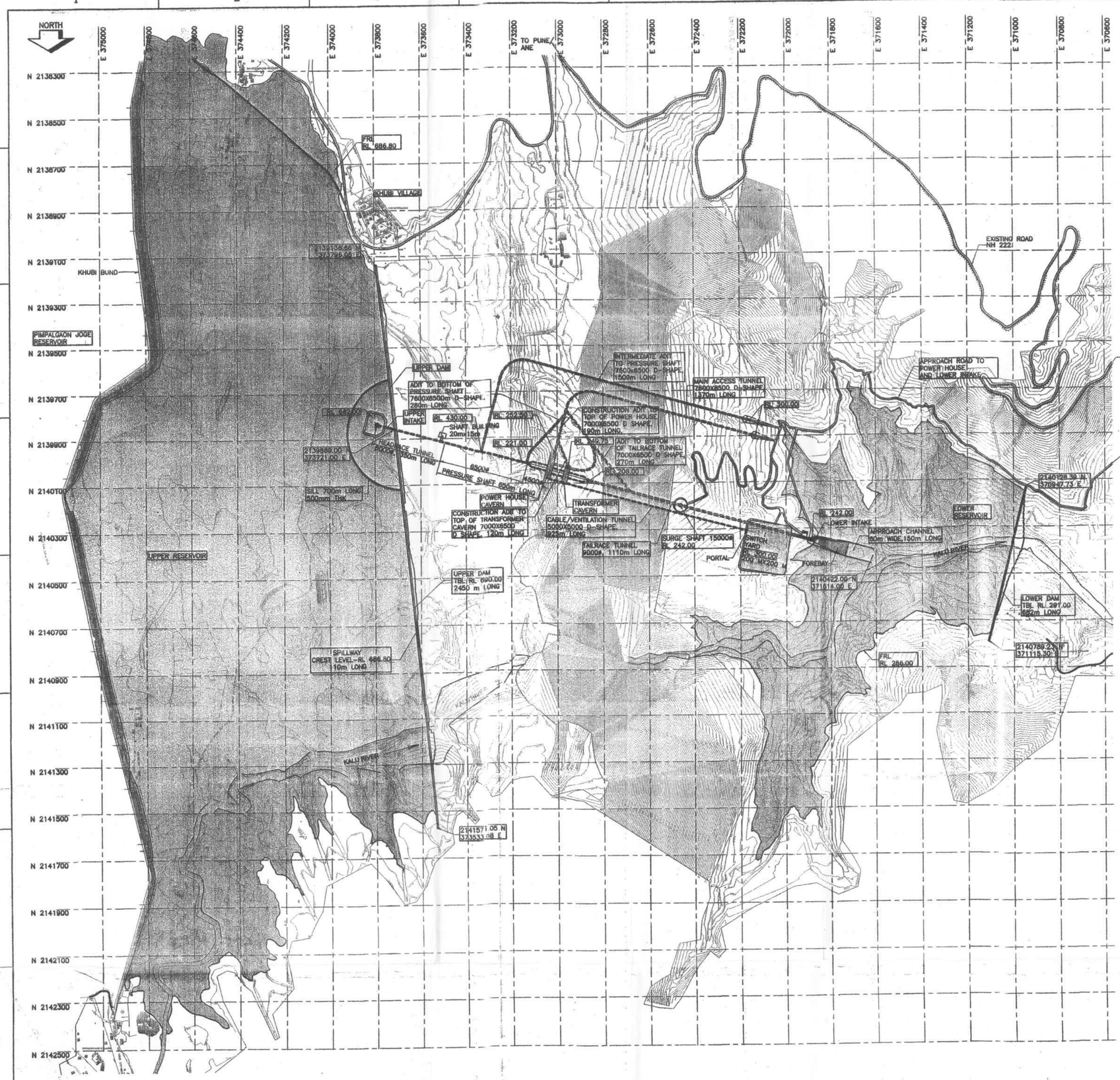
Catchment Area (Sq. Km) Upper Dam	10.53
Catchment Area (Sq. Km) Lower Dam	26.03

WATER CONDUCTOR SYSTEM (proposed):

HEAD RACE TUNNEL	
Number	1
Length (m)	350
Diameter (m)	8
PRESSURE SHAFT/PENSTOCK	
Number	1
Length (m)	650
Diameter (m)	6.5
TAIL RACE TUNNEL	
Length (m)	1110
Diameter (m)	9

POWER HOUSE :

Type	Underground
No. of Generating Units	2
Capacity of each Unit (MW)	350
Installed Capacity (MW)	700
Design Head (m)	1680
Gross Head(m)	413
Turbine	Reversible Vertical Francis
Annual Energy(MU)	700



LEGEND

FRL – FULL RESERVOIR LEVEL

TBL – TOP BUND LEVEL

NOTES

1 ALL DIMENSIONS ARE IN MILLIMETERS AND LOCATIONS ARE IN UTM CO-ORDINATE SYSTEM.

2. FOR L-SECTION ALONG WATER CONDUCTOR SYSTEM REFER MGPSS/10000/6405/ED/PO-PLATE No.-6.

SCALE
120 0 120 600m

FOR DPR PURPOSE ONLY

MALSHEJ GHAT PSS
(2x350MW)

GENERAL LAYOUT OF THE PROJECT

Electricite De France, France
&
TATA CONSULTING ENGINEERS LIMITED, India

DRAWN	MS	CHECKED	LGC
DESIGNED	KC	APPROVED	DNK
SCALE AS NOTED	DWG. NO: MGPSS/10000/6601/ED/PO		MAY 2010

SIZE-A2

27. MUTKHEL PUMPED STORAGE PROJECT (1X110MW=110 MW)

1. INTRODUCTION

Mutkhel Pumped Storage Project having proposed upper reservoir and existing lower reservoir with installed capacity of 110MW. The project is located in Ahemadnagar district of Maharashtra. The project utilizes water of Pravara River for power generation harnessing design head of 231 m. The powerhouse has 1 units of 110MW having installed capacity of 110 MW generating Design Energy of 205.55 MU in 90% dependable year with 95% machine availability.

2. LOCATION/ACCESSIBILITY

The upper dam site of the project is located on Pravara River having upper reservoir at latitude of 19°31'23.35''N and longitude of 73°46'8.59''E and lower dam site is located on Pravara River at latitude of 19°31'51.84''N and longitude of 73°45'29.94''E. The nearest railway station is Ahmednagar and the nearest Airport is Pune.

3. PROJECT FEATURES

Mutkhel Pumped Storage Project involves :

Upper Reservoir (Artificial Tank to be Constructed) (Proposed): Upper Reservoir is created by excavating rock and pentagon in shape with dam Height of 48 m with a live storage of 2.3786 Mcum on Pravara River between a Full Reservoir Level (FRL) of 970 m and Minimum Draw down Level (MDDL) of 940 m.

Lower Reservoir (Existing Bhandardara Dam): Existing Bhandardara dam is used as Lower Dam of Mutkhel pumped storage with dam height of 90 m with a live storage of 249 Mcum on Pravara River between a Full Reservoir Level (FRL) of 744.73 m and Minimum Draw down Level (MDDL) of 679.155 m.

Water Conductor System: The proposed Water Conductor System comprises of a Pressure shaft/penstock of length 460 m and diameter 4 m carrying water to the underground powerhouse. The Project to be operated under design head of 231 m with installed capacity of 110 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 677m.

4. HYDROLOGY

The Catchment area of the river upto the lower dam site is 121.7 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Mutkhel Pumped Storage Project would be 110 MW. Utilizing the Design head of 231 m, the Design Energy of the project comes out to be of 205.55MU in 90% dependable year with 95% machine availability. The project will provide peaking of 6 hrs on week days.

SALIENT FEATURES

MUTKHEL PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Ahmednagar
River	Pravara
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Ahmednagar
Nearest Airport	Pune/Mumbai

UPPER RESERVOIR (Proposed):

Location	Latitude: 19° 31'23.35''N
	Longitude: 73°46'8.59''E
Full Reservoir Level (FRL) (m)	970
Minimum Draw Down Level (MDDL) (m)	940
Length of the Dam at the top (m)	322
Height of Dam (above RBL) (m)	48
Live Storage (Mcum)	2.3786
Gross Storage (Mcum)	2.3786

LOWER RESERVOIR (Existing Bhandardara Dam)

Location	Latitude: 19° 31'51.84''N
	Longitude: 73°45'29.94''E
Full Reservoir Level (FRL) (m)	744.73
Minimum Draw Down Level (MDDL) (m)	679.15
Height of Dam (above RBL) (m)	90
Live Storage (Mcum)	249

HYDROLOGY:

Catchment Area (Sq. Km) Lower Dam	121.7

WATER CONDUCTOR SYSTEM (proposed):

PRESSURE SHAFT/PENSTOCK	
Number	1
Length (m)	460
Diameter (m)	4
TAIL RACE TUNNEL	
Length (m)	677
Diameter (m)	4.5

POWER HOUSE :

Type	Underground
No. of Generating Units	1
Capacity of each Unit (MW)	110
Installed Capacity (MW)	110
Design Head (m)	231
Gross Head (m)	237.13
Turbine	Reversible Vertical Francis
Annual Energy(MU)	110
Design Energy (MU)	205.55
No. of hours of Generation	6

Salient Features

TOPOSHEET NO 47 E/10,11& 14

S.N.	Particulars of Item	Upper Storage	Lower Dam
1.	State	Maharashtra	Maharashtra
2.	Region	Western	Western
3.	District	Ahemadnagar	Ahemadnagar
4.	Taluka	Akole	Akole
5.	Village	Mutkhel	Bhandardara
6.	River	Artificial Storage	Pravara River
7.	Latitude	19°31'23.35"(Intake)	19°31'51.54"(Outfall)
8.	Longitude	73°46'8.59"(Intake)	73°45'29.94"(Outfall)
9.	Controlling Levels :		
	a) M.D.D.L.	940.00 m	679.155 m
	b) F.R.L.	970.00 m	744.730 m
	c) T.B.L	973.00 m	749.307 m
10.	Gross Storage	2.3786 Mcum	318.000 Mcum
11.	Design Head	231 m	
12.	Installed Capacity	110 MW	
13.	Pressure Shaft	4.00m Dia., L= 460 m	
14.	Tail Race Tunnel	4.50m Dia., L= 677 m	
15.	Lower Intake Tunnel	4.50m Dia., L= 354 m	
16.	Total Length of WCS	L= 1491 m	
17.	Approach Tunnel	L= 920 m, D-shape(7.0 m X 7.0 m)	
18.	Cable Tunnel	L= 712 m, D-shape (6.0 m X 6.0 m)	
19.	Inter Adit	L= 380 m, D-shape (6.0 m X 6.0 m)	

Station Point	Line	Length in Drg.mm	Length in m	Fore Bearing
A	A-B	4.7777	239	57^0.
B	B-C	3.8161	191	158^0.
C	C-D	4.1478	207	147^0.
D	D-E	3.7011	185	261^0.
E	E-A	6.4478	322	321^0.
Total Length @ RL940m			1144	

MUTKHEL PUMPED STORAGE SCHEME (110 MW)

INDEX PLAN

(M.R. JOSHI) (Assistant Engineer II)			
(A.L.GHATKAR) (Sectional Engineer)	(D.S.PRAKSHALE) (Sub Divisional Engineer)	(J.P.JAHAGIRDAR) (Executive Engineer)	(R.R.SHAH) (Superintending Engineer)

DRG. NO.:KDC/HED-2/MUTKHEL PSS/1, DATE: 31.07.2015

28. WARASGAON PUMPED STORAGE PROJECT (4X300MW=1200 MW)

1. INTRODUCTION

Warasgaon Pumped Storage Project has a proposed upper reservoir and lower reservoir with proposed installed capacity of 1200MW. The upper reservoir is located in Pune district and lower reservoir is located in Raigad district of Maharashtra. The project utilizes water of Mose/Kal River for power generation harnessing design head of 538 m. The powerhouse has 4 units of 300MW having installed capacity of 1200 MW generating Design Energy of 22142.33MU in 90% dependable year at 95 % machine avalability.

2. LOCATION/ACCESSIBILITY

The upper dam site of the project is located on Mose River having upper reservoir at latitude of 18°23'25''N and longitude of 73°26'11''E and lower reservoir is located on Kal River at latitude of 18°22'14''N and longitude of 73°23'39''E. The nearest railway station and the nearest Airport is Pune.

3. PROJECT FEATURES

Warasgaon Pumped Storage Project involves construction of.

Upper Reservoir (Proposed): Upper Reservoir with dam Height of 52.6 m with a live storage of 12.6861Mcum on Mose River between a Full Reservoir Level (FRL) of 695.6 m and Minimum Draw down Level (MDDL) of 663 m.

Lower Reservoir (Proposed): Lower Reservoir with dam height of 37 m with a live storage of 17.9567 Mcum on Kal River between a Full Reservoir Level (FRL) of 138 m and Minimum Draw down Level (MDDL) of 127 m.

Water Conductor System: The proposed Water Conductor System comprises of a Head Race Tunnel (HRT) of length 750 m and Pressure shaft/penstock of length 989.26 m and diameter 5.50 m carrying water to the underground powerhouse. The Project to be operated under design head of 538 m with installed capacity of 1200 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 1206 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 2.463 Sq.Km and the lower dam site is 19.677 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Warasgaon Pumped Storage Project would be 1200 MW. Utilizing the Design head of 538 m, the Design Energy of the project is 2242.33 MU in 90% dependable year at 95 % machine avalability. The project will provide peaking of 6hrs.

SALIENT FEATURES

WARASGAON PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Pune/Raigad
River	Mose/Kal
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Pune
Nearest Airport	Pune

UPPER RESERVOIR (Proposed):

Location	Latitude: 18°23'25''N
	Longitude: 73°26'08''E
Full Reservoir Level (FRL) (m)	695.6
Minimum Draw Down Level (MDDL) (m)	663
Length of the Dam at the top(m)	571
Height of Dam (above RBL) (m)	52.6
Live Storage (Mcum)	12.6861
Gross Storage (Mcum)	14.176

LOWER RESERVOIR (Existing)

Location	Latitude: 18°21'50''N
	Longitude: 73°24'01''E
Full Reservoir Level (FRL) (m)	138
Minimum Draw Down Level (MDDL) (m)	127
Height of Dam (above RBL) (m)	37
Live Storage (Mcum)	17.9567

HYDROLOGY:

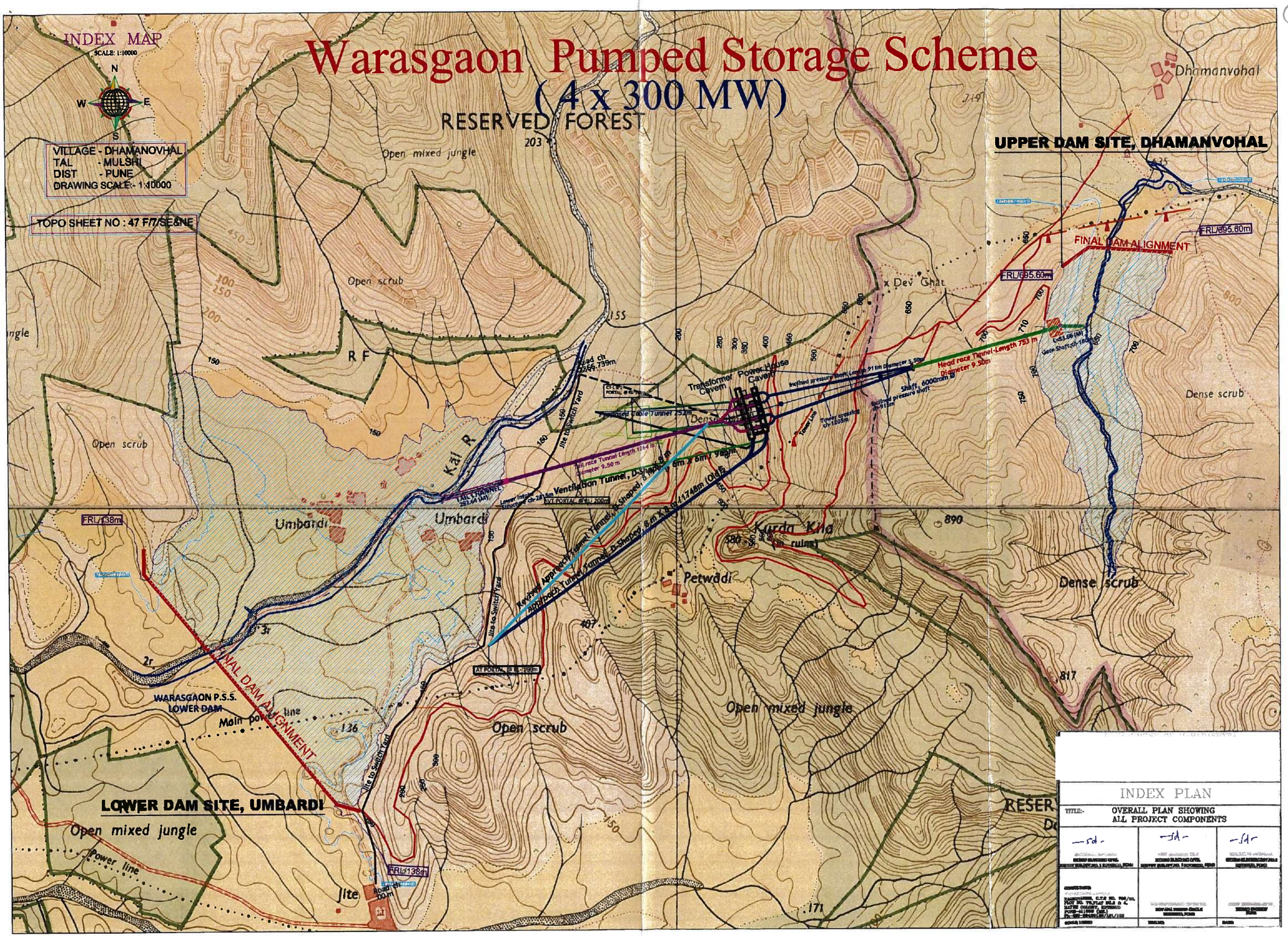
Catchment Area (Sq. Km) Upper Dam	2.463
Catchment Area (Sq. Km) Lower Dam	19.677

WATER CONDUCTOR SYSTEM (proposed):

HEAD RACE TUNNEL	
Number	1
Length (m)	750
Diameter (m)	9.50
Design Discharge (Cumecs)	74.64
PRESSURE SHAFT/PENSTOCK	
Number	2
Length (m)	989.26
Diameter (m)	5.50
TAIL RACE TUNNEL	
Length (m)	1206
Diameter (m)	9.50

POWER HOUSE:

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	300
Installed Capacity (MW)	1200
Design Head (m)	538
Gross Head(m)	568.6
Turbine	Reversible Vertical Francis
Design Energy(MU)	2242.33



Warasgaon Pumped Storage Scheme
(4 x 300 MW)
INDEX MAP
SCALE: 1:10000
N
W
E
S
VILLAGE - DHAMANOVHAL
TAL - MULSHI
DIST - PUNE
DRAWING SCALE:- 1:10000
TOPO SHEET NO : 47 F/7/SE&NE
RESERVED FOREST
Open mixed jungle
Open scrub
Dhamanvohal
UPPER DAM SITE, DHAMANVOHAL
FINAL DAM ALIGNMENT
FRL/695.60m
x Dev Ghat
Transformer Cavern
Power House Cavern
Head race Tunnel-Length 753 m
Diameter 9.50m
Shaft, 6000mm Ø
Inclined pressure shaft
Tower Line
Tower crossing
Dense scrub
Kāl R
Jite to Switch Yard
Ventilation Tunnel, D-Shaped
Umbardi
FRL/138m
Kurda Kila
(in ruins)
Petwadi
Dense scrub
Revised Approach Tunnel
Approach Tunnel
Jite to Switch Yard
WARASGAON P.S.S.
LOWER DAM
Main power line
Open scrub
Open mixed jungle
LOWER DAM SITE, UMBARDI
Open mixed jungle
Power line
Jite
FRL/138m
INDEX PLAN
TITLE:-
OVERALL PLAN SHOWING
ALL PROJECT COMPONENTS

29. KENGADI PUMPED STORAGE PROJECT (1550 MW)

1. INTRODUCTION

Kengadi Pumped Storage Project has a proposed upper reservoir and lower reservoir with installed capacity of 1550MW. The project is located in Thane district of Maharashtra. The project utilizes water of Vaitarni and Savitri River for power generation harnessing head of 225 m. The powerhouse would have installed capacity of 1550 MW.

2. LOCATION/ACCESSIBILITY

The upper dam site of the project is located on Vaitarni River having upper reservoir at latitude of 19°41'02.0"N and longitude of 73°27'27.0"E and lower reservoir is located on Savitri River at latitude of 19°38'42.0"N and longitude of 73°25'03.0"E. The nearest railway station and the nearest Airport is Pune.

3. PROJECT FEATURES

Kengadi Pumped Storage Project involves construction of.

Upper Reservoir (Proposed): Upper Reservoir is created with live storage capacity of 12.3 Mcum and dam Height of 45 m with a live storage of 12.3 Mcum on Vaitarni River between a Full Reservoir Level (FRL) of 525 m and Minimum Draw down Level (MDDL) of 508 m.

Lower Reservoir (Proposed): Lower Reservoir is created with gross storage capacity of 18 Mcum dam height of 39 m with a live storage of 18Mcum on Savitri River between a Full Reservoir Level (FRL) of 300 m and Minimum Draw down Level (MDDL) of 285 m.

Water Conductor System: The proposed Water Conductor System is about 2.5 km long and may consist of two or three head race tunnel.

4. POWER & ENERGY BENEFITS

The installed capacity of Kengadi Pumped Storage Project would be 1550 MW. Utilizing the head of 225 m, the Annual Energy of the project comes out to be of MU. The project will provide peaking of 6hrs.

SALIENT FEATURES

KENGADI PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Thane
River	Vaitarni/Savitri
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Pune
Nearest Airport	Pune

UPPER RESERVOIR (Proposed):

Location	Latitude: 19°41'02.0"N
	Longitude: 73°27'27.0"E
Full Reservoir Level (FRL) (m)	525
Minimum Draw Down Level (MDDL) (m)	508
Length of the Dam at the top(m)	500
Height of Dam (above RBL) (m)	45
Live Storage (Mcum)	12.3

LOWER RESERVOIR (Existing)

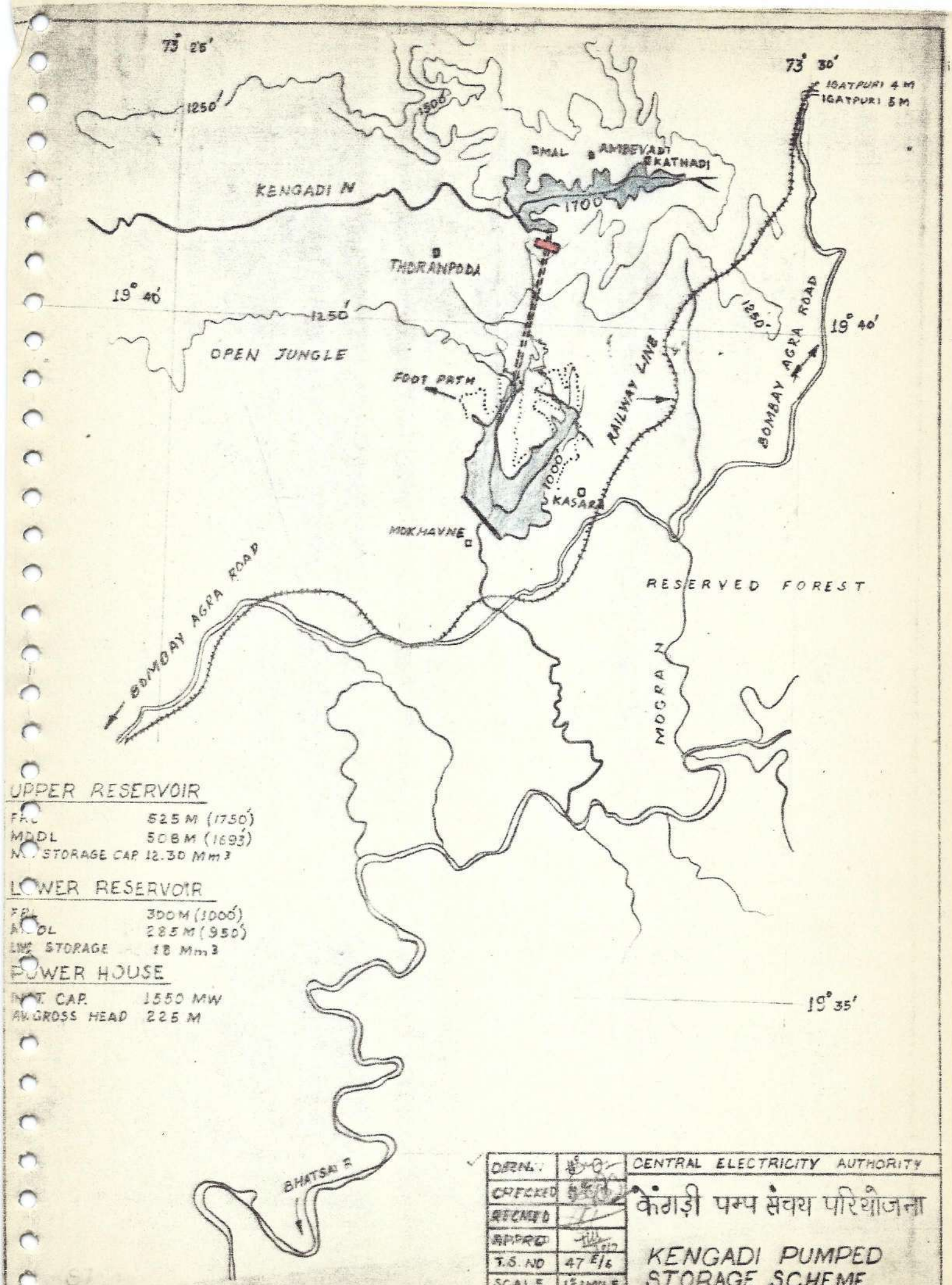
Location	Latitude: 19°38'42.0"N
	Longitude: 73°25'03.0"E
Full Reservoir Level (FRL) (m)	300
Minimum Draw Down Level (MDDL) (m)	285
Height of Dam (above RBL) (m)	39
Live Storage (Mcum)	18

WATER CONDUCTOR SYSTEM:

Length (m)	460

POWER HOUSE :

Installed Capacity (MW)	1550
Head (m)	225
No. of hours of Generation	6


73° 25'
73° 30'
IGATPURI 4 M
IGATPURI 5 M
1250'
1500
DMAL
AMBEVADI
KATHADI
KENGADI N
1700
THORANPODA
19° 40'
1250'
OPEN JUNGLE
FOOT PATH
RAILWAY LINE
BOMBAY AGRA ROAD
1250
19° 40'
1000
KASARA
MOKHAVNE
BOMBAY AGRA ROAD
RESERVED FOREST
MOGRA N
19° 35'
BHATSAI R
UPPER RESERVOIR
FRL 525 M (1750')
MDDL 508 M (1693')
NET STORAGE CAP. 12.30 Mm3
LOWER RESERVOIR
FRL 300 M (1000')
MDDL 285 M (950')
LIVE STORAGE 18 Mm3
POWER HOUSE
INST. CAP. 1550 MW
AV. GROSS HEAD 225 M
DRN.
CHECKED
RECMD
APPRD
T.S. NO 47 E/6
SCALE 1" = 1 MILE
JULY, 1980.
CENTRAL ELECTRICITY AUTHORITY
केंगड़ी पम्प संचय परियोजना
KENGADI PUMPED STORAGE SCHEME
DRG. NO. HEPR-PS-WFR-524

30. JALOND PUMPED STORAGE PROJECT (2400 MW)

1. INTRODUCTION

Jalond Pumped Storage Project having proposed upper reservoir and lower reservoir with installed capacity of 2400 MW. The project is located in Thane district of Maharashtra. The project utilizes water of Mula and Jalond River for power generation harnessing head of 600m. The powerhouse would have installed capacity of 2400 MW.

2. LOCATION/ACCESSIBILITY

The upper dam site of the project is located on Mula River having upper reservoir at latitude of 19°26'22.6"N and longitude of 73°43'16.0"E and lower reservoir is located on Jalond River at latitude of 19°24'44.3"N and longitude of 73°41'48.8"E. The nearest railway station and the nearest Airport is Pune.

3. PROJECT FEATURES

Jalond Pumped Storage Project involves:

Upper Reservoir (Proposed): Upper Reservoir may be created on Mula River providing small dam height of 45 m. The project has a live storage of 14.4 Mcum between Full Reservoir Level (FRL) of 840 m and Minimum Draw down Level (MDDL) of 822 m.

Lower Reservoir (Proposed): Lower Reservoir may be created on Jalond River with dam height of 30 m with a live storage of 10.08 Mcum between Full Reservoir Level (FRL) of 240 m and Minimum Draw down Level (MDDL) of 228 m.

Water Conductor System: The proposed Water Conductor System may consist of tunnels with total carrying capacity of 500 cumecs and about 2300 m long carrying water to the Power House. The discharge water from the power house is carried back to the river by Tail race Tunnel.

4. POWER & ENERGY BENEFITS

The installed capacity of Jalond Pumped Storage Project would be 2400 MW. Utilizing the head of 600 m, the Annual Energy of the project comes out to be of MU in 90% dependable year with 95% machine availability.

SALIENT FEATURES

JALOND PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Thane
River	Mule/Jalond
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Pune
Nearest Airport	Pune

UPPER RESERVOIR (Proposed):

Location	Latitude: 19°26'22.6"N
	Longitude: 73°43'16.0"E
Full Reservoir Level (FRL) (m)	840
Minimum Draw Down Level (MDDL) (m)	822
Length of the Dam at the top(m)	400
Height of Dam (above RBL) (m)	45
Live Storage (Mcum)	14.4

LOWER RESERVOIR (Proposed)

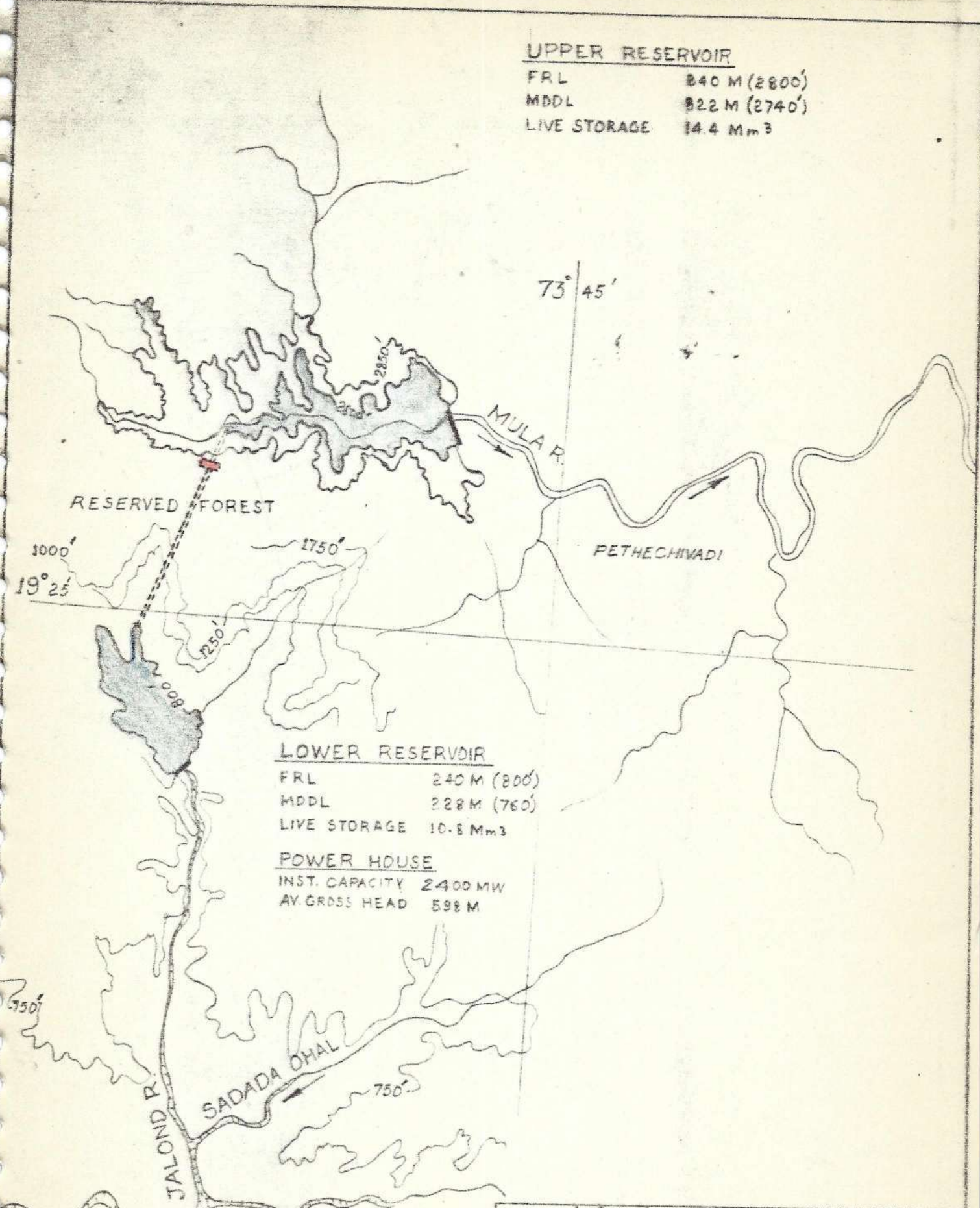
Location	Latitude: 19°24'44.3"N
	Longitude: 73°41'48.8"E
Full Reservoir Level (FRL) (m)	240
Minimum Draw Down Level (MDDL) (m)	228
Height of Dam (above RBL) (m)	30
Live Storage (Mcum)	10.8

WATER CONDUCTOR SYSTEM (proposed):

Length (m)	2300

POWER HOUSE :

Installed Capacity (MW)	2400
Head (m)	600



DRN-N		HYDRO POTENTIAL RE-ASSESSMENT PROJ
CHECKED		जालोन्द पम्प संचय परियोजना
RECMED		
APPRD		JALOND PUMPED STORAGE SCHEME
T.S. NO	47 E/11	
SCALE	1" = 1 MILE	CENTRAL ELECTRICITY AUTHORITY
JULY, 1980		DRG NO. HEPR-PS-WFR-512

31. AMBA PUMPED STORAGE PROJECT (4X200MW=800 MW)

1. INTRODUCTION

Amba Pumped Storage Project having proposed upper reservoir and lower reservoir with installed capacity of 800MW. The project is located in Pune and Raigad district of Maharashtra. The project utilizes water of Indrayani/Amba River for power generation harnessing rated head (generation) of 514.22 m and (pumping) of 549.69 m. The powerhouse has 4 units of 200 MW having installed capacity of 800 MW generating annual energy of 1664.40 MU.

2. LOCATION/ACCESSIBILITY

The upper dam site of the project is located on Indrayani River having at latitude of 18°41'25''N and longitude of 73°24'28''E and lower dam site is located on Amba River at latitude of 18°40'52''N and longitude of 73°21'48''E. The nearest railway station is Lonavala and the Airport is Pune.

3. PROJECT FEATURES

Amba Pumped Storage Project involves construction of

Upper Reservoir (New): Upper Reservoir for of Amba pumped storage project is proposed with dam Height of 26 m with a live storage of 4.11 Mcum on Indrayani River between a Full Reservoir Level (FRL) of 631 m and Minimum Draw down Level (MDDL) of 618 m.

Lower Reservoir (New): Lower Reservoir of Amba pumped storage with dam height of 26 m with a live storage of 4.0 Mcum on Amba River between a Full Reservoir Level (FRL) of 100 m and Minimum Draw down Level (MDDL) of 88 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Pressure shaft of length 550 m and penstock of length 50 m and diameter 3.20 m carrying water to the underground powerhouse. The Project to be operated under rated head of 514.22 m (generation) and 549.69 m (pumping) with installed capacity of 800 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 1700 m.

4. HYDROLOGY

The quantity of water required daily for 6 hours power generation is 3.80 Mcum.

5. POWER & ENERGY BENEFITS

The installed capacity of Amba Pumped Storage Project would be 800 MW. Utilizing the rated head (Generation) is 514.22 m and rated head (pumping) is 549.69 m .The Annual Energy generation of the project is 1664.40 MU.

SALIENT FEATURES

AMBA PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Pune/Raigad
River	Indrayani/Amba
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Lonavala
Nearest Airport	Pune

UPPER RESERVOIR (New):

Location	Latitude: 18°41'25''N
	Longitude: 73°24'28''E
Full Reservoir Level (FRL) (m)	631
Minimum Draw Down Level (MDDL) (m)	618
Top of the Dam at the top(m)	634
Height of Dam (above RBL) (m)	26
Live Storage (Mcum)	4.11

LOWER RESERVOIR (New)

Location	Latitude: 18°40'52''N
	Longitude: 73°21'48''E
Full Reservoir Level (FRL) (m)	100
Minimum Draw Down Level (MDDL) (m)	88
Height of Dam (above RBL) (m)	26
Live Storage (Mcum)	4.0

HYDROLOGY:

Quantity of water required daily for 6 Hrs power generation (Mcum)	3.80

INTAKE:

	Upper Reservoir	**Lower Reservoir**
Type	Sloping type with bell mouth entry	Sloping type with bell mouth entry
Size (m)	10.4 m high, 7.80 m wide	10.4 m high, 7.80 m wide

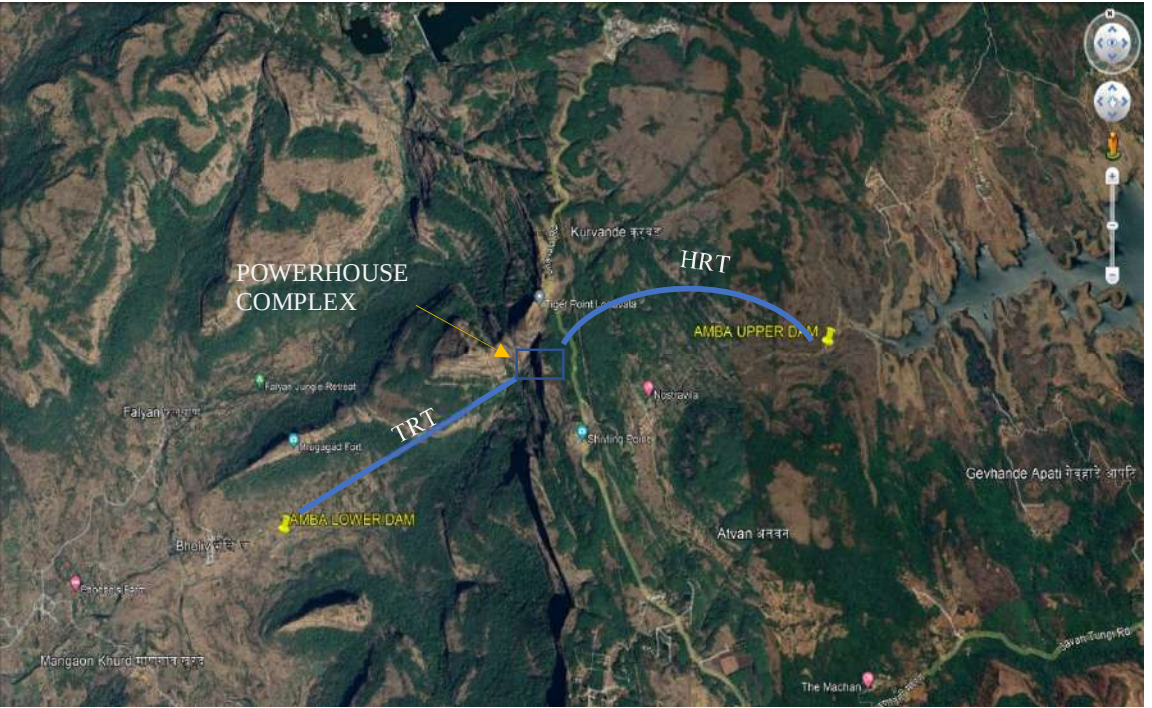
WATER CONDUCTOR SYSTEM:

HEAD RACE TUNNEL	
Number	1
Length (m)	2300
Shape	Circular
Diameter (m)	6.6
PRESSURE SHAFT	
Number	1
Length (m)	550
Shape (m)	Circular
Diameter (m)	4.50
PENSTOCK	
Number	4
Length (m)	50
Shape	Circular
Diameter (m)	3.2

TAIL RACE TUNNEL	
Number	1
Length (m)	1700
Shape	Circular
Diameter (m)	6.6

POWER HOUSE:

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	200
Installed Capacity (MW)	800
Rated Head (m)	514.22 (Generation) 549.69 (Pumping)
Gross Head(m)	420.08
Turbine	Reversible Vertical Francis
Annual Energy(MU)	1664.40


POWERHOUSE
COMPLEX
HRT
TRT
Kurvande करवड
Tiger Point Lonavala
AMBA UPPER DAM
Falyan Jungle Retreat
Falyan
Nostravila
Shivling Point
Mrugagad Fort
AMBA LOWER DAM
Bholiv
Phoenix Farm
Mangaon Khurd
Gevhande Apati
Atvan अनवन
The Machan

32. SAVITRI PUMPED STORAGE PROJECT (2250 MW)

1. INTRODUCTION

Savitri Pumped Storage Project having proposed upper reservoir and lower reservoir with installed capacity of 2250 MW. The project is located in Satara & Raigad district of Maharashtra. The project utilizes water of Krishna and Savitri River for power generation harnessing head of 1065 m. The powerhouse would have installed capacity of 2250 MW.

2. LOCATION/ACCESSIBILITY

The upper reservoir of the project is located on Krishna River having latitude of 17°58'14.5"N and longitude of 73°39'54.0"E and lower reservoir is located on Savitri River at latitude of 17°58'05.2"N and longitude of 73°35'47.0"E. The nearest railway station and the nearest Airport is Pune.

3. PROJECT FEATURES

Savitri Pumped Storage Project involves construction of

Upper Reservoir (Proposed): Upper Reservoir may be created on Krishna River by providing small dam height of 45 m with a live storage of 5.7 Mcum. The Upper Reservoir has a Full Reservoir Level (FRL) of 1290 m and Minimum Draw down Level (MDDL) of 1275 m.

Lower Reservoir (Proposed): Lower Reservoir may be created on Savitri River with dam height of 45 m with a live storage of 8.8 Mcum .The lower reservoir has a Full Reservoir Level (FRL) of 225 m and Minimum Draw down Level (MDDL) of 208 m.

Water Conductor System: The proposed Water Conductor System may consist of tunnel of length 3000m long.

4. POWER & ENERGY BENEFITS

The installed capacity of Savitri Pumped Storage Project would be 2250MW. Utilizing the head of 1065 m, the project generates the Annual Energy of MU. The project will provide peaking of hrs.

SALIENT FEATURES

SAVITRI PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Satara/Raigad
River	Krishna/Savitri
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Pune
Nearest Airport	Pune

UPPER RESERVOIR (Proposed):

Location	Latitude: 17°58'14.5"N
	Longitude: 73°39'54.0"E
Full Reservoir Level (FRL) (m)	1290
Minimum Draw Down Level (MDDL) (m)	1275
Length of the Dam at the top(m)	600
Height of Dam (above RBL) (m)	45
Live Storage (Mcum)	5.7

LOWER RESERVOIR (Proposed)

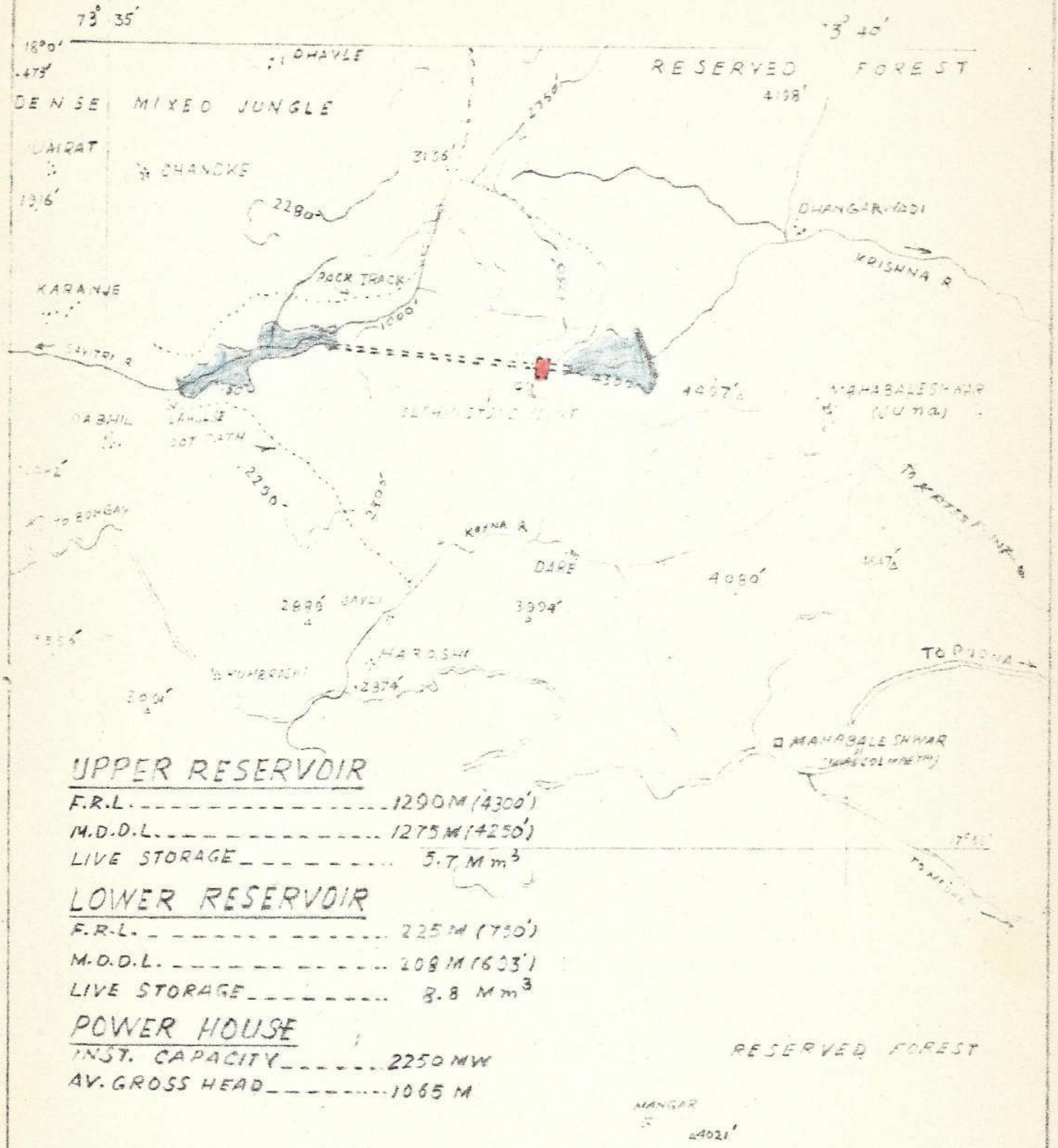
Location	Latitude: 17°58'05.2"N
	Longitude: 73°35'47.0"E
Full Reservoir Level (FRL) (m)	225
Minimum Draw Down Level (MDDL) (m)	208
Length of the Dam at the top(m)	400
Height of Dam (above RBL) (m)	45
Live Storage (Mcum)	8.8

WATER CONDUCTOR SYSTEM (proposed):

Length (m)	3000

POWER HOUSE :

Installed Capacity (MW)	2250
Head (m)	1065



UPPER RESERVOIR

F.R.L. ..... 1290 M (4300')

M.D.D.L. ..... 1275 M (4250')

LIVE STORAGE ..... 5.7 Mm^3

LOWER RESERVOIR

F.R.L. ..... 225 M (750')

M.D.D.L. ..... 208 M (683')

LIVE STORAGE ..... 8.8 Mm^3

POWER HOUSE

INST. CAPACITY ..... 2250 MW

AV. GROSS HEAD ..... 1065 M

DRN.		CENTRAL ELECTRICITY AUTHORITY
CHECKED		सावित्री पम्प भंडारण परियोजना
RECMED		SAVITRI PUMPED STORAGE SCHEME
APPRD		
T.S. NO.	47 G/9	
SCALE	1" = 1 MILE	
JULY, 1980		DRG. NO. HEPR-PS-WFR-536

33. JALVARA PUMPED STORAGE PROJECT (8X277.50MW=2220 MW)

1. INTRODUCTION

Jalvara Pumped Storage Project is located on the district of Sindhudurg in Maharashtra and on the District of Belgaum in Karnataka. The project utilizes water of Hajatar River and Jalvara River for power generation harnessing Rated Net Head (Turnine Mode) is 527.60m. The powerhouse has 8 units of 277.50MW having installed capacity of 2200 MW.

2. LOCATION/ACCESSIBILITY

The Project having upper reservoir at latitude of 15°40'7.57''N and longitude of 74°08'43.04''E and lower reservoir at latitude of 15°41'37.367''N and longitude of 74°06'13.56''E. There is a proposal of underground type of Power house. The nearest railway station is Thivm, Goa and the Airport is Goa International Airport.

3. PROJECT FEATURES

Jalvara Pumped Storage Project involves construction of :

Upper Reservoir (proposed): The height of the dam of Upper Reservoir is proposed to be of 46 m with a live storage of 10.49 Mcum on river Hajatar between a Full Reservoir Level (FRL) of 782 m and Minimum Draw down Level (MDDL) of 761 m.

Lower Reservoir (proposed): The height of the dam of Lower Reservoir is proposed to be of 77 m with a live storage of 10.88 Mcum on Jalvara river between a Full Reservoir Level (FRL) of 235 m and Minimum Draw down Level (MDDL) of 218 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of 2 nos. Head race tunnel (HRT) of length 1580 and 1562 m and diameter of 8.50 m, 4 nos. of Pressure shaft of length 630.33/220/160/167.51 m and diameter of 4.85/4.55/4.35/4.15m carrying water to the underground powerhouse. The discharged water from powerhouse is carried back to the river by 2 nos. of Tail race tunnel of length 927 and 923m of diameter 8.50m.

4. HYDROLOGY

The Catchment area for Upper resevior is 2.88 Km^2 and Lower Reservior is 9.69 Km^2.

5. POWER & ENERGY BENEFITS

The installed capacity of Jalvara Pumped Storage Project would be 2200 MW utilizing Rated Net Head (Turbine Mode) of 527.60m.

SALIENT FEATURES

JALVARA PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra/Karnatka
District	Sindhudurg/Belgaum
River	Hajatar/Jalvara River
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Thivm, Goa
Nearest Airport	Goa International Airport

UPPER RESERVOIR (proposed):

Location	Latitude: 15°40'7.57''N
	Longitude: 74°08'43.04''E
Full Reservoir Level (FRL) (m)	782
Minimum Draw Down Level (MDDL) (m)	761
Length of the Dam at the top(m)	674
Height of Dam (above RBL) (m)	46
Live Storage (Mcum)	10.49
Gross Storage (Mcum)	12.35

LOWER RESERVOIR (proposed):

Location	Latitude: 15°41'37.367''N
	Longitude: 74°06'13.56''E
Full Reservoir Level (FRL) (m)	235
Minimum Draw Down Level (MDDL) (m)	218
Height of Dam (above RBL) (m)	77
Live Storage (Mcum)	10.88
Gross Storage (Mcum)	23.98

HYDROLOGY:

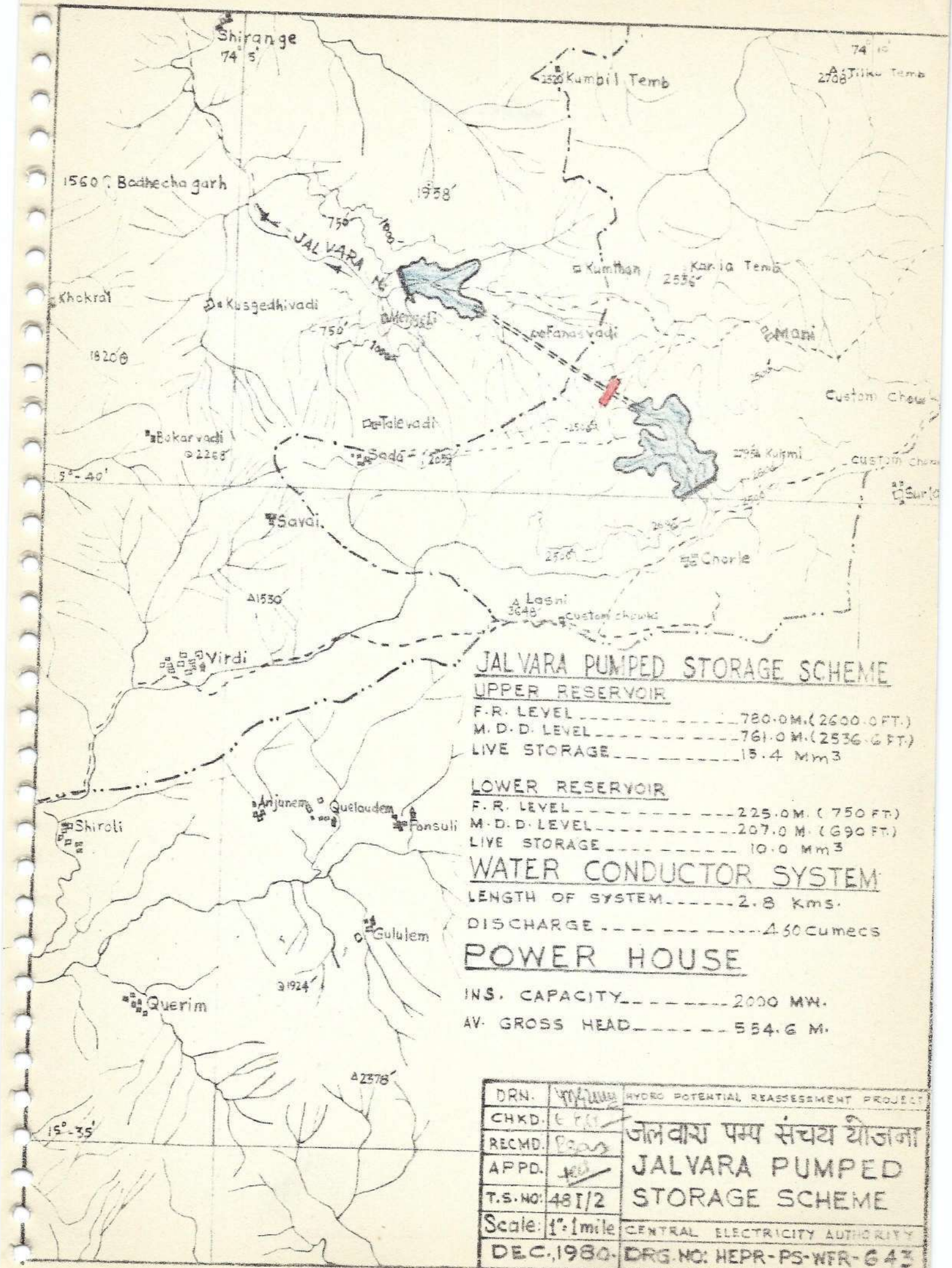
Catchment Area (Sq. Km) Upper Dam	2.88
Catchment Area (Sq. Km) Lower Dam	9.69

WATER CONDUCTOR SYSTEM :

HEAD RACE TUNNEL	
Number	2
Length (m)	1580 & 1562
Diameter (m)	8.50
PRESSURE SHAFT/PENSTOCK	
Number	4
Length (m)	630.33, 220, 160 & 167.51
Diameter (m)	4.85, 4.55, 4.34 & 4.15
TAIL RACE TUNNEL	
Length (m)	927, 923
Diameter (m)	8.50

POWER HOUSE:

Type	Underground
No. of Generating Units	8
Capacity of each Unit (MW)	227.50
Installed Capacity (MW)	2220
Rated Head (m) (Turbine)	527.60
Rated Head (m) ([Pump)	558.72
Turbine	Vertical Shaft, Reversible Francis



JALVARA PUMPED STORAGE SCHEME

UPPER RESERVOIR

F.R. LEVEL ..... 780.0 M. (2600.0 FT.)
M.D.D. LEVEL ..... 761.0 M. (2536.6 FT.)
LIVE STORAGE ..... 15.4 Mm^3

LOWER RESERVOIR

F.R. LEVEL ..... 225.0 M. (750 FT.)
M.D.D. LEVEL ..... 207.0 M. (690 FT.)
LIVE STORAGE ..... 10.0 Mm^3

WATER CONDUCTOR SYSTEM

LENGTH OF SYSTEM ..... 2.8 Kms.
DISCHARGE ..... 450 Cumecs

POWER HOUSE

INS. CAPACITY ..... 2000 MW.
AV. GROSS HEAD ..... 554.6 M.

DRN.		HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD.		जलवारा पम्प संचय योजना
RECMD.		JALVARA PUMPED
APPD.		STORAGE SCHEME
T.S. NO:	48 I/2	
Scale:	1" = 1 mile	CENTRAL ELECTRICITY AUTHORITY
DEC., 1980.		DRG. NO: HEPR-PS-WTR-643

34. VARANDHGHAT PUMPED STORAGE PROJECT (2X400MW=800 MW)

1. INTRODUCTION

Varandhghat Pumped Storage Project has a proposed upper reservoir and lower reservoir with installed capacity of 800MW. The project is located in Pune/Raigad district of Maharashtra. The project will utilize the water of Welvandi/Kharak River for power generation harnessing design head of 547.65 m. The powerhouse would have 2 units of 400MW having installed capacity of 800MW generating Design Energy of 1491.88 MU in 90% dependable year with 95% machine availability.

2. LOCATION/ACCESSIBILITY

The upper dam site of the project is located on Welvandi River having upper reservoir at latitude of 18°11'46.09"N and longitude of 73°37'15.86"E and lower dam site is located on Kharak River at latitude of 18°10'24.36"N and longitude of 73°35'1.50"E. The nearest railway station from the project site is Pune/Mahad and the nearest Airport is Pune.

3. PROJECT FEATURES

Varandhghat Pumped Storage Project involves construction of

Upper Reservoir (Proposed): Upper Reservoir is proposed for this project is to be constructed with dam Height of 29.70 m. The project has a live storage of 11.17 Mcum on Welvandi River between a Full Reservoir Level (FRL) of 648 m and Minimum Draw down Level (MDDL) of 638 m.

Lower Reservoir (Proposed): Lower Reservoir is proposed for this project is to be constructed with dam Height of 39.84 m. The project has a live storage of 13.47 Mcum on Kharak River between a Full Reservoir Level (FRL) of 110.80 m and Minimum Draw down Level (MDDL) of 91 m.

Water Conductor System: The proposed Water Conductor System comprises of Head Race Tunnel of length 420 m, Pressure shaft/penstock of length 970 m and diameter of 6.0 m carrying water to the underground powerhouse. The Project to be operated under design head of 547.65 m with installed capacity of 800 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 1022 m.

4. HYDROLOGY

The Catchment area of the river upto the dam site is 54.01 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Varandhghat Pumped Storage Project would be 800 MW. Utilizing the Design head of 547.65 m, the Design Energy of the project is 1491.88 MU in 90% dependable year with 95% machine availability.

SALIENT FEATURES

VARANDHGHAT PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Pune/Raigad
River	Welvandi/Kharak
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Pune/Mahad
Nearest Airport	Pune

UPPER RESERVOIR (Proposed):

Location	Latitude: 18°11'46.09"N
	Longitude: 73°37'15.86"E
Full Reservoir Level (FRL) (m)	648
Minimum Draw Down Level (MDDL) (m)	638
Length of the Dam at the top(m)	504
Height of Dam (above RBL) (m)	29.70
Live Storage (Mcum)	11.17
Gross Storage (Mcum)	12.76

LOWER RESERVOIR (Proposed)

Location	Latitude: 18°10'24.36"N
	Longitude: 73°35'1.50"E
Full Reservoir Level (FRL) (m)	110.80
Minimum Draw Down Level (MDDL) (m)	91
Height of Dam (above RBL) (m)	39.84
Live Storage (Mcum)	13.47

HYDROLOGY:

Catchment Area (Sq. Km)	54.01
Flood Discharge (Cumec)	1267.80

WATER CONDUCTOR SYSTEM (proposed):

HEAD RACE TUNNEL	
Number	1
Length (m)	420
Diameter (m)	9
Design Discharge (Cumec)	188.32
PRESSURE SHAFT/PENSTOCK	
Number	1
Length (m)	970
Diameter (m)	6
TAIL RACE TUNNEL	
Length (m)	1022
Diameter (m)	9.5

POWER HOUSE:

Type	Underground
No. of Generating Units	2
Capacity of each Unit (MW)	400
Installed Capacity (MW)	800
Design Head (m)	547.65
Gross Head(m)	542.76
Turbine	Reversible Vertical Francis
Design Energy (MU)	1491.88

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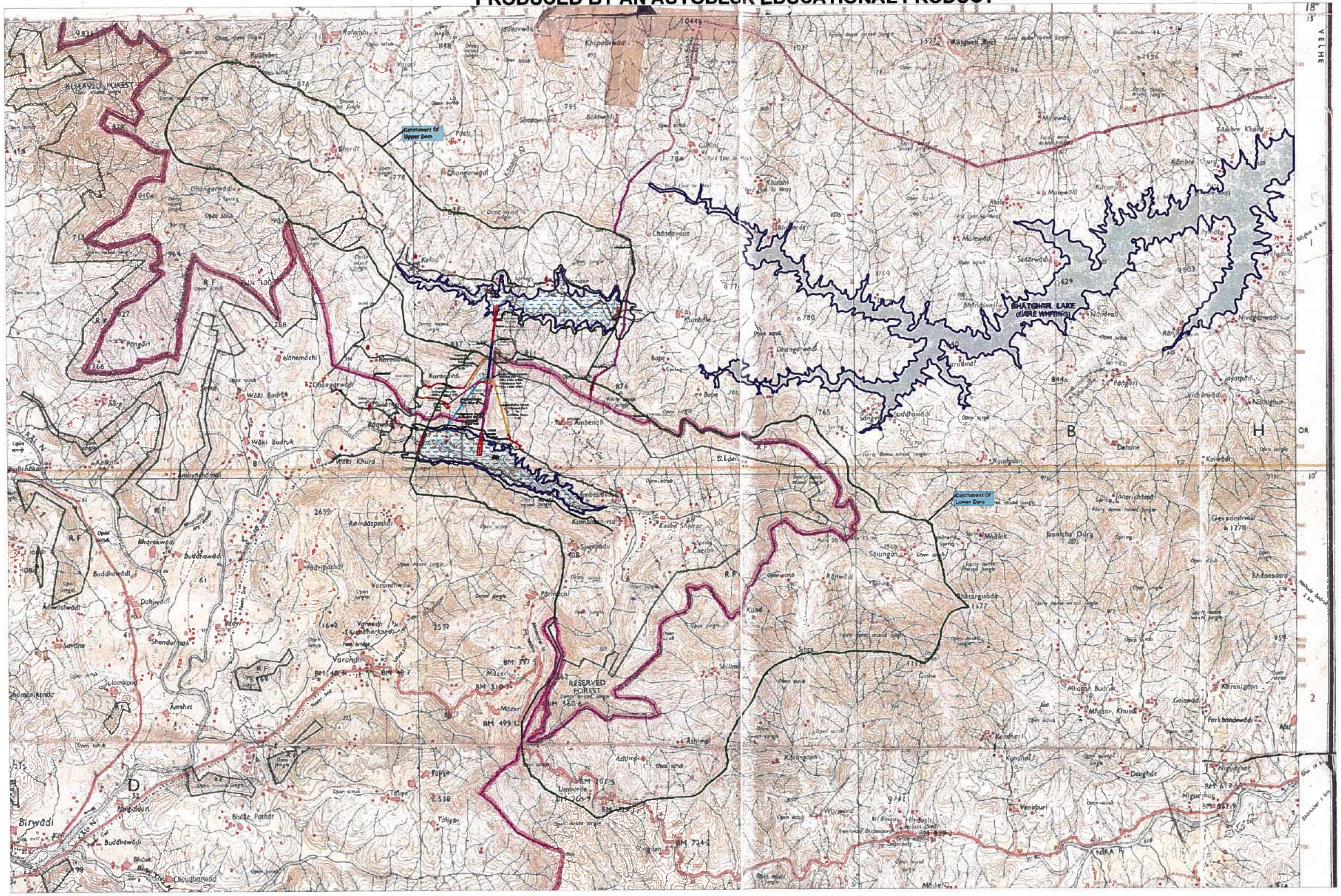

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SCALE:- 1:25000

LEGENDS

S.NO.	DESCRIPTION	SIGN	S.NO.	DESCRIPTION	SIGN
1	Dam Alignment		7	Tailrace Tunnel	
2	F.R.L.		8	Intermediate Adit	
3	Ventilation Tunnel		9	Cable Tunnel	
4	Approach Tunnel		10	Catchment Area	
5	Headrace Tunnel		11	Village Boundary	
6	Pressure Shaft		12	Proposed Road	

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VARANDH GHAT PUMPED STORAGE HYDRO ELECTRIC PROJECT
(2 X 400 MW)

INDEX MAP

-Sd- (A.L.Ghatkar) Sectional Engineer H E C S Sub Dn No-6 Pune	-Sd- (S.R.Tele) (Assistant Engineer (Gr-1)) Hydro Electric Civil Survey Sub Division No.-6 , Pune	-Sd- (J.P.Jahagirdar) Executive Engineer Hydro Electric Division No-2 Pune	-Sd- (R.R.Shah) Superintending Engineer Koyna Design Circle Pune	-Sd- (D.N.Modak) Chief Engineer Hydro Electric Project & Quality Control Pune
Scale : As Shown	Drawing No : KDC / HED-2 / VGPSHEP / 01 / 2016		December -2016	PLATE NO : 01

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35. PANSHET PUMPED STORAGE PROJECT (4X400=1600 MW)

1. INTRODUCTION

Panshet Pumped Storage Project is located near Dapsar village in Raigad and Pune district of Maharashtra. The project utilizes water of Mose/Kal River for power generation harnessing design head of 555 m. The powerhouse has 4 units of 400 MW having installed capacity of 1600 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Mose/Kal River having upper reservoir at latitude of 18°20'25"N and longitude of 73°27'07"E and lower reservoir at latitude of 18°20'58"N and longitude of 73°24'52"E. There is a proposal of underground type of Power house. The nearest railway station and Airport is Pune/ Mumbai.

3. PROJECT FEATURES

Panshet Pumped Storage Project involves.

Upper Reservoir (proposed): Upper Reservoir is of Height 63.8 m with a live storage of 16.57 Mcum on river Mose/ Kal between a Full Reservoir Level (FRL) of 740.2 m and Minimum Draw down Level (MDDL) of 703 m.

Lower Reservoir (proposed): Height of the lower reservoir is 45.6 m with a live storage of 20.44 Mcum on river Mose/ Kal between a Full Reservoir Level (FRL) of 167.8 m and Minimum Draw down Level (MDDL) of 147 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of 2 no. of Head race tunnel (HRT) of total length 1198 m and diameter of 7.6 m, 2 no. of Penstock of diameter of 6.2 m and length 942.17 m carrying water to the underground powerhouse. The Project to be operated under gross head of 566.93 m with installed capacity of 1600 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 1000 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 6.98 Sq.Km. and the lower dam site is 8.91 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Panshet Pumped Storage Project would be 1600 MW. Utilizing the design head of 555 m, the Design Energy of the project comes out to be of 2983.77 MU in 90% dependable year at 95% machine availability.

SALIENT FEATURES

PANSHET PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Pune/ Raigad
River	Mose/ Kal
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Pune/ Mumbai
Nearest Airport	Pune/ Mumbai

UPPER RESERVOIR (proposed):

Location	Latitude: 18°20'25"N
	Longitude: 73°27'07"E
Full Reservoir Level (FRL) (m)	740.2
Minimum Draw Down Level (MDDL) (m)	703
Length of the Dam at the top(m)	463
Height of Dam (above RBL) (m)	63.8
Live Storage (Mcum)	16.57
Gross Storage (Mcum)	17.49

LOWER RESERVOIR (proposed):

Location	Latitude: 18°20'58"N
	Longitude: 73°24'52"E
Full Reservoir Level (FRL) (m)	167.8
Minimum Draw Down Level (MDDL) (m)	147
Height of Dam (above RBL) (m)	45.6
Live Storage (Mcum)	20.44

HYDROLOGY:

Catchment Area (Sq. Km) Upper Dam	6.9875
Catchment Area (Sq. Km) Lower Dam	8.9155

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	2
Length (m)	1198
Diameter (m)	7.6
PRESSURE SHAFT/PENSTOCK	
Number	2
Length (m)	942.17
Diameter (m)	6.2
TAIL RACE TUNNEL	
Length (m)	1000
Diameter (m)	7.6

POWER HOUSE

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	400
Installed Capacity (MW)	1600
Design Head (m)	555
Gross Head (m)	566.93
Turbine	Vertical Shaft Reversible Francis
Design Energy(MU)	2983.77
No. of hours of Generation	

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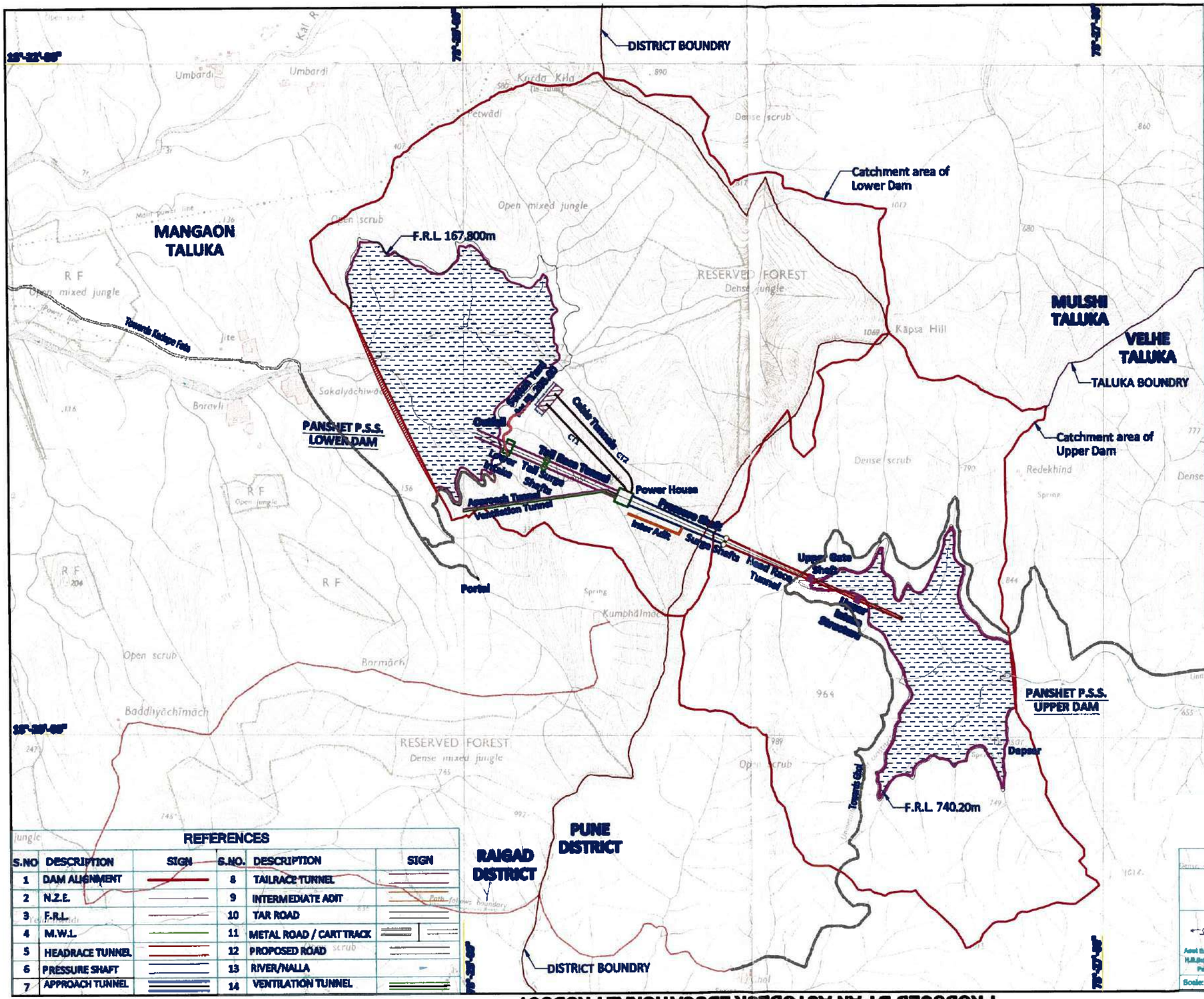

INDEX PLAN

UPPER DAM
VILLAGE - DAPSAR
TAL - VELHE
DIST - PUNE

LOWER DAM
VILLAGE - SAKALYACHIWADI
TAL - MANGAON
DIST - RAIGAD

TOPO SHEET NO. 47 F/7

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SCALE:- 1:25000

SALIENT FEATURES	UPPER DAM	LOWER DAM
1.LONGITUDE	73°-27'-07"	73°-24'-52"
2.LATITUDE	18°-20'-25"	18°-20'-58"
3.CATCHMENT AREA	6.9875 SqKm	8.9155 SqKm
4.CONTROLLING LEVELS		
I)R.B.L.	679.400 m	125.200 m
II)M.D.D.L.	703.000 m	147.000 m
III)F.R.L.	740.200 m	167.800 m
IV)M.W.L.	741.700 m	169.300 m
V)T.B.L.	743.200 m	170.800 m
5.LENGTH OF DAM	463.0 m	1345.0 m

DETAILS OF COMPONENT

SR. NO	COMPONENT	DESCRIPTION	NO.	SIZE	LENGTH
1	HEAD RACE TUNNEL	CIRCULAR	2	DIA.7.60 M	1198.1 M
2	SURGE SHAFT ON H.R.T	CIRCULAR	2	DIA.12.00 M	115 M (H)
3	PRESSURE SHAFT	CIRCULAR	2	DIA.6.20 M	942.17 M
	POWER HOUSE				
4	MACHINE HALL	RECTANGULAR	1	170 M X 25 M	
	TRANSFORMER HALL	RECTANGULAR	1	190 M X 20 M	
5	TAIL RACE TUNNEL	CIRCULAR	2	DIA 7.60 M	1000 M
6	SURGE SHAFT ON T.R.T	CIRCULAR	2	DIA 9.10 M	170 M
7	APPROACH TUNNEL	D-SHAPED	1	8.0 M X 8.0 M	1160 M
8	CABLE TUNNEL CT1	D-SHAPED	1	6.00 M X 6.00 M	855 M
	CABLE TUNNEL CT2	D-SHAPED	1	6.00 M X 6.00 M	900 M
9	SWITCH YARD	RECTANGULAR	1	165 M X 50 M	
10	VENTILATION TUNNEL	D-SHAPED	1	6.00 M X 6.00 M	1150 M
11	INTER ADIT	D-SHAPED	1	6.50 M X 6.50 M	455 M

REFERENCES

S.NO	DESCRIPTION	SIGN	S.NO.	DESCRIPTION	SIGN
1	DAM ALIGNMENT		8	TAILRACE TUNNEL	
2	N.Z.E.		9	INTERMEDIATE ADIT	
3	F.R.L.		10	TAR ROAD	
4	M.W.L.		11	METAL ROAD / CART TRACK	
5	HEADRACE TUNNEL		12	PROPOSED ROAD	
6	PRESSURE SHAFT		13	RIVER/NALLA	
7	APPROACH TUNNEL		14	VENTILATION TUNNEL	

PANSHET PUMPED STORAGE SCHEME (1600 MW)

INDEX PLAN

-sd-	-sd-	-sd-	-sd-	-sd-
Asst Engineer Gr-II H.E.Sub Div No.04 Pune-[illegible]	Sub Divisional Officer H.E.Sub Div No.01 Pune-[illegible]	Assistant Engineer Gr-I H.E.C.S.Div No.03 Pune-[illegible]	Executive Engineer H.E. Div No.03 Pune-[illegible]	Superintending Engineer Koyna Design Circle Pune-[illegible]
Scale: As shown	DRG. NO.:KDC/HED-2/PANSHET PHS/01			PLATE NO:01

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36. NIVE PUMPED STORAGE PROJECT (4X300=1200MW)

1. INTRODUCTION

Nive Pumped Storage Project is located near Nive village in Raigad and Pune district of Maharashtra. The project utilizes water of Kundalika River for power generation harnessing design head of 449 m. The powerhouse has 4 units of 300 MW having installed capacity of 1200 MW. The project is proposed to be executed by Water Resource Department of Government of Maharashtra.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Kundalika River having upper reservoir at latitude of 18°29'15.59"N and longitude of 73°25'2.09"E and lower reservoir at latitude of 18°28'31"N and longitude of 73°23'46.43"E. There is a proposal of underground type of Power house. The nearest railway station and Airport is Pune.

3. PROJECT FEATURES

Nive Pumped Storage Project involves.

Upper Reservoir (proposed): Height of the upper reservoir dam is 58.50 m with a live storage of 13.76 Mcum on river Kundalika between a Full Reservoir Level (FRL) of 617.50 m and Minimum Draw down Level (MDDL) of 587 m.

Lower Reservoir (proposed): Height of the lower reservoir dam is 66 m with a live storage of 13.43 Mcum on river Kundalika between a Full Reservoir Level (FRL) of 161 m and Minimum Draw down Level (MDDL) of 123 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of 1 no. of Head race tunnel (HRT) of total length 410 m and diameter of 7.3 m, 1 no. of Penstock of diameter of 6 m, length 900 m carrying water to the underground powerhouse. The Project to be operated under gross head of 459 m with installed capacity of 1200 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 525 m.

4. HYDROLOGY

The Catchment area of the river is 17.98 Sq. Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Nive Pumped Storage Project would be 1200 MW. Utilizing the design head of 449 m, the Design Energy of the project comes out to be of 2242.33 MU in 90% dependable year of 95 % machine availability.

SALIENT FEATURES
NIVE PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Pune/ Raigad
River	Kundalika river
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Pune
Nearest Airport	Pune

UPPER RESERVOIR (proposed):

Location	Latitude: 18°29'15.59"N
	Longitude: 73°25'2.09"E
Full Reservoir Level (FRL) (m)	617.50
Minimum Draw Down Level (MDDL) (m)	587
Length of the Dam at the top(m)	851
Height of Dam (above RBL) (m)	58.50
Live Storage (Mcum)	13.76
Gross Storage (Mcum)	14.39

LOWER RESERVOIR (proposed):

Location	Latitude: 18°28'31"N
	Longitude: 73°23'46.43"E
Full Reservoir Level (FRL) (m)	161
Minimum Draw Down Level (MDDL) (m)	123
Type of Dam	Roller Compacted Concrete Dam
Height of Dam (above RBL) (m)	66
Live Storage (Mcum)	13.43

HYDROLOGY:

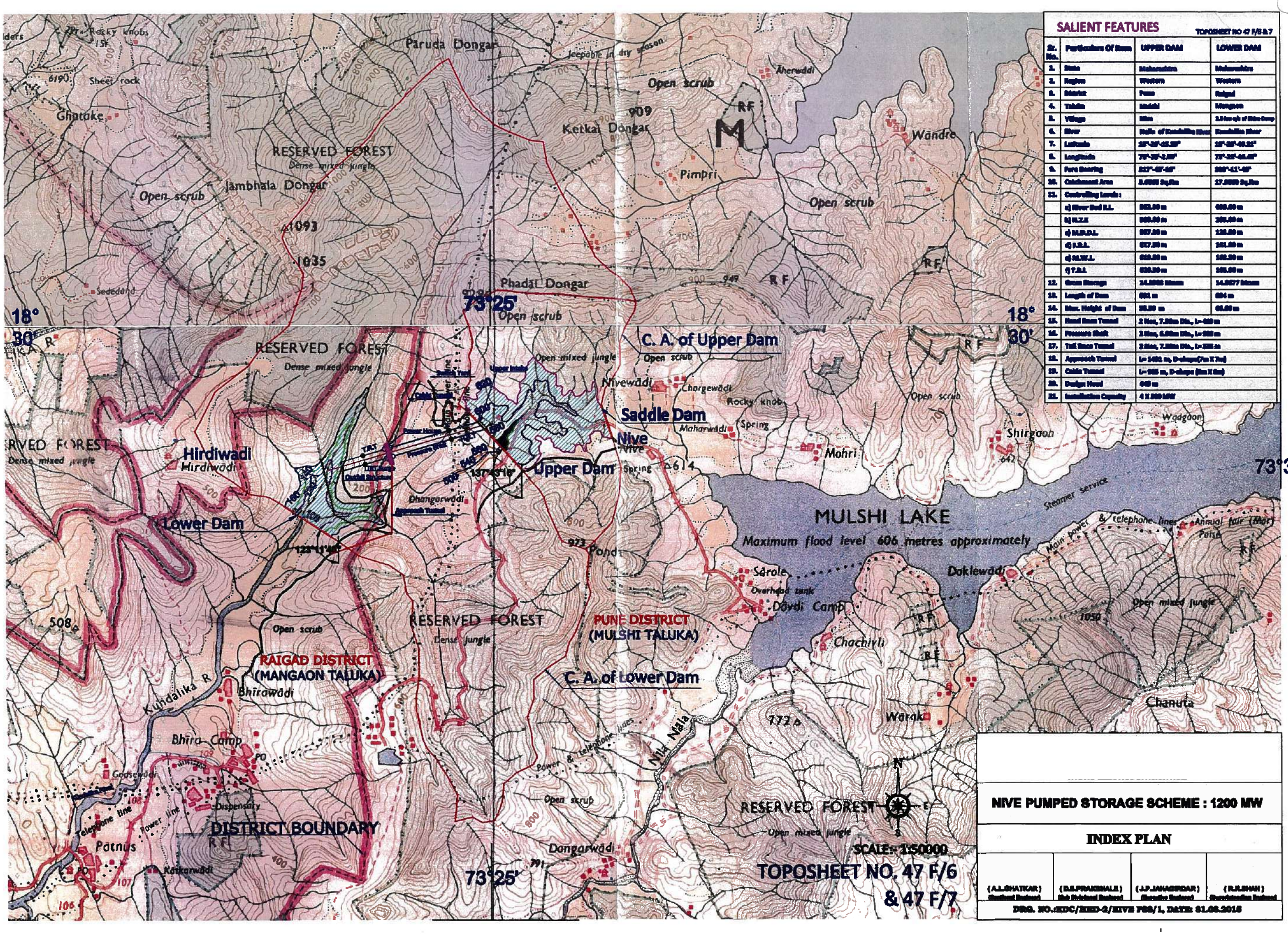
Catchment Area (Sq. Km)	17.986

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	1
Length (m)	410
Diameter (m)	7.3
PRESSURE SHAFT/PENSTOCK	
Number	1
Length (m)	900
Diameter (m)	6
TAIL RACE TUNNEL	
Length (m)	525
Diameter (m)	7.30

POWER HOUSE

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	300
Installed Capacity (MW)	1200
Design Head (m)	449
Gross Head (m)	459
Turbine	Vertical Shaft Reversible Francis
Design Energy(MU)	2242.33



SALIENT FEATURES

TOPOSHEET NO 47 F/6 & 7

Sr. No.	Particulars Of Item	UPPER DAM	LOWER DAM
1.	State	Maharashtra	Maharashtra
2.	Region	Western	Western
3.	District	Pune	Raigad
4.	Taluka	Mulshi	Mangaon
5.	Village	Nive	2.5 km u/s of Shiva Camp
6.	River	Nalla of Kundalika River	Kundalika River
7.	Latitude	[illegible]	[illegible]
8.	Longitude	[illegible]	[illegible]
9.	Fore Bearing	[illegible]	[illegible]
10.	Catchment Area	[illegible] Sq.Km	[illegible] Sq.Km
11.	Controlling Levels :		
	a) River Bed R.L.	[illegible] m	[illegible] m
	b) N.Z.E	[illegible] m	[illegible] m
	c) M.D.D.L.	[illegible] m	[illegible] m
	d) F.R.L.	[illegible] m	[illegible] m
	e) M.W.L.	[illegible] m	[illegible] m
	f) T.R.L	[illegible] m	[illegible] m
12.	Gross Storage	[illegible] Mtrcm	[illegible] Mtrcm
13.	Length of Dam	[illegible] m	[illegible] m
14.	Max. Height of Dam	[illegible] m	[illegible] m
15.	Head Race Tunnel	2 Nos, 7.[illegible] Dia., L= [illegible] m	
16.	Pressure Shaft	2 Nos, [illegible] Dia., L= [illegible] m	
17.	Tail Race Tunnel	2 Nos, 7.[illegible] Dia., L= [illegible] m	
18.	Approach Tunnel	L= [illegible] m, D-shape(7m X 7m)	
19.	Cable Tunnel	L= [illegible] m, D-shape ([illegible] X [illegible])	
20.	Design Head	[illegible] m	
21.	Installation Capacity	4 X [illegible] MW	

NIVE PUMPED STORAGE SCHEME : 1200 MW

INDEX PLAN

(A.L.SHATKAR)	(D.S.PRAKSHALE)	(J.P.JAHAGIRDAR)	(R.R.SHAH)
[illegible]	[illegible]	[illegible]	[illegible]

DRG. NO.:KDC/HED-2/NIVE PSS/1, DATE: 31.08.2015

37. KODALI PUMPED STORAGE PROJECT (2X110MW=220MW)

1. INTRODUCTION

Kodali Pumped Storage Project is located near Nive village in Raigad and Pune district of Maharashtra. The project utilizes water of Kodali Nalla/ Kharal Nadi river for power generation harnessing design head of 525 m. The powerhouse has 2 units of 110 MW having installed capacity of 220 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Kodali Nalla/ Kharal Nadi river having upper reservoir at latitude of 18°47'20"N and longitude of 74°10'21"E and lower reservoir at latitude of 15°48'37"N and longitude of 74°09'40"E. There is a proposal of underground type of Power house. The nearest railway station and Airport is Kolhapur.

3. PROJECT FEATURES

Kodali Pumped Storage Project involves.

Upper Reservoir (proposed): Dam is of Upper reservoir Height 26.54 m with a live storage of 1.513 Mcum on river Kodali Nalla between a Full Reservoir Level (FRL) of 727.23 m and Minimum Draw down Level (MDDL) of 720.59 m.

Lower Reservoir (proposed): Dam Height of the Lower reservoir is 53 m with a live storage of 1.65 Mcum on river Kharal Nadi between a Full Reservoir Level (FRL) of 190 m and Minimum Draw down Level (MDDL) of 182 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of 1 no. of Penstock of diameter of 3.30 m & length 1030 m carrying water to the underground powerhouse. The Project to be operated under gross head of 537.69 m with installed capacity of 220 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 970 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 2.12 Sq.Km. and the lower dam site is 21.68 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Kodali Pumped Storage Project would be 220 MW. Utilizing the design head of 525 m, the Design Energy of the project comes out to be of 342.58 MU in 90% dependable year at 95% machine availability.

SALIENT FEATURES
KODALI PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Kolhapur
River	Kodali Nalla/ Kharal Nadi
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Kolhapur
Nearest Airport	Kolhapur

UPPER RESERVOIR:

Location	Latitude: 18°47'20"N
	Longitude: 74°10'21"E
Full Reservoir Level (FRL) (m)	727.23
Minimum Draw Down Level (MDDL) (m)	720.59
Length of the Dam at the top(m)	347.59
Height of Dam (above RBL) (m)	26.54
Live Storage (Mcum)	1.513
Gross Storage (Mcum)	2.130

LOWER RESERVOIR:

Location	Latitude: 15°48'37"N
	Longitude: 74°09'40"E
Full Reservoir Level (FRL) (m)	190
Minimum Draw Down Level (MDDL) (m)	182
Type of Dam	Roller Compacted Concrete
Height of Dam (above RBL) (m)	53
Live Storage (Mcum)	1.6512

HYDROLOGY:

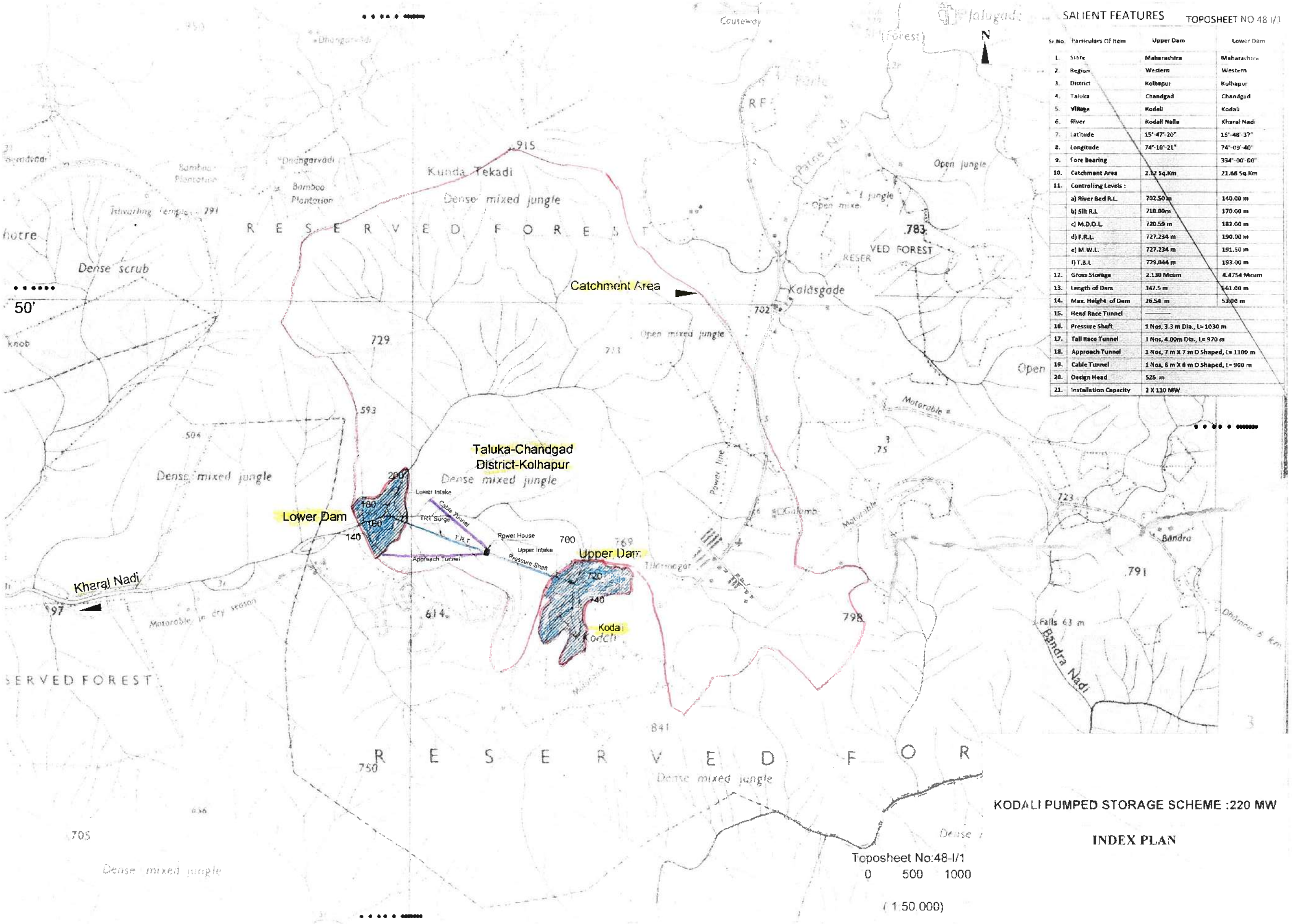
Catchment Area (Sq. Km) (Upper)	2.12
Catchment Area (Sq. Km) (Lower)	21.68

WATER CONDUCTOR SYSTEM

PRESSURE SHAFT/PENSTOCK	
Number	1
Length (m)	1030
Diameter (m)	3.30
TAIL RACE TUNNEL	
Length (m)	970
Diameter (m)	4

POWER HOUSE

Type	Underground
No. of Generating Units	2
Capacity of each Unit (MW)	110
Installed Capacity (MW)	220
Design Head (m)	525
Gross Head (m)	537.69
Turbine	Vertical Shaft Reversible Francis
Design Energy(MU)	342.58



SALIENT FEATURES

TOPOSHEET NO 48 I/1

Sr No.	Particulars Of Item	Upper Dam	Lower Dam
1.	State	Maharashtra	Maharashtra
2.	Region	Western	Western
3.	District	Kolhapur	Kolhapur
4.	Taluka	Chandgad	Chandgad
5.	Village	Kodali	Kodali
6.	River	Kodali Nalla	Kharal Nadi
7.	Latitude	15°-47'-20"	15°-48'-37"
8.	Longitude	74°-10'-21"	74°-09'-40"
9.	Fore Bearing		334°-00'-00"
10.	Catchment Area	2.12 Sq.Km	21.68 Sq Km
11.	Controling Levels :		
	a) River Bed R.L.	702.50 m	140.00 m
	b) Silt R.L.	710.00m	170.00 m
	c) M.D.O.L.	720.59 m	182.00 m
	d) F.R.L.	727.234 m	190.00 m
	e) M.W.L.	727.234 m	191.50 m
	f) T.B.L	729.044 m	193.00 m
12.	Gross Storage	2.130 Mcum	4.4754 Mcum
13.	Length of Dam	347.5 m	561.00 m
14.	Max. Height of Dam	26.54 m	52.00 m
15.	Head Race Tunnel	———	
16.	Pressure Shaft	1 Nos, 3.3 m Dia., L= 1030 m	
17.	Tail Race Tunnel	1 Nos, 4.00m Dia., L= 970 m	
18.	Approach Tunnel	1 Nos, 7 m X 7 m D Shaped, L= 1100 m	
19.	Cable Tunnel	1 Nos, 6 m X 6 m D Shaped, L= 900 m	
20.	Design Head	525 m	
21.	Installation Capacity	2 X 110 MW	

KODALI PUMPED STORAGE SCHEME :220 MW

INDEX PLAN

38. BHAVALI PUMPED STORAGE PROJECT (6X250MW=1500MW)

1. INTRODUCTION

Bhavali Pumped Storage Project is located near small town yazali in Lower Nashik/ Thane district of Maharashtra. The project utilizes water of Darna/ Ulhas River for power generation harnessing rated gross head of 467 m. The powerhouse has 6 units of 250 MW having installed capacity of 1500 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Darna / Ulhas River having upper reservoir at latitude of 19°36'31.69"N and longitude of 73°35'45.06"E and lower reservoir at latitude of 19°34'56.38"N and longitude of 73°35'10"E. There is a proposal of Power house. The nearest railway station is Igatpuri and the Airport is Mumbai at Nashik/ Thane.

3. PROJECT FEATURES

Bhavali Pumped Storage Project involves.

Upper Reservoir (proposed): Upper Reservoir involves construction of dam of Height 52 m with a live storage of 11.41 Mcum on river Darna between a Full Reservoir Level (FRL) of 737 m and Minimum Draw down Level (MDDL) of 711 m.

Lower Reservoir (proposed): Height of dam on the lower reservoir is 65 m with a live storage of 11.308 Mcum on river Ulhas between a Full Reservoir Level (FRL) of 300 m and Minimum Draw down Level (MDDL) of 270 m.

Water Conductor System (proposed): The proposed Water Conductor System of length 2191.9 m carrying water to the powerhouse. The Project to be operated under gross head of 467 m with installed capacity of 1500 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel.

4. POWER & ENERGY BENEFITS

The installed capacity of Bhavali Pumped Storage Project would be 1500 utlizing the gross head of 467 m.

SALIENT FEATURES

BHAVALI PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Nashik/ Thane
River	Darna/ Ulhas
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Igatpuri
Nearest Airport	Mumbai

UPPER RESERVOIR (proposed):

Location	Latitude: 19°36'31.69"N
	Longitude: 73°35'45.06"E
Full Reservoir Level (FRL) (m)	737
Minimum Draw Down Level (MDDL) (m)	711
Length of the Dam at the top(m)	956.5
Height of Dam (above RBL) (m)	52
Live Storage (Mcum)	11.419
Gross Storage (Mcum)	13.073

LOWER RESERVOIR (proposed):

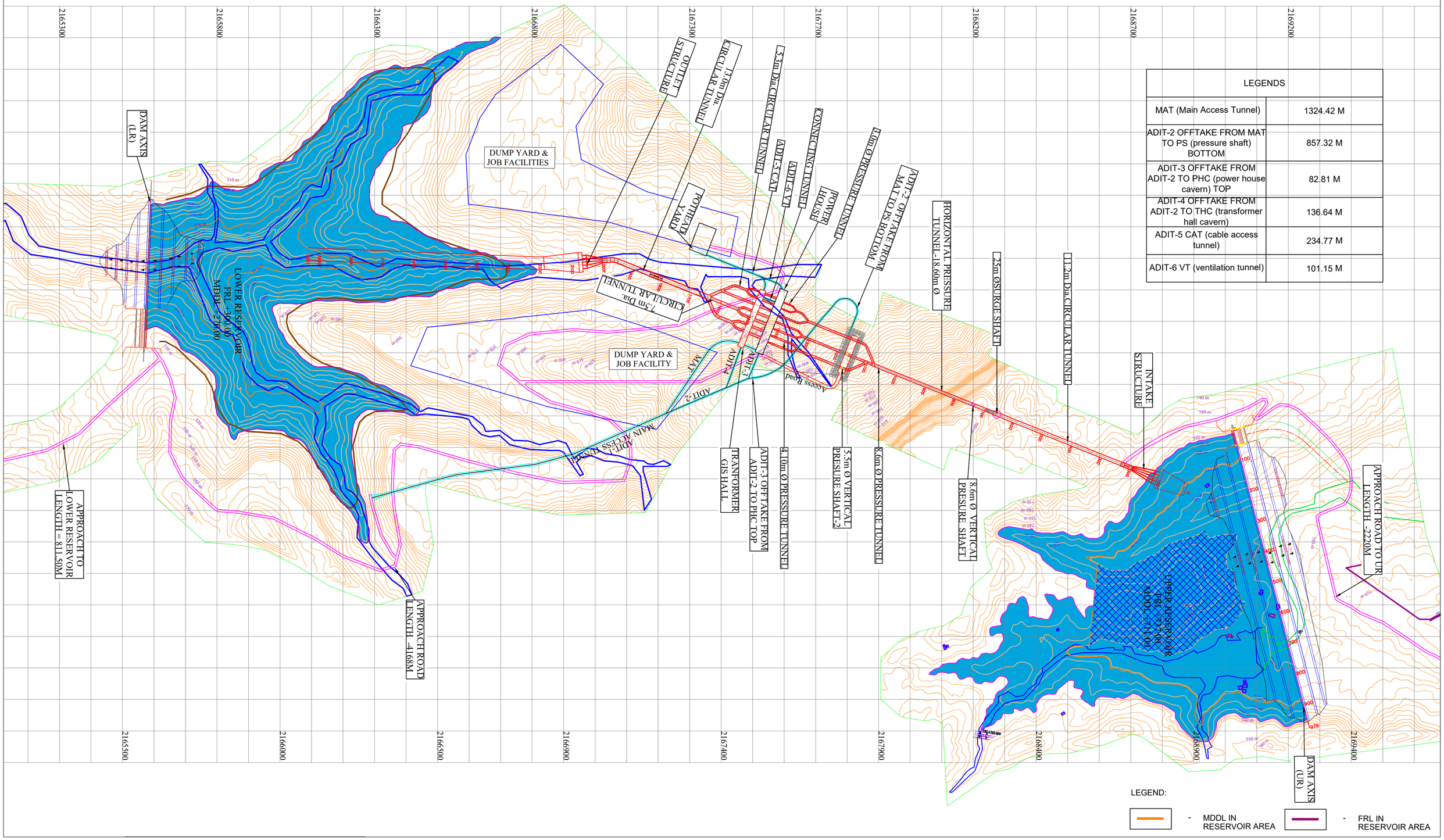
Location	Latitude: 19°34'56.38"N
	Longitude: 73°35'10"E
Full Reservoir Level (FRL) (m)	300
Minimum Draw Down Level (MDDL) (m)	270
Type of Dam	Rockfill & Concrete Spillway
Height of Dam (above RBL) (m)	65
Live Storage (Mcum)	11.308

WATER CONDUCTOR SYSTEM

Length (m)	2191.9

POWER HOUSE

No. of Generating Units	6
Capacity of each Unit (MW)	250
Installed Capacity (MW)	1500
Gross Head (m)	467



LEGENDS	
MAT (Main Access Tunnel)	1324.42 M
ADIT-2 OFFTAKE FROM MAT TO PS (pressure shaft) BOTTOM	857.32 M
ADIT-3 OFFTAKE FROM ADIT-2 TO PHC (power house cavern) TOP	82.81 M
ADIT-4 OFFTAKE FROM ADIT-2 TO THC (transformer hall cavern)	136.64 M
ADIT-5 CAT (cable access tunnel)	234.77 M
ADIT-6 VT (ventilation tunnel)	101.15 M

No	REVISION	Date
A	FOR DPR PURPOSE ONLY	

SCALES

SCALE 1 : 8000

0 80 160 240 320 400

PROJECT: BHAVALI PUMPED STORAGE PROJECT

TITLE: PROJECT GENERAL LAYOUT UNDERGROUND POWERHOUSE

DATE OF ISSUE	ORIGINAL PRINT	DRAWING NO.	REV.	SHEET NO.	1
06-04-2023	A2	AA/POWER/2441/GEN/001	R1	TOTAL SHEET	1

39. ATVAN PUMPED STORAGE PROJECT (2X250MW=500MW)

1. INTRODUCTION

Atvan Pumped Storage Project is located near small village Atvan and Bheliv in Pune district of Maharashtra. The project utilizes water of Pawana/Uttara River for power generation harnessing design head of 553 m. The powerhouse has 2 units of 250 MW having installed capacity of 500 MW generating annual energy of 500 MU in 90 % dependable year.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Pawana River having upper reservoir at latitude of 18°40'49"N and longitude of 73°23'44"E and lower reservoir on uttra river at latitude of 18°40'56.5"N and longitude of 73°22'4.54"E. There is a proposal of underground type of Power house. The nearest railway station is Lonavala and the Airport is Pune International.

3. PROJECT FEATURES

Atvan Pumped Storage Project involves construction.

Upper Reservoir (proposed): Upper Reservoir is proposed with a dam of Height 44 m with a live storage of 4.63 Mcum on river Pawana between a Full Reservoir Level (FRL) of 679 m and Minimum Draw down Level (MDDL) of 655 m.

Lower Reservoir (Proposed): Height of the dam on lower reservoir is 31 m with a live storage of 4.68 Mcum on river Uttara between a Full Reservoir Level (FRL) of 113 m and Minimum Draw down Level (MDDL) of 95 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 555 m and diameter of 6.5 m, 1 no. of Penstock of length 968 m and diameter of 5.30 m carrying water to the underground powerhouse. The Project to be operated under design head of 553 m with installed capacity of 500 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 601 m.

4. POWER & ENERGY BENEFITS

The installed capacity of Atvan Pumped Storage Project would be 500 MW. Utilising the Design head of 553 m, the Annual Energy of the project comes out to be of 500 MU in 90% dependable year.

SALIENT FEATURES

ATVAN PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Pune/Raigad
River	Pawana/Uttara
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Lonavala
Nearest Airport	Pune

UPPER RESERVOIR (proposed):

Location	Latitude: 18°40’49”N
	Longitude:73°23’44”E
Full Reservoir Level (FRL) (m)	679
Minimum Draw Down Level (MDDL) (m)	655
Length of the Dam at the top(m)	384
Height of Dam (above RBL) (m)	44
Live Storage (Mcum)	4.63
Gross Storage (Mcum)	5.21

LOWER RESERVOIR (Proposed):

Location	Latitude: 18°40’56.5”N
	Longitude:73°22’4.54”E
Full Reservoir Level (FRL) (m)	113
Minimum Draw Down Level (MDDL) (m)	95
Type of Dam	Concrete gravity
Height of Dam (above RBL) (m)	31
Live Storage (Mcum)	4.68

HYDROLOGY:

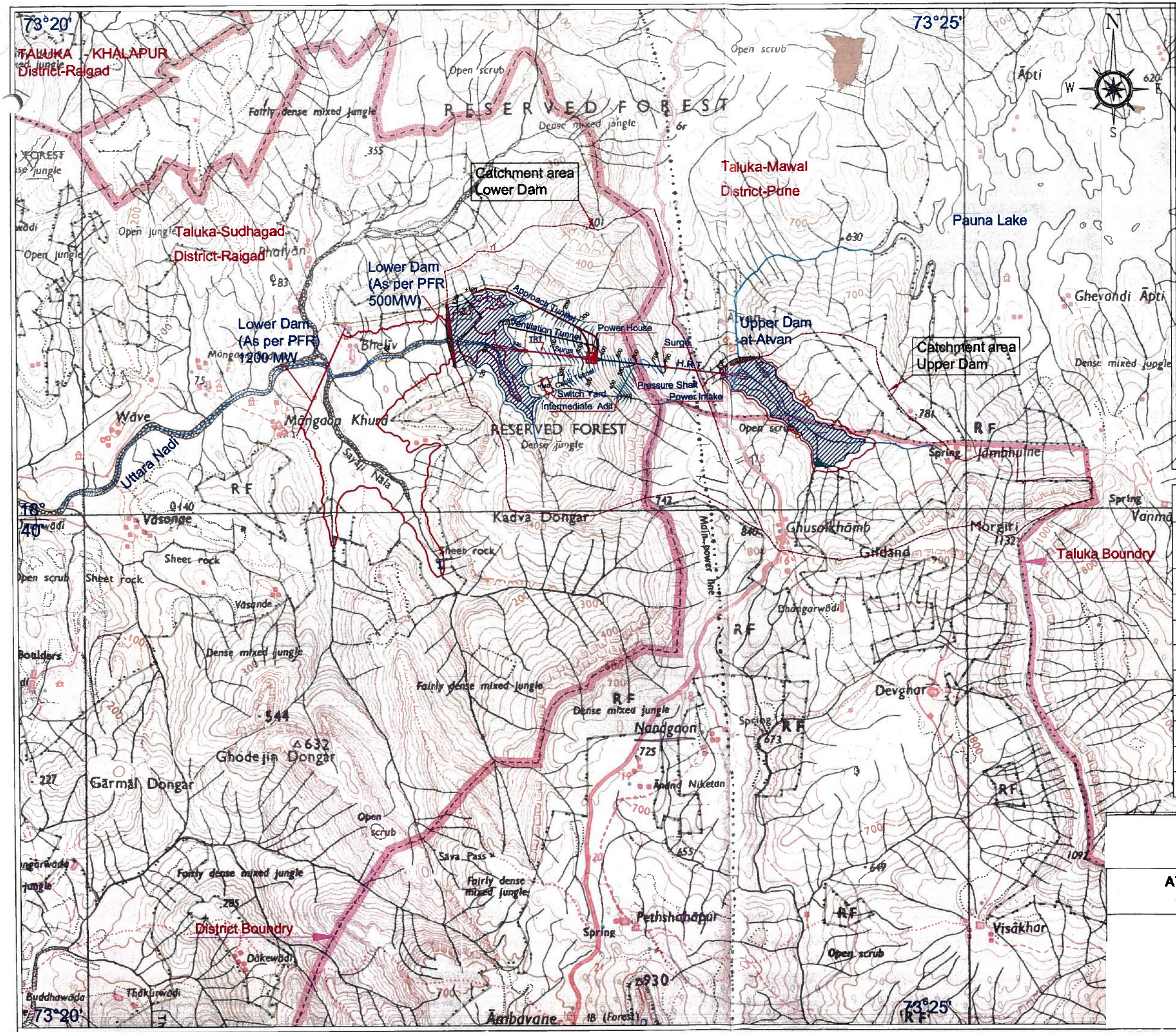
Catchment Area (Sq. Km)	6.23

WATER CONDUCTOR SYSTEM (proposed):

HEAD RACE TUNNEL	
Number	1
Length (m)	555
Diameter (m)	6.5
Design Discharge (Cumec)	129.97
PRESSURE SHAFT/PENSTOCK	
Number	1
Length (m)	968
Diameter (m)	5.30
TAIL RACE TUNNEL	
Length (m)	601
Diameter (m)	5.30

POWER HOUSE (proposed):

Type	Underground
No. of Generating Units	2
Capacity of each Unit (MW)	250
Installed Capacity (MW)	500
Design Head (m)	553
Gross Head(m)	564
Turbine	Reversible Vertical Francis
Annual Energy(MU)	500



SALIENT FEATURES

TOPOSHEET NO 47 F/6

Sr. No.	Particulars Of Item	Upper Dam	Lower Dam
1.	State	Maharashtra	Maharashtra
2.	Region	Western	Western
3.	District	Pune	Raigad
4.	Taluka	Maval	Sudhagad
5.	Village	Atvan	Bhaliv
6.	River	Local Nalla of Pauna Lake	Sayaji Nalla
7.	Latitude	18°-40'-49"	18°-40'-56.5"
8.	Longitude	73°-23'-44"	73°-22'-4.54"
9.	Fore Bearing	74°-28'-00"	352°-40'-00"
10.	Catchment Area	4.6718 Sq.Km	6.2360 Sq.Km
11.	Controlling Levels :		
	a) River Bed R.L.	640.00 m	087.00 m
	b) N.Z.E.	647.00 m	091.00 m
	c) M.D.D.L.	655.00 m	095.00 m
	d) F.R.L.	679.00 m	113.00 m
	e) M.W.L.	681.50 m	115.50 m
	f) T.B.L	684.00 m	118.00 m
12.	Gross Storage	5.2094 Mcum	4.9508 Mcum
13.	Length of Dam	384 m	590 m
14.	Max. Height of Dam	44.00 m	31.00 m
15.	Head Race Tunnel	1 Nos, 6.50m Dia., L= 555 m	
16.	Penstock	1 Nos, 5.30m Dia., L= 968 m	
17.	Tail Race Tunnel	1 Nos, 6.50m Dia., L= 601 m	
18.	Approach Tunnel	L= 1130 m, D-shape(8m X 8m)	
19.	Cable Tunnel	L= 450 m, D-shape (6m X 6m)	
20.	Ventilation Tunnel	L= 773 m, D-shape (6m X 6m)	
21.	Design Head	553 m	
22.	Installation Capacity	2 X 250 MW	

References

S.N.	Description	Sign
1.	Cable Tunnel	
2.	Approach Tunnel	
3.	Pressure Shaft	
4.	Dam Alignment	
5.	Catchment Area	
6.	Tailrace Tunnel	
7.	Intermediate Adit	
8.	Approach Road	
9.	Ventilation Tunnel	

ATVAN PUMPED STORAGE H.E.P
(2 x 250 MW)

INDEX PLAN

40. KOYNA STAGE VI PUMPED STORAGE PROJECT (2X200MW= 400 MW)

1. INTRODUCTION

Koyna Stage VI Pumped Storage Project is located near small village Karvat and Helwak in Pune district of Maharashtra. The project utilizes water of Koyna River for power generation harnessing design head of 380 m. The powerhouse has 2 units of 200 MW having installed capacity of 400 MW generating annual energy of 400 MU in 90% dependable year. The existing Koyana Dam Reservior of Koyana Stage VI Hydro electric project is used as the Lower Reservoir.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Koyna River having upper reservoir at latitude of 17°23'28"N and longitude of 73°49'32"E and lower reservoir at latitude of 17°57'43"N and longitude of 73°42'38"E. There is a proposal of underground type of Power house. The nearest railway station is Karad and the Airport is Pune International.

3. PROJECT FEATURES

Koyna Stage VI Pumped Storage Project involves construction

Upper Reservoir (Proposed): Upper Reservoir is proposed with a dam height 13.5 m with a live storage of 6.29 Mcum on river Koyana between a Full Reservoir Level (FRL) of 1032.50 m and Minimum Draw down Level (MDDL) of 1017.50 m.

Lower Reservoir (Existing): Height of the dam on lower reservoir is 103.20 m with a live storage of 2687.79 Mcum on river Koyana between a Full Reservoir Level (FRL) of 650 m and Minimum Draw down Level (MDDL) of 608.57 m.

Water Conductor System: The proposed Water Conductor System comprises of a 1 no. of Penstock of length 885 m and diameter of 5.30 m carrying water to the underground powerhouse. The Project to be operated under design head of 380 m with installed capacity of 400 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 1705 m.

4. HYDROLOGY

The Catchment area of the river upto the lower dam site is 891.78 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Koyna VI Pumped Storage Project would be 400 MW. Utilizing the Design head of 380 m, the Annual Energy of the project comes out to be of 400 MU in 90% dependable year.

SALIENT FEATURES
KOYNA- VI PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Satara
River	Koyna
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Karad
Nearest Airport	Pune

UPPER RESERVOIR (proposed):

Location	Latitude: 17°23'28"N
	Longitude:73°49'32"E
Full Reservoir Level (FRL) (m)	1032.50
Minimum Draw Down Level (MDDL) (m)	1017.50
Length of the Dam at the top(m)	1100
Height of Dam (above RBL) (m)	13.5
Live Storage (Mcum)	6.29
Gross Storage (Mcum)	6.29

LOWER RESERVOIR (Existing):

Location	Latitude: 17°57'43"N
	Longitude:73°42'38"E
Full Reservoir Level (FRL) (m)	650
Minimum Draw Down Level (MDDL) (m)	608.57
Type of Dam	Rubble Concrete
Height of Dam (above RBL) (m)	103.20
Live Storage (Mcum)	2687.79

HYDROLOGY:

Catchment Area (Sq. Km) Lower Dam	891.78

WATER CONDUCTOR SYSTEM (proposed):

PRESSURE SHAFT/PENSTOCK	
Number	1
Length (m)	885
Diameter (m)	5.30
TAIL RACE TUNNEL	
Length (m)	1705
Diameter (m)	6.50

POWER HOUSE (proposed):

Type	Underground
No. of Generating Units	2
Capacity of each Unit (MW)	200
Installed Capacity (MW)	400
Design Head (m)	380
Gross Head(m)	391.31
Turbine	Reversible Vertical Francis
Annual Energy(MU)	400

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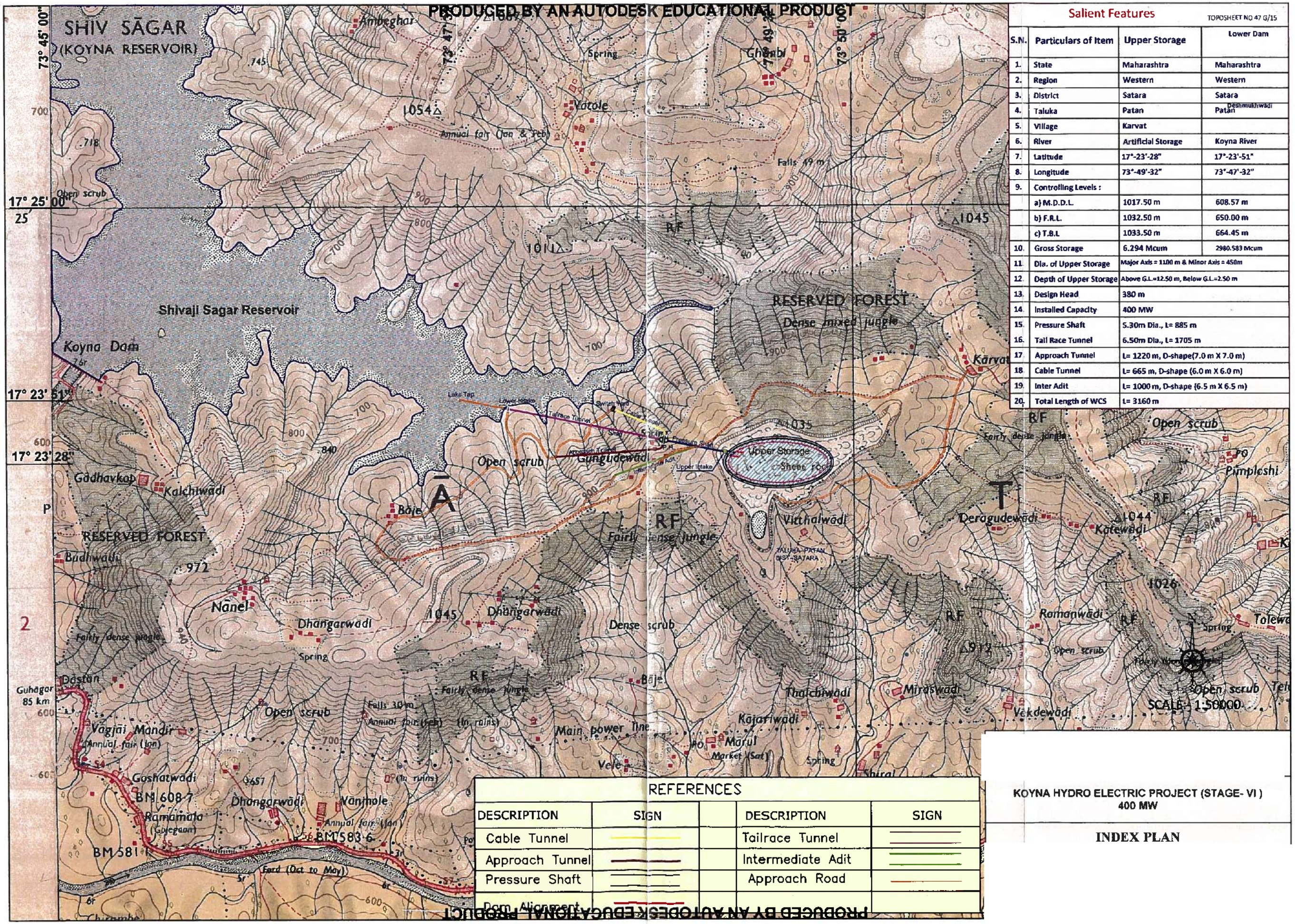

Salient Features

TOPOSHEET NO 47 G/15

S.N.	Particulars of Item	Upper Storage	Lower Dam
1.	State	Maharashtra	Maharashtra
2.	Region	Western	Western
3.	District	Satara	Satara
4.	Taluka	Patan	Patan Deshmukhwadi
5.	Village	Karvat	
6.	River	Artificial Storage	Koyna River
7.	Latitude	17°-23'-28"	17°-23'-51"
8.	Longitude	73°-49'-32"	73°-47'-32"
9.	Controlling Levels :		
	a) M.D.D.L.	1017.50 m	608.57 m
	b) F.R.L.	1032.50 m	650.00 m
	c) T.B.L	1033.50 m	664.45 m
10.	Gross Storage	6.294 Mcum	2980.583 Mcum
11.	Dia. of Upper Storage	Major Axis = 1100 m & Minor Axis = 450m	
12.	Depth of Upper Storage	Above G.L.=12.50 m, Below G.L.=2.50 m	
13.	Design Head	380 m	
14.	Installed Capacity	400 MW	
15.	Pressure Shaft	5.30m Dia., L= 885 m	
16.	Tail Race Tunnel	6.50m Dia., L= 1705 m	
17.	Approach Tunnel	L= 1220 m, D-shape(7.0 m X 7.0 m)	
18.	Cable Tunnel	L= 665 m, D-shape (6.0 m X 6.0 m)	
19.	Inter Adit	L= 1000 m, D-shape (6.5 m X 6.5 m)	
20.	Total Length of WCS	L= 3160 m	

REFERENCES

DESCRIPTION	SIGN		DESCRIPTION	SIGN
Cable Tunnel			Tailrace Tunnel	
Approach Tunnel			Intermediate Adit	
Pressure Shaft			Approach Road	
Dam Alignment				

KOYNA HYDRO ELECTRIC PROJECT (STAGE- VI)
400 MW

INDEX PLAN

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41. LEIVA LUI PUMPED STORAGE PROJECT (6 X 250=1500 MW)

1. INTRODUCTION

Leiva Lui Pumped Storage Project is located in Saitual district of Mizoram. The project utilizes water of Pharsih Lui and Leiva Lui River for power generation harnessing gross head of 503 m. The powerhouse has 6 units of 250 MW having installed capacity of 1500 MW. The Upper and Lower Dam is proposed to be developed.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Pharsih Lui River having upper reservoir at latitude of 23°52'17.13"N and longitude of 93°16'47.29"E and lower reservoir at latitude of 23°50'33.43"N and longitude of 93°17'56.81"E. There is a proposal of Power house. The nearest railway station is Bhairabi and the Airport is Lengpui at Saitual district.

3. PROJECT FEATURES

Leiva Lui Pumped Storage Project involves.

Upper Reservoir (proposed): Upper Reservoir would involve construction of dam of height 77 m with a live storage of 8.12 MCM on river Pharsih Lui between a Full Reservoir Level (FRL) of 1527.87 m and Minimum Draw down Level (MDDL) of 1502 m.

Lower Reservoir (proposed): Lower Reservoir would involve construction of dam of height 84 m with a live storage of 8.12 MCM on river Leiva Lui between a Full Reservoir Level (FRL) of 1024.84 m and Minimum Draw down Level (MDDL) of 1004.84 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of length 3730 m carrying water to the powerhouse. The Project to be operated under gross head of 503 m with installed capacity of 1500 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 0.4 Sq.Km. and the lower dam site is 0.48Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Leiva Lui Pumped Storage Project would be 1500 MW. Utilizing the gross head of 503 m.

SALIENT FEATURES
LEIVA LUI PUMPED STORAGE PROJECT

GENERAL:

State	Mizoram
District	Saitual
River	Pharsih Lui & Leiva Lui
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Bhairabi
Nearest Airport	Lengpui

UPPER RESERVOIR (Proposed):

Location	Latitude: 23°52'17.13"N
	Longitude: 93°16'47.29"E
Full Reservoir Level (FRL) (m)	1527.87
Minimum Draw Down Level (MDDL) (m)	1502
Height of Dam (m)	77
Live Storage (MCM)	8.12
Gross Storage (MCM)	11.43

LOWER RESERVOIR (Proposed):

Location	Latitude: 23°50'33.43"N
	Longitude: 93°17'56.81"E
Full Reservoir Level (FRL) (m)	1024.84
Minimum Draw Down Level (MDDL) (m)	1004.84
Height of Dam (m)	84
Live Storage (MCM)	8.12
Gross Storage (MCM)	20.03

HYDROLOGY:

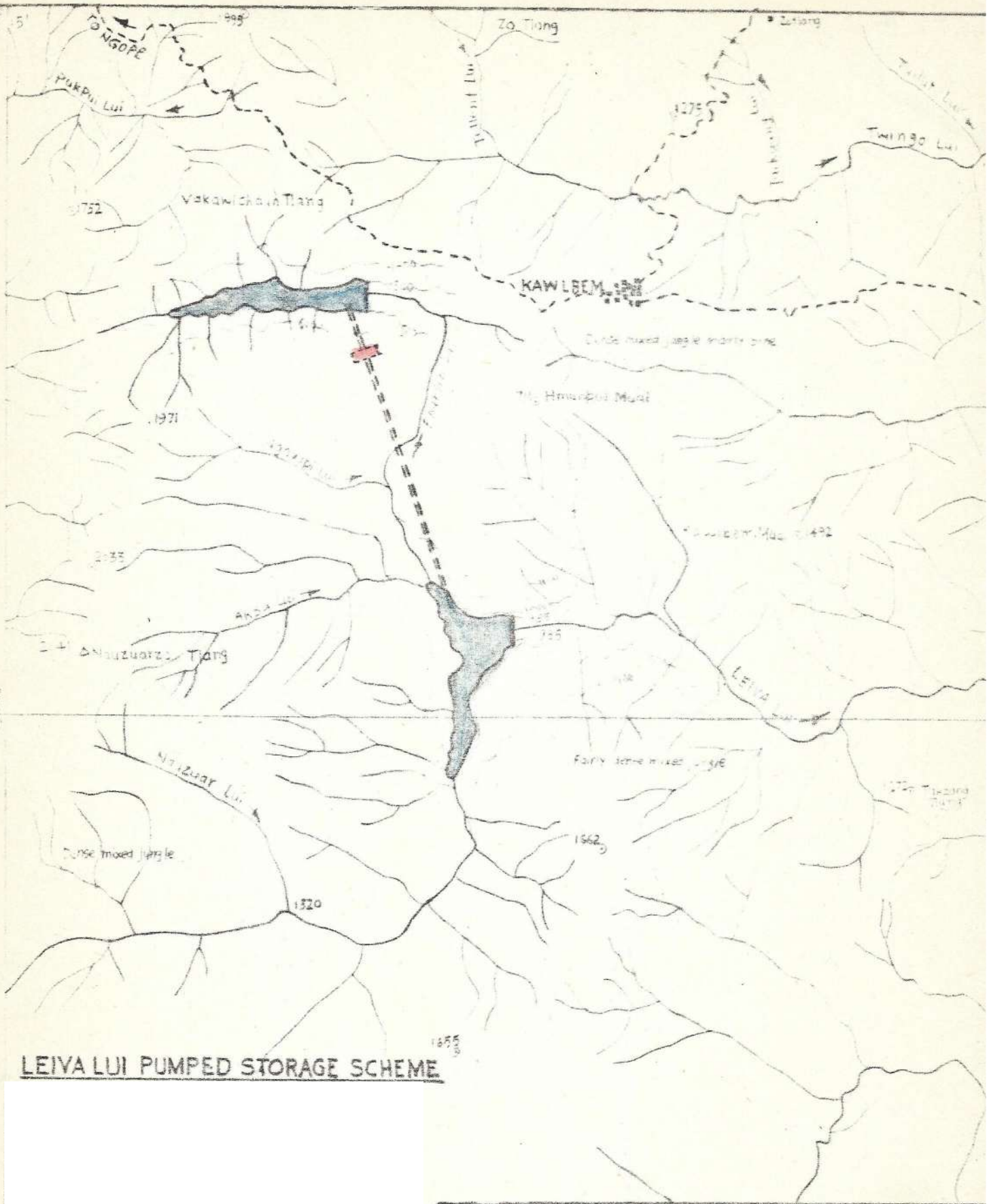
Catchment Area (Sq. Km) Upper Dam	0.4
Catchment Area (Sq. Km) Lower Dam	0.48

WATER CODUCTOR SYSTEM

Length (m)	3730

POWER HOUSE

No. of Generating Units	6
Capacity of each Unit (MW)	250
Installed Capacity (MW)	1500
Gross Head (m)	503



LEIVA LUI PUMPED STORAGE SCHEME

DRN.		HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD.		लीवालुई पम्प संचय योजना
SUBMD.		LEIVA LUI PUMPED
APPD.		STORAGE SCHEME
T.S. No.	84 E/5	
Scale:	1:50,000	CENTRAL ELECTRICITY AUTHORITY
JAN., 1982		DRG. NO: HEPR-PS-BHM-718

42. TUIPHAI LUI PUMPED STORAGE PROJECT (5X330MW=1650MW)

1. INTRODUCTION

Tuiphai Lui Pumped Storage Project is located near Pamtul- Tlang/ Fachil-Tlang locality in Aizawl district of Mizoram. The project utilizes water of Tuiphai Lui / Tuikual Lui River for power generation, harnessing average gross head of 643 m. The powerhouse has 5 units of 330 MW having installed capacity of 1650 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Tuiphai Lui River having upper reservoir at latitude of 23°5'1.48"N and longitude of 93°02'20.57"E and lower reservoir at latitude of 23°6'33.94"N and longitude of 93°0'40.71"E. There is a proposal of underground type of Power house. The nearest railway station is Silchar and the Airport is Aizawl at Aizawl district.

3. PROJECT FEATURES

Tuiphai Lui Pumped Storage Project involves.

Upper Reservoir (proposed): Upper Reservoir with a live storage of 4.6 Mm^3 on river Tuiphai Lui between a Full Reservoir Level (FRL) of 1240 m and Minimum Draw down Level (MDDL) of 1226 m.

Lower Reservoir (proposed): Lower Reservoir with a live storage of 7.8 Mm^3 on river Tuikual Lui between a Full Reservoir Level (FRL) of 600 m and Minimum Draw down Level (MDDL) of 577 m.

Water Conductor System (proposed): The Water Conductor System comprises of length 2800 m is proposed to carry water to the underground powerhouse. The Project to be operated under rated gross head of 643 m with installed capacity of 1650 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel.

4. HYDROLOGY

The Catchment area of the river upto the upper dam site is 18.6 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Tuiphai Lui Pumped Storage Project would be 1650 MW utilizing the average gross head of 643 m.

SALIENT FEATURES

TUIPHAI LUI PUMPED STORAGE PROJECT

GENERAL:

State	Mizoram
District	Aizawl
River	Tuiphai Lui
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Silchar
Nearest Airport	Aizawl

UPPER RESERVOIR (Proposed):

Location	Latitude: 23°5'1.48"N
	Longitude: 93°02'20.57"E
Full Reservoir Level (FRL) (m)	1240
Minimum Draw Down Level (MDDL) (m)	1226
Length of Dam (m)	250
Dam Height (m)	33
Live Storage (Mm^3)	4.6

LOWER RESERVOIR (Proposed):

Location	Latitude: 23°6'33.94"N
	Longitude: 93°0'40.71"E
Full Reservoir Level (FRL) (m)	600
Minimum Draw Down Level (MDDL) (m)	577
Length of Dam (m)	300
Dam Height (m)	60
Live Storage (Mm^3)	7.8

HYDROLOGY:

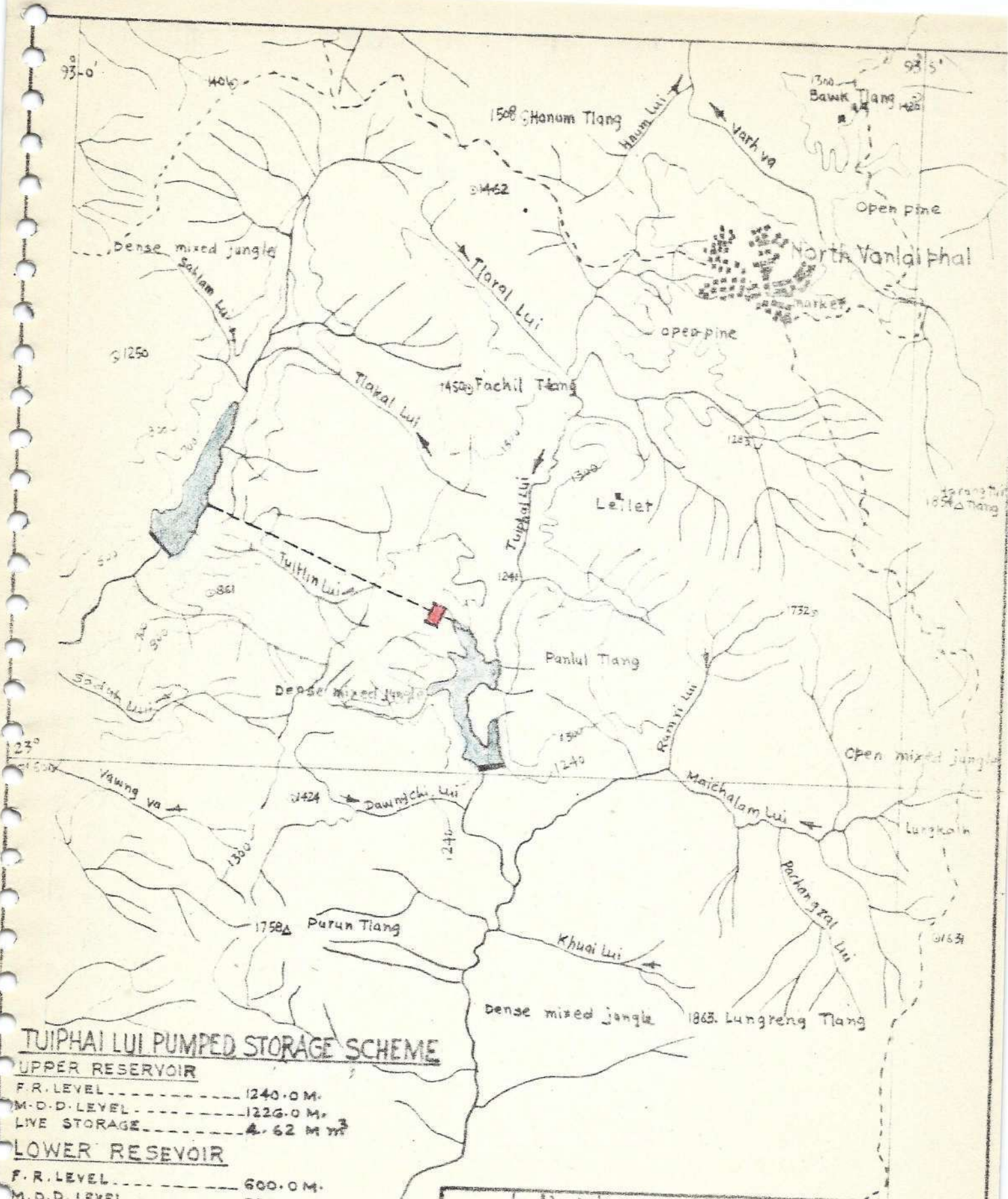
Catchment Area (Sq. Km) Upper Dam	18.6

WATER CONDUCTOR SYSTEM

Length (m)	2800

POWER HOUSE

Type	Underground
No. of Generating Units	5
Capacity of each Unit (MW)	330
Installed Capacity (MW)	1650
Average Gross Head (m)	643



TUIPHAI LUI PUMPED STORAGE SCHEME

UPPER RESERVOIR

F.R. LEVEL ..... 1240.0 M.
M.D.D. LEVEL ..... 1226.0 M.
LIVE STORAGE ..... 4.62 M m^3

LOWER RESEVOIR

F.R. LEVEL ..... 600.0 M.
M.D.D. LEVEL ..... 577.0 M.
LIVE STORAGE ..... 7.82 M. m^3

WATER CONDUCTOR SYSTEM

LENGTH OF SYSTEM ..... 2.8 K.M.
DISCHARGE ..... 320.0 cumecs

POWER HOUSE

INS. CAPACITY ..... 1650.0 MW.
AV. GROSS HEAD ..... 643.0 M.

DRN.		HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD.		तुईफाइलुइ पम्प संचय योजना
SUBMD.		TUIPHAI LUI PUMPED STORAGE SCHEME
APPD.		
T.S.NO:	84E/4	
Scale:	1:50,000	CENTRAL ELECTRICITY AUTHORITY
DEC. 1981		DRG. NO: HEPR-PS-BHM-715

43. NGHASIH PUMPED STORAGE PROJECT (4X100MW=400MW)

1. INTRODUCTION

Nghasih Pumped Storage Project is located in Lunglai district of Mizoram. The project utilizes water of Khawiva Lui/ Nghasih Lui River for power generation harnessing gross head of 308 m. The powerhouse has 4 units of 100 MW having installed capacity of 400 MW. The Upper and Lower Dam is proposed to be developed.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Khawiva Lui/ Nghasih Lui River having upper reservoir at latitude of 22°55'44.28"N and longitude of 92°46'23.30"E and lower reservoir at latitude of 22°55'32.43"N and longitude of 92°48'9.28"E. There is a proposal of underground type of Power house. The nearest railway station is Silchar and the Airport is Lengpui at Lunglai district.

3. PROJECT FEATURES

Nghasih Pumped Storage Project involves

Upper Reservoir (proposed): Dam is of Upper reservoir Height 57 m with a live storage of 3.7 Mcum on Khawiva Lui River between a Full Reservoir Level (FRL) of 797.63 m and Minimum Draw down Level (MDDL) of 777.63 m.

Lower Reservoir (proposed): Dam is of Lower reservoir Height 52 m with a live storage of 3.72 Mcum on Khawiva Lui River between a Full Reservoir Level (FRL) of 492.01 m and Minimum Draw down Level (MDDL) of 479 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of length 3000 m carrying water to the underground powerhouse. The Project to be operated under gross head of 308 m with installed capacity of 400 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 0.362 Sq.Km. and the lower dam site is 0.523 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Nghasih Pumped Storage Project would be 400 MW utilizing the rated head of 308 m.

SALIENT FEATURES
NGHASIH PUMPED STORAGE PROJECT

GENERAL:

State	Mizoram
District	Lunglai
River	Khawiva Lui/ Nghasih Lui
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Silchar
Nearest Airport	Lengpui

UPPER RESERVOIR (Proposed):

Location	Latitude: 22°55'44.28"N
	Longitude: 92°46'23.30"E
Full Reservoir Level (FRL) (m)	797.63
Minimum Draw Down Level (MDDL) (m)	777.63
Height of Dam (m)	57
Live Storage (MCM)	3.7
Gross Storage (MCM)	7.9

LOWER RESERVOIR (Proposed):

Location	Latitude: 22°55'32.43"N
	Longitude: 92°48'9.28"E
Full Reservoir Level (FRL) (m)	492
Minimum Draw Down Level (MDDL) (m)	479
Height of Dam (m)	52
Live Storage (MCM)	3.72
Gross Storage (MCM)	25.23

HYDROLOGY:

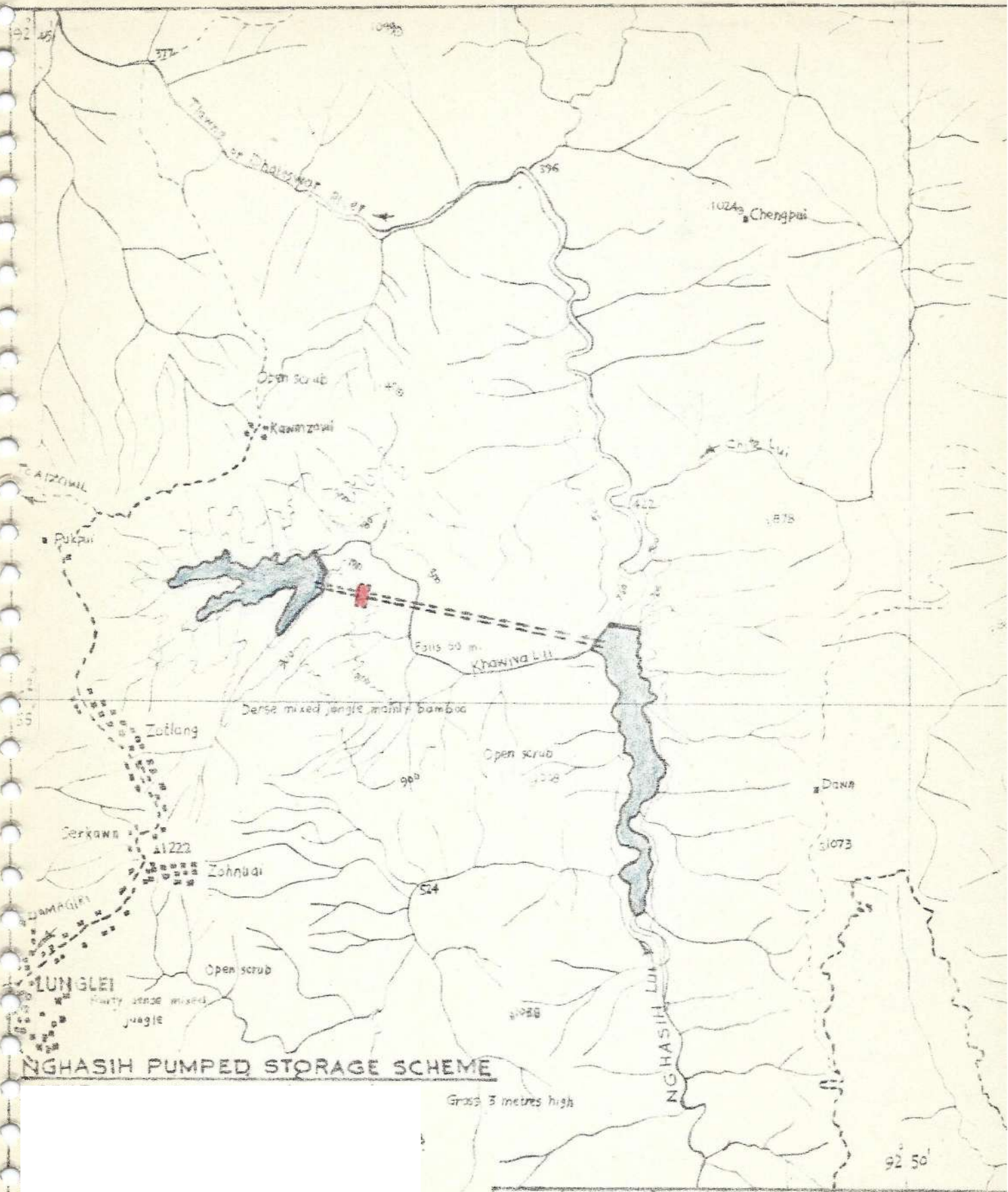
Catchment Area (Sq. Km) Upper Dam	0.362
Catchment Area (Sq. Km) Lower Dam	0.523

WATER CONDUCTOR SYSTEM

Length (m)	3000

POWER HOUSE

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	100
Installed Capacity (MW)	400
Gross Head (m)	308



NGHASIH PUMPED STORAGE SCHEME

DRN.		HYDRO POTENTIAL REASSESSMENT PROJEC
CHKD.		न्घासीह पम्प संचय योजना
SUBMD.		NGHASIH PUMPED
APPD.		STORAGE SCHEME
T.S. No:	84 B/13	
Scale:	1: 50,000	CENTRAL ELECTRICITY AUTHORIT
JAN., 1982		DRG. NO: HERR-PS-BHM-722

44. DAIZO LUI PUMPED STORAGE PROJECT (8X250 MW=2000MW)

1. INTRODUCTION

Daizo Lui Pumped Storage Project is located near small town yazali in Lunglei district of Mizoram. The project utilizes water of Hnachang Lui & Daizo Lui River for power generation harnessing gross head of 770 m. The powerhouse has 08 units of 250 MW having installed capacity of 2000 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Hnachang Lui & Daizo Lui River having upper reservoir at latitude of 22°46'22.8"N and longitude of 92°57'49.8"E and lower reservoir at latitude of 22°46'45.5"N and longitude of 92°58'43.9"E. There is a proposal of underground type of Power house. The nearest railway station is Silchar and the Airport is Lengpui at Lunglei district.

3. PROJECT FEATURES

Daizo Lui Pumped Storage Project involves.

Upper Reservoir (Proposed): Upper Reservoir is of Height 60 m with a live storage of 7.3 mm^3 on Hnachang Lui River between a Full Reservoir Level (FRL) of 1120 m and Minimum Draw down Level (MDDL) of 1099 m.

Lower Reservoir (Proposed): Height of the lower reservoir is 50 m with a live storage of 8.60 mm^3 on Daizo Lui River between a Full Reservoir Level (FRL) of 350 m and Minimum Draw down Level (MDDL) of 330 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 1800 m. The Project to be operated under gross head of 770 m with installed capacity of 2000 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel.

4. HYDROLOGY

The Catchment area of the river upto the lower dam site is 40 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Daizo Lui Pumped Storage Project would be 2000 MW. Utilizing the Gross head of 770 m.

SALIENT FEATURES
DAIZO LUI PUMPED STORAGE PROJECT

GENERAL:

State	Mizoram
District	Lunglei
River	Hnachang Lui /Daizo Lui
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Silchar
Nearest Airport	Lengpui

UPPER RESERVOIR (proposed):

Location	Latitude: 22°46'22.8"N
	Longitude: 92°57'49.8"E
Full Reservoir Level (FRL) (m)	1120
Minimum Draw Down Level (MDDL) (m)	1099
Length of the Dam at the top(m)	300
Height of Dam (above RBL) (m)	60
Live Storage (mm^3)	7.3
Gross Storage (mm^3)	11

LOWER RESERVOIR (proposed):

Location	Latitude: 22°46'45.5"N
	Longitude: 92°58'43.9"E
Full Reservoir Level (FRL) (m)	350
Minimum Draw Down Level (MDDL) (m)	330
Length of the Dam at the top(m)	300
Height of Dam (m)	50
Live Storage (mm^3)	8.60
Gross Storage (mm^3)	12.50

HYDROLOGY:

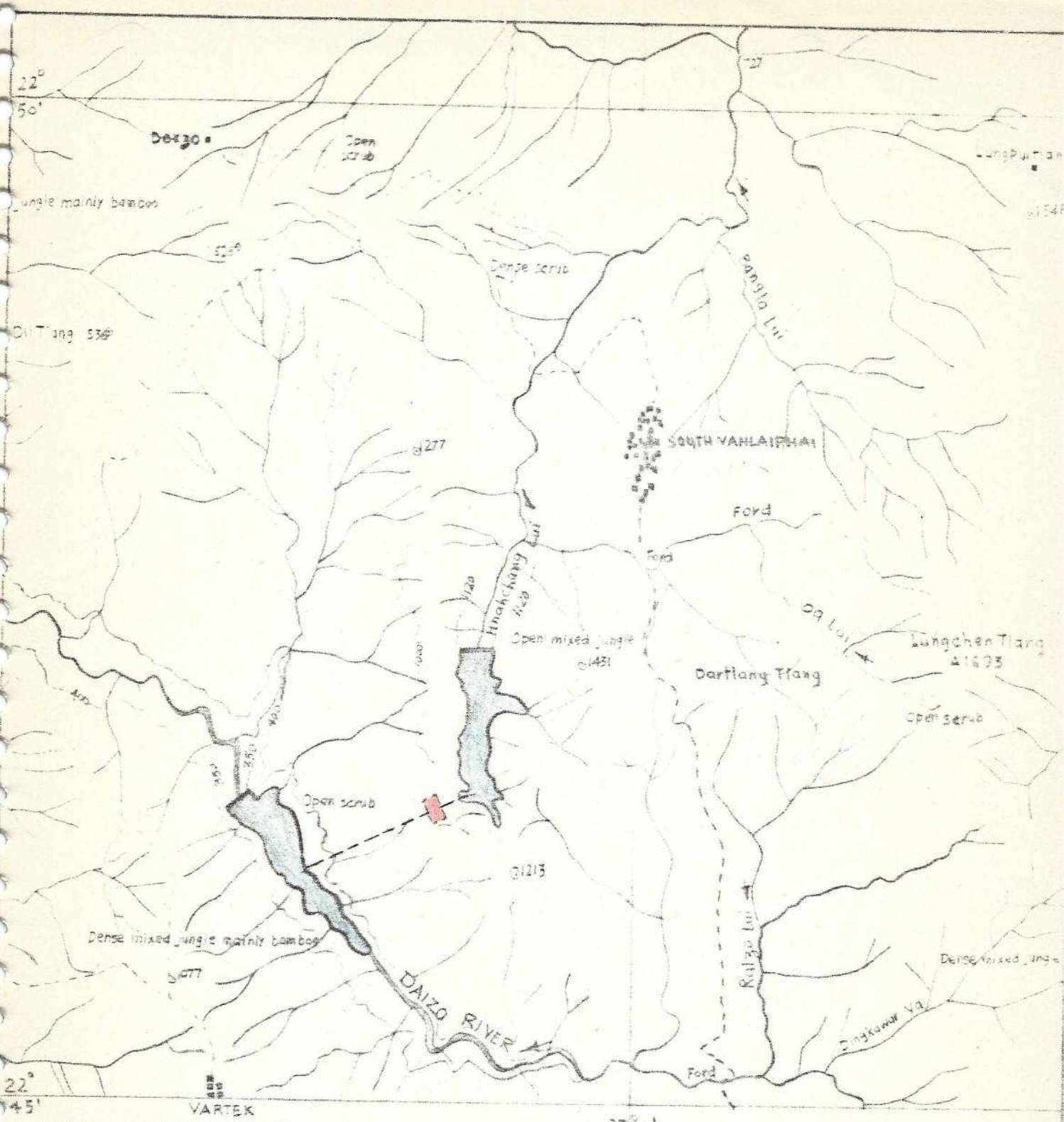
Catchment Area (Sq. Km) Lower Dam	40

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	1
Length (m)	1800

POWER HOUSE

Type	Underground
No. of Generating Units	8
Capacity of each Unit (MW)	250
Installed Capacity (MW)	2000
Gross Head (m)	770



DAIZO LUI PUMPED STORAGE SCHEME

UPPER RESERVOIR

F.R. LEVEL ..... 1120.0 M.
M.D.D. LEVEL ..... 1099.0 M.
LIVE STORAGE ..... 7.3 M. m^3.

LOWER RESERVOIR

F.R. LEVEL ..... 350.0 M.
M.D.D. LEVEL ..... 330.0 M.
LIVE STORAGE ..... 8.6 M m^3

WATER CONDUCTOR SYSTEM

LENGTH OF SYSTEM ..... 1.8 K.M.
DISCHARGE ..... 330.0 cumecs.

POWER HOUSE

INS. CAPACITY ..... 2000.0 MW.
AV. GROSS HEAD ..... 770.0 M.

DRN.		HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD.		डेजोलुई पम्प संचय योजना
SUBMD.		DAIZO LUI PUMPED
APPD.		STORAGE SCHEME
T.S. No:	84-B/13,F/1	
Scale:	1: 50,000	CENTRAL ELECTRICITY AUTHORITY
JAN. 1982		DRG. NO: HEPR-PS-BHM-719

45. SILLAHALLA ST.-I PUMPED STORAGE PROJECT (4X250MW=1000MW)

1. INTRODUCTION

Sillahalla St.-I Pumped Storage Project is located near small village Thangadu and Kundha in Nilgiris district of Tamil Nadu. The project utilizes water of Sillahal/Kundah River for power generation harnessing rated head of 387 m. The powerhouse has 4 units of 250 MW having installed capacity of 1000 MW generating annual energy of 2190 MU.

2. LOCATION/ACCESSIBILITY

The dam site of the project located on Sillahalla River having upper reservoir at latitude of 11°19'25.58"N and longitude of 76°39'6.31"E. The lower reservoir at latitude of 11°16'27.59"N and longitude of 76°40'12.66"E. There is a proposal of underground type of Power house. The nearest railway station is Mettupalayam and the Airport is Coimbatore International.

3. PROJECT FEATURES

Sillahalla St.-I Pumped Storage Project involves construction:-

Upper Reservoir (Proposed): The height of the dam on Upper Reservoir is proposed to be Height of 75 m with a live storage of 10.61 Mcum on river Sillahalla between a Full Reservoir Level (FRL) of 1950 m and Minimum Draw down Level (MDDL) of 1940 m.

Lower Reservoir (Proposed): Height of the dam on lower reservoir is 108 m with a live storage of 6.50 Mcum on river Kundah between a Full Reservoir Level (FRL) of 1560 m and Minimum Draw down Level (MDDL) of 1522 m.

Water Conductor System (Proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 2760 m and diameter of 9 m, 2 nos. of Pressure shaft of length 800m & 758 m carrying water to the underground powerhouse. The Project to be operated under rated head of 387 m with installed capacity of 1000 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 1672 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 65 Sq.Km and the lower dam site is 183.48 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Sillahalla St.-I Pumped Storage Project would be 1000 MW. Utilising the Design head of 420m.

SALIENT FEATURES
SILLAHALLA ST.-I PUMPED STORAGE PROJECT

GENERAL:

State	Tamil Nadu
District	Nilgiris
River	Sillahalla
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Mettupalayam
Nearest Airport	Coimbatore

UPPER RESERVOIR (proposed):

Location	Latitude: 11°19'25.58"N
	Longitude: 76°39'6.31"E
Full Reservoir Level (FRL) (m)	1950
Minimum Draw Down Level (MDDL) (m)	1940
Length of the Dam at the top(m)	560
Height of Dam (above RBL) (m)	75
Live Storage (Mcum)	10.62

LOWER RESERVOIR (Proposed):

Location	Latitude: 11°16'27.59"N
	Longitude: 76°40'12.66"E
Full Reservoir Level (FRL) (m)	1560
Minimum Draw Down Level (MDDL) (m)	1522
Type of Dam	Concrete Gravity Dam
Height of Dam (above RBL) (m)	108
Live Storage (Mcum)	6.00

HYDROLOGY:

Catchment Area (Sq. Km) Upper Dam	65
Catchment Area (Sq. Km) Lower Dam	183.48

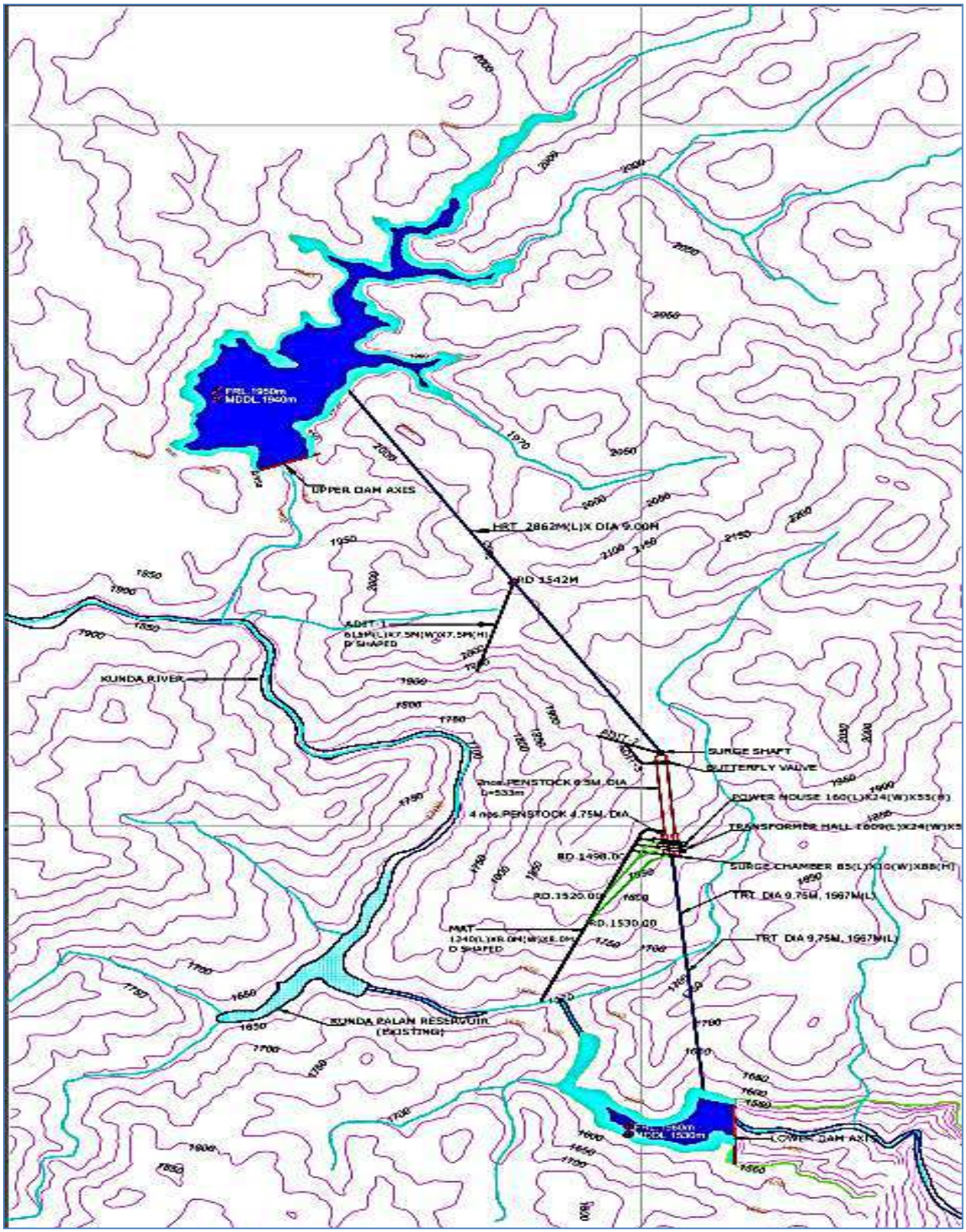
WATER CONDUCTOR SYSTEM (proposed):

HEAD RACE TUNNEL	
Number	1
Length (m)	2760
Diameter (m)	9
Design Discharge (Cumecs)	297.12
PRESSURE SHAFT/PENSTOCK	
Number	2
Length (m)	800 & 758
Diameter (m)	5.65
TAIL RACE TUNNEL	
Length (m)	1672
Diameter (m)	9.75

POWER HOUSE (proposed):

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	250
Installed Capacity (MW)	1000
Design Head (m)	387
Turbine	Reversible Vertical Francis

Sillahalla Stage-I (1000MW) General Layout



46. KODAYAR PUMPED STORAGE PROJECT (6X250MW=1500MW)

1. INTRODUCTION

Kodayar Pumped Storage Project is located near small town Vazhichal in Kanyakumari district of Tamil Nadu. The project utilizes water of Kodayar River for power generation harnessing rated net head (Pumping) of 1280.32 m. The powerhouse has 6 units of 250 MW having installed capacity of 1500 MW. The existing reservoir at Kodayar Dam as the upper reservoir and Pechiparai reservoir existing as lower reservoir.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Kodayar River having upper reservoir at latitude of 8°31'19.30"N and longitude of 77°21'35.25"E and lower reservoir at latitude of 8°27'4.98"N and longitude of 77°18'29.53"E. There is a proposal of underground type of Power house. The nearest railway station is Kuzhithurai and Airport is Madurai at Kanyakumari District.

3. PROJECT FEATURES

Kodayar Pumped Storage Project involves.

Upper Reservoir (existing): The height of the dam is 87.78 m with a live storage of 98.57 MCM on Kodayar River between a Full Reservoir Level (FRL) of 1325.90 m and Minimum Draw down Level (MDDL) of 1295.40 m.

Lower Reservoir (existing): The height of the dam is 32.31 m with a live storage of 123.15 MCM on Kodayar River between a Full Reservoir Level (FRL) of 92.07 m and Minimum Draw down Level (MDDL) of 77.43 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 297 m and diameter of 7 m, 2 no. of pressure shaft of diameter 3.8 m and length 6049 m, 6 no. of Penstock of diameter of 2.2 m and length 40 m (each) carrying water to the underground powerhouse. The Project to be operated under Rated Net Head (Pumping) of 1280.32 m with installed capacity of 1500 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 1050 m.

4. POWER & ENERGY BENEFITS

The installed capacity of Kodayar Pumped Storage Project would be 1500 MW. Utilizing Rated Net Head (Pumping) of 1280.32 m.

SALIENT FEATURES
KODAYAR PUMPED STORAGE PROJECT

GENERAL:

State	Tamil Nadu
District	Kanyakumari
River	Kodayar
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Kuzhithurai
Nearest Airport	Madurai

UPPER RESERVOIR (Kodayar Dam Existing):

Location	Latitude: 8°31'19.30"N
	Longitude: 77°21'35.25"E
Full Reservoir Level (FRL) (m)	1325.90
Minimum Draw Down Level (MDDL) (m)	1295.40
Height of Dam (m)	87.78
Live Storage (Mcum)	98.57
Gross Storage (Mcum)	98.66

LOWER RESERVOIR (Pechiparai Reservoir Existing):

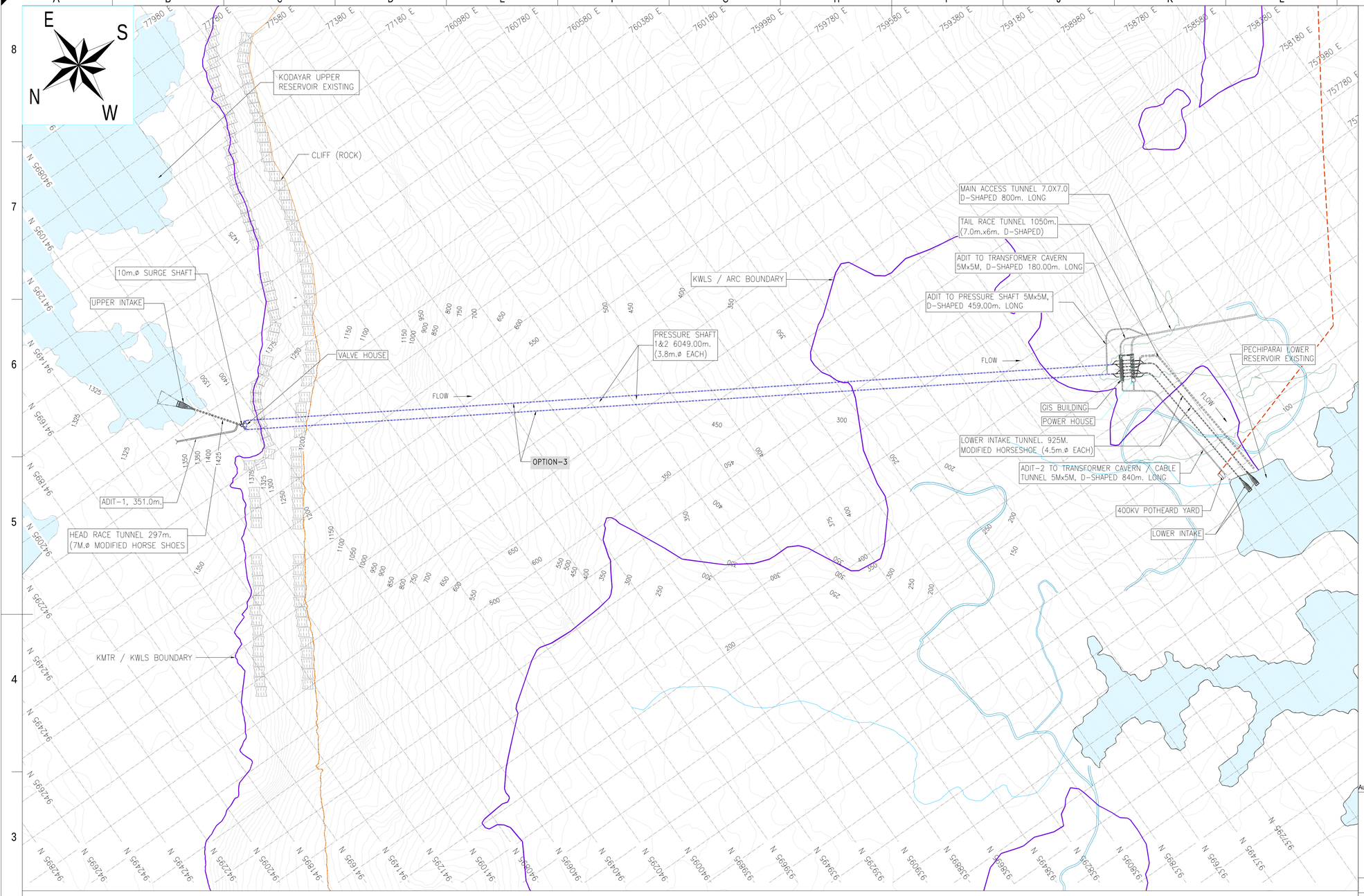
Location	Latitude: 8°27'4.98"N
	Longitude:77°18'29.53"E
Full Reservoir Level (FRL) (m)	92.07
Minimum Draw Down Level (MDDL) (m)	77.43
Height of Dam (m)	32.31
Live Storage (Mcum)	123.154
Gross Storage (Mcum)	150.22

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	1
Length (m)	297
Diameter (m)	7
PRESSURE SHAFT	
Type	Circular
Number	2
Diameter (m)	3.8
Length (m)	6049
PENSTOCK	
Type	Circular
Number	6
Length (m)	40 (each)
Diameter (m)	2.20
TAIL RACE TUNNEL	
Type	D shaped (Modified)
Number	1
Length (m)	1050

POWER HOUSE

No. of Generating Units	6
Capacity of each Unit (MW)	250
Installed Capacity (MW)	1500
Rated Net Head (Pumping) (m)	1280.32
Net Head (Turbine) (m)	1190
Max Gross Head (Pumping) (m)	1250.72
Min Gross Head (Pumping) (m)	1209.93



GENERAL LAYOUT PLAN

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETER AND ELEVATIONS ARE IN METERS.
2. NO DIMENSION SHALL BE SCALED FROM THE DRAWING, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.

LEGEND:-

FOREST BOUNDARY

TRANSMISSION LINE

SCALE 0 120 180 400 1200 M

Autocad release : 2008

FOR FEASIBILITY STUDY

REV. No.	DATE	STAGE	DESCRIPTION	CIVIL	HM	E&M
				-	-	-
				-	-	-
-	-	-		-	-	-
-	-	-	-	CHECKED		

	NAME	SIGN
DRAWN BY	S K PANDEY	
CHECKED BY	T KHATRI	
APPROVED BY	B S SRINIVAS	

PROJECT: KODAYAR PUMPED STORAGE HYDRO ELECTRIC PROJECT (6 x 250 MW)

DRAWING TITLE: PROJECT GENERAL LAYOUT PLAN

DATE:-	18-08-2022		
SHEET SIZE	A1	SCALE	1:12000

DRG NO. P.019086-W-20211-001 | REV. | SHEET 1 OF 1

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47. SANDYNALLA PUMPED STORAGE PROJECT (4X300MW=1200 MW)

1. INTRODUCTION

Sandynalla Pumped Storage Project is located near small town Ooty in Nilgiris district of Tamil Nadu. The project utilizes water of Sandynalla River for power generation harnessing rated head of 431.49 m. The powerhouse has 4 units of 300 MW having installed capacity of 1200 MW. The existing reservoir at Kamrajsagar Reservoir as the upper reservoir and lower reservoir is proposed. The project is proposed to be executed by National Thermal Power Corporation Limited (NTPC).

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Sandynalla River having upper reservoir at latitude of 11°26'38.24"N and longitude of 76°39'7.58"E and lower reservoir at latitude of 11°28'22.86"N and longitude of 76°39'46.17"E. There is a proposal of underground type of Power house. The nearest railway station is Mysore and Airport is Coimbatore.

3. PROJECT FEATURES

Sandynalla Pumped Storage Project involves.

Upper Reservoir (existing): Upper Reservoir has a live storage of 23.11 Mcum on river Sandynalla between a Full Reservoir Level (FRL) of 2145.51 m and Minimum Draw down Level (MDDL) of 2124.46 m.

Lower Reservoir (proposed): Lower reservoir has a live storage of 7 Mcum on river Sandynalla between a Full Reservoir Level (FRL) of 1757 m and Minimum Draw down Level (MDDL) of 1682 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 2300 m and diameter of 9 m, 4 no. of Penstock of diameter of 4.2 m and length 50 m (each) carrying water to the underground powerhouse. The Project to be operated under rated head of 431.49 m with installed capacity of 1200 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 1000 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 44.04 Sq.Km. and the lower dam site is 9.76 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Sandynalla Pumped Storage Project would be 1200 MW utilizing the rated head of 431.49 m.

SALIENT FEATURES
SANDYNALLA PUMPED STORAGE PROJECT

GENERAL:

State	Tamil Nadu
District	Nilgiris
River	Sandynalla
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Mysore
Nearest Airport	Coimbatore

UPPER RESERVOIR (Kamrajsagar Reservoir Existing):

Location	Latitude: 11°26'38.24"N
	Longitude: 76°39'7.58"E
Full Reservoir Level (FRL) (m)	2145.51
Minimum Draw Down Level (MDDL) (m)	2124.46
Live Storage (Mcum)	23.11

LOWER RESERVOIR (Proposed):

Location	Latitude: 11°28'22.86"N
	Longitude:76°39'46.17"E
Full Reservoir Level (FRL) (m)	1757
Minimum Draw Down Level (MDDL) (m)	1682
Type of Dam	Sloping type Bellmouth entry
Live Storage (Mcum)	7

HYDROLOGY:

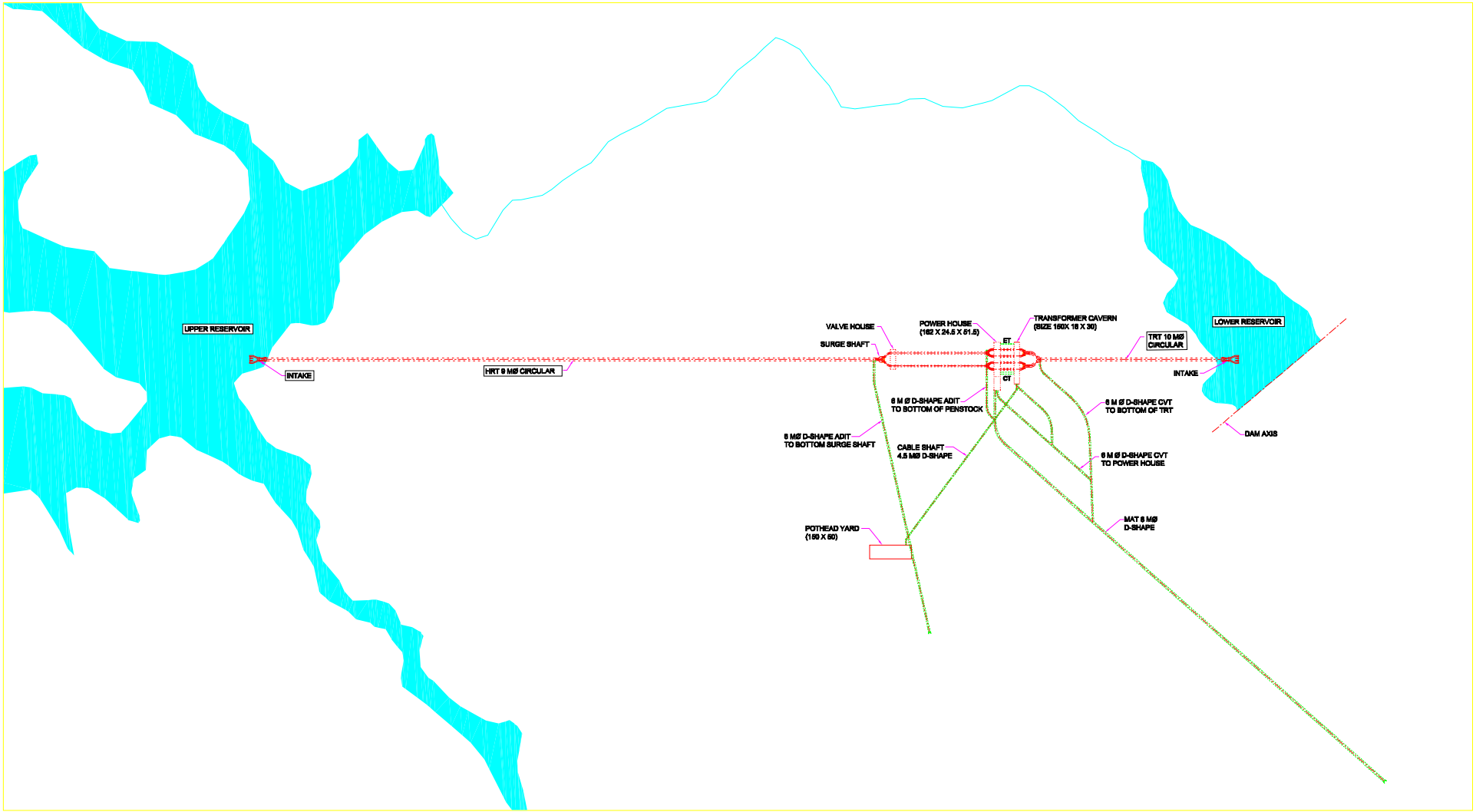
Catchment Area (Sq. Km) (Upper)	44.04
Catchment Area (Sq. Km) (Lower)	9.76

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	1
Length (m)	2300
Diameter (m)	9
PRESSURE SHAFT	
Number	2
Diameter (m)	6
Length (m)	443 (each)
PENSTOCK	
Shape	Circular
Number	4
Length (m)	50 (each)
Diameter (m)	4.2
TAIL RACE TUNNEL	
Shape	Circular
Number	1
Length (m)	1000
Diameter (m)	10

POWER HOUSE

Type	44.04
Installed Capacity	1200
Rated Head	431.49



GENERAL LAYOUT

48. UPPER BHAVANI PUMPED STORAGE PROJECT (4X250 MW=1000 MW)

1. INTRODUCTION

Upper Bhavani Pumped Storage Project is located near small town Kundah in Nilgiris district of Tamil Nadu. The project utilizes water of Bhavani River for power generation harnessing rated head of 310.39 m. The powerhouse has 4 units of 250 MW having installed capacity of 1000 MW. The existing reservoir at Upper Bhavani as the upper reservoir and Avalanche- Emerald reservoir system as lower reservoir.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Bhavani River having upper reservoir at latitude of 11°13'46.31"N and longitude of 76°31'23.97"E and lower reservoir (avalanche) at latitude of 11°19'11.80"N and longitude of 76°36'57.07"E, (emerald) at latitude of 11°19'36.84"N and longitude of 76°37'14.74"E. There is a proposal of underground type of Power house. The nearest railway station and Airport is Mysore at Nilgiris District.

3. PROJECT FEATURES

Upper Bhavani Pumped Storage Project involves.

Upper Reservoir (existing): Upper Reservoir involves construction of dam of Height 80 m with a live storage of 85.2 Mcum on river Bhavani between a Full Reservoir Level (FRL) of 2276.88 m and Minimum Draw down Level (MDDL) of 2249.42 m.

Lower Reservoir (existing): Height of Avalanche and Emerald Dam on the lower reservoir is 57 m with a live storage of 152.8 Mcum on river Bhavani between a Full Reservoir Level (FRL) of 1985.80 m and Minimum Draw down Level (MDDL) of 1943.10 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 3050 m and diameter of 9.8 m, 2 no. of Pressure Shaft of length 350 m and diameter of 6.6 m, 4 no. of Penstock of diameter of 4.6 m and length 50 m (each) carrying water to

the underground powerhouse. The Project to be operated under rated head of 310.39 m with installed capacity of 1000 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 2250 m.

4. HYDROLOGY

The Catchment area of the existing dam site is 33.57 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Upper Bhavani Pumped Storage Project would be 1000 MW utilizing the rated head of 310.39 m.

SALIENT FEATURES
UPPER BHAVANI PUMPED STORAGE PROJECT

GENERAL:

State	Tamil Nadu
District	Nilgiris
River	Bhavani
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Mysore
Nearest Airport	Mysore

UPPER RESERVOIR (Existing):

Location	Latitude: 11°13'46.31"N
	Longitude: 76°31'23.97"E
Full Reservoir Level (FRL) (m)	2276.88
Minimum Draw Down Level (MDDL) (m)	2249.42
Live Storage (Mcum)	85.2

LOWER RESERVOIR (Existing):

Location (avalanche dam)	Latitude: 11°19'11.80"N
	Longitude:76°36'57.07"E
Location (emerald dam)	Latitude: 11°19'36.84"N
	Longitude:76°37'14.74"E
Full Reservoir Level (FRL) (m)	1985.80
Minimum Draw Down Level (MDDL) (m)	1943.10
Type of Dam	Sloping type Bellmouth entry
Live Storage (Mcum)	152.8

HYDROLOGY:

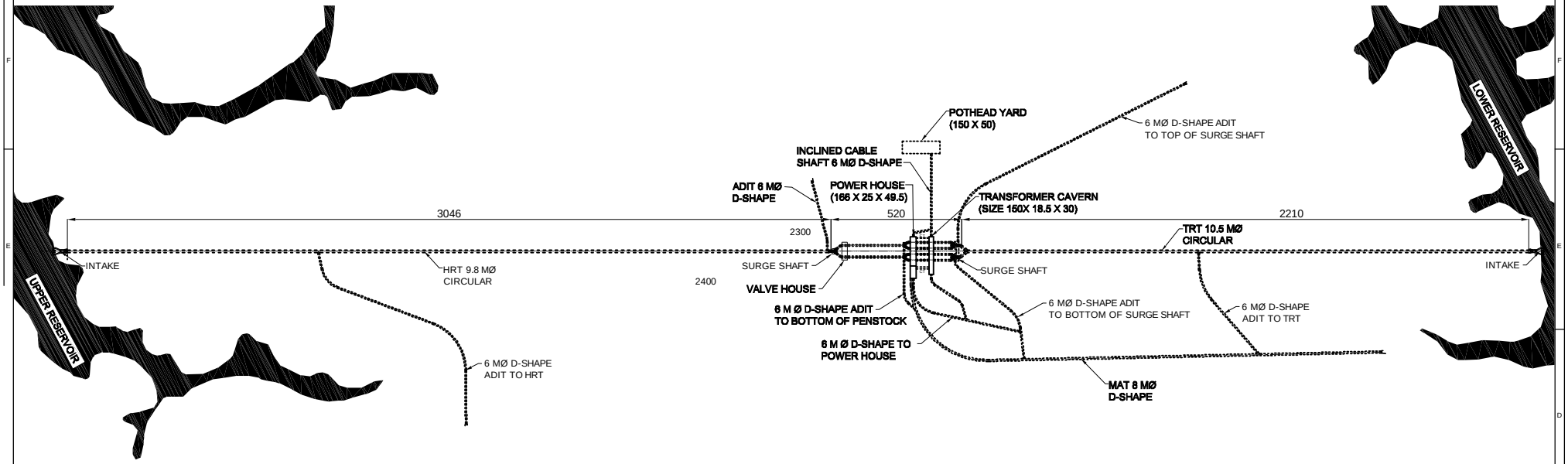
Catchment Area (Sq. Km) (Upper)	33.57

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	1
Length (m)	3050
Diameter (m)	9.8
PRESSURE SHAFT	
Number	2
Diameter (m)	6.6
Length (m)	350
PENSTOCK	
Shape	Circular
Number	4
Length (m)	50
Diameter (m)	4.6
TAIL RACE TUNNEL	
Number	1
Length (m)	2250
Diameter (m)	10.5

POWER HOUSE

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	250
Installed Capacity (MW)	1000
Rated Head (m)	310.39
Rated Net Head Generation (m)	297.01
Rated Net Head Pumping (m)	320.13
Turbine	Single Stage Vertical Reversible Francis



GENERAL LAYOUT

49. SIGUR PUMPED STORAGE PROJECT (4 X 200 MW = 800 MW)

1. INTRODUCTION

Sigur Pumped Storage Project in Nilgiris district of Tamil Nadu. The project utilizes water of Sigur River for power generation harnessing rated head of 342.67 m. The powerhouse has 4 units of 200 MW having installed capacity of 800 MW generating annual energy of 1664.40 MU in 90% dependable year.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Sigur River having upper reservoir at latitude of 11°35'26.69"N and longitude of 76°42'27.99"E and lower reservoir at latitude of 11°36'8.11"N and longitude of 76°44'45.08"E There is a proposal of underground type of Power house. The nearest railway station is Coimbatore, Mysore and the Airport is Coimbatore, Bangalore.

3. PROJECT FEATURES

Sigur Pumped Storage Project involves:-

Upper Reservoir (proposed): Upper Reservoir would involve construction of a dam of Height 42 m with a live storage of 6 MCM on river Sigur between a Full Reservoir Level (FRL) of 846 m and Minimum Draw down Level (MDDL) of 830 m.

Lower Reservoir (proposed): Height of the dam on Lower Reservoir is 48 m with a live storage of 6 MCM on river Sigur between a Full Reservoir Level (FRL) of 514 m and Minimum Draw down Level (MDDL) of 490 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 2650 m and diameter of 8.2 m, 2 no's of pressure shaft of length 290 m and diameter 5.6m and 4 no's of Penstock of length 48 m and diameter of 4 m carrying water to the underground powerhouse. The Project to be operated under rated head of 342.67 m with installed capacity of 800 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 1000 m and diameter 8.8m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 132 Sq.Km and the lower dam site is 173.44 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Sigur Pumped Storage Project would be 1200 MW. Utilising the rated head of 342.67 m, the Annual Energy of the project comes out to be of 1664.40 MU in 90% dependable year.

SALIENT FEATURES
SIGUR PUMPED STORAGE PROJECT

GENERAL:

State	Tamil Nadu
District	Nilgiris
River	Sigur
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Coimbatore
Nearest Airport	Coimbatore

UPPER RESERVOIR (proposed):

Location	Latitude: 11°35'26.69"N,
	Longitude: 76°42'27.99"E
Full Reservoir Level (FRL) (m)	846
Minimum Draw Down Level (MDDL) (m)	830
Height of Dam (above RBL) (m)	42
Live Storage (MCM)	6

LOWER RESERVOIR (proposed):

Location	Latitude: 11°36'8.11"N,
	Longitude: 76°44'45.08"E
Full Reservoir Level (FRL) (m)	514
Minimum Draw Down Level (MDDL) (m)	490
Height of Dam (above RBL) (m)	78
Live Storage (MCM)	6

HYDROLOGY:

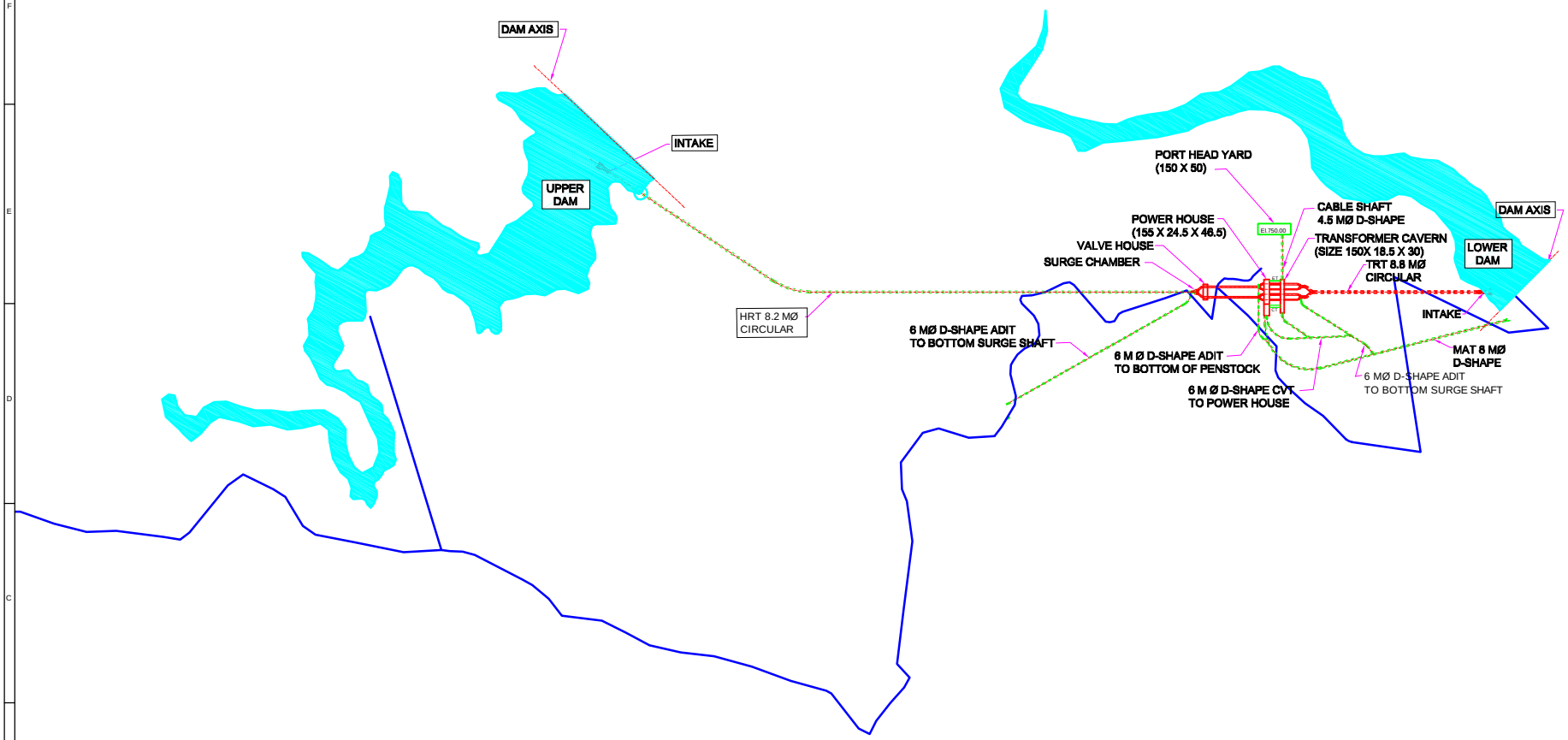
Catchment Area (Sq. Km) Upper Dam	132
Catchment Area (Sq. Km) Lower Dam	173.44

WATER CONDUCTOR SYSTEM (proposed):

HEAD RACE TUNNEL	
Number	1
Length (m)	2650
Diameter (m)	8.2
PRESSURE SHAFT	
Number	2
Length (m)	290
Diameter (m)	5.6
PENSTOCK	
Number	4
Length (m)	48
Diameter (m)	4
TAIL RACE TUNNEL	
Length (m)	1000
Diameter (m)	8.8

POWER HOUSE (proposed):

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	200
Installed Capacity (MW)	800
Rated Head(m)	342.67
Turbine	Reversible Vertical Francis
Annual Energy (MU) generation	1664.40
No. of hours of Generation	
Energy (MU) for Pumping	2149



GENERAL LAYOUT

50. MANALAR PUMPED STORAGE PROJECT (6X200MW=1200MW)

1. INTRODUCTION

Manalar Pumped Storage Project has an existing upper reservoir and proposed lower reservoir with installed capacity of 1200MW. The project is located in Theni district of Tamil Nadu. The project utilizes water of Suruli River for power generation. The powerhouse has 6 units of 200 MW having installed capacity of 1200 MW generating design energy of 2496.60 MU in 90% dependable year at 95% machine availability.

2. LOCATION/ACCESSIBILITY

The upper dam site of the project is located on Suruli River having upper reservoir at latitude of 9°38'16.32''N and longitude of 77°20'45.44''E and lower dam site is located on Suruli River at latitude of 9°41'13.56''N and longitude of 77°19'38.42''E. The nearest railway station and nearest airport from the project site is Madurai.

3. PROJECT FEATURES

Manalar Pumped Storage Project involves construction of

Upper Reservoir (Existing): Upper Reservoir is an existing reservoir with dam height of 40 m having live storage of 11.50 Mcum on Suruli River between a Full Reservoir Level (FRL) of 1492 m and Minimum Draw down Level (MDDL) of 1470.4 m.

Lower Reservoir (Proposed): Proposed Lower Reservoir with dam height of 32 m with a live storage of 6.001 Mcum on Suruli River between a Full Reservoir Level (FRL) of 440 m and Minimum Draw down Level (MDDL) of 420 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of Head Race Tunnel (HRT) of length 635 m and diameter 7.0 m each and 2 nos. of Pressure shaft of length 4700 m, 6 nos. of penstock length of main unit 40 m and diameter of unit penstock 2.20 m carrying water to the underground powerhouse. The project with installed capacity of 1200 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 915 m.

4. POWER & ENERGY BENEFITS

The installed capacity of Manalar Pumped Storage Project would be 1200 MW. The project generates the Design Energy of 12496.60 MU in 90% dependable year at 95% machine availability.

5. PUMPING ENERGY REQIREMENT

The pumping energy required for the project is 3174.84 MU.

SALIENT FEATURES
MANALAR PUMPED STORAGE PROJECT

GENERAL:

State	Tamil Nadu
District	Theni
River	Suruli
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Madurai
Nearest Airport	Madurai

UPPER RESERVOIR (Existing):

Location	Latitude: 9°38'16.32"N
	Longitude: 77°20'45.44"E
Full Reservoir Level (FRL) (m)	1492
Minimum Draw Down Level (MDDL) (m)	1470.4
Length of the Dam at the top(m)	184.5
Height of Dam (above RBL) (m)	40
Live Storage (Mcum)	11.50
Gross Storage (Mcum)	12.07

LOWER RESERVOIR (Proposed)

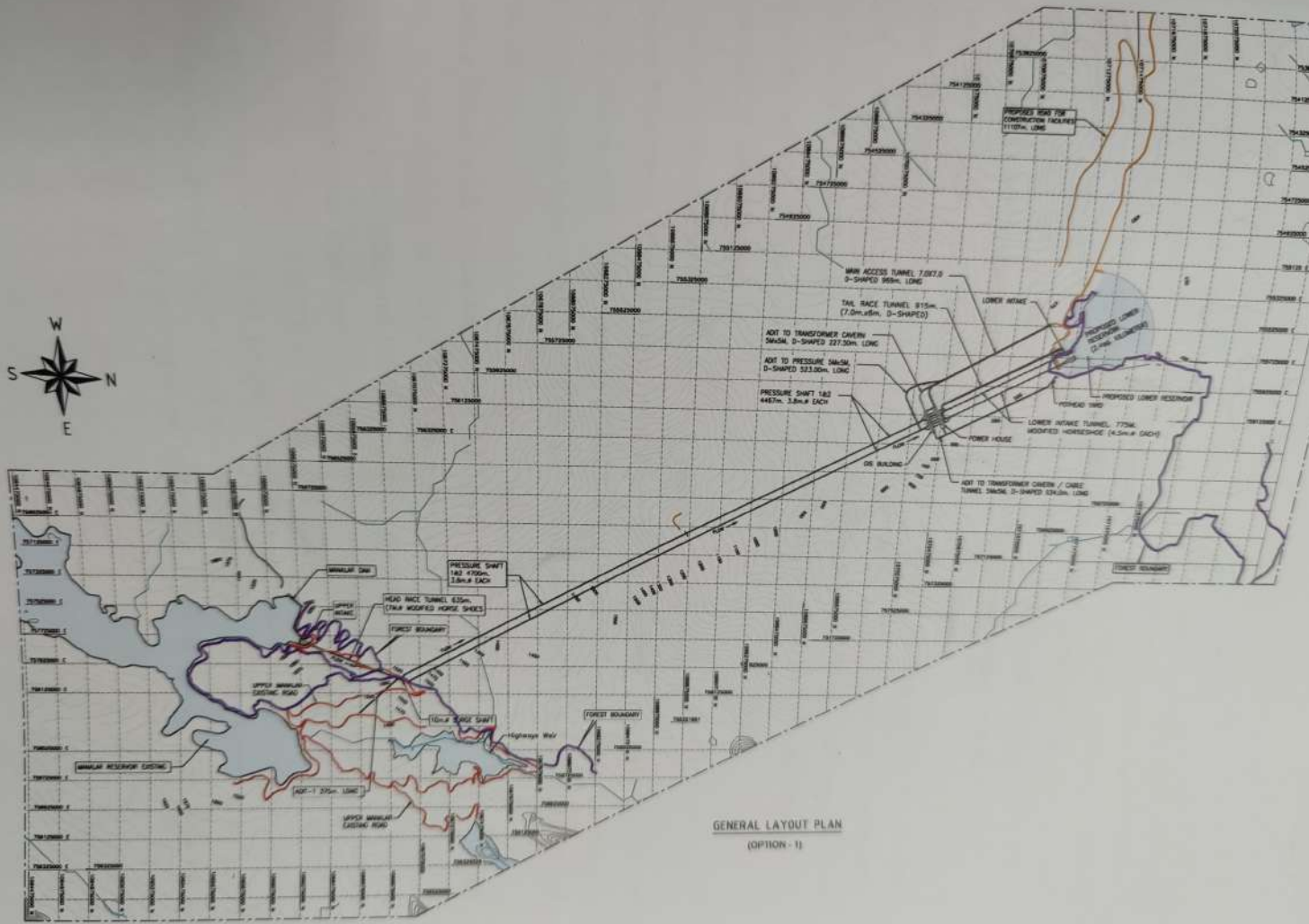
Location	Latitude: 9°41'13.56"N
	Longitude: 77°19'38.42"E
Full Reservoir Level (FRL) (m)	440
Minimum Draw Down Level (MDDL) (m)	420
Height of Dam (above RBL) (m)	32
Live Storage (Mcum)	6.001

WATER CONDUCTOR SYSTEM:

HEAD RACE TUNNEL	
Type	Concrete Lined, Modified Horse shoe
Number	1
Length (m)	635
Diameter (m)	7
PRESSURE SHAFT	
Type	Circular
Number	2
Length (m)	4700
Diameter (m)	3.80
PENSTOCK	
Type	Circular
Number	6
Length (m) (Main Penstock)	40
Diameter (m) (Unit Penstock)	2.20
TAIL RACE TUNNEL	
Type & Shape	D-Shaped (Modified)
Number	1
Length (m)	915

POWER HOUSE:

Type	Underground
No. of Generating Units	6
Capacity of each Unit (MW)	200
Installed Capacity (MW)	1200
Turbine	Pelton Machines-Vertical Axis
Design Energy (MU)	2496.60
Energy(MU) for Pumping	3174.84



GENERAL LAYOUT PLAN

(OPTION - 1)

51. CHATTAR PUMPED STORAGE PROJECT (4X275MW=1100MW)

1. INTRODUCTION

Chattar Pumped Storage Project has proposed upper reservoir and existing lower reservoir with installed capacity of 1100MW. The project is located in Kanyakumari district of Tamil Nadu. The project utilizes water of Chattar Nallah/Kodayar river for power generation under rated head of 574 m. The powerhouse would have 4 units of 275 MW having installed capacity of 1100 MW generating annual energy of 2289 MU in 90% dependable year.

2. LOCATION/ACCESSIBILITY

The upper dam site of the project is proposed to be located on Chattar Nallah River at latitude of 8°27'51.5''N and longitude of 77°22'35.3''E and lower dam site is located on Kodayar River at latitude of 8°27'04''N and longitude of 77°18'30''E. The nearest railway station from the project site is Kulitturai and nearest airport is Trivandrum.

3. PROJECT FEATURES

Chattar Pumped Storage Project involves construction of

Upper Reservoir (Proposed): Upper Reservoir for proposed reservoir with dam top of 703 m with a live storage of 5.3 Mm^3 on Chattar Nallah River between a Full Reservoir Level (FRL) of 700 m and Minimum Draw down Level (MDDL) of 640 m.

Lower Reservoir (Existing): Existing Lower Reservoir with dam top of 97 m with a live storage of 123.2 Mm^3 on Kodayar River between a Full Reservoir Level (FRL) of 92.05 m and Minimum Draw down Level (MDDL) of 77.42 m.

Water Conductor System: The proposed Water Conductor System comprises of Head Race Tunnel (HRT) of length 265 m and diameter 8.0 m each and 1 nos. of Pressure shaft of length 3750 m which would carry water to the underground powerhouse having installed capacity of 1100 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 1085 m.

4. POWER & ENERGY BENEFITS

The installed capacity of Chattar Pumped Storage Project would be 1100 MW. And would generate the Annual Energy of 2289 MU in 90% dependable year under rated head of 574 m. The project will provide daily hours generation of 6 Hours and daily hours pumping of 7.1 Hours

SALIENT FEATURES
CHATTAR PUMPED STORAGE PROJECT

GENERAL:

State	Tamil Nadu
District	Kanyakumari
River	Chattar Nallah/Kodayar
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Kulitturai
Nearest Airport	Trivandrum

UPPER RESERVOIR (Proposed):

Location	Latitude: 8°27'51.5''N
	Longitude: 77°22'35.3''E
Full Reservoir Level (FRL) (m)	700
Minimum Draw Down Level (MDDL) (m)	640
Top of the Dam (m)	703
Live Storage (Mm^3)	5.3

LOWER RESERVOIR (Existing)

Location	Latitude: 8°27'04''N
	Longitude: 77°18'30''E
Full Reservoir Level (FRL) (m)	92.05
Minimum Draw Down Level (MDDL) (m)	77.42
Top of Dam (m)	97
Live Storage (Mm^3)	123.2

INTAKE:

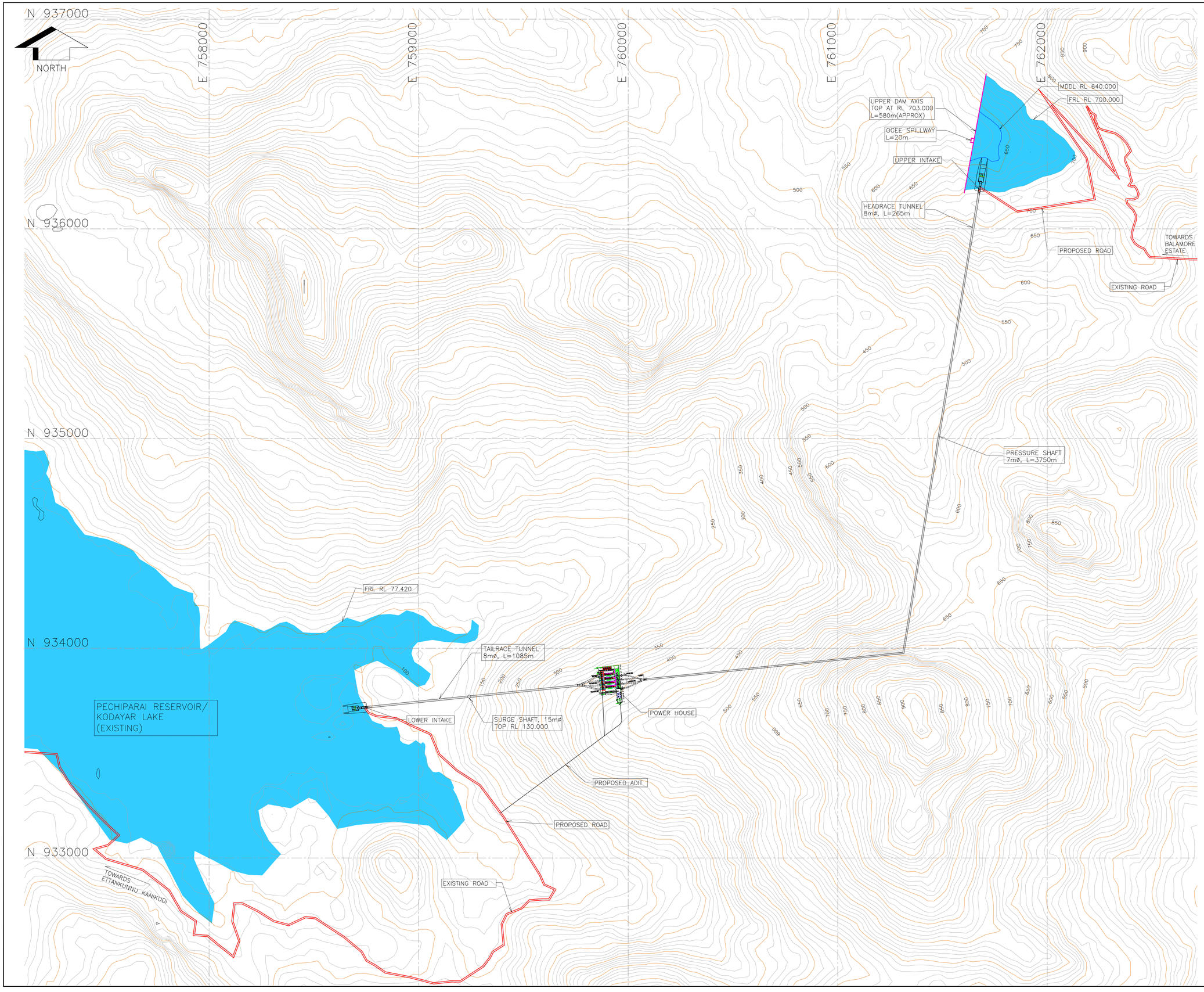
	Upper	**Lower**
Number	01	01
Type	Horizontal	Horizontal
Size m (wxh)	6.5 x16	6x15

WATER CONDUCTOR SYSTEM:

HEAD RACE TUNNEL	
Shape	Horse Shoe
Number	1
Length (m)	265
Diameter (m)	8
PRESSURE SHAFT	
Shape	Circular
Number	1
Length (m)	3750
Diameter (m)	7
TAIL RACE TUNNEL	
Shape	Horse-Shoe
Number	1
Length (m)	1085
Diameter (m)	8

POWER HOUSE:

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	275
Installed Capacity (MW)	1100
Turbine	Vertical Reversible Francis
Rated Head (Generation)	574
Rated Head (Pumping)	606
Annual Energy(MU)	2289
No. of hours of Generation	6
Energy(MU) for Pumping	2985
No. of hours for Pumping	7.1



LEGEND

- CONTOUR 50m INTERVAL
- CONTOUR 10m INTERVAL
- FRL(FULL RESERVOIR LEVEL)

NOTES

1. ALL DIMENSIONS, LEVELS AND COORDINATES ARE IN METERS.
2. GRIDS COORDINATES ARE BASED ON MAGNETIC NORTH AND ARE UTM COORDINATES.
3. CONTOURS HAVE BEEN GENERATED BASED ON 1" SRTM DIGITAL ELEVATION MODEL (30M RESOLUTION) OF PROJECT AREA
4. LAYOUT INDICATED IN THE DRAWING HAS BEEN FORMULATED BASED ON PRELIMINARY TOPOGRAPHICAL DATA AND IS TENTATIVE. TO BE FINALIZED BASED ON DETAILED TOPOGRAPHICAL SURVEY AND GEOLOGICAL/GEO-TECHNICAL INVESTIGATIONS DURING DPR STAGE

CHATTAR PUMPED STORAGE PROJECT
(4x275=1100MW)

GENERAL LAYOUT - PLAN

52. KARAIYAR PUMPED STORAGE PROJECT(4 X 250=1000 MW)

1. INTRODUCTION:

Karaiyar Pumped Storage Project is located near small town Manimutaru & Papanasam in Tirunelveli district of Tamil Nadu. The project utilizes water of Manpidi Ar/ Thamirabarani River for power generation harnessing rated head pumping of 693 m. The powerhouse has 4 units of 250 MW having installed capacity of 1000 MW. The Upper Dam is proposed and existing Karaiyar Dam of Karaiyar Hydroelectric project is used as the Lower Reservoir.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Manpidi Ar/ Thamirabarani River having upper reservoir at latitude of 08°35'06"N and longitude of 77°18'40.9"E and lower reservoir at latitude of 08°39'3.7"N and longitude of 77°18'40.3"E. There is a proposal of underground type of Power house. The nearest railway station is Tirunelveli and the Airport is Trivandrum at Tirunelveli district.

3. PROJECT FEATURES

Karaiyar Pumped Storage Project involves.

Upper Reservoir (proposed): Upper Reservoir with a live storage of 4.5 Mm^3 on river Manpidi Ar between a Full Reservoir Level (FRL) of 950 m and Minimum Draw down Level (MDDL) of 889 m.

Lower Reservoir (Aliyar Dam existing): Lower Reservoir with a live storage of 149 Mm^3 on river Thamirabarani between a Full Reservoir Level (FRL) of 264.57 m and Minimum Draw down Level (MDDL) of 224.03 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 160 m and diameter of 7 m, 1 no. of Pressure Shaft of diameter of 6 m and length 4460 m carrying water to the underground powerhouse. The Project to be operated under rated head pumping of 693 m with installed capacity of 1000 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 890 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 11.7 Sq.Km. and the lower dam site is 149.03 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Karaiyar Pumped Storage Project would be 1000 MW. Utilizing the rated head pumping of 693 m, the Annual Energy of the project comes out to be of 2081 MU in 90% dependable year with 95% machine availability.

SALIENT FEATURES
KARAIYAR PUMPED STORAGE PROJECT

GENERAL:

State	Tamil Nadu
District	Tirunelveli
River	Manpidi Ar/ Thamirabarani
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Tirunelveli
Nearest Airport	Trivandrum

UPPER RESERVOIR (Proposed):

Location	Latitude: 08°35'06"N
	Longitude: 77°18'40.9"E
Full Reservoir Level (FRL) (m)	950
Minimum Draw Down Level (MDDL) (m)	889
Live Storage (Mm^3)	4.5

LOWER RESERVOIR (Karaiyar Dam existing):

Location	Latitude: 08°39'3.7"N
	Longitude: 77°18'40.3"E
Full Reservoir Level (FRL) (m)	264.57
Minimum Draw Down Level (MDDL) (m)	224.03
Live Storage (Mm^3)	149

HYDROLOGY:

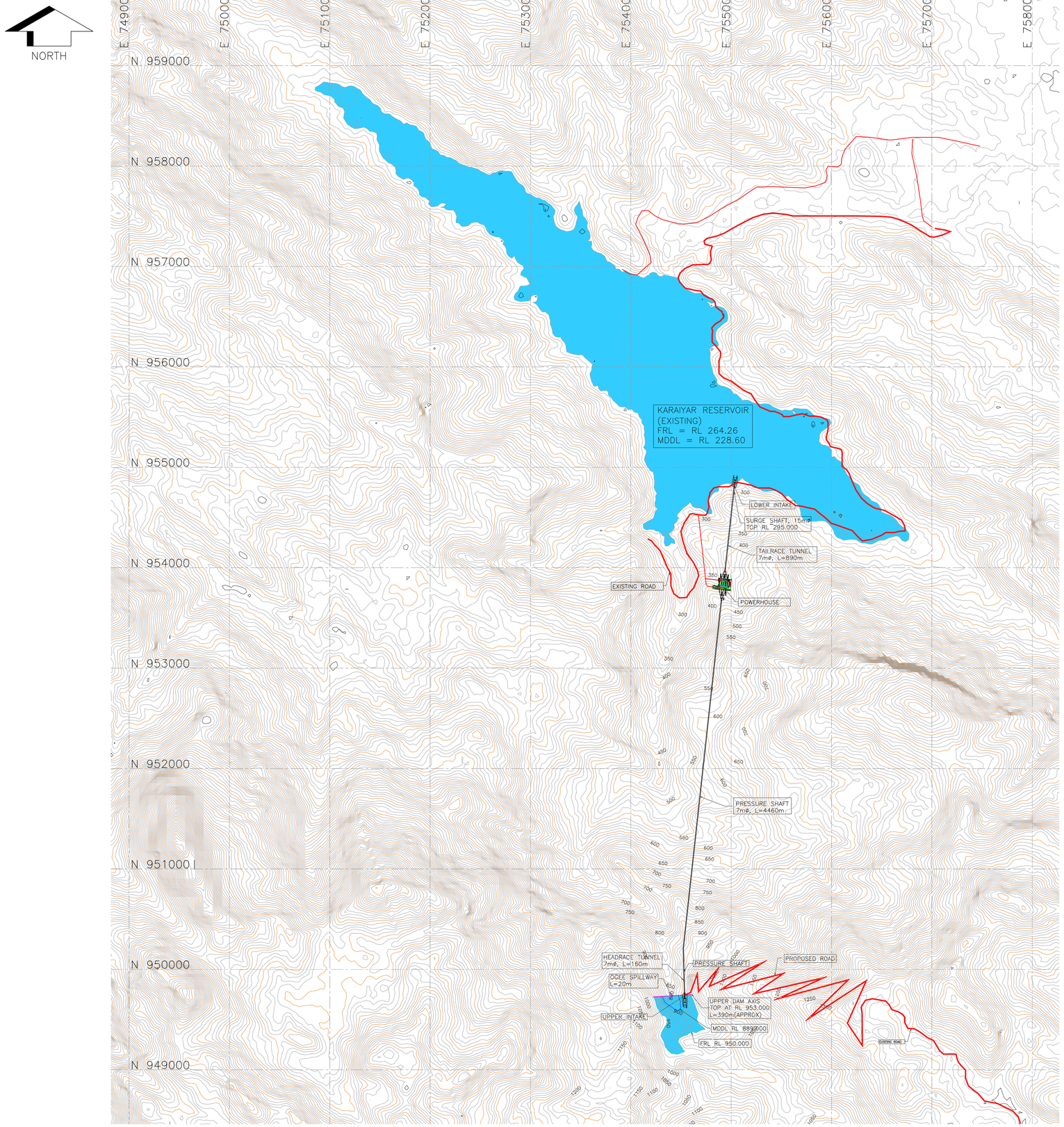
Catchment Area (Sq. Km) Upper Dam	11.7
Catchment Area (Sq. Km) Lower Dam	149.03

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	1
Length (m)	160
Diameter (m)	7
PRESSURE SHAFT/PENSTOCK	
Number	1
Length (m)	4460
Diameter (m)	6
TAIL RACE TUNNEL	
Length (m)	890
Diameter (m)	7

POWER HOUSE

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	250
Installed Capacity (MW)	1000
Rated Head Generation (m)	655
Rated Head Pumping (m)	693
Turbine	Vertical Francis Reversible Pump
Annual Energy (MU)	2081
Annual Energy (MU) for Pumping	2715



LEGEND

- CONTOUR 50m INTERVAL
- CONTOUR 10m INTERVAL
- FRL(FULL RESERVOIR LEVEL)

NOTES

1. ALL DIMENSIONS, LEVELS AND COORDINATES ARE IN METERS.
2. GRIDS COORDINATES ARE BASED ON MAGNETIC NORTH AND ARE UTM COORDINATES.
3. CONTOURS HAVE BEEN GENERATED BASED ON 1" SRTM DIGITAL ELEVATION MODEL (30M RESOLUTION) OF PROJECT AREA
4. LAYOUT INDICATED IN THE DRAWING HAS BEEN FORMULATED BASED ON PRELIMINARY TOPOGRAPHICAL DATA AND IS TENTATIVE. TO BE FINALIZED BASED ON DETAILED TOPOGRAPHICAL SURVEY AND GEOLOGICAL/GEO-TECHNICAL INVESTIGATIONS DURING DPR STAGE

KARAIYAR PUMPED STORAGE PROJECT
(4x250=1000MW)

GENERAL LAYOUT - PLAN

53. ALIYAR PUMPED STORAGE PROJECT (4 X 175=700 MW)

1. INTRODUCTION

Aliyar Pumped Storage Project is located near small town Valparai & Pollachi in Coimbatore district of Tamil Nadu. The project utilizes water of Aliyar River for power generation harnessing rated head generation of 437 m. The powerhouse has 4 units of 175 MW having installed capacity of 700 MW. The existing Upper Aliyar Dam of Aliyar Hydroelectric project is used as the Upper Reservoir and existing Aliyar Dam of Ranganadi Hydroelectric project is used as the Lower Reservoir.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Aliyar River having upper reservoir at latitude of 10°26'14.1"N and longitude of 77°0'47.6"E and lower reservoir at latitude of 10°28'57.8"N and longitude of 76°58'0.5"E. There is a proposal of surface type of Power house. The nearest railway station is Pollachi and the Airport is Coimbatore at Coimbatore district.

3. PROJECT FEATURES

Aliyar Pumped Storage Project involves.

Upper Reservoir (Upper Aliyar Dam existing): Upper Reservoir with a gross storage of 26.6 Mm^3 on river Aliyar between a Full Reservoir Level (FRL) of 769.62 m and Minimum Draw down Level (MDDL) of 745.24 m.

Lower Reservoir (Aliyar Dam existing): Lower Reservoir with a gross storage of 109.4 Mm^3 on river Aliyar between a Full Reservoir Level (FRL) of 320.04 m and Minimum Draw down Level (MDDL) of 295.05 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 1130 m and diameter of 8 m, 1 no. of Pressure Shaft of diameter of 7 m & length 1520 m carrying water to the surface powerhouse. The Project to be operated under rated head pumping of 459 m with installed capacity of 700 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 700 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 121 Sq.Km. and the lower dam site is 197 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Aliyar Pumped Storage Project would be 700 MW. Utilizing the rated head generation of 437 m, the Annual Energy of the project comes out to be of 1456 MU in 90% dependable year with 95% machine availability.

SALIENT FEATURES
ALIYAR PUMPED STORAGE PROJECT

GENERAL:

State	Tamil Nadu
District	Coimbatore
River	Aliyar
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Pollachi
Nearest Airport	Coimbatore

UPPER RESERVOIR (Upper Aliyar Dam existing):

Location	Latitude: 10°26'14.1"N
	Longitude: 77°0'47.6"E
Full Reservoir Level (FRL) (m)	769.62
Minimum Draw Down Level (MDDL) (m)	745.24
Gross Storage (Mm^3)	26.6

LOWER RESERVOIR (Aliyar Dam existing):

Location	Latitude: 10°28'57.8"N
	Longitude: 76°58'0.5"E
Full Reservoir Level (FRL) (m)	320.04
Minimum Draw Down Level (MDDL) (m)	295.05
Gross Storage (Mm^3)	109.4

HYDROLOGY:

Catchment Area (Sq. Km) Upper Dam	121
Catchment Area (Sq. Km) Lower Dam	197

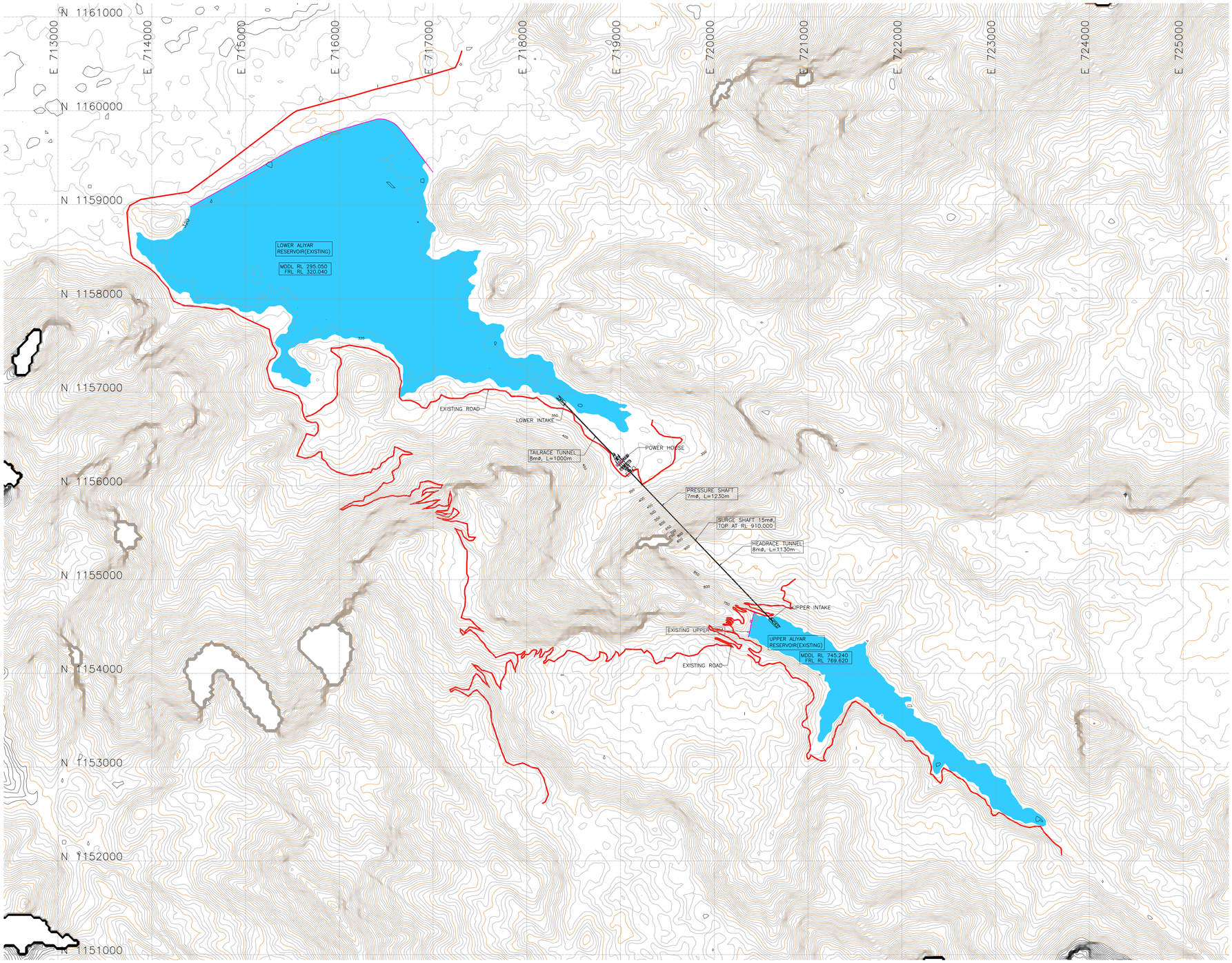
WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	1
Length (m)	1130
Diameter (m)	8
PRESSURE SHAFT/PENSTOCK	
Number	1
Length (m)	1520
Diameter (m)	7
TAIL RACE TUNNEL	
Length (m)	700
Diameter (m)	8

POWER HOUSE

Type	Surface
No. of Generating Units	4
Capacity of each Unit (MW)	175
Installed Capacity (MW)	700
Rated Head Generation (m)	437
Rated Head Pumping (m)	459
Turbine	Vertical Reversible Francis Pump
Annual Energy (MU)	1456
Annual (MU) for Pumping	1889

NORTH



LEGEND

- CONTOUR 50m INTERVAL
- CONTOUR 10m INTERVAL
- FRL(FULL RESERVOIR LEVEL)

NOTES

1. ALL DIMENSIONS, LEVELS AND COORDINATES ARE IN METERS.
2. GRIDS COORDINATES ARE BASED ON MAGNETIC NORTH AND ARE UTM COORDINATES.
3. CONTOURS HAVE BEEN GENERATED BASED ON 1" SRTM DIGITAL ELEVATION MODEL (30M RESOLUTION) OF PROJECT AREA
4. LAYOUT INDICATED IN THE DRAWING HAS BEEN FORMULATED BASED ON PRELIMINARY TOPOGRAPHICAL DATA AND IS TENTATIVE. TO BE FINALIZED BASED ON DETAILED TOPOGRAPHICAL SURVEY AND GEOLOGICAL/GEO-TECHNICAL INVESTIGATIONS DURING DPR STAGE

ALIYAR PUMPED STORAGE PROJECT
(4x175=700MW)

GENERAL LAYOUT – PLAN

54. PALAR- PORANTHALAR PUMPED STORAGE PROJECT (4X 275=1100MW)

1. INTRODUCTION

Palar- Poranthalar Pumped Storage Project is located near town pallangi in Dindigul district of Tamil Nadu. The project utilizes water of Palar/ Poranthalar River for power generation harnessing rated head pumping of 650 m. The powerhouse has 4 units of 275 MW having installed capacity of 1100 MW. The Upper Dam is proposed and existing Palar Porundalar Dam of Palar Porundalar Hydroelectric project is used as the Lower Reservoir.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Palar/ Poranthalar River having upper reservoir at latitude of 10°18'51.65"N and longitude of 77°27'12.59"E and lower reservoir at latitude of 08°39'3.7"N and longitude of 77°28'52.8"E. There is a proposal of underground type of Power house. The nearest railway station is Palani and the Airport is Coimbatore at Dindigul district.

3. PROJECT FEATURES

Palar- Poranthalar Pumped Storage Project involves.

Upper Reservoir (proposed): Upper Reservoir with a live storage of 4.4 Mm^3 on river Poranthalar between a Full Reservoir Level (FRL) of 979 m and Minimum Draw down Level (MDDL) of 961 m.

Lower Reservoir (Palar Porundalar Dam existing): Lower Reservoir with a live storage of 37 Mm^3 on river Palar/ Poranthalar between a Full Reservoir Level (FRL) of 339.85 m and Minimum Draw down Level (MDDL) of 329 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 2220 m and diameter of 8 m, 1 no. of Pressure Shaft of diameter of 7 m, length 1480 m carrying water to the underground powerhouse. The Project to be operated under rated head pumping of 650 m with installed capacity of 1100 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 2000 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 85 Sq.Km. and the lower dam site is 259 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Palar- Poranthalar Pumped Storage Project would be 1100 MW. Utilizing the rated head pumping of 650 m, the Annual Energy of the project comes out to be of 2289 MU in 90% dependable year with 95% machine availability.

SALIENT FEATURES
PALAR- PORANTHALAR PUMPED STORAGE PROJECT

GENERAL:

State	Tamil Nadu
District	Dindigul
River	Palar/ Poranthalar
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Palani
Nearest Airport	Coimbatore

UPPER RESERVOIR (Proposed):

Location	Latitude: 10°18'51.65"N
	Longitude: 77°27'12.59"E
Full Reservoir Level (FRL) (m)	979
Minimum Draw Down Level (MDDL) (m)	961
Live Storage (Mm^3)	4.4

LOWER RESERVOIR (Palar Porundalar Dam existing):

Location	Latitude: 08°39'3.7"N
	Longitude: 77°28'52.8"E
Full Reservoir Level (FRL) (m)	339.85
Minimum Draw Down Level (MDDL) (m)	329
Live Storage (Mm^3)	37

HYDROLOGY:

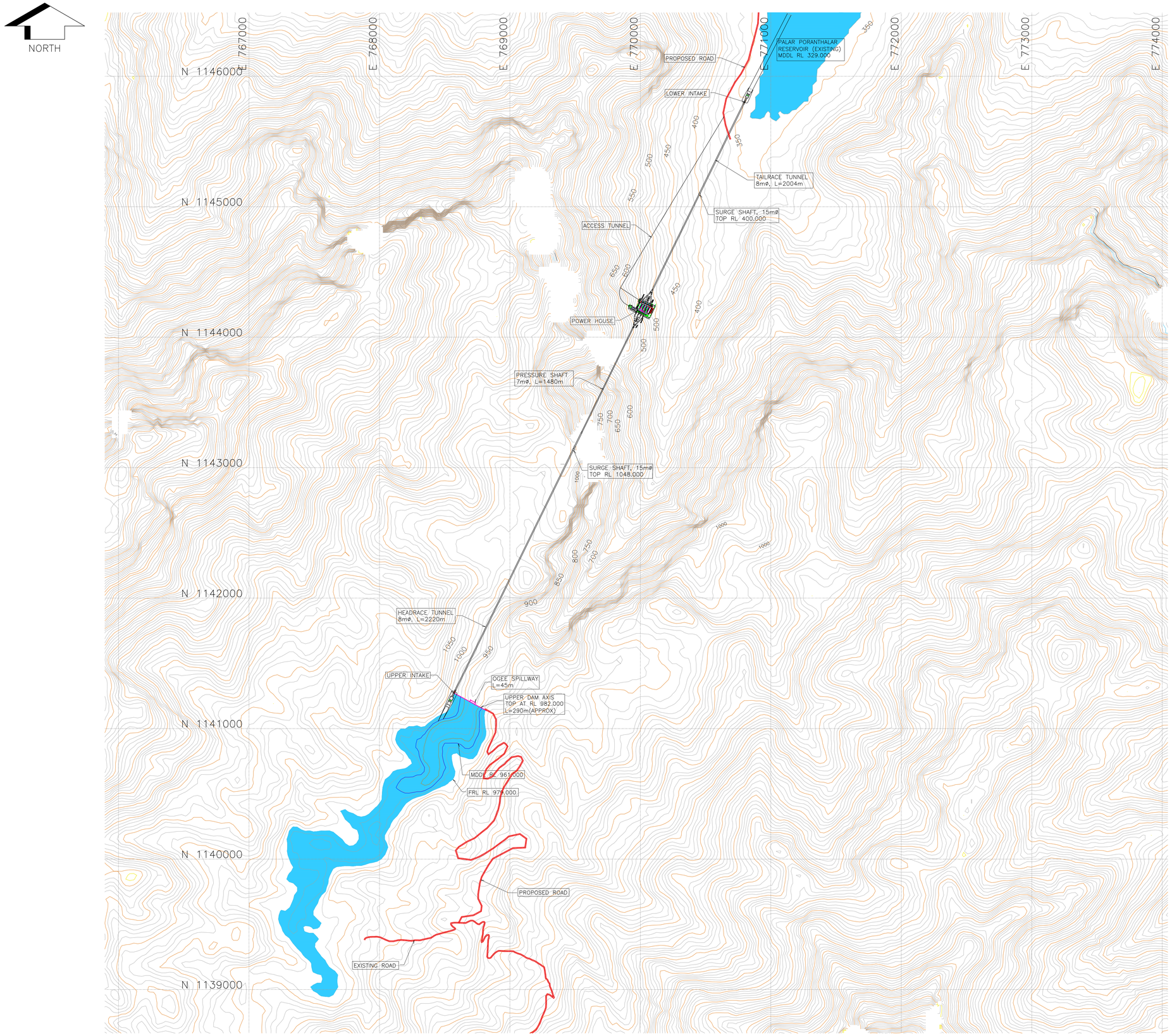
Catchment Area (Sq. Km) Upper Dam	85
Catchment Area (Sq. Km) Lower Dam	259

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	1
Length (m)	2220
Diameter (m)	8
PRESSURE SHAFT/PENSTOCK	
Number	1
Length (m)	1480
Diameter (m)	7
TAIL RACE TUNNEL	
Length (m)	2000
Diameter (m)	8

POWER HOUSE

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	275
Installed Capacity (MW)	1100
Rated Head Generation (m)	619
Rated Head Pumping (m)	650
Turbine	Vertical Reversible Francis Pump
Annual Energy Generation (MU)	2289
Annual Energy (MU) for Pumping	2967



LEGEND

- CONTOUR 50m INTERVAL
- CONTOUR 10m INTERVAL
- FRL(FULL RESERVOIR LEVEL)

NOTES

1. ALL DIMENSIONS, LEVELS AND COORDINATES ARE IN METERS.
2. GRIDS COORDINATES ARE BASED ON MAGNETIC NORTH AND ARE UTM COORDINATES.
3. CONTOURS HAVE BEEN GENERATED BASED ON 1" SRTM DIGITAL ELEVATION MODEL (30M RESOLUTION) OF PROJECT AREA
4. LAYOUT INDICATED IN THE DRAWING HAS BEEN FORMULATED BASED ON PRELIMINARY TOPOGRAPHICAL DATA AND IS TENTATIVE. TO BE FINALIZED BASED ON DETAILED TOPOGRAPHICAL SURVEY AND GEOLOGICAL/GEO-TECHNICAL INVESTIGATIONS DURING DPR STAGE

PALAR PORANTHALAR PUMPED STORAGE PROJECT (4x275=1100MW)

GENERAL LAYOUT - PLAN

55. ATHUR PUMPED STORAGE PROJECT (2 X150 MW = 300MW)

1. INTRODUCTION

Athur Pumped Storage Project is located near Pulla veli/Athur village in Dindigul district of Tamil Nadu. The project utilizes water of Kodaganar River for power generation under rated head (Generation) of 574 m. The powerhouse has 2 units of 150 MW having installed capacity of 300 MW generating annual energy of 520 MU.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Kodaganar River having upper reservoir at latitude of 10°18'12.99"N and longitude of 77°45'13.36"E and lower reservoir at latitude of 10°17'34.35"N and longitude of 77°49'2.90" E. There is a proposal of Surface type of Power house. The nearest railway station is Dindigul and the Airport is Coimbatore.

3. PROJECT FEATURES

Athur Pump Storage Project involves:-

Upper Reservoir (proposed): Upper Reservoir is proposed with a live storage of 3.6 Mm^3 on river Kodaganar between a Full Reservoir Level (FRL) of 896 m and Minimum Draw down Level (MDDL) of 883 m.

Lower Reservoir (Kamarajar Sagar Dam existing): Lower Reservoir is proposed m with a live storage of 5.5 Mm^3 on river Kodaganar between a Full Reservoir Level (FRL) of 305.10 m and Minimum Draw down Level (MDDL) of 296 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 130 m and diameter of 5 m, 1 no. of Pressure Shaft of length 5260 m and diameter of 4.5 m. The Project to be operated under rated head (Generation) of 574 m with installed capacity of 300 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 180 m and diameter of 5 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 37 Sq. Km and the lower dam site is 77 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Athur Pumped Storage Project would be 300 MW under rated head (Generation) of 574 m. The Annual Energy of the project comes out to be of 520 MU in 90% dependable year with 95% machine availability.

SALIENT FEATURES
ATHUR PUMPED STORAGE PROJECT

GENERAL:

State	Tami Nadu
District	Dindigul
River	Kodaganar (Amravati)
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Dindigul
Nearest Airport	Coimbatore Airport

UPPER RESERVOIR (proposed):

Location	Latitude: 10°18'12.99"N,
	Longitude: 77°45'13.36"E
Full Reservoir Level (FRL) (m)	896
Minimum Draw Down Level (MDDL) (m)	883
Top of Dam (m)	899
Live Storage (Mm^3)	3.6

LOWER RESERVOIR (Kamarajar Sagar Dam existing):

Location	Latitude: 10°17'34.35"N
	Longitude: 77°49'2.90" E
Full Reservoir Level (FRL) (m)	305.10
Minimum Draw Down Level (MDDL) (m)	296
Top of Dam (m)	308.10
Live Storage (Mm^3)	5.5

HYDROLOGY:

Catchment Area (Sq. Km) Upper Dam	37
Catchment Area (Sq. Km) Lower Dam	77

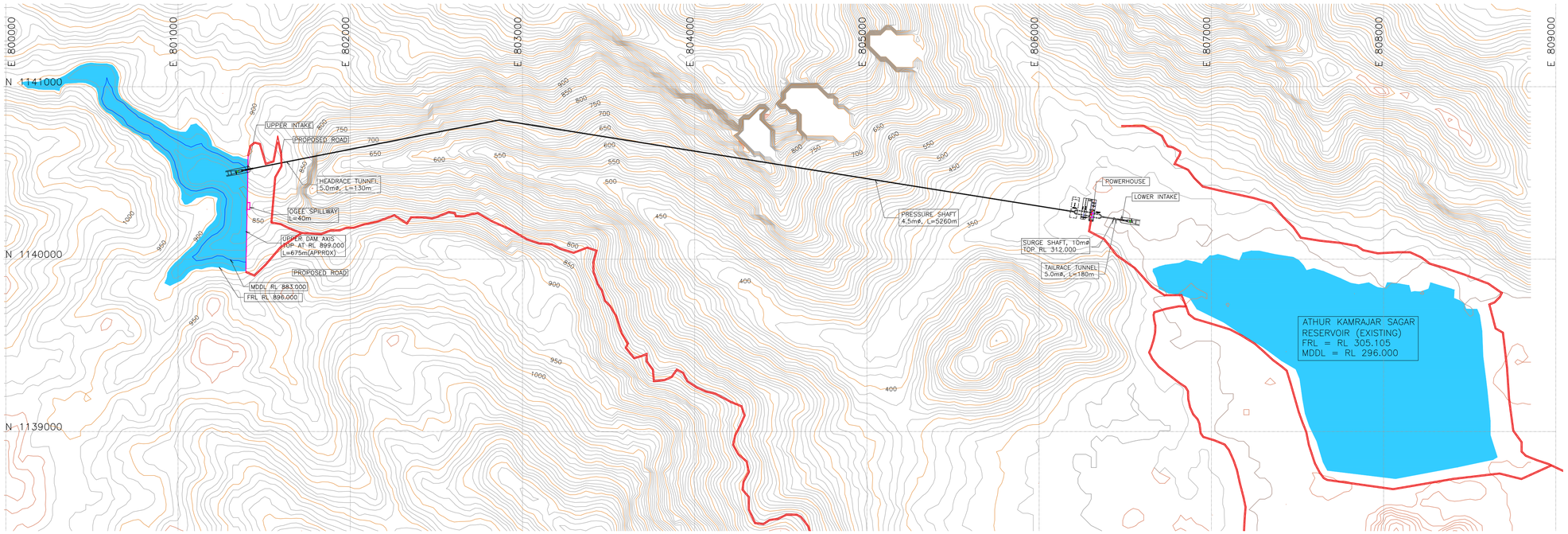
WATER CONDUCTOR SYSTEM (proposed):

HEAD RACE TUNNEL	
Number	1
Length (m)	130
Diameter (m)	5
PRESSURE SHAFT	
Number	1
Length (m)	5260
Diameter (m)	4.5
TAIL RACE TUNNEL	
Length (m)	180
Diameter (m)	5

POWER HOUSE:

Type	Surface
No. of Generating Units	2
Capacity of each Unit (MW)	150
Installed Capacity (MW)	300
Rated Head (Generation) (m)	574
Rated Head (Pumping) (m)	600
Turbine	Vertical Reversible Francis Pump Turbine
Annual Energy (MU)	520

NORTH



LEGEND

- CONTOUR 50m INTERVAL
- CONTOUR 10m INTERVAL
- FRL(FULL RESERVOIR LEVEL)

NOTES

1. ALL DIMENSIONS, LEVELS AND COORDINATES ARE IN METERS.
2. GRIDS COORDINATES ARE BASED ON MAGNETIC NORTH AND ARE UTM COORDINATES.
3. CONTOURS HAVE BEEN GENERATED BASED ON 1" SRTM DIGITAL ELEVATION MODEL (30M RESOLUTION) OF PROJECT AREA
4. LAYOUT INDICATED IN THE DRAWING HAS BEEN FORMULATED BASED ON PRELIMINARY TOPOGRAPHICAL DATA AND IS TENTATIVE. TO BE FINALIZED BASED ON DETAILED TOPOGRAPHICAL SURVEY AND GEOLOGICAL/GEO-TECHNICAL INVESTIGATIONS DURING DPR STAGE

ATHUR PUMPED STORAGE PROJECT
(2X150=300MW)

GENERAL LAYOUT - PLAN

2

56. MANJALAR PUMPED STORAGE PROJECT (2x250MW=500MW)

1. INTRODUCTION

Manjalar Pumped Storage Project is located near Kumbaraiyur/Devadhanapatti village in Dindigul and Theni district of Tamil Nadu. The project utilizes water of Iruttar and Manjalar River for power generation under rated head (Generation) of 587 m. The powerhouse has 2 units of 250 MW having installed capacity of 500 MW generating annual energy of 867 MU.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Iruttar and Manjalar River having upper reservoir at latitude of 10°14'1.6"N and longitude of 77°39'5.24"E and lower reservoir at latitude of 10°11'51.3" N and longitude of 77°38'4.9"E. There is a proposal of Surface type of Power house. The nearest railway station is Andipati and the Airport is Coimbatore.

3. PROJECT FEATURES

Manjalar Pump Storage Project involves:-

Upper Reservoir (proposed): Upper Reservoir is proposed with a live storage of 3.6 Mm^3 on river Iruttar between a Full Reservoir Level (FRL) of 913 m and Minimum Draw down Level (MDDL) of 896 m.

Lower Reservoir (Manjalar Dam existing): Lower Reservoir is proposed with a live storage of 12.6 Mm^3 on river Manjalar between a Full Reservoir Level (FRL) of 306.32 m and Minimum Draw down Level (MDDL) of 296 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 2550 m and diameter of 5.5 m, 1 no. of Pressure Shaft of length 2030 m and diameter of 5 m. The Project to be operated under rated head (Generation) of 587 m with installed capacity of 500 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 120 m and diameter of 5.5 m

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 4.2 Sq. Km and the lower dam site is 119 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Manjalar Pumped Storage Project would be 500 MW under rated head of (Generation) of 587m. The Annual Energy of the project comes out to be of 867 MU in 90% dependable year with 95% machine availability.

SALIENT FEATURES

MANJALAR PUMPED STORAGE PROJECT

GENERAL:

State	Tami Nadu
District	Dindigul/Theni
River	Iruttar/Manjalar
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Andipatti
Nearest Airport	Coimbatore Airport

UPPER RESERVOIR (proposed):

Location	Latitude: 10°14'1.6" N
	Longitude: 77°39'5.24 E
Full Reservoir Level (FRL) (m)	913
Minimum Draw Down Level (MDDL) (m)	896
Top of Dam (m)	916
Live Storage (Mm^3)	2.5

LOWER RESERVOIR (Manjalar Dam existing):

Location	Latitude: 10°11'51.3" N
	Longitude: 77°38'4.9"E
Full Reservoir Level (FRL) (m)	306.32
Minimum Draw Down Level (MDDL) (m)	296
Type of Dam (m)	309.32
Live Storage (Mm^3)	12.6

HYDROLOGY:

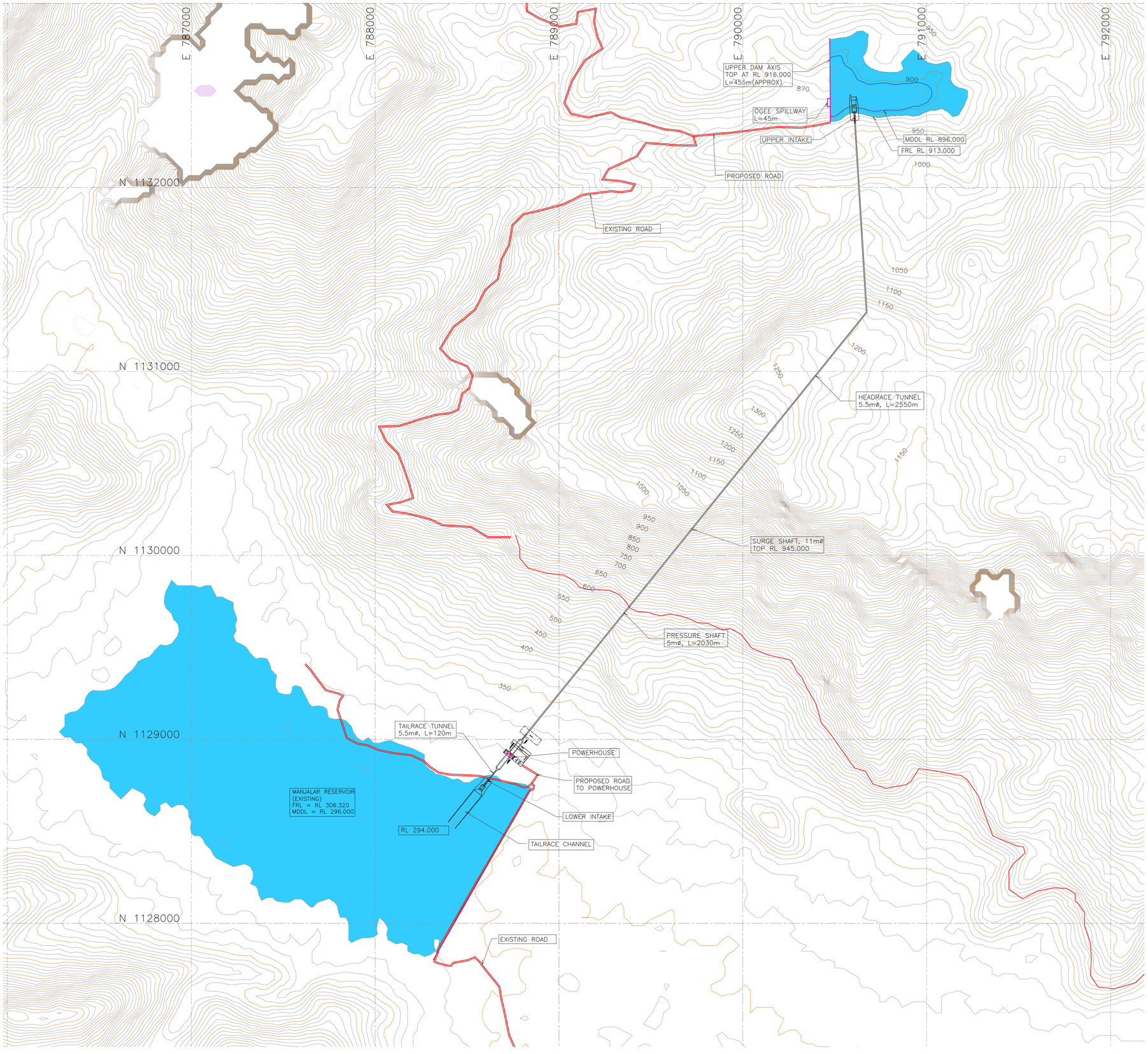
Catchment Area (Sq. Km) Upper Dam	4.2
Catchment Area (Sq. Km) Lower Dam	119

WATER CONDUCTOR SYSTEM :

HEAD RACE TUNNEL	
Number	1
Length (m)	2550
Diameter (m)	5.5
Shape	Horse Shoe
PRESSURE SHAFT	
Number	1
Length (m)	2030
Diameter (m)	5
TAIL RACE TUNNEL	
Length (m)	120
Diameter (m)	5.5

POWER HOUSE:

Type	Surface
No. of Generating Units	2
Capacity of each Unit (MW)	250
Installed Capacity (MW)	500
Rated Head (Generation) (m)	587
Rated Head (pumping) (m)	617
Turbine	Vertical Reversible Vertical Francis
Annual Energy (MU) for generation	867
Annual Energy (MU) for Pumping	1123



LEGEND

- CONTOUR 50m INTERVAL
- CONTOUR 10m INTERVAL
- FRL(FULL RESERVOIR LEVEL)

NOTES

1. ALL DIMENSIONS, LEVELS AND COORDINATES ARE IN METERS.
2. GRIDS COORDINATES ARE BASED ON MAGNETIC NORTH AND ARE UTM COORDINATES.
3. CONTOURS HAVE BEEN GENERATED BASED ON 1" SRTM DIGITAL ELEVATION MODEL (30M RESOLUTION) OF PROJECT AREA
4. LAYOUT INDICATED IN THE DRAWING HAS BEEN FORMULATED BASED ON PRELIMINARY TOPOGRAPHICAL DATA AND IS TENTATIVE. TO BE FINALIZED BASED ON DETAILED TOPOGRAPHICAL SURVEY AND GEOLOGICAL/GEO-TECHNICAL INVESTIGATIONS DURING DPR STAGE

MANJALAR PUMPED STORAGE PROJECT
(2x250=500MW)

GENERAL LAYOUT - PLAN

57. METTUR PUMPED STORAGE PROJECT (4X250MW =1000MW)

1. INTRODUCTION

Mettur Pumped Storage Project is located near Anthiyur village in Erode district of Tamil Nadu. The project utilizes water of Palar/Periyan Pallan River for power generation under rated head of 576 m. The powerhouse has 4 units of 250 MW having installed capacity of 1000 MW generating annual energy of 2081 MU.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Palar/Periyan Pallan River having upper reservoir at latitude of 11°46'57.1"N and longitude of 77°37'1.8"E and lower reservoir at latitude of 11°47'49.1"N and longitude of 77°39'40.3"E. There is a proposal of Underground/Cavern type of Power house. The nearest railway station is Erodeand the Airport is Cochin.

3. PROJECT FEATURES

Mettur Pump Storage Project involves construction of Upper and Lower Reservoirs.

Upper Reservoir (proposed): The live storage of Upper Reservoir is 5 Mm^3 on river Palar. The Full Reservoir Level (FRL) is 1056 m and Minimum Draw down Level (MDDL) is 1027 m.

Lower Reservoir (proposed): The live storage of Lower Reservoir is 5.4 Mm^3 on river Periyan Pallan. The Full Reservoir Level (FRL) is 458 m and Minimum Draw down Level (MDDL) is 444 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 545 m and diameter of 8 m, 1 no. of Pressure Shaft of length 2645 m and diameter of 7 m. The Project to be operated under rated head of 576 m with installed capacity of 1000 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 735 m and diameter of 8 m

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 1.2 Sq. Km and the lower dam site is 12 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Athur Pumped Storage Project would be 1000 MW under rated head of 576 m. The Annual Energy of the project comes out to be of 2081 MU in 90% dependable year with 95% machine availability.

SALIENT FEATURES
METTUR PUMPED STORAGE PROJECT

GENERAL:

State	Tami Nadu
District	Anthiyur
River	Palar/Periyan Pallam
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Erode
Nearest Airport	Cochin Airport

UPPER RESERVOIR (proposed):

Location	Latitude: 11°46'57.1"N
	Longitude: 77°37'1.8"E
Full Reservoir Level (FRL) (m)	1056
Minimum Draw Down Level (MDDL) (m)	1027
Live Storage (Mm^3)	5

LOWER RESERVOIR (proposed):

Location	Latitude: 11°47'49.1"N
	Longitude: 77°39'40.3"E
Full Reservoir Level (FRL) (m)	458
Minimum Draw Down Level (MDDL) (m)	444
Live Storage (Mm3)	5.4

HYDROLOGY:

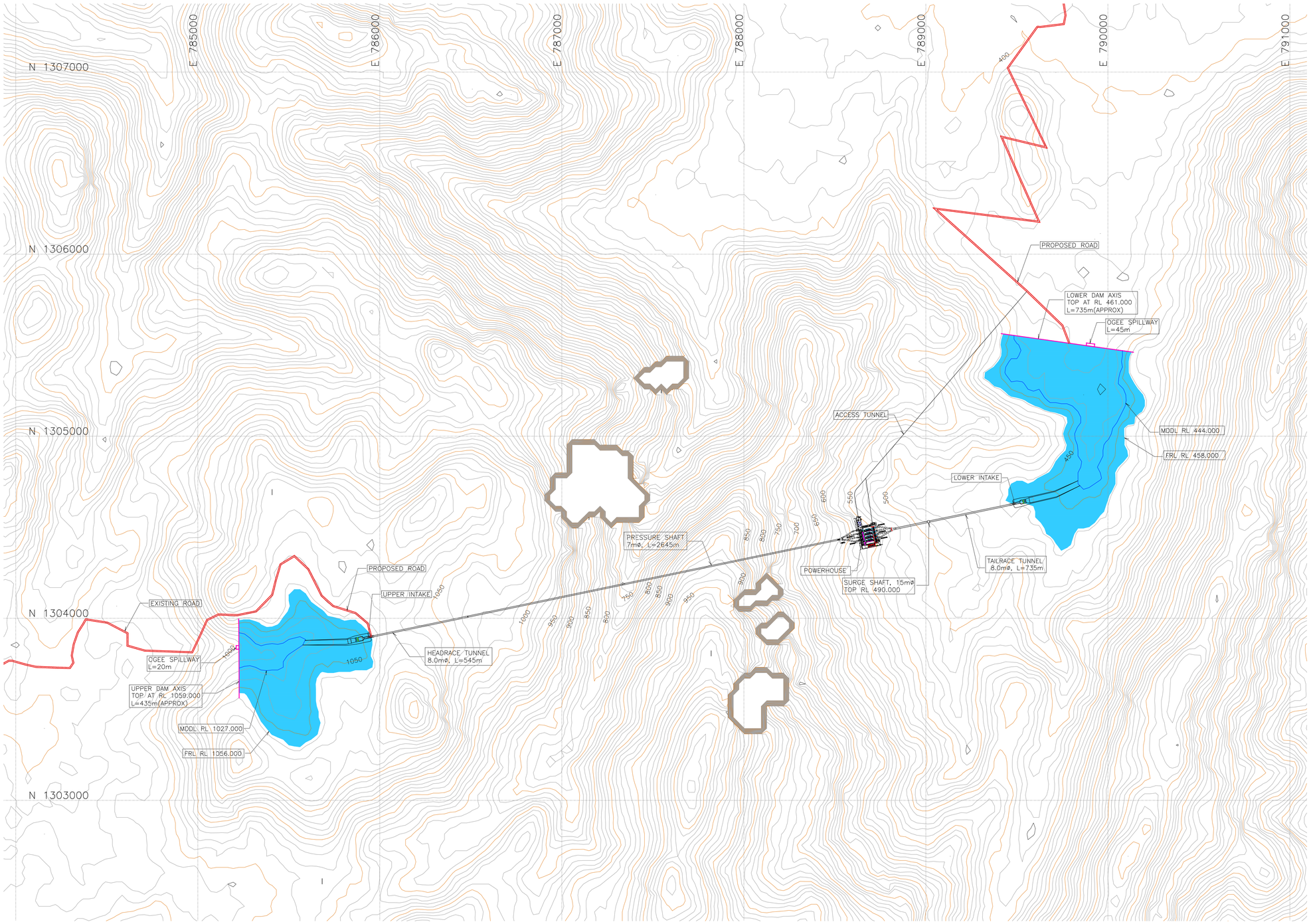
Catchment Area (Sq. Km) Upper Dam	1.2
Catchment Area (Sq. Km) Lower Dam	12

WATER CONDUCTOR SYSTEM :

HEAD RACE TUNNEL	
Number	1
Length (m)	545
Diameter (m)	8
PRESSURE SHAFT	
Number	1
Length (m)	2645
Diameter (m)	7
TAIL RACE TUNNEL	
Length (m)	735
Diameter (m)	8

POWER HOUSE:

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	250
Installed Capacity (MW)	1000
Rated Head (Generation) (m)	576
Rated Head (pumping) (m)	605
Turbine	Vertical Reversible Vertical Francis
Annual Energy (MU)	2081
Energy (MU) for Pumping	2700



LEGEND

- CONTOUR 50m INTERVAL
- CONTOUR 10m INTERVAL
- FRL(FULL RESERVOIR LEVEL)

NOTES

1. ALL DIMENSIONS, LEVELS AND COORDINATES ARE IN METERS.
2. GRIDS COORDINATES ARE BASED ON MAGNETIC NORTH AND ARE UTM COORDINATES.
3. CONTOURS HAVE BEEN GENERATED BASED ON 1" SRTM DIGITAL ELEVATION MODEL (30M RESOLUTION) OF PROJECT AREA
4. LAYOUT INDICATED IN THE DRAWING HAS BEEN FORMULATED BASED ON PRELIMINARY TOPOGRAPHICAL DATA AND IS TENTATIVE. TO BE FINALIZED BASED ON DETAILED TOPOGRAPHICAL SURVEY AND GEOLOGICAL/GEO-TECHNICAL INVESTIGATIONS DURING DPR STAGE

METTUR PUMPED STORAGE PROJECT
(4X250=1000MW)

GENERAL LAYOUT - PLAN

58. KULBERA PUMPED STORAGE PROJECT (4X200MW=800MW)

1. INTRODUCTION

Kulbera Pumped Storage Project is located in Purulia district of West Bengal. The project utilizes water of Kulbera Nadi for power generation harnessing gross head of 154 m. The powerhouse has 4 units of 200MW having installed capacity of 800 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Kulbera Nadi having upper reservoir at latitude of 23°15'26.87"N and longitude of 86°01'35.35"E and lower reservoir at latitude of 23°15'47.90"N and longitude of 86°00'6.84"E. There is a proposal of underground cavern type of Power house. The nearest railway station from the project site is Suisa and the nearest Airport is Ranchi.

3. PROJECT FEATURES

Kulbera Pumped Storage Project involves construction of Upper and Lower Reservoirs.

Upper Reservoir (proposed): The Height of the dam of Upper Reservoir is proposed to be 27.50 m with a live storage of 7.41Mcum between a Full Reservoir Level (FRL) of 530 m and Minimum Draw down Level (MDDL) of 506 m.

Lower Reservoir (proposed): The Height of the dam of Lower Reservoir is proposed to be 39.60 m with a live storage of 16 Mcum on Kulbera Nadi between a Full Reservoir Level (FRL) of 312.10 m and Minimum Draw down Level (MDDL) of 300 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a 2 nos. of Head race tunnels (HRT) of length 395 m each. The Project to be operated under gross head of 230 m with installed capacity of 800 MW. The discharged water from powerhouse is carried back to the river by Tail race channel.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 0.36 Sq. Km and the lower dam site is 18.67 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Kulbera Pumped Storage Project would be 800 MW utilising the gross head of 230 m.

SALIENT FEATURES
KULBERA PUMPED STORAGE PROJECT

GENERAL:

State	West Bengal
District	Purulia
River	Kulbera Nadi
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Suisa
Nearest Airport	Ranchi

UPPER RESERVOIR (proposed):

Location	Latitude: 23°15'26.87"N
	Longitude: 86°01'35.35"E
Full Reservoir Level (FRL) (m)	530
Minimum Draw Down Level (MDDL) (m)	506
Length of the Dam at the top(m)	530
Height of Dam (above RBL) (m)	27.50
Live Storage (Mm^3)	7.41

LOWER RESERVOIR (proposed):

Location	Latitude: 23°15'47.90"N
	Longitude: 86°00'6.84"E
Full Reservoir Level (FRL) (m)	312.10
Minimum Draw Down Level (MDDL) (m)	300
Height of Dam (above RBL) (m)	39.60
Live Storage (Mcum)	7.41

HYDROLOGY:

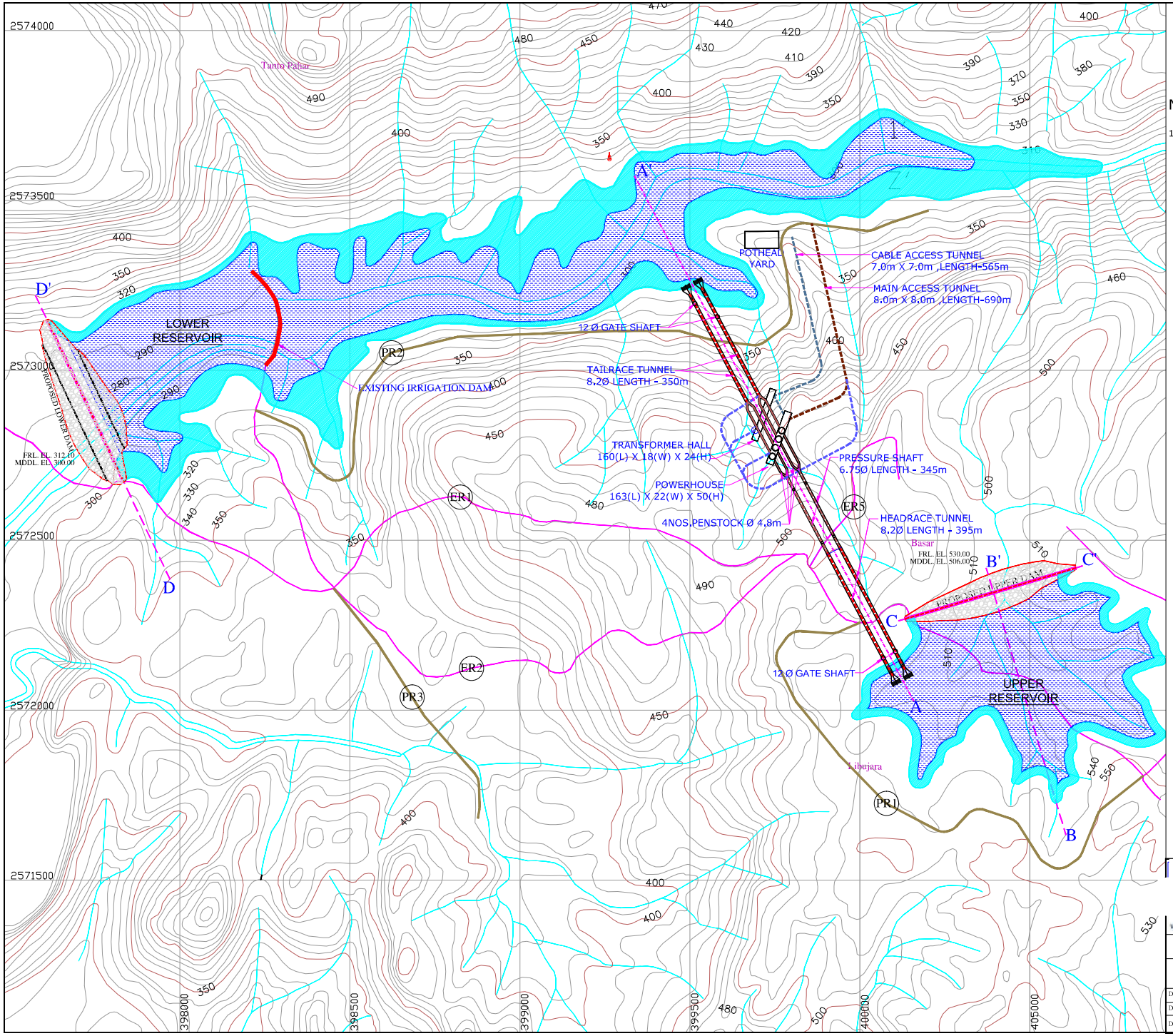
Catchment Area (Sq. Km) Upper Dam	0.36
Catchment Area (Sq. Km) Lower Dam	18.67

WATER CONDUCTOR SYSTEM:

HEAD RACE TUNNEL	
Number	2
Length (m)	395
Design Discharge (Cumecs)	110.78 (Maximum discharge of turbine at rated head)

POWER HOUSE:

Type	Cavern Underground
No. of Generating Units	4
Capacity of each Unit (MW)	200
Installed Capacity (MW)	800
Gross Head(m)	230



NOTE:

1. ALL DIMENSIONS AND LEVELS ARE IN METER UNLESS OTHERWISE SPECIFIED.

KULBERA PUMPED STORAGE PROJECT (800 MW)

GENERAL LAYOUT PLAN

DEGN.	CHKD.	SUBM.
DRAWN.	REV. NO.	APPRD.
DATE: MARCH-2023	DRG. NO. WAP/KULBERA/PFR/001	

59. BANDHU PUMPED STORAGE PROJECT (4X225MW=900MW)

1. INTRODUCTION

Bandhu Pumped Storage Project is located in Purulia district of West Bengal. The project utilizes water of Bandhu Nallah for power generation harnessing gross head of 155 m. The powerhouse has 4 units of 225 MW having installed capacity of 900 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Bandhu Nala having upper reservoir at latitude of 23°13'57.734"N and longitude of 86°09'22.7585"E and lower reservoir at latitude of 23°14'17.237"N and longitude of 86°10'15.95"E. There is a proposal of underground type of Power house. The nearest railway station is Tumna and the Airport is Ranchi.

3. PROJECT FEATURES

Bandhu Pumped Storage Project involves construction of Upper and Lower Reservoirs.

Upper Reservoir (proposed): The height of the dam of Upper Reservoir is Height 71m with a live storage of 13.49 Mm^3 on a small river Bandhu Nullah between a Full Reservoir Level (FRL) of 480 m and Minimum Draw down Level (MDDL) of 460.83 m.

Lower Reservoir (proposed): The height of the dam of Lower Reservoir is proposed to be of Height 35m with a live storage of 13.49 Mm^3 on bandhu nala between a Full Reservoir Level (FRL) of 340.44 m and Minimum Draw down Level (MDDL) of 325 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a 2 nos. of Head race tunnels (HRT) of length 847 m each. The Project to be operated under gross head of 155 m with installed capacity of 900 MW. The discharged water from powerhouse is carried back to the river by 2 nos. of Tail race tunnel of length 628 m each.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 3.50 Sq. Km and the lower dam site is 24 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Bandhu Pumped Storage Project would be 900MW utilizing the gross head of 155 m.

SALIENT FEATURES
BANDHU PUMPED STORAGE PROJECT

GENERAL:

State	West Bengal
District	Purulia
River	Bandhu Nala
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Tumna
Nearest Airport	Kolkata Airport

UPPER RESERVOIR (proposed):

Location	Latitude: 23°13'57.734"N
	Longitude: 86°09'22.758"E
Full Reservoir Level (FRL) (m)	480
Minimum Draw Down Level (MDDL) (m)	460.83
Length of the Dam at the top(m)	1776
Height of Dam (above RBL) (m)	71
Live Storage ($Mm^{3)}$	13.49

LOWER RESERVOIR (proposed):

Location	Latitude: 23°14'17.237"N
	Longitude: 86°10'15.95"E
Full Reservoir Level (FRL) (m)	340.44
Minimum Draw Down Level (MDDL) (m)	325
Type of Dam	644
Height of Dam (above RBL) (m)	53
Live Storage (Mm^3)	13.49

HYDROLOGY:

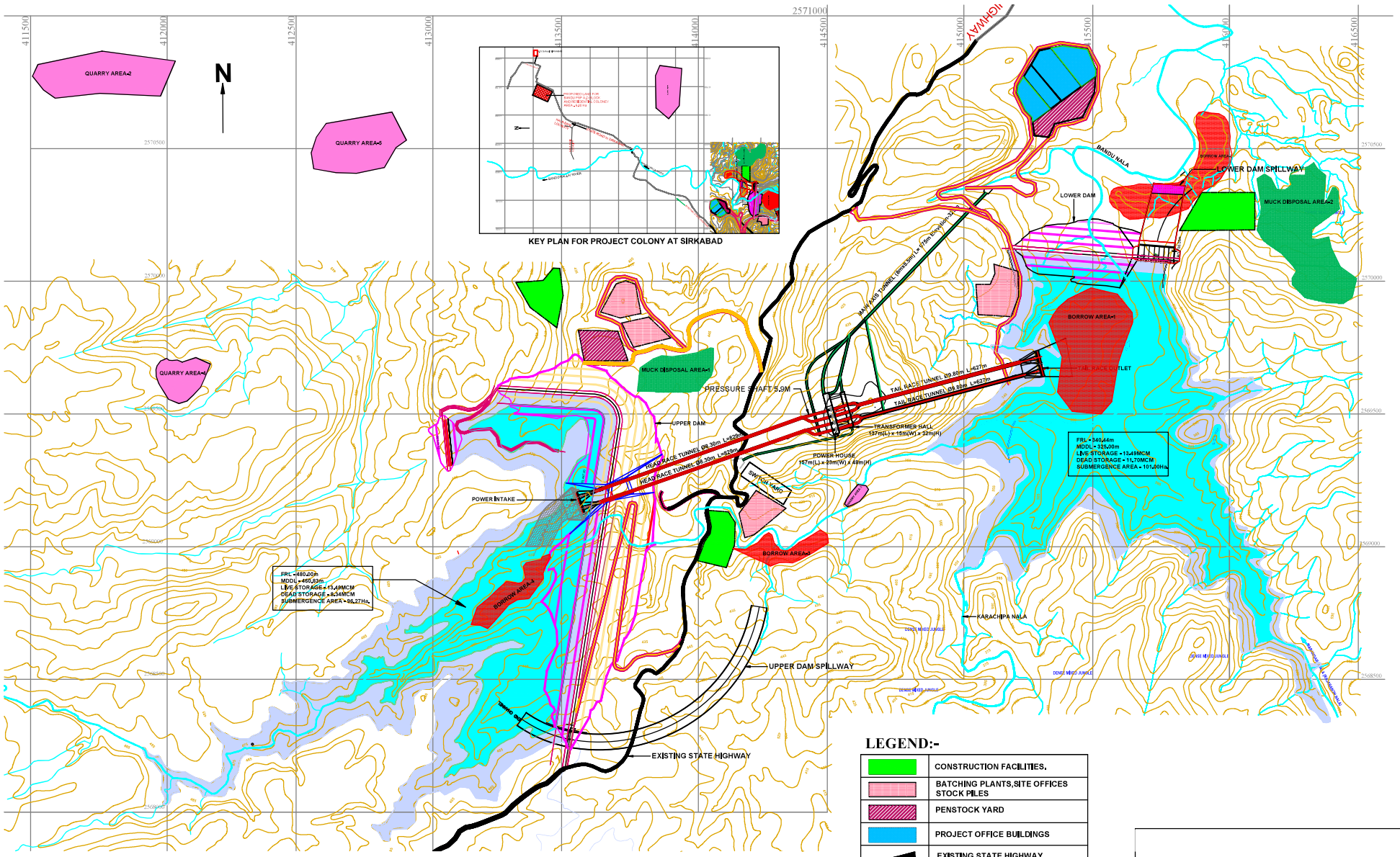
Catchment Area (Sq. Km) Upper Dam	3.5
Catchment Area (Sq. Km) Lower Dam	24

WATER CONDUCTOR SYSTEM :

HEAD RACE TUNNEL	
Number	2
Length (m)	847
Design Discharge (Cumecs)	370.50
TAIL RACE TUNNEL	
Number	2
Length (m)	628

POWER HOUSE:

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	225
Installed Capacity (MW)	900
Gross Head(m)	155


N
QUARRY AREA-2
QUARRY AREA-5
QUARRY AREA-1
KEY PLAN FOR PROJECT COLONY AT SIRKABAD
MUCK DISPOSAL AREA-1
PRESSURE SHAFT 5.9M
UPPER DAM
HEAD RACE TUNNEL Ø8.30m L=629m
HEAD RACE TUNNEL Ø8.30m L=629m
POWER INTAKE
SWITCH YARD
TRANSFORMER HALL
137m(L) x 15m(W) x 32m(H)
POWER HOUSE
157m(L) x 28m(W) x 49m(H)
TAIL RACE TUNNEL Ø9.80m L=627m
TAIL RACE TUNNEL Ø9.80m L=627m
TAIL RACE OUTLET
MAIN AXIS TUNNEL (BREASH) L=575m Ø9m(sph)
BORROW AREA-1
BORROW AREA-2
BORROW AREA-4
FRL = 480.00m
MDDL = 465.00m
LIVE STORAGE = 13.49MCM
DEAD STORAGE = 8.34MCM
SUBMERGENCE AREA = 86.27Ha.
FRL = 340.44m
MDDL = 325.00m
LIVE STORAGE = 13.49MCM
DEAD STORAGE = 11.70MCM
SUBMERGENCE AREA = 101.00Ha.
UPPER DAM SPILLWAY
EXISTING STATE HIGHWAY
KARACHIPA NALA
BANDU NALA
LOWER DAM
LOWER DAM SPILLWAY
MUCK DISPOSAL AREA-2
BORROW AREA-3
411500
412000
412500
413000
413500
414000
414500
415000
415500
416000
416500
2571000
2570500
2570000
2569500
2569000
2568500
LEGEND:-
CONSTRUCTION FACILITIES.
BATCHING PLANTS,SITE OFFICES STOCK PILES
PENSTOCK YARD
PROJECT OFFICE BUILDINGS
EXISTING STATE HIGHWAY
PROJECT ROAD
ROCK QUARRY AREA
BORROW AREA
MUCK DISPOSAL AREA
BANDU PUMPED STORAGE PROJECT (900 MW)
PROJECT LAYOUT PLAN
DEGN.
CHKD.
SUBM.
DRAWN.
REV.NO.
APPD.
DATE: FEB,2018
DRG.NO.WAP:D&RE/BANDU/02

60. PANCHET HILL PUMPED STORAGE PROJECT (4X250MW=1000MW)

1. INTRODUCTION

Panchet Hill Pumped Storage Project is located in Purulia district of West Bengal. The project utilizes water of Panchet reservoir for power generation harnessing Gross head of 457.5 m. The powerhouse has 4 units of 250 MW having installed capacity of 1000MW. The project is proposed to be executed by Damodar Valley Corporation (DVC).

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Panchet reservoir having upper reservoir at latitude of 23°37'49.6"N and longitude of 86°45'49.6"E and lower reservoir at latitude of 23°40'23.97"N and longitude of 86°44'51.28"E .There is a proposal of underground type of Power house. The nearest railway station is Kumardobi and the Airport is Durgapur.

3. PROJECT FEATURES

Panchet Hill Pumped Storage Project involves construction of

Upper Reservoir (proposed): The height of the dam of Upper Reservoir is proposed to be 6.75m with a live storage of 7 Mcum on panchet reservoir between a Full Reservoir Level (FRL) of 577 m and Minimum Draw Down Level of 555 m.

Lower Reservoir (existing): The height of the dam of Lower reservoir is proposed to be 47.85 m with a live storage of 172 Mcum on panchet reservoir between a Full Reservoir Level (FRL) of 125 m and Minimum Draw down Level (MDDL) of 119.5 m.

Water Conductor System (proposed): The proposed length of Water Conductor System is 2300m.

4. HYDROLOGY

The Catchment area of the river upto lower dam site is 5488.21 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Panchet Hill Pumped Storage Project would be 1000 MW utilising the Gross head of 457.5 m.

SALIENT FEATURES
PANCHET HILL PUMPED STORAGE PROJECT

GENERAL:

State	West Bengal
District	Purulia
River	Panchet Reservior
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Kumardobi
Nearest Airport	Durgapur

UPPER RESERVOIR:

Location	Latitude: 23°37'49.6"N
	Longitude: 86°45'49.6"E
Full Reservoir Level (FRL) (m)	577
Minimum Draw Down Level (MDDL) (m)	555
Height of Dam (above RBL) (m)	6.75
Live Storage (Mm^3)	7

LOWER RESERVOIR:

Location	Latitude: 23°40'23.97"N
	Longitude: 86°44'51.28"E
Full Reservoir Level (FRL) (m)	137
Minimum Draw Down Level (MDDL) (m)	119.5
Type of Dam	Earthen dam
Height of Dam (above RBL) (m)	47.85
Live Storage (Mm^3)	1318

HYDROLOGY:

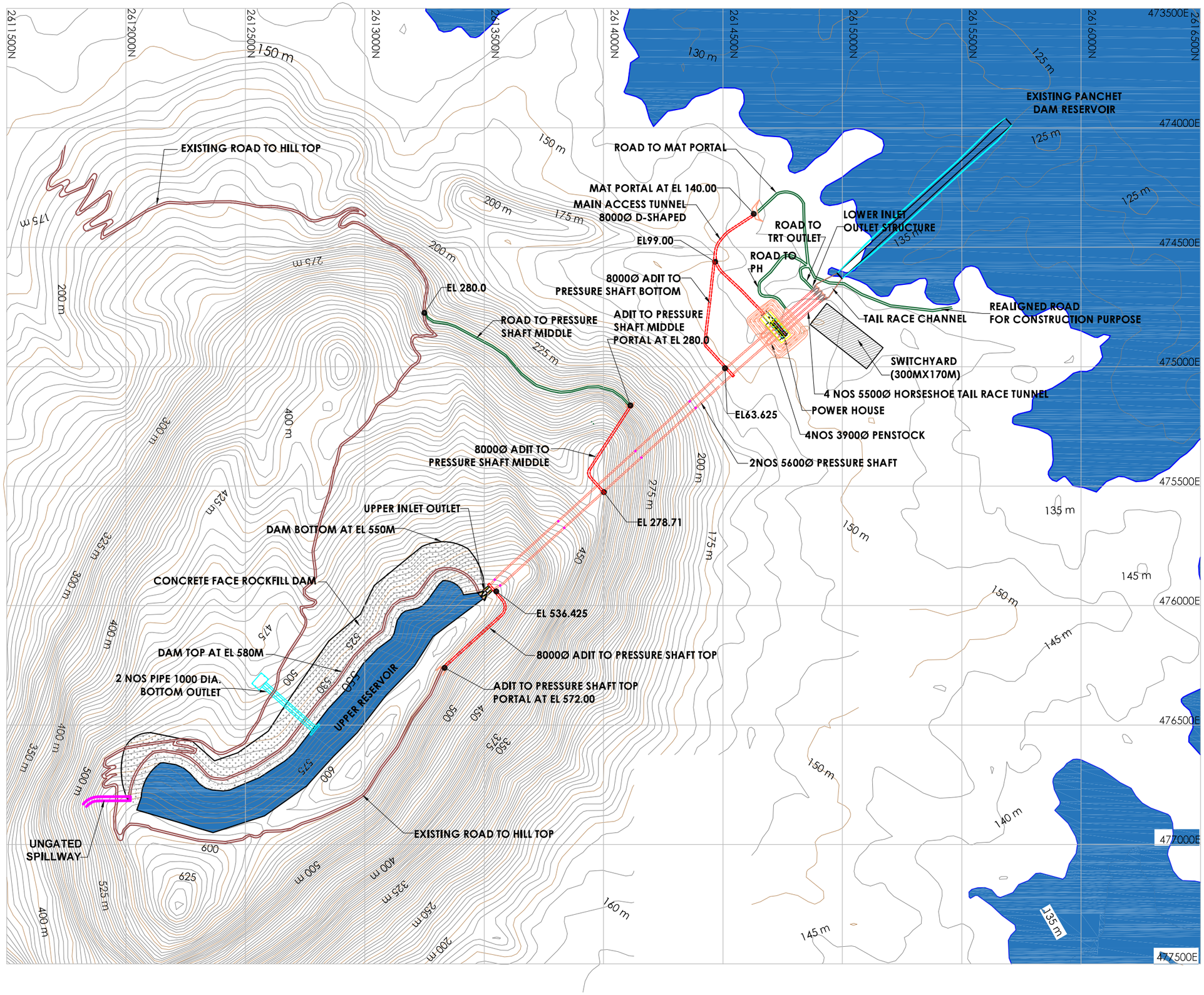
Catchment Area (Sq. Km) Lower Dam	5488.21

WATER CONDUCTOR SYSTEM:

Length (m)	2300

POWER HOUSE:

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	250
Installed Capacity (MW)	1000
Gross Head(m)	457.5



NOTES:-

1) ALL DIMENSIONS IN MM AND ELEVATIONS IN METRES.

SCALE:

0 160 320 480 640 800M

(1:16000)

पचत ।हल्स पम्प स्टारज प्लाट

PANCHET HILLS PUMP STORAGE PLANT

PROJECT GENERAL LAYOUT

PFR DRAWING

DATE	NO.	REVISION OR ISSUES	BY.	CH.	APP.

DESIGN MEMO NO.- डिजाइन मेमो संख्या

DRAWN अंकित	SUBMITTED प्रस्तुत	RECOMMENDED अनुशंसित	APPROVED अनुमोदन

DATE दिनांक	DRG. NO. ड्रेस संख्या						
DEC.2022	NHPH	F	41	GA	001	00

DRG. NO.

61. KATHLAJAL PUMPED STORAGE PROJECT (4X225MW=900MW)

1. INTRODUCTION

Kathlajal Pumped Storage Project is located in Purulia district of West Bengal. The project utilizes water of Kathlajal nala for power generation harnessing gross head of 221.1 m. The powerhouse has 4 units of 225MW having installed capacity of 900MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Kathlajal nala having upper reservoir at latitude of 23°10'25.61''N and longitude of 86°09'10.40''E and lower reservoir is located at latitude of 23°09'17.22''N and longitude of 86°08'52.43''E. There is a proposal of underground cavern type of Powerhouse .The nearest railway station is Barabhum and the Airport is Ranchi.

3. PROJECT FEATURES

Kathlajal Pumped Storage Project involves construction of Upper Reservoir and Lower Reservoirs

Upper Reservoir (Proposed): The Height of the dam of Upper Reservoir is proposed to be 59 m with a live storage of 11.25 Mcum. The Upper Reservoir has Full Reservoir Level (FRL) of 511.10 m and Minimum Draw down Level (MDDL) of 480 m.

Lower Reservoir (Proposed: The Height of the dam of Lower Reservoir is proposed to be 68.50 m with a live storage of 11.25 Mcum. The Lower Reservoir has Full Reservoir Level (FRL) of 330.50 m and Minimum Draw down Level (MDDL) of 290 m.

Water Conductor System (Proposed): The proposed Water Conductor System comprises of a 2 nos. of Head race Tunnel (HRT) of length 471 m each. The Project is to be operated under average gross head of 221.1 m with installed capacity of 900MW. The discharged water from powerhouse is carried back to the river by Tail Race Channel.

4. HYDROLOGY

The catchment area of the river upto upper dam site is 4.88 Sq. km and the lower dam site is 11.45 Sq.km.

5. POWER & ENERGY BENEFITS

The installed capacity of Kathlajal Pumped Storage Project would be 900MW utilizing the average gross head of 221.1 m.

SALIENT FEATURES
KATHLAJAL PUMPED STORAGE PROJECT

GENERAL:

State	West Bengal
District	Purulia
River	Kathlajal Nala
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Barabhum
Nearest Airport	Ranchi

UPPER RESERVOIR (proposed):

Location	Latitude: 23°10'25.61"N
	Longitude: 86°09'10.40"E
Full Reservoir Level (FRL) (m)	511.10
Minimum Draw Down Level (MDDL) (m)	480
Length of the Dam at the top(m)	516
Height of Dam (above RBL) (m)	59
Live Storage (Mm^3)	11.25

LOWER RESERVOIR (proposed):

Location	Latitude: 23°09'17.22"N
	Longitude: 86°08'52.43"E
Full Reservoir Level (FRL) (m)	330.50
Minimum Draw Down Level (MDDL) (m)	290
Length of Dam at top (m)	580
Height of Dam (above RBL) (m)	68.50
Live Storage (Mcum)	11.25

HYDROLOGY:

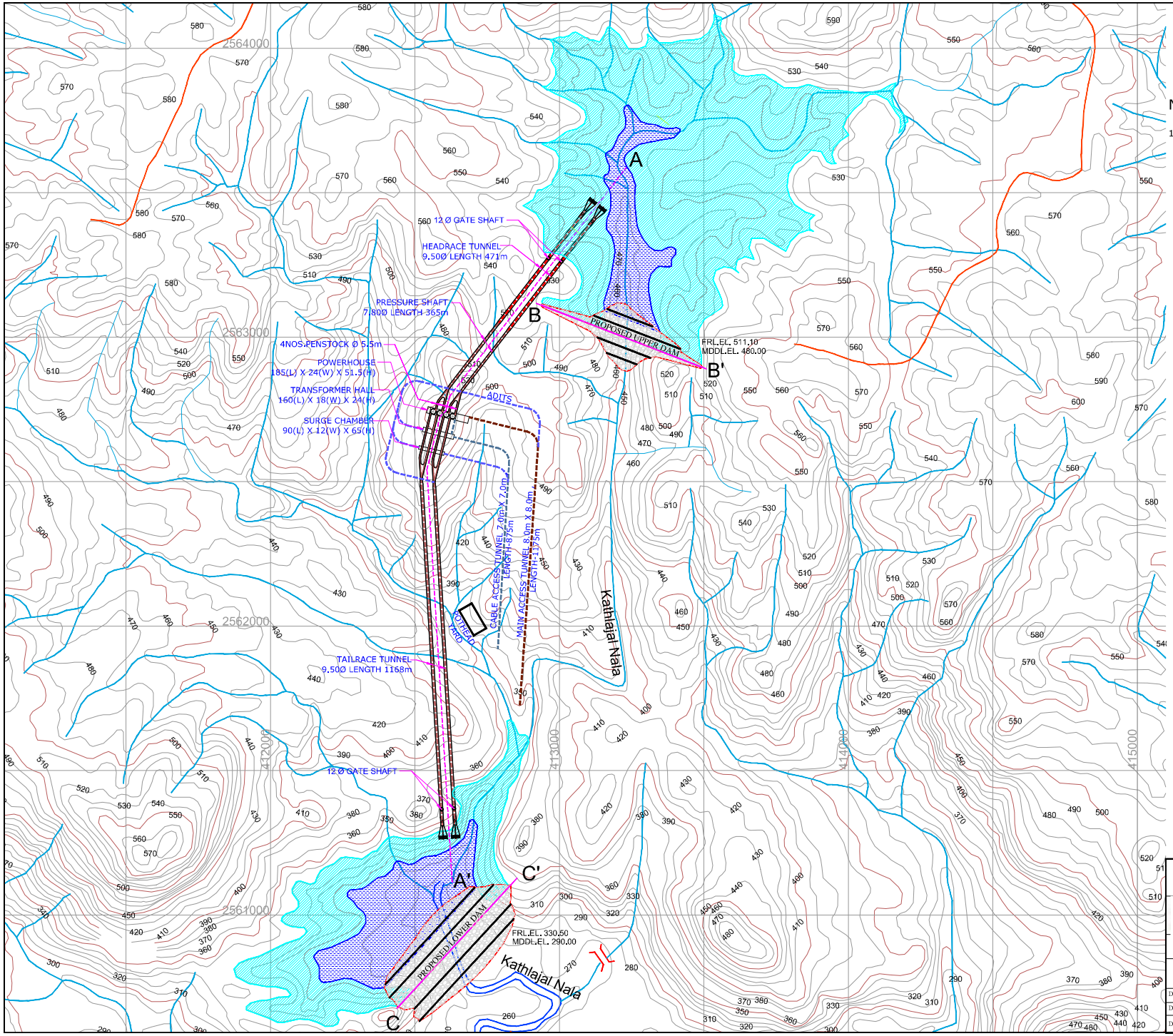
Catchment Area (Sq. Km) Upper Dam	4.88
Catchment Area (Sq. Km) Lower Dam	11.45

WATER CONDUCTOR SYSTEM (proposed):

HEAD RACE TUNNEL	
Number	2
Length (m)	471
Design Discharge (Cumecs)	148.84 (Maximum discharge of turbine at rated head)

POWER HOUSE (proposed):

Type	Underground Cavern
No. of Generating Units	4
Capacity of each Unit (MW)	225
Installed Capacity (MW)	900
Gross Head(m)	221.1



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NOTE:

1. ALL DIMENSIONS AND LEVELS ARE IN METER UNLESS OTHERWISE SPECIFIED.

KATHLAJAL PUMPED STORAGE PROJECT (900 MW)

GENERAL LAYOUT PLAN

DEGN.	CHKD.	SUBM.
DRAWN.	REV. NO.	APPRD.
DATE: DEC-2022	DRG. NO. WAP/KATHLAJAL/PPR/001	

RANKING CRITERIA FOR ON-RIVER PUMPED STORAGE PROJECT

S.NO	PARAMETERS FOR RANKING OF ON RIVER PUMPED STORAGE HYDROELECRIC PROJECT (PRIORITY WISE)	MARKS ALLOTED
1	Potential of Scheme (20 Marks)	100 MW=1 Marks
2	Type of Development (Number of Reservoirs) (20 Marks)	2 Reservoir= 20 Marks 1 Reservoir= 10 Marks
3	R&R Aspect (10 Marks)	Case to Case basis Marks. Any submergence and R&R issue, Population, mandir etc.
4	Height of Dam (15 Marks) (m)	Upto 50 m= 15 Marks 51 m to 75 m= 10 Marks Above 75 m = 5 Marks
5	Length of Tunnel (15 Marks) (m)	Upto 2km= 15 Marks 2.1 Km to 3Km= 10 Marks Beyond 3Km = 5 Marks
6	Accessibility to Site (10 Marks)	Case to Case basis marks. Presence of Approach road/Rail Head or Project location in higher reaches of river, Availability of Infrastructure such as 1.Township 2.Storage 3.Residential
7	Interstate Aspect (5 Marks)	If, YES= 0 Marks If, No= 5 Marks
8	Wildlife issue (5 Marks)	If, YES= 0 Marks If, No= 5 Marks
	TOTAL	**100**

RANKING	Name of the projects	State	River	Ranking of Pump Storage Hydroelectric Projects														TOTAL (100 marks)
				(1) Potential of Scheme (20 Marks)		(2) Type of Development (20 Marks)		(3) R&R Aspect (10 Marks)		(4) Height of Dam (15 Marks) (m)		(5) Length of Tunnel (15 Marks) (m)		(6) Accessibility to Site (10 Marks)		(7) Interstate Aspect (5 Marks)	(8) Wildlife issue	
				100 MW=1 Marks		2Reservoir= 20 marks, 1 Reservoir= 10 marks		Case to Case basis marks		Upto 50 m= 15 marks, 51 m to 75 m= 10 marks, Above 75 m = 5 marks		Upto 2km= 15marks, 2.1 Km to 3Km= 10 marks, Beyond 3Km = 5 marks		Case to Case basis marks		If, YES= 0 Marks, If, No= 5 Marks	If, YES= 0 Marks, If, No= 5 Marks	
				Proposed Installed Capacity (MW)	Marks	No. of Reservoirs Operational	Marks	Any submergence and R&R issue, Population, mandir etc	Marks	Range of the total Height of All Dams to be constructed	Marks	Range of Length of Total water conductor system	Marks	Presence of Approach road/Rail Head or Project location in higher reaches of river, Availablity of Infrastructure such as 1.Township 2.Storage 3.Residential	Marks			
1	Sharavathy	Karnataka	Sharavathy	2000	20	2	20	Very Less Population	8	62.48 (Upper)(Existing), 53 (Lower) (Existing)	15	7240	5	Road/ Existing Reservoir	10	5	0 Proximity to Ecological senstive area Sharavathy WLS	**83**
2	Indira Sagar-Omkareshwar PSP	Madhya Pradesh	Narmada	525	5.25	2	20	Both existing Reservoir	10	92m (Upper)(exisiting Indira Sagar Dam reservoir) Constructed, 53m (Lower)(Existing Omkareshwar Dam Reservoir) Constructed	15	2030	10	Both existing Reservoir	10	5	5	**80.25**
3	Kodayar	Tamil Nadu	Kodayar	1500	15	2	20	Both existing Reservoir	10	87.78m (Upper)(exisiting Upper Kodayar Dam) Constructed, 32.31 m (Lower)(Existing Pechiparai dam) Constructed	15	5310	5	Both existing Reservoir	10	5	0 Inside wildlife boundary Keelamalai /Veerapuli RF	**80**
4	Aliyar	Tamil Nadu	Valparai/ Pollachi	700	7	2	20	No R&R issue, Population	10	Upper Existing , Lower Existing	15	2720	10	Both existing Reservoir	10	5	0 Indra Gandhi National Park	**77**
5	Ghatghar Stage-II	Maharashtra	Pravara	125	1.25	2	20	No R&R issue, Population	10	15.56 (Upper Existing),86.14 (lower Existing)	15	660	15	Both existing Reservoir	10	5	0 Kalsubai WLS	**76.25**
6	Upper Bhavani	Tamil Nadu	Bhavani	1000	10	2	20	Both existing Reservoir	10	80m (Upper)(exisiting Upper bhavani reservoir) Constructed, 57 m (Lower)(Existing Avalance dam) Constructed 65 m (Lower)(Existing Emerald dam Constructed	15	6000	5	All the three existing Reservoir	10	5	0 One reservoir in wildlife	**75**
7	Varahi	Karnataka	Varahi	1500	15	1	10	Near Existing Varahi HEP, Bridge in submergence	9	39.6 (Upper)(Existing), 27.25 (Lower) (Proposed)	15	3430	5	Near Varahi HEP	10	5	5	**74**
8	Kopili	Assam	Kopili	320	3.2	2	20	Existing Reservoir	10	66 (Upper) (Existing)	15	3875	5	Existing reservoir	10	5	5	**73.2**
9	Panchet Hill	West Bengal	Panchet Reservoir	1000	10	1	10	Existing reservoir,Colony in FRL may be R&R issue	8	6.75 (Upper)(Proposed), 45(Lower) (Existing)	15	2300	10	Existing upper Reservoir & Road	10	5	5	**73**
10	Idukki	Kerala	Periyar,Kilivallithodu and Cheruthoni	600	6	1	10	Existing upper reservoir/No population nearby	10	99.97(Upper)(Existing), 50 (Lower) (Proposed)	15	2320	10	Existing upper reservoir	10	5	5	**71**
11	Manalar	Tamil Nadu	Megamalai	1200	12	1	10	No R&R issue, Population	10	40 (Upper Existing) ,32 (Lower Proposed)	15	5375	5	Existing reservoir Pechiparai Reservoir	10	5	0 Kanyakumari WLS	**67**
12	Panyor	Arunachal Pradesh	Panyor	660	6.6	1	10	Both existing Reservoir	10	37.5 (Upper) (Proposed), 68 (Lower) (Existing)	15	5395	5	Existing reservoir	10	5	5	**66.6**

13	Mutkhel	Maharashtra	Pravara	110	1.1	1	10	No R&R issue, Population	10	48 (Proposed)/90 (Existing)	15	460	15	Existing reservoir	10	5	0 Kalsubai WLS	**66.1**
14	Daizo Lui	Mizoram	Koladyne	2000	20	0	0	No R&R issue, Population	10	60 (Upper)(Proposed), 50 (Lower) (Proposed)	5	1800	15	No Infra/Population	5	5	5	**65**
15	Majra	Himachal Pradesh	Sarhyali Khad/Govind Sagar	700	7	1	10	Mild Population, R&R issue	6	40 (Upper)(Proposed), 225.55Govid Sagar Reservior (Lower) (Existing)	15	2200	10	Less Infrastucture & Residential Present	7	5	5	**65**
16	Renukaji (Renuka)	Himachal Pradesh	Jogar ka Khala/ Dadahu Storage	1630	16.3	1	10	Mild Population, R&R issue	9	110 (Upper)(Proposed), 148 (Lower) (Existing)	5	3833.83	5	Less Infrastucture & Residential Present	7	5	5	**62.3**
17	Nive	Maharashtra	Kundalika	1200	12	0	0	No R&R issue, Population	10	58.50 (Upper)(Proposed), 66 (Lower) (Proposed)	5	1310	15	Near mulshi/bhira dam	10	5	5	**62**
18	Warasgaon	Maharashtra	Mose/Kal	1200	12	0	0	No R&R issue, Population	10	52.6/37 (Proposed)	5	1739.26	15	Near Gadheli dam	10	5	5	**62**
19	Sandynalla	Tamil Nadu	Sandynallah	1200	12	1	10	No R&R issue, Population	10	35.88 m (Upper)(exisiting Sandynallah (Kamaraj Sagar dam)Constructed, 82 m (Lower)(proposed)	5	3900	5	Existing reservoir	10	5	5	**62**
20	Savitri	Maharashtra	Satara/Raigad	2250	20	0	0	Old mahabaleshwar town, mild population	6	45/45 (Proposed)	5	3 km	10	Near existing reservoir, Infrastucture & Residential Present	10	5	5	**61**
21	Bhavali	Maharashtra	Darna/ Ulhas	1500	15	0	0	No R&R issue, Population	10	52 (Upper)(Proposed), 65 (Lower) (Proposed)	5	2191.9	10	Near bhavali dam	10	5	5	**60**
22	Lugupahar	Jharkhand	Damodar River/Bokaro River	1500	15	0	0	No R&R issue, Population	10	104.5 (Upper)(Proposed), 31.5 (Lower) (Proposed)	5	2204	10	Coal Field, Railway Station present	10	5	5	**60**
23	Palar-Porathalar	Tamil Nadu	Amravati	1100	11	1	10	Temple only,No R&R issue, Population	9	Upper Proposed , Lower Existing	5	3820	5	Lower Existing Palar dam	10	5	5	**60**
24	Kengadi	Maharashtra	Thane	1550	15.5	0	0	Local road in submergence,No R&R issue, Population	9	45/39 (Proposed)	5	2.5km	10	Kasara Railway station/NH available	10	5	5	**59.5**
25	Panshet	Maharashtra	Mose/Kal	1600	16	0	0	No R&R issue, Population	10	63.8 (Upper)(Proposed), 45.6 (Lower) (Proposed)	5	2140.17	10	Local approach road present	8	5	5	**59**
26	Bandhu	West Bengal	Bandhu Nala	900	9	0	0	No R&R issue, Population	10	35 (Upper)(Proposed), 35(Lower) (Proposed)	10	1475	15	No Infrastucture, Approach road & Residential Present	5	5	5	**59**
27	Kulbera	West Bengal	Rupai Nala/Kulbera Nala	800	8	0	0	No R&R issue, Population	10	75(Upper)(Proposed), 40 (Lower) (Proposed)	5	395	15	Near Khairabera Dam	10	5	5	**58**
28	Jalond	Maharashtra	Thane/Ahmednagar	2400	20	0	0	No R&R issue, Population	10	45/30 (Proposed)	5	2.3 km	10	Less Infrastucture & Residential Present	7	5	0 Kalsubai WLS	**57**
29	Malshej Ghat	Maharashtra	Kalu	700	7	0	0	No R&R issue, Population	10	34/59 (Proposed)	5	1000	15	Near Pimpalgaon Joga dam	10	5	5	**57**
30	Chattar	Tamil Nadu	Chattar nallah/Kodayar	1100	11	1	10	No R&R issue, Population	10	Upper Proposed, Lower Existing	5	5300	5	Existing reservoir	10	5	0 Kanyakumari WLS	**56**
31	Karayar	Tamil Nadu	Manpidi Ar/ Ambasamudram	1000	10	1	10	No R&R issue, Population	10	Upper Proposed , Lower Existing KARAYAR DAM	5	4620	5	Existing reservoir	10	5	0 UR in Mundanthurai Sactury	**55**
32	Manjalar	Tamil Nadu	Iruttar/Manjalar	500	5	1	10	No R&R issue, Population	10	(Upper)(proposed), (Lower) (existing)	5	4580	5	Near Highway, Lower Existing Manjalar dam	10	5	5	**55**
33	Koyna Stage-VI	Maharashtra	Koyna	400	4	1	10	No R&R issue, Population	10	13.5 upper (proposed), 103.2 (Existing)	10	7 km	5	Existing reservoir	10	5	0 KOYNA WLS	**54**
34	Atvan	Maharashtra	Pawana/Uttara	500	5	0	0	5-10 houses present, Population	9	44/31 (Proposed)	5	1523	15	Infrastucture & Residential Present	10	5	5	**54**
35	Amba	Maharashtra	Raigad	800	8	0	0	No R&R issue, Population	10	26 (Proposed),26 (Proposed)	10	4700	5	Near pawana dam	10	5	5	**53**
36	Kodali	Maharashtra	Kodali Nalla/Kharal Nadi	220	2.2	0	0	No R&R issue, Population	10	26.54 (Upper)(Proposed), 53 (Lower) (Proposed)	5	2000	15	Near National highway	10	5	5	**52.2**
37	Tuiphai Lui	Mizoram	Tuiphai Lui	1650	16.5	0	0	No R&R issue, Population	10	33 (Upper)(Proposed), 60 (Lower) (Proposed)	5	2800	10	No Infra/Population	5	5	0 Lower Reservoir in WLS	**51.5**

38	Yerravaram PSP	Andhra Pradesh	local stream joining Thandava River	1200	12	0	0	Very Less Population on lower Reservoir	8	62m (Upper reservoir)(proposed), 59m (Lower Reservoir)(proposed)	5	2870	10	NO Infrastucture & Residential Present	5	5	5	**50**
39	Sillahalla St.-I	Tamil Nadu	Sillahalla	1000	10	0	0	Very few homes in R&R	10	82m (Upper reservoir)(proposed), 112m (Lower Reservoir)(proposed)	5	5790	5	Kundah-I HEP nearby	10	5	5	**50**
40	Athur	Tamil Nadu	Kodaganar	300	3	1	10	Mild Population, R&R issue	6	(Upper)(proposed), (Lower) (existing)	5	7008	5	Lower Existing Athur dam	10	5	5	**49**
41	Kathlajal	West Bengal	Kathlajal Nala	900	9	0	0	No R&R issue, Population	10	59 (Upper Proposed), 68.50 (Lower) (Proposed)	5	2300	10	No Infra/Population	5	5	5	**49**
42	Jalvara	Maharashtra	Hajatar River	2220	20	0	0	Less Population, R&R issue	8	46 (Upper)(Proposed), 77 (Lower) (Proposed)	5	5200	5	No Infra/Population	5	0 UR in karnataka	5	**48**
43	Varandhghat	Maharashtra	Welvandi/Kharak	800	8	0	0	No R&R issue, Population	10	29.7(Upper)(Proposed), 39.84(Lower) (Proposed)	10	3180	5	No infra/accessbility/ approach road	5	5	5	**48**
44	Leiva Lui	Mizoram	Pharsih Lui	1500	15	0	0	No R&R issue, Population	10	77 (Upper)(Proposed), 84 (Lower) (Proposed)	5	3730	5	No Infra/Population	5	5	0 FRL in wildlife	**45**
45	Mettur	Tamil Nadu	Palar/Periya Pallam	1000	10	0	0	No R&R issue, Population	10	(Upper)(proposed), (Lower) (proposed)	5	5100	5	No Accesbility/Infra present	5	5	5	**45**
46	Sigur	Tamil Nadu	Sigur	800	8	0	0	No R&R issue, Population	10	42 (Upper Proposed) ,78 (Lower Proposed)	5	4340	5	Mayar dam nearby	10	5	0 Both reservoir in wildlife	**43**
47	Pallivasal	Kerala	Mudirapuzha	600	6	0	0	Road in submergence	7	80(Upper)(Proposed), 50 (Lower) (Proposed)	5	3280	5	Infrastucture & Residential Present	10	5	5	**43**
48	Nghasih	Mizoram	Khawiva Lui	400	4	0	0	No R&R issue, Population	10	57 (Upper)(Proposed), 52 (Lower) (Proposed)	5	3000	5	No Infra/Population	5	5	5	**39**
				50360														

STATUS OF ON-RIVER PUMPED STORAGE PROJECTS UNDER PLANNING STAGE WHICH CAN BE TAKEN UP FOR FURTHER STUDIES

Ranking	Project Name	State	Proposed Installed Capacity (MW)	Status
1	Sharavathy	Karnataka	2000	Being developed by KPCL DPR under Preparation
2	Indira Sagar-Omkareshwar PSP	Madhya Pradesh	525	Being developed by NHPC PFR prepared
3	Kodayar	Tamil Nadu	1500	Being developed by TANGEDCO DPR under Preparation
4	Aliyar	Tamil Nadu	700	Being developed by TANGEDCO PFR Prepared
5	Ghatghar Stage-II	Maharashtra	125	Being developed by WRD Maharashtra PFR Prepared
6	Upper Bhavani	Tamil Nadu	1000	Indicated by MoP to NTPC
7	Varahi	Karnataka	1500	Being developed by KPCL. DPR under Preparation
8	Kopili	Assam	320	Being developed by NEEPCO PFR Prepared
9	Panchet Hill	West Bengal	1000	Being developed by DVC PFR Prepared
10	Idukki	Kerala	600	Indicated by MoP to THDC
11	Manalar	Tamil Nadu	1200	Being developed by TANGEDCO PFR Prepared
12	Panyor	Arunachal Pradesh	660	Being developed by NEEPCO PFR Prepared
13	Mutkhel	Maharashtra	110	Being developed by WRD Maharashtra PFR Prepared
14	Daizo Lui	Mizoram	2000	Being developed by SJVN PFR under Preparation
15	Majra	Himachal Pradesh	700	Indicated by MoP to BBMB

STATUS OF ON-RIVER PUMPED STORAGE PROJECTS UNDER PLANNING STAGE WHICH CAN BE TAKEN UP FOR FURTHER STUDIES

16	Renukaji	Himachal Pradesh	1630	Being developed by HPPCL PFR Prepared
17	Nive	Maharashtra	1200	Being developed by WRD Maharashtra PFR Prepared
18	Warasgaon	Maharashtra	1200	Being developed by WRD Maharashtra Under S&I
19	Sandynalla	Tamil Nadu	1200	Indicated by MoP to NTPC
20	Savitri	Maharashtra	2250	Indicated by MoP to NHPC
21	Bhavali	Maharashtra	1500	Being developed by JSW Energy Under S&I
22	Lugupahar	Jharkhand	1500	Indicated by MoP to DVC
23	Palar-Porathalar	Tamil Nadu	1100	Being developed by TANGEDCO PFR Prepared
24	Kengadi	Maharashtra	1550	Indicated by MoP to NHPC
25	Panshet	Maharashtra	1600	Being developed by WRD Maharashtra PFR Prepared
26	Bandhu	West Bengal	900	Being developed by WBSEDCL PFR under Preparation
27	Kulbera	West Bengal	800	Indicated by MoP to DVC
28	Jalond	Maharashtra	2400	Indicated by MoP to NHPC
29	Malshej Ghat	Maharashtra	700	Being developed by Adani PFR under Preparation
30	Chattar	Tamil Nadu	1100	Being developed by TANGEDCO PFR Prepared
31	Karayar	Tamil Nadu	1000	Being developed by TANGEDCO PFR Prepared
32	Manjalar	Tamil Nadu	500	Being developed by TANGEDCO PFR Prepared
33	Koyna Stage-VI	Maharashtra	400	Being developed by WRD Maharashtra PFR Prepared

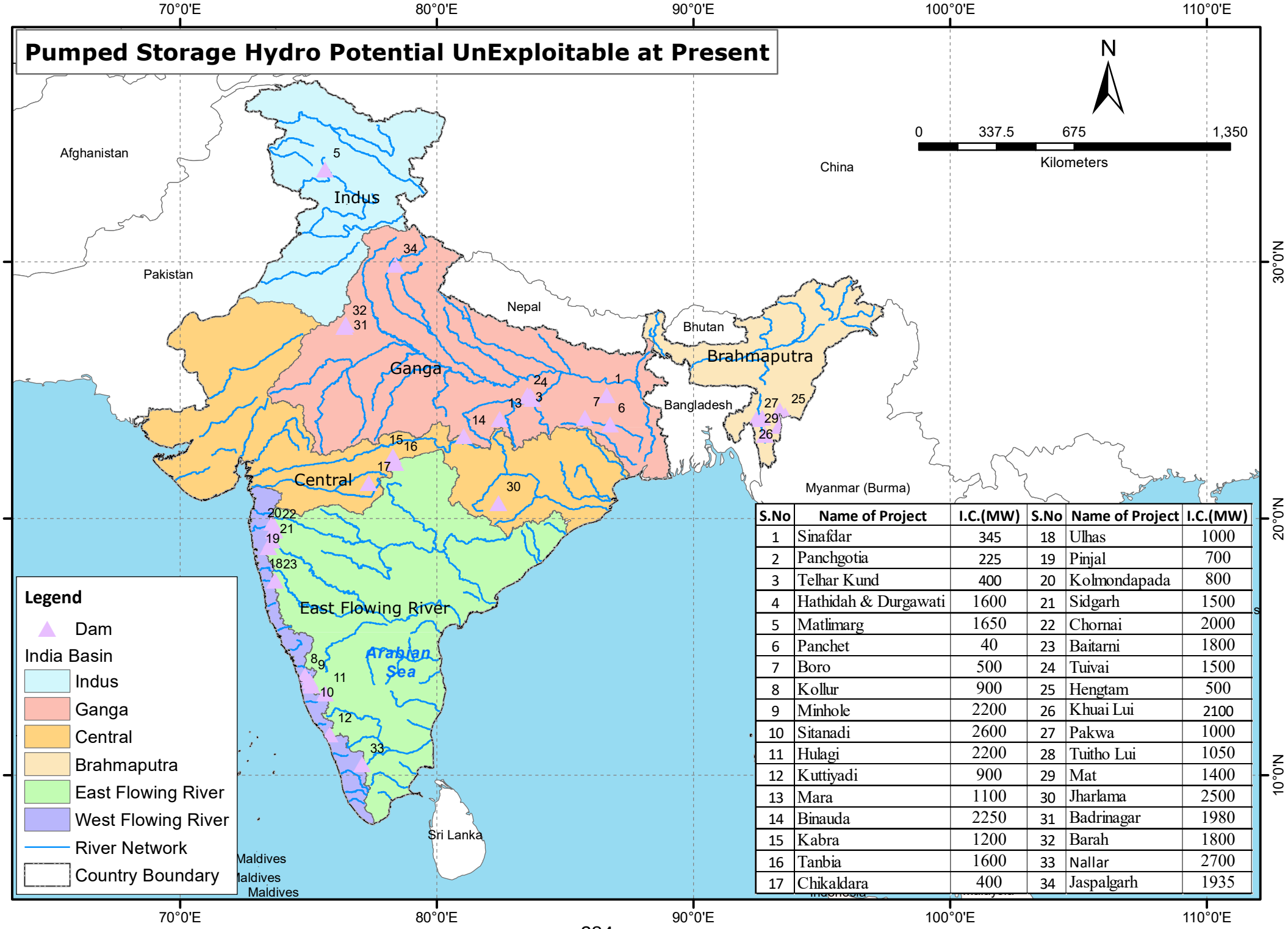
STATUS OF ON-RIVER PUMPED STORAGE PROJECTS UNDER PLANNING STAGE WHICH CAN BE TAKEN UP FOR FURTHER STUDIES

34	Atvan	Maharashtra	500	Being developed by WRD Maharashtra PFR Prepared
35	Amba	Maharashtra	800	Being developed by NTPC PFR Prepared
36	Kodali	Maharashtra	220	Being developed by WRD Maharashtra and PFR Prepared
37	Tuiphai Lui	Mizoram	1650	Being developed by NEEPCO PFR under Preparation
38	Yerravaram PSP	Andhra Pradesh	1200	Being developed by NREDCAP Under S&I
39	Sillahalla St.-I	Tamil Nadu	1000	Being developed by TANGEDCO DPR under Preparation
40	Athur	Tamil Nadu	300	Being developed by TANGEDCO PFR Prepared
41	Kathlajal	West Bengal	900	Being developed by WBSEDCL PFR under Preparation
42	Jalvara	Maharashtra	2220	Being developed by SJVN PFR prepared
43	Varandhghat	Maharashtra	800	Being developed by WRD Maharashtra PFR Prepared
44	Leiva Lui	Mizoram	1500	Being developed by NEEPCO PFR under Preparation
45	Mettur	Tamil Nadu	1000	Being developed by TANGEDCO PFR Prepared
46	Sigur	Tamil Nadu	800	Indicated by MoP to NTPC
47	Pallivasal	Kerala	600	Being developed by KSEB DPR under Preparation
48	Nghasih	Mizoram	400	Being developed by NEEPCO PFR under Preparation

UNEXPLOITABLE STATE-WISE ON- RIVER PUMPED STORAGE POTENTIAL		
Region/ State	**No of projects**	**Installed capacity (MW)**
NORTHERN		
Rajasthan	2	3780
Uttarakhand	1	1935
J&K	1	1650
Sub Total (NR)	**4**	**7365**
WESTERN		
Madhya Pradesh	4	6150
Maharashtra	7	8200
Sub Total (WR)	**11**	**14,350**
SOUTHERN		
Karnataka	4	7900
Kerala	1	900
Tamil Nadu	1	2700
Sub Total (SR)	**6**	**11,500**
EASTERN		
Jharkhand	2	540
Bihar	4	2570
Odisha	1	2500
Sub Total (ER)	**7**	**5610**
NORTH EASTERN		
Mizoram	4	5550
Manipur	2	2000

Sub Total (NE)	**6**	**7550**
Grand Total	**34**	**46,375.0**

Pumped Storage Hydro Potential UnExploitable at Present



S.No	Name of Project	I.C.(MW)	S.No	Name of Project	I.C.(MW)
1	Sinafdar	345	18	Ulhas	1000
2	Panchgotia	225	19	Pinjal	700
3	Telhar Kund	400	20	Kolmondapada	800
4	Hathidah & Durgawati	1600	21	Sidgarh	1500
5	Matlimarg	1650	22	Chornai	2000
6	Panchet	40	23	Baitarni	1800
7	Boro	500	24	Tuivai	1500
8	Kollur	900	25	Hengtam	500
9	Minhole	2200	26	Khuai Lui	2100
10	Sitanadi	2600	27	Pakwa	1000
11	Hulagi	2200	28	Tuitho Lui	1050
12	Kuttiyadi	900	29	Mat	1400
13	Mara	1100	30	Jharlama	2500
14	Binauda	2250	31	Badrinagar	1980
15	Kabra	1200	32	Barah	1800
16	Tanbia	1600	33	Nallar	2700
17	Chikaldara	400	34	Jaspalgarh	1935

Details of Unexploitable Pumped Storage Projects

S.No.	Name	Installed Capacity (MW)	State
1	Sinafdar Pumped Storage Project	345	Bihar
2	Panchgotia Pumped Storage Project	225	Bihar
3	Telhar Pumped Storage Project	400	Bihar
4	Hathidah & Durgawati Pumped Storage Project	1600	Bihar
5	Matlimarg Pumped Storage Project	1650	Jammu & Kashmir
6	Panchet Pumped Storage Project	40	Jharkhand
7	Boro Pumped Storage Project	500	Jharkhand
8	Kollur Pumped Storage Project	900	Karnataka
9	Minhole Pumped Storage Project	2200	Karnataka
10	Sitandi Pumped Storage Project	2600	Karnataka
11	Hulagi Pumped Storage Project	2200	Karnataka
12	Kuttiyadi Pumped Storage Project	900	Kerala
13	Mara Pumped Storage Project	1100	Madhya Pradesh
14	Binauda Pumped Storage Project	2250	Madhya Pradesh
15	Kabra Pumped Storage Project	1200	Madhya Pradesh
16	Tanbia Pumped Storage Project	1600	Madhya Pradesh
17	Chikaldara Pumped Storage Project	400	Maharashtra
18	Ulhas Pumped Storage Project	1000	Maharashtra
19	Pinjal Pumped Storage Project	700	Maharashtra
20	Kolmondapada Pumped Storage Project	800	Maharashtra

Details of Unexploitable Pumped Storage Projects

21	Sidgarh Pumped Storage Project	1500	Maharashtra
22	Chornai Pumped Storage Project	2000	Maharashtra
23	Baitarni Pumped Storage Project	1800	Maharashtra
24	Tuivai Pumped Storage Project	1500	Manipur
25	Hengtam Pumped Storage Project	500	Mizoram
26	Khuai Lui Pumped Storage Project	2100	Mizoram
27	Pakwa Pumped Storage Project	1000	Mizoram
28	Tuitho Lui Pumped Storage Project	1050	Mizoram
29	Mat Pumped Storage Project	1400	Mizoram
30	Jhalmara Pumped Storage Project	2500	Odisha
31	Badrinagar Pumped Storage Project	1980	Rajasthan
32	Barah Pumped Storage Project	1800	Rajasthan
33	Nallar Pumped Storage Project	2700	Tamil Nadu
34	Jaspalgarh Pumped Storage Project	1935	Uttarakhand

PROJECT PROFILES OF ON-RIVER PUMPED STORAGE HYDRO PROJECTS UNEXPLOITABLE AT PRESENT

1. SINAFDAR PUMPED STORAGE PROJECT (3X115MW=345MW)

1. INTRODUCTION

Sinafdar Pumped Storage Project is located in Kaimur district of Bihar. The project utilizes water of Sura River for power generation harnessing design head of 120 m. The powerhouse has 3 units of 115 MW having installed capacity of 345 MW generating annual energy of 755.6 MU 90% dependable year.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Sura River having upper reservoir at latitude of 24°49'46.89''N and longitude 86°36'38.86''E of and lower reservoir at latitude of 24°50'14.86''N and longitude of 83°37'10.97''E. There is a proposal of underground type of Power house. The nearest railway station is Bhabhua and the Airport is Patna.

3. PROJECT FEATURES

Sinafdar Pumped Storage Project involves construction of Upper and Lower Reservoirs.

Upper Reservoir (proposed): The height of dam of Upper Reservoir is proposed to be 45 m with a live storage of 8.08 Mcum on river Sura between a Full Reservoir Level (FRL) of 320 m and Minimum Draw down Level (MDDL) of 300 m.

Lower Reservoir (proposed): The height of dam of Lower Reservoir is proposed to be t 42 m with a live storage of 7.88 Mcum on river Sura between a Full Reservoir Level (FRL) of 185 m and Minimum Draw down Level (MDDL) of 170 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of 3 Nos. of Head Race Tunnel of length (Steel lined 65m, Concrete Lined 500 m) and diameter of 7 m, 3 Nos. of Pressure shaft/Penstock of length 194 m and diameter of 7 m. The Project would be operated under gross head of 120 m with installed capacity of 345 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 175 m and diameter 7.

4. HYDROLOGY

The Catchment area at Upper Dam is 27.96 Sq. Km and at Lower Dam is 17.73 Sq. Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Sinafdar Pumped Storage Project would be 345 MW. Utilising the gross head of 120 m, the Annual Energy of the project would be of 755.6 MU in 90% dependable year.

NOTE: Sinafdar Pumped Storage project is Unexploitable at present which lies in the identified Wild Life Sanctuary.

SALIENT FEATURES
SINAFDAR PUMPED STORAGE PROJECT

GENERAL:

State	Bihar
District	Kaimur
River	Sura
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Bhabhua Road
Nearest Airport	Patna

UPPER RESERVOIR (proposed):

Location	Latitude: 24°49'46.89''N
	Longitude: 83°36'38.36''E
Full Reservoir Level (FRL) (m)	320
Minimum Draw Down Level (MDDL) (m)	300
Length of the Dam at the top(m)	500
Height of Dam (above RBL) (m)	45
Live Storage (Mcum)	8.08
Gross Storage (Mcum)	9.88

LOWER RESERVOIR (proposed):

Location	Latitude: 24°50'14.86''N
	Longitude: 83°37'10.97''E
Full Reservoir Level (FRL) (m)	185
Minimum Draw Down Level (MDDL) (m)	170
Type of Dam	Concrete/RCC Dam
Height of Dam (above RBL) (m)	42
Live Storage (Mcum)	7.88

HYDROLOGY:

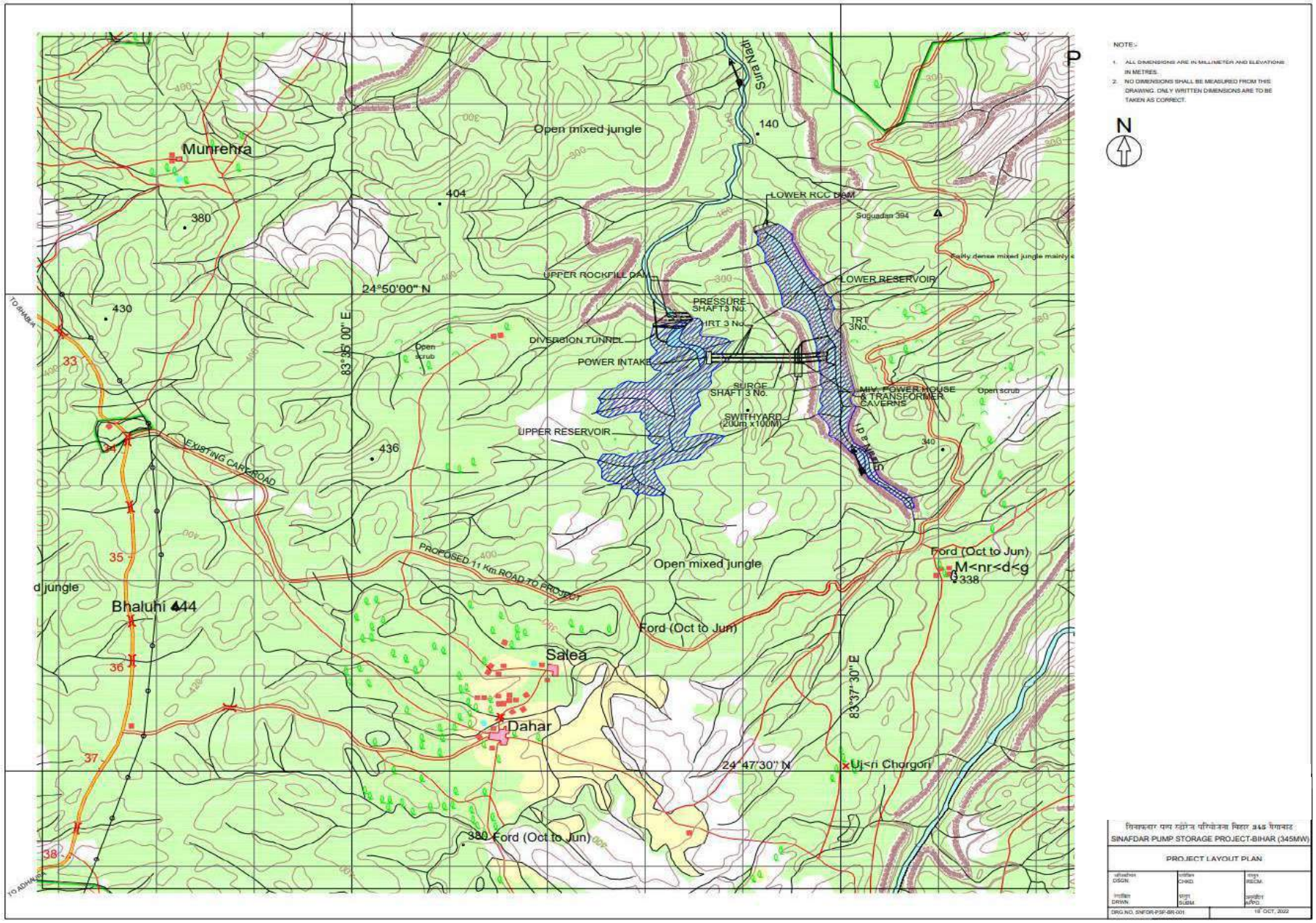
Catchment Area (Sq. Km) Upper Dam	27.96
Catchment Area (Sq. Km) Lower Dam	13.73

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	3
Length (m)	(Steel lined 65m, Concrete Lined 500 m)
Diameter (m)	7
PRESSURE SHAFT/PENSTOCK	
Number	3
Length (m)	194
Diameter (m)	7
TAIL RACE TUNNEL	
Length (m)	175
Diameter (m)	7

POWER HOUSE

Type	Underground
No. of Generating Units	3
Capacity of each Unit (MW)	115
Installed Capacity (MW)	345
Design Head (m)	120
Gross Head(m)	133.33
Turbine	Vertical Francis, reversible pump
Annual Energy (MU)	755.6


NOTE:-
1. ALL DIMENSIONS ARE IN MILLIMETER AND ELEVATIONS IN METRES.
2. NO DIMENSIONS SHALL BE MEASURED FROM THIS DRAWING. ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.
N
Munrehra
Open mixed jungle
Sura Nadi
140
404
380
LOWER RCC DAM
Suguadan 394
Fairly dense mixed jungle mainly
UPPER ROCKFILL DAM
LOWER RESERVOIR
24°50'00" N
PRESSURE SHAFT 3 No.
HRT 3 No.
TRT 3No.
430
83°35'00" E
DIVERSION TUNNEL
POWER INTAKE
Open scrub
SURGE SHAFT 3 No.
MIV, POWER HOUSE & TRANSFORMER CAVERNS
Open scrub
SWITHYARD (200m x100M)
UPPER RESERVOIR
436
340
EXISTING CARTROAD
TO SHABLA
33
34
35
36
37
38
PROPOSED 11 Km ROAD TO PROJECT
Open mixed jungle
Ford (Oct to Jun)
M<nr<d<g
338
d jungle
Bhaluhi 444
Ford (Oct to Jun)
Salea
Dahar
83°37'30" E
24°47'30" N
Uj<ri Chorgori
380 Ford (Oct to Jun)
TO ADHAUBA
सिनाफदार पम्प स्टोरेज परियोजना बिहार 345 मेगावाट
SINAFDAR PUMP STORAGE PROJECT-BIHAR (345MW)
PROJECT LAYOUT PLAN
DSGN.
CHKD.
RECM.
DRWN.
SUBM.
APPD.
DRG.NO. SNFDR-PSP-BR-001
18 OCT, 2022

2. PANCHGOTIA PUMPED STORAGE PROJECT (3X75MW=225MW)

1. INTRODUCTION

Panchgotia Pumped Storage Project is located in Kaimur district of Bihar. The project utilizes water of Karsotha Nallah River for power generation harnessing design head of 110 m. The powerhouse has 3 units of 75 MW having installed capacity of 225 MW generating annual energy of 493 MU in 90% dependable year.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Karsotha Nallah River having upper reservoir at latitude of 24°46'43.85"N and longitude 83°37'51.24"E of and lower reservoir at latitude of 24°47'58.16''N and longitude of 83°37'50.4"E. There is a proposal of underground type of Power house. The nearest railway station is Bhabhua and the Airport is Patna.

3. PROJECT FEATURES

Panchgotia Pumped Storage Project involves construction of Upper and Lower Reservoirs.

Upper Reservoir (proposed): The height of the dam of Upper Reservoir is proposed to be 36 m with a live storage of 6.04 Mcum on river Karsotha Nallah between a Full Reservoir Level (FRL) of 356 m and Minimum Draw down Level (MDDL) of 345 m.

Lower Reservoir (proposed): The height of the dam of Lower Reservoir is proposed to be 57 m with a live storage of 5.54 Mcum on river Karsotha Nallah between a Full Reservoir Level (FRL) of 240 m and Minimum Draw down Level (MDDL) of 210 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises 3 Nos. of Pressure shaft of length 106.5 m and diameter of 6 m. The Project would be operated under design head of 110 m with installed capacity of 225 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 185 m and diameter 6.

4. HYDROLOGY

The Catchment area of the Project site is 28.2 Sq.Km

5. POWER & ENERGY BENEFITS

The installed capacity of Panchgotia Pumped Storage Project would be 225 MW. Utilising the Design head of110 m the Annual Energy of the project is 493 MU in 90% dependable year.

NOTE: Panchgotia Pumped Storage project is Unexploitable at present which lies in the identified Wild Life Sanctuary.

SALIENT FEATURES

PANCHGOTIA PUMPED STORAGE PROJECT

GENERAL:

State	Bihar
District	Kaimur
River	Karsotha Nallah
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Bhabhua Road 60Km
Nearest Airport	Patna (240 Km)/Varanasi (130km)

UPPER RESERVOIR (proposed):

Location	Latitude: 24°46'43.85"N
	Longitude: 83°37'51.24"E
Full Reservoir Level (FRL) (m)	356
Minimum Draw Down Level (MDDL) (m)	345
Length of the Dam at the top(m)	360
Height of Dam (above RBL) (m)	36
Live Storage (Mcum)	6.04
Gross Storage (Mcum)	12.08

LOWER RESERVOIR (proposed):

Location	Latitude: 24°47'58.16"N
	Longitude: 83°37'50.4"E
Full Reservoir Level (FRL) (m)	240
Minimum Draw Down Level (MDDL) (m)	210
Type of Dam	Roller compacted concrete Dam
Height of Dam (above RBL) (m)	57
Live Storage (Mcum)	5.54

HYDROLOGY

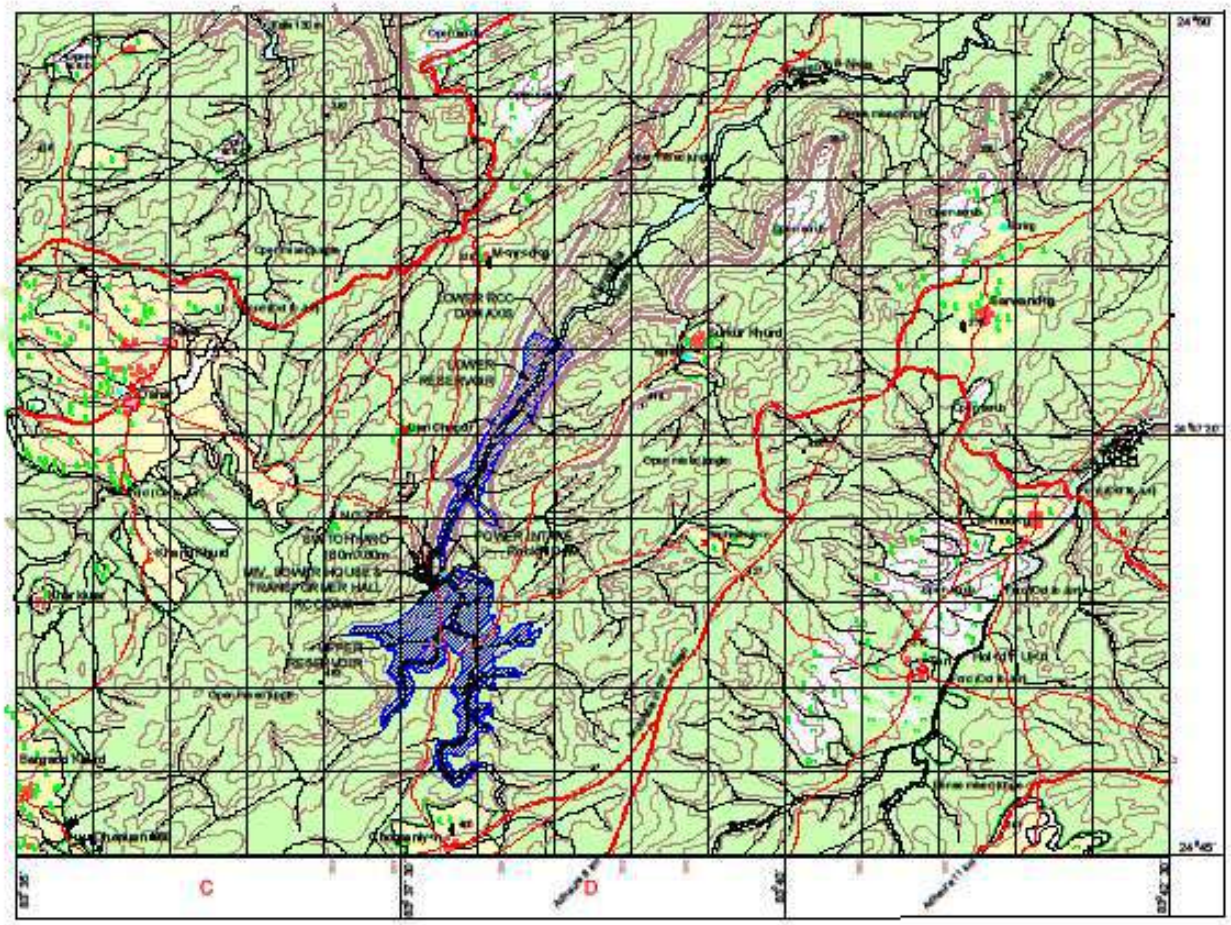
Catchment Area (Sq. Km)	28.2

WATER CONDUCTOR SYSTEM

PRESSURE SHAFT/PENSTOCK	
Number	3
Length (m)	106.5
Diameter (m)	6
TAIL RACE TUNNEL	
Length (m)	185
Diameter (m)	6

POWER HOUSE

Type	Underground
No. of Generating Units	3
Capacity of each Unit (MW)	75
Installed Capacity (MW)	225
Design Head (m)	110
Gross Head(m)	122.33
Turbine	Vertical Francis, reversible pump
Annual Energy(MU)	493



NOTE:-

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N

पन्चगोटिया पम्प स्टोरेज परियोजना बिहार(225 मैगावाट)

PUNCHGOTIA PUMP STORAGE PROJECT-BIHAR (225 MW)

PROJECT LAYOUT PLAN

DSGN.	CHKD.	RECM.
DRWN.	SUBM.	APPD.

DRG.NO.PNCH-PSP-BR-001 | 25th NOV. 2022

3. TELHARKUND PUMPED STORAGE PROJECT (4X100MW=400MW)

1. INTRODUCTION

Telhar Kund Pumped Storage Project is located on Sura River with installed capacity of 400MW. The project is located in Kaimur district of Bihar. The project utilizes water of Sura River for power generation under gross head of 125 m. The powerhouse would have 4 units of 100MW with total installed capacity of 400 MW The project would generate the annual energy of 876 MU in 90% dependable year.

2. LOCATION/ACCESSIBILITY

The upper dam site of the project is proposed to be located on Sura River at latitude of 24°49'52.10"N and longitude of 83°31'45.06"E and lower dam site is located on Sura River at latitude of 24°51'7.72"N and longitude of 83°31'29.80"E. The nearest railway station from the project site is Bhabua Road and nearest airport is Patna.

3. PROJECT FEATURES

Telhar Kund Pumped Storage Project involves construction of

Upper Reservoir (Proposed): Upper Reservoir for proposed reservoir with dam height of 65 m on Sura with a live storage of 9.45 Mcum between a Full Reservoir Level (FRL) of 315 m and Minimum Draw down Level (MDDL) of 295 m.

Lower Reservoir (Proposed): Proposed Lower Reservoir with dam height of 55 m with a live storage of 9.36 Mcum on Sura River between a Full Reservoir Level (FRL) of 190 m and Minimum Draw down Level (MDDL) of 170 m.

Water Conductor System: The proposed Water Conductor System comprises of 2 nos. of Pressure shaft/Penstock of length 120 m and diameter 7 m which would carry water to the underground powerhouse having installed capacity of 400 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 115 m.

4. POWER & ENERGY BENEFITS

The installed capacity of Telhar Kund Pumped Storage Project would be 400MW. It would generate the Annual Energy of 876 MU in 90% dependable year under gross head of 125 m. The project will provide daily hours generation of 6 hours and daily hours pumping of Hours.

NOTE: Telhar Kund Pumped Storage Project is presently Unexplotable as it is located on left fork of Sura River. This fall is located in the identified Wild Life Sanctuary

SALIENT FEATURES

TELHAR KUND PUMPED STORAGE PROJECT

GENERAL:

State	Bihar
District	Raigad
River	Sura River
Type of Scheme (On-River/Off-River)	On-River
Nearest Railhead	Bhabua
Nearest Airport	Patna

UPPER RESERVOIR (proposed):

Location	Latitude: 24°49'52.10"N
	Longitude: 83°31'45.06"E
Full Reservoir Level (FRL) (m)	315
Minimum Draw Down Level (MDDL) (m)	295
Length of the Dam at the top (m)	500
Height of Dam (above RBL) (m)	65
Reservoir area at FRL (sq.km)	86
Live Storage (Mcum)	9.45

LOWER RESERVOIR (Proposed):

Location	Latitude: 24°51'7.72"N
	Longitude: 83°31'29.80"E
Full Reservoir Level (FRL) (m)	190
Minimum Draw Down Level (MDDL) (m)	170
Height of Dam (above RBL) (m)	55
Live Storage (Mcum)	9.36

HYDROLOGY:

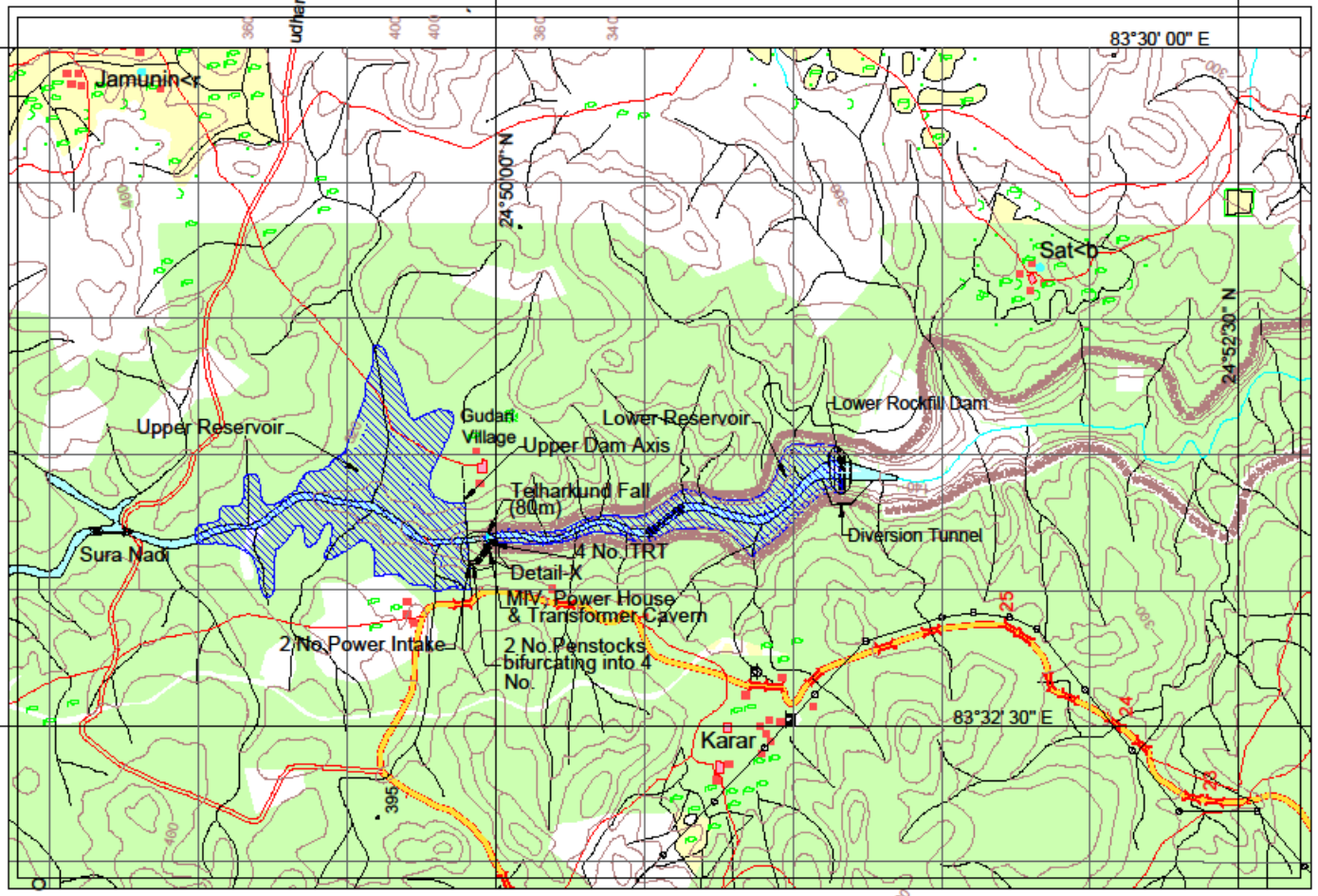
Catchment Area (Sq. Km)	61.61
Flood Discharge (Cumecs)	2.50

WATER CONDUCTOR SYSTEM (proposed):

PRESSURE SHAFT/PENSTOCK	
Number	2
Length (m)	120
Diameter (m)	7
TAIL RACE TUNNEL	
Length (m)	115
Diameter (m)	7

POWER HOUSE (proposed):

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	100
Installed Capacity (MW)	400
Design Head (m)	112.50
Gross Head(m)	125
Turbine	Vertical Francis Reversible
Annual Energy(MW)	876



NOTE:-

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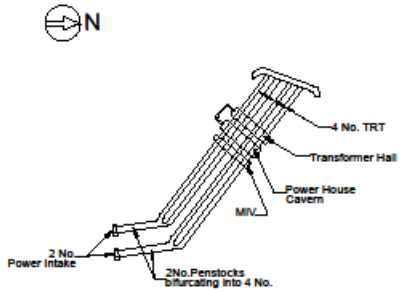


Detail-X
(WCS & PH Complex-Underground)

तेल्हारकुन्ड पम्प स्टोरेज परियोजना बिहार(400 मैगावाट)

TELHARKUND PUMP STORAGE PROJECT-BIHAR (400 MW)

PROJECT LAYOUT PLAN

अभिकल्पित DSGN.	प्रमोदित CHKD.	संस्तुत RECM.
रेखांकित DRWN.	प्रस्तुत SUBM.	अनुमोदित APPD.

DRG.NO. TLHKD-PSP-BR-001 | 19th OCT, 2022

4. HATHIADAH & DURGAWATI PUMPED STORAGE PROJECT (4X200MW+4X200MW=1600MW)

1. INTRODUCTION

Hathiadah & Durgawati Pumped Storage Project is located on Hathiadah river on left side and Durgawati river on right side with installed capacity of 1600MW. The project is located in Kaimur district of Bihar. The project utilizes water of Hathiadah/Durgawati River for power generation under gross head of 195.33 m. The powerhouse would have 4 units of 200MW on left side and 4 units of 200MW on right side with total installed capacity of 1600 MW The project would generate the annual energy of 3504 MU in 90% dependable year.

2. LOCATION/ACCESSIBILITY

The upper dam site of the project is proposed to be located on Hathiadah River at latitude of 24°40'26.78"N and longitude of 83°43'45.28"E and on Durgawati River at latitude 24°40'31.17"N and longitude of 83°44'22.46"E and lower dam site is located at latitude of 24°42'21.50"N and longitude of 83°45'10.51"E. The nearest railway station from the project site is Bhabua Road and nearest airport is Patna.

3. PROJECT FEATURES

Hathiadah & Durgawati Pumped Storage Project involves construction of

Upper Reservoir (Proposed): Upper Reservoir for proposed reservoir with dam height of 41 m on Hathiadah River and 42 m on Durgawati River with a live storage of 13.05 Mcum on Hathiadah and 11.59 Mcum on Durgawati River between a Full Reservoir Level (FRL) of 440 m (Hathiadah River), 440 m (Durgawati River) and Minimum Draw down Level (MDDL) of 430 m (Hathiadah River), 420 m (Durgawati River).

Lower Reservoir (Proposed): Proposed Lower Reservoir with dam height of 71 m with a live storage of 24.77 Mcum on Hathiadah/Durgawati River between a Full Reservoir Level (FRL) of 252 m and Minimum Draw down Level (MDDL) of 210 m.

Water Conductor System: The proposed Water Conductor System comprises of 8 nos. of Pressure shaft of length 75 m each and diameter 5.5 m which would carry water to the underground powerhouse having installed capacity of 1600 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 320 m (in left bank of Durgawati) and 147 m (in right bank of Hathiadah).

4. POWER & ENERGY BENEFITS

The installed capacity of Hathiadah & Durgawati Pumped Storage Project would be 1600MW. It would generate the Annual Energy of 3504 MU in 90% dependable year under gross head of 195.33 m.

NOTE: Hathiadah & Durgawati Pumped Storage Project is is presently Unexploitable as it is located on Hathiadah river on left side and Durgawati river on right side. This fall is located in the identified Wild Life Sanctuary

SALIENT FEATURES
HATHIDAH & DURGAWATI PUMPED STORAGE PROJECT

GENERAL:

State	Bihar
District	Kaimur
River	Hathiadah River on left side and Durgawati River on right side
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Bhabua Road
Nearest Airport	Patna

UPPER RESERVOIR (proposed):

Location : Hathiadah Upper Dam Site	Latitude: 24°40'26.78"N
	Longitude: 83°43'45.28"E
Durgawati Upper Dam Site	Latitude: 24°40'31.17"N
	Longitude: 83°44'22.46"E
Full Reservoir Level (FRL) (m)	440 (on Hathiadah River), 440 (on Durgawati River)
Minimum Draw Down Level (MDDL) (m)	430 (on Hathiadah River), 420 (on Durgawati River)
Length of the Dam (m)	805 (on Hathiadah River), 670 (on Durgawati River)
Height of Dam (m)	41 (on Hathiadah River), 42 (on Durgawati River)
Live Storage (Mcum)	13.05 (on Hathiadah River), 11.59 (on Durgawati River)
Gross Storage (Mcum)	25.87 (on Hathiadah River), 12.62 (on Durgawati River)

LOWER RESERVOIR (Existing):

Location	Latitude: 24°42'21.50"N
	Longitude: 83°45'10.51"E
Full Reservoir Level (FRL) (m)	252
Minimum Draw Down Level (MDDL) (m)	210

Height of Dam (m)	71
Live Storage (Mcum)	24.77

HYDROLOGY:

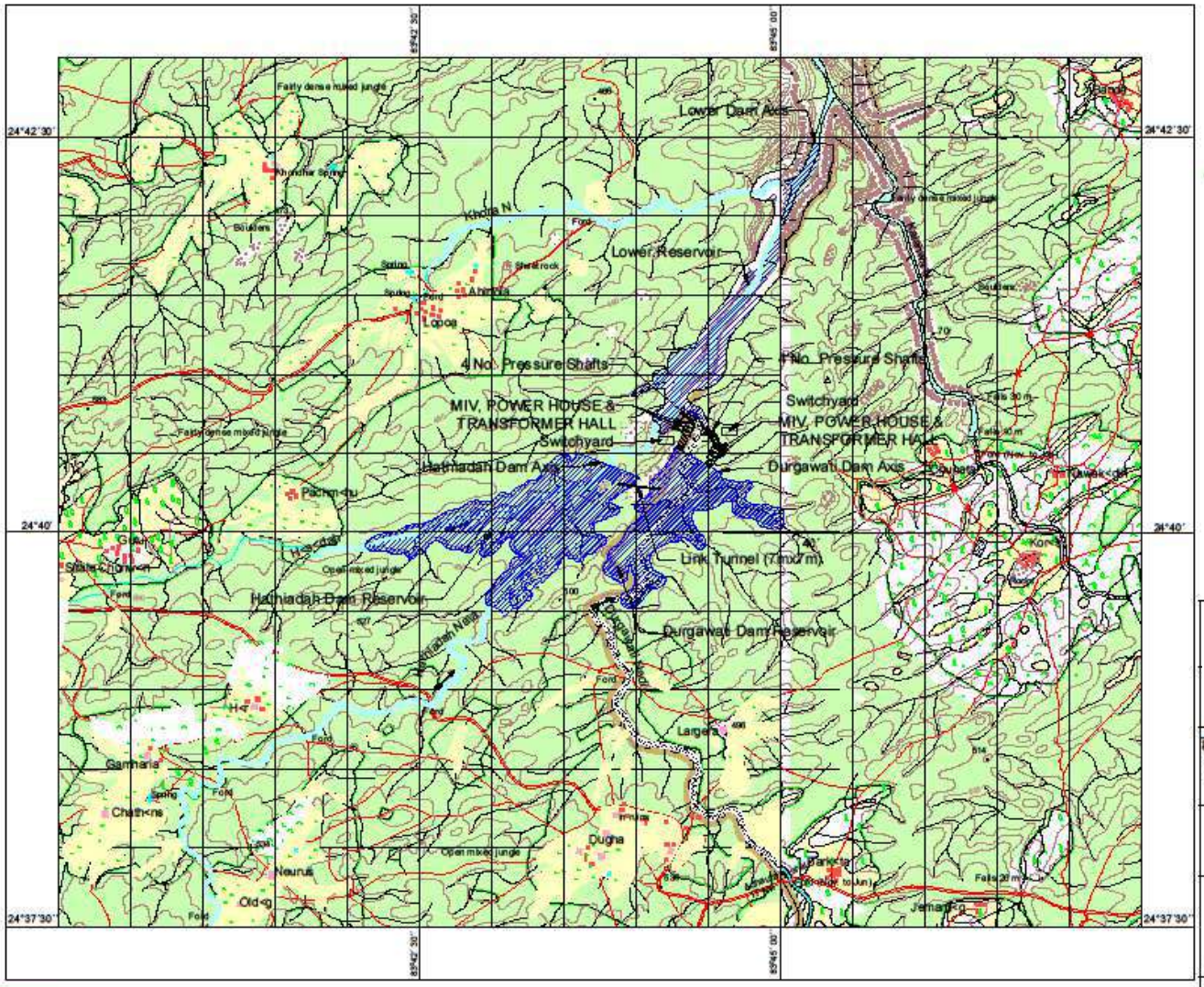
Catchment Area (Sq.km)	52.95 (at upper dam Hathiadah), 225 (at lower dam Hathiadah), 55.33 (at upper dam Durgawati) 232 (at lower dam Durgawati)
Flood Discharge (Cumecs)	590

WATER CONDUCTOR SYSTEM (proposed):

PRESSURE SHAFT/PENSTOCK	
Number	8
Length (m)	75
Diameter (m)	5.5
TAIL RACE TUNNEL	
Length (m)	320 (in left bank of Durgawati),147 (in right bank of Hathiadah)
Diameter (m)	7

POWER HOUSE (proposed):

Type	Underground
No. of Generating Units	4 (in left bank of Hathiadah), 4 (in right bank of Durgawati)
Capacity of each Unit (MW)	200
Installed Capacity (MW)	1600
Turbine	Vertical Reversible Francis
Design Head (m)	175.8
Gross Head (m)	195.33
Annual Energy(MU)	3504



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हाथियादाह दुगावती पम्प स्टोरेज परियोजना बिहार(1600 मेगावाट)

HATHIADAH-DRGAVATI PUMP STORAGE PROJECT-BIHAR (1600 MW)

PROJECT LAYOUT PLAN

अभिकल्पित DSGN.	समीक्षित CHKD.	संस्तुत RECM.
रेखांकित DRWN.	प्रस्तुत SUBM.	अनुमोदित APPD.
DRG.NO. HDDW-PSP-BR-001	06th DEC, 2022	

5. MATLIMARG PUMPED STORAGE PROJECT (5X330MW=1650MW)

1. INTRODUCTION

Matlimarg Pumped Storage Project is located near small village Kolhil Nar and Matlimarg in Udhampur district of Jammu & Kashmir. The project utilizes water of Satkol/Khanwur River for power generation harnessing Average Gross head of 520 m. The powerhouse has 5 units of 330 MW having installed capacity of 1650 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Satkol River having upper reservoir at latitude of 33°36'30"N and longitude of 75°38'34"E and lower reservoir at latitude of 33°35'35"N and longitude of 75°36'34"E. There is a proposal of underground type of Power house. The nearest railway station and Airport is Jammu International.

3. PROJECT FEATURES

Matlimarg Pumped Storage Project involves construction of :

Upper Reservoir (Proposed): Upper Reservoir is proposed to be of Height 70 m with a live storage of 13.2 Mcum on river Satkol between a Full Reservoir Level (FRL) of 3350 m and Minimum Draw down Level (MDDL) of 3320 m.

Lower Reservoir (Proposed): Lower reservoir is proposed to be of Height 70 m with a live storage of 8.7 Mcum on river Uttara between a Full Reservoir Level (FRL) of 2830 m and Minimum Draw down Level (MDDL) of 2800 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 1700 m. The Project to be operated under average gross head of 520 m with installed capacity of 1650 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 600 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 66 Sq.Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Matlimarg Pumped Storage Project would be 1650 MW. utilising the Design head of 520 m,

NOTE- Matlimarg Pumped Storage Project found not feasible due to project not accessible Snow Bound, High sedimentation, Risk and Reservoir topography not matching with CEA Data.

SALIENT FEATURES

MATLIMARG PUMPED STORAGE PROJECT

GENERAL:

Union Territory	Jammu & Kashmir
District	Udhampur
River	Satkol/Khanwur
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Jammu
Nearest Airport	Jammu

UPPER RESERVOIR (Proposed):

Location	Latitude: 33°36'30"N
	Longitude: 75°38'34"E
Full Reservoir Level (FRL) (m)	3350
Minimum Draw Down Level (MDDL) (m)	3320
Length of the Dam at the top(m)	300
Height of Dam (above RBL) (m)	70
Live Storage (Mcum)	13.2
Gross Storage (Mcum)	12.7

LOWER RESERVOIR (Proposed):

Location	Latitude: 33°35'35"N
	Longitude: 75°36'34"E
Full Reservoir Level (FRL) (m)	2830
Minimum Draw Down Level (MDDL) (m)	2800
Type of Dam	
Height of Dam (above RBL) (m)	70
Live Storage (Mcum)	8.7

HYDROLOGY:

Catchment Area (Sq. Km)	60

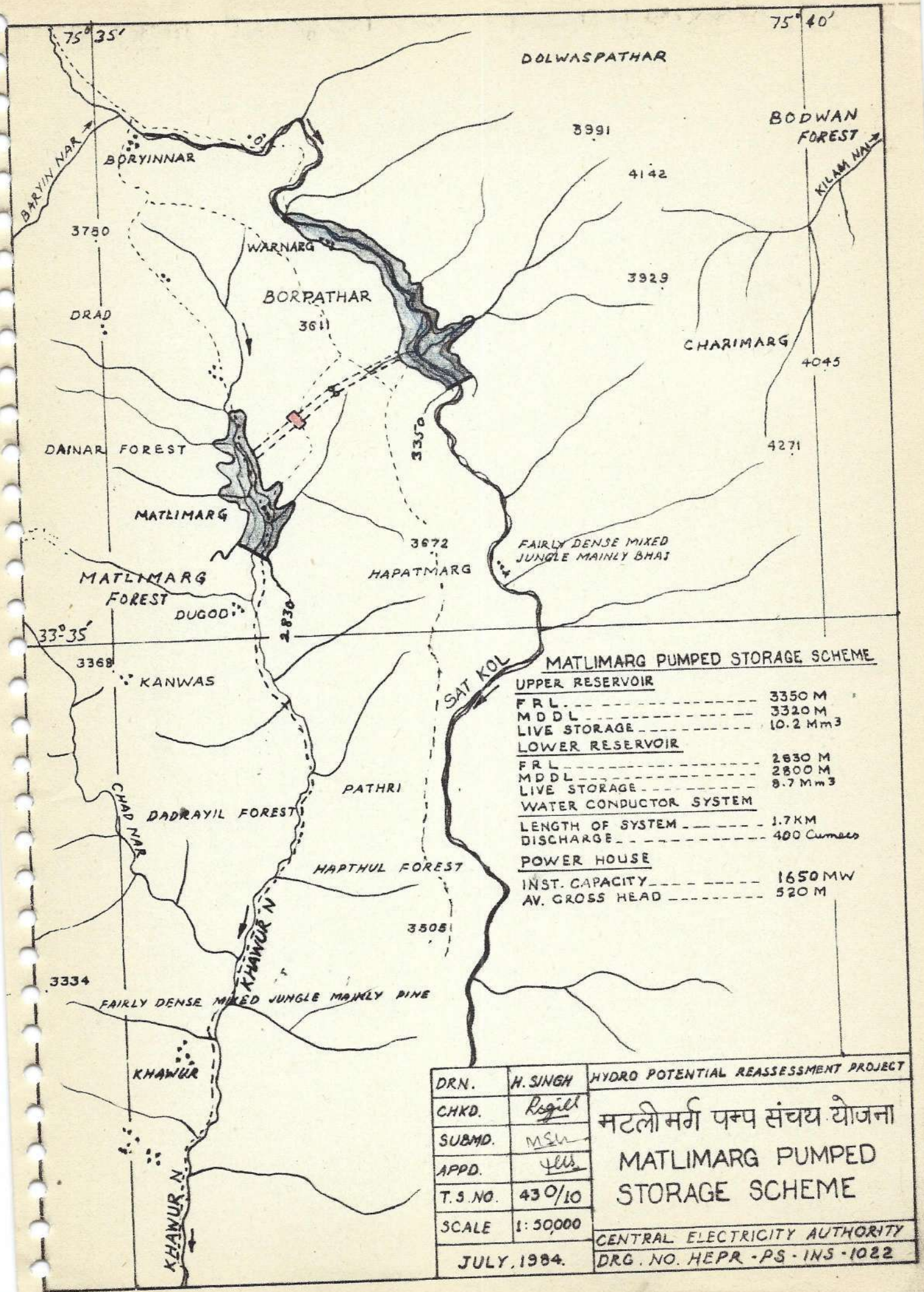
Flood Discharge (Cumecs)	2.50

WATER CONDUCTOR SYSTEM (proposed):

HEAD RACE TUNNEL	
Number	1
Length (m)	1700
Number	1
TAIL RACE TUNNEL	
Length (m)	600

POWER HOUSE (proposed):

Type	Underground
No. of Generating Units	5
Capacity of each Unit (MW)	330
Installed Capacity (MW)	1650
Gross Head(m)	520
Turbine	Reversible Vertical Francis


75° 35'
75° 40'
DOLWASPATHAR
BODWAN FOREST
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BARYIN NAR
BORYINNAR
3991
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BORPATHAR
3611
DRAD
CHARIMARG
4045
3350
DAINAR FOREST
4271
MATLIMARG
3672
FAIRLY DENSE MIXED JUNGLE MAINLY BHAJ
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FAIRLY DENSE MIXED JUNGLE MAINLY PINE
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MATLIMARG PUMPED STORAGE SCHEME
UPPER RESERVOIR
FRL 3350 M
MDDL 3320 M
LIVE STORAGE 10.2 Mm3
LOWER RESERVOIR
FRL 2830 M
MDDL 2800 M
LIVE STORAGE 8.7 Mm3
WATER CONDUCTOR SYSTEM
LENGTH OF SYSTEM 1.7 KM
DISCHARGE 400 Cumecs
POWER HOUSE
INST. CAPACITY 1650 MW
AV. GROSS HEAD 520 M
DRN. H. SINGH
CHKD. Rsgill
SUBMD. MSh
APPD. Ells
T.S. NO. 430/10
SCALE 1:50,000
JULY, 1984.
HYDRO POTENTIAL REASSESSMENT PROJECT
मटलीमर्ग पम्प संचय योजना
MATLIMARG PUMPED STORAGE SCHEME
CENTRAL ELECTRICITY AUTHORITY
DRG. NO. HEPR-PS-INS-1022

6. PANCHET PUMPED STORAGE PROJECT (1X40MW=40MW)

1. INTRODUCTION

Panchet Pumped Storage Project is located in Purlia district of West Bengal The project utilizes water of Panchet Reservoir for power generation harnessing average gross head of 24.5 m. The powerhouse has 1 unit of 40 MW having installed capacity of 40 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Panchet reservoir having upper reservoir at latitude of 23°40'54"N and longitude of 86°44'51"E and lower reservoir at latitude of 23°40'N and longitude of 86°45'E. The nearest railway station is Kumardobi and the Airport is Durgapur.

3. PROJECT FEATURES

Panchet Pumped Storage Project involves construction of :

Upper Reservoir (exisiting): The height of the dam of Upper Reservoir is proposed to be 47.85 m with a live storage of 170.31 Mcum on panchet reservoir between a Full Reservoir Level (FRL) of 132.59 m and Minimum Draw down Level (MDDL) of 119.48 m.

Lower Reservoir (proposed): Lower reservoir is proposed to be of Height 15.2 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 5488.21 Sq.Km

5. POWER & ENERGY BENEFITS

The installed capacity of Panchet Pumped Storage Project would be 40 MW utilising the average gross head of 24.5 m

NOTE: Panchet Pumped Storage project is Unexploitable at present because People agitation in state of Bihar and West Bengal. As per decision taken on meeting held on 16th August 2021, this project is removed from CEA list of PSP projects.

SALIENT FEATURES

PANCHET PUMPED STORAGE PROJECT

GENERAL:

State	West Bengal
District	Purulia
River	Panchet Reservoir
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Kumardobi
Nearest Airport	Durgapur

UPPER RESERVOIR (proposed):

Location	Latitude: 23°40'54"N
	Longitude: 86°44'51"E
Full Reservoir Level (FRL) (m)	132.59
Minimum Draw Down Level (MDDL) (m)	119.48
Length of the Dam at the top(m)	132.29
Height of Dam (above RBL) (m)	47.85
Live Storage (Mcum)	170.31

LOWER RESERVOIR (Proposed):

Location	Latitude: 23°40'N
	Longitude: 86°45'E.
Height of Dam (above RBL) (m)	15.2

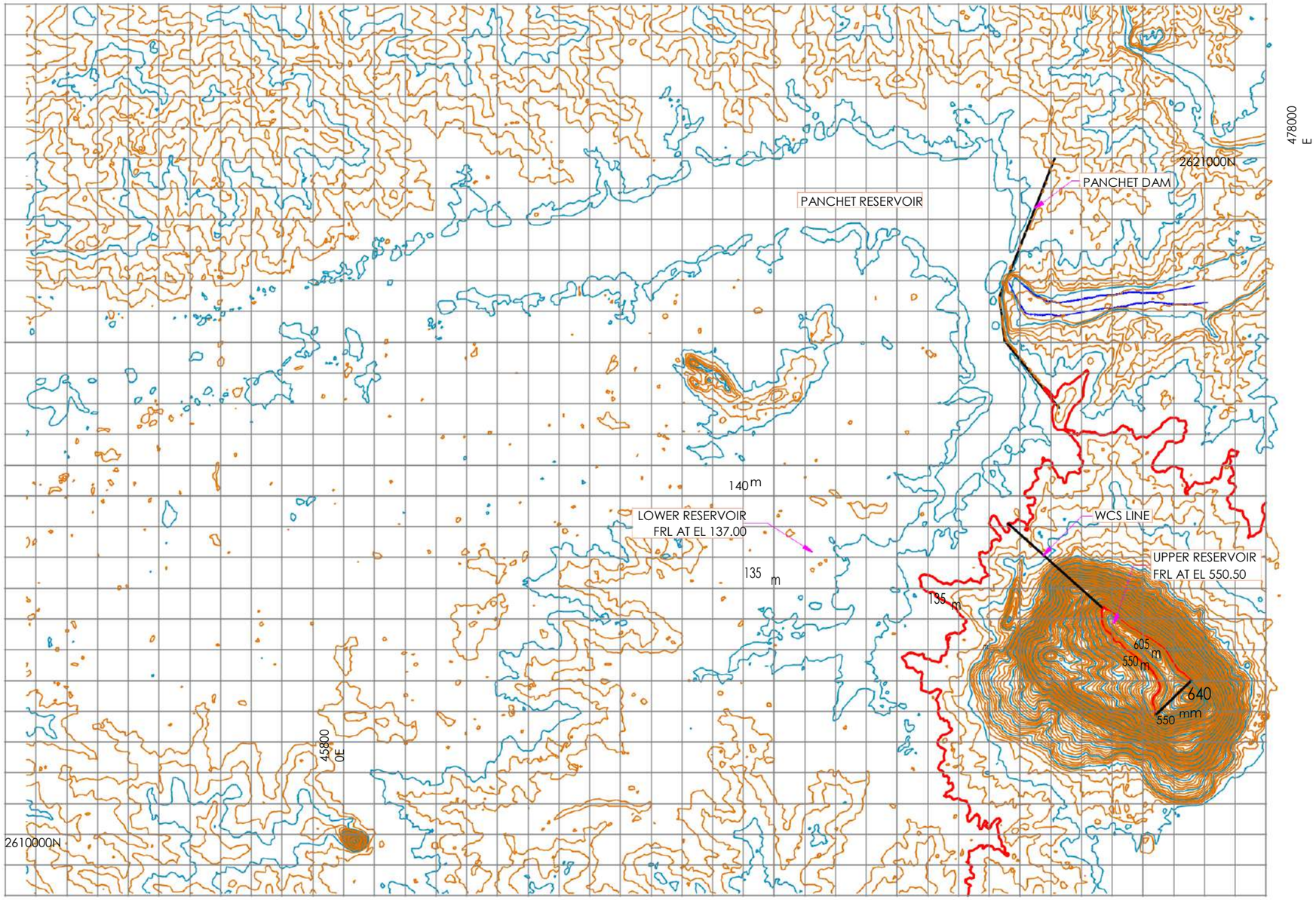
HYDROLOGY:

Catchment Area (Sq. Km)	5488.21

POWER HOUSE (proposed):

Type	Underground
No. of Generating Units	1
Capacity of each Unit (MW)	40
Installed Capacity (MW)	40
Gross Head (m)	24.5

Type	Underground
No. of Generating Units	1
Capacity of each Unit (MW)	40



SALIENT FEATURES

GROSS HEAD	:	427 M
L/H RATIO	:	5.4
UPPER RESERVOIR		
FRL	:	EL 550.50
LIVE STORAGE	:	3.1 MCM
LOWER RESERVOIR		
FRL	:	EL 137.0
MDDL	:	EL 119.5
LIVE CAPACITY	:	1318 MCM

PANCHET PSP

RESERVOIR PLAN

7. BORO PUMPED STORAGE PROJECT (4X125MW=500MW)

1. INTRODUCTION

Boro Pumped Storage Project is located in Hazaribagh district of Jharkhand. The project utilizes water of Konar Resrvior/Boro nala for power generation harnessing Gross head of 97 m. The powerhouse has 4 units of 125 MW having installed capacity of 500 MW generating. The project is proposed to be executed by Damodar Valley Corporation (DVC).

2. LOCATION/ACCESSIBILITY

The Project having upper reservoir at latitude of 23°55'46.8"N and longitude of 85°45'47.4"E and lower reservoir at latitude of 23°46'06.9"N and longitude of 85°48'22.1"E. There is a proposal of underground type of Power house. The nearest railway station is Hazaribagh Town and the Airport is Birsa Munda Airport Ranchi.

3. PROJECT FEATURES

Boro Pumped Storage Project involves construction of Lower Reservoir.

Upper Reservoir (exisiting): Upper Reservoir with a live storage of 2507 Mm^3 on river Konar between a Full Reservoir Level (FRL) of 429.16 m and Minimum Draw down Level (MDDL) of 410.6 m.

Lower Reservoir (proposed): The height of the dam of the lower reservoir is 21 m with a live storage of 9.2 Mm^3 on Boro Nala between a Full Reservoir Level (FRL) of 326.8 m and Minimum Draw down Level (MDDL) of 320 m.

Water Conductor System (proposed): The proposed Water Conductor System consist of 2 Nos. of Head Race Tunnel of 400 m. Project is proposed to be operated under gross head of 97 m with installed capacity of 500 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 2900 m.

4. POWER & ENERGY BENEFITS

The installed capacity of Boro Pumped Storage Project would be 500 MW Utilising the Gross head of 97 m.

NOTE: Boro Pumped storage Project is Unexploitable at Present as Based on Ground Survey, PSP does not appear to be technically feasible.

SALIENT FEATURES

BORO PUMPED STORAGE PROJECT

GENERAL:

State	Jharkhand
District	Hazaribagh
River	Konar Resrvior/Boro
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Hazaribagh Town
Nearest Airport	Birsa Munda Airpor Ranchi

UPPER RESERVOIR (proposed):

Location	Latitude: 23°55'46.8"N
	Longitude: 85°45'47.4"E
Full Reservoir Level (FRL) (m)	429.16
Minimum Draw Down Level (MDDL) (m)	410.6
Live Storage (Mm^3)	2507

LOWER RESERVOIR (Proposed):

Location	Latitude: 23°46'06.9"N
	Longitude: 85°48'22.1"E
Full Reservoir Level (FRL) (m)	326.80
Minimum Draw Down Level (MDDL) (m)	320
Height of Dam (above RBL) (m)	21
Live Storage (Mm3)	9.2

HYDROLOGY:

Catchment Area (Sq. Km)	61.61
Flood Discharge (Cumecs)	2.50

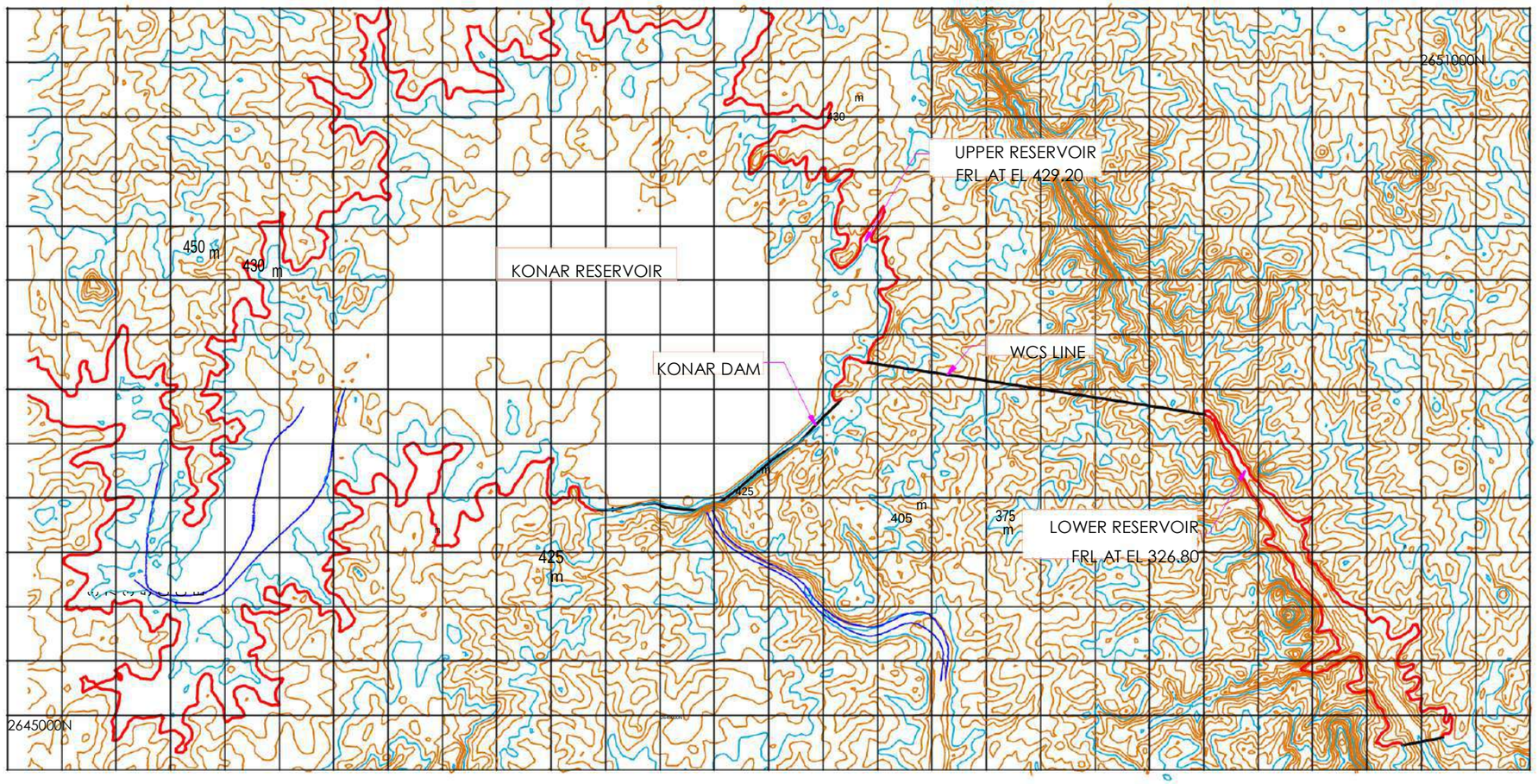
WATER CONDUCTOR SYSTEM (proposed):

HEAD RACE TUNNEL	
Number	2

Length (m)	400
Design Discharge (Cumecs)	325
TAIL RACE TUNNEL	
Number	2
Length (m)	2900

POWER HOUSE (proposed):

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	125
Installed Capacity (MW)	500
Gross Head(m)	97



SALIENT FEATURES

CAPACITY	:	500 MW
SEPARATION	:	3.3 KM
GROSS HEAD	:	102.40 M
UPPER RESERVOIR		
FRL	:	EL 429.20
MDDL	:	EL 410.60
LIVE STORAGE	:	2507 MCM
LOWER RESERVOIR		
FRL	:	EL 326.80
LIVE CAPACITY	:	9.2 MCM
DAM HEIGHT	:	21 M
DAM LENGTH	:	300 M

BORO PSP

RESERVOIR PLAN

DRG. NO.

8. KOLLUR PUMPED STORAGE PROJECT (4X225MW=900MW)

1. INTRODUCTION

Kollur Pumped Storage Project is located near small village Kollur in Shimoga district of Karnatka. The project utilizes water of Sharavati/Kollur River for power generation harnessing gross head of 523.7 m. The powerhouse has 4 units of 225 MW having installed capacity of 900 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Sharavati River having upper reservoir at latitude of 13°54'43"N and longitude of 74°51'43"E and lower reservoir at latitude of 13°52'32"N and longitude of 74°48'46"E. The nearest railway station is Shomga and the Airport is Manglore International.

3. PROJECT FEATURES

Kollur Pumped Storage Project involves construction of :

Upper Reservoir (proposed): Upper Reservoir is proposed to be of Height 27 m with a live storage of 22.8 Mcum on Nagodi hole a small tributary of Sharavati River between a Full Reservoir Level (FRL) of 621 m and Minimum Draw down Level (MDDL) of 610 m.

Lower Reservoir (Proposed): Lower Reservoir is is proposed to be of Height 31 m with a live storage of 18.7 Mcum on river Kollur between a Full Reservoir Level (FRL) of 98 m and Minimum Draw down Level (MDDL) of 85m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of 1 nos. Head race tunnel (HRT) of length 2800 m carrying water to the underground powerhouse. The Project to be operated under gross head of 214 m with installed capacity of 1800 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 1600 m.

4. HYDROLOGY

The Catchment area of the river is 55.7 Sq. Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Kollur Pumped Storage Project would be 900 MW. utilising the gross head of 523.7 m.

Note: Kollur Pumped storage is Unexploitaable at present as project lies in Western Ghat region. All the construction activities in Western Ghat have been stopped by MoEF. These schemes therefore could not be developed.

SALIENT FEATURES
KOLLUR PUMPED STORAGE PROJECT

GENERAL:

State	Karnatka
District	Shimoga
River	Nagodi Hole a small tributary of Sharavati river/Kollur
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Shimoga
Nearest Airport	Manglore

UPPER RESERVOIR (proposed):

Location	Latitude: 13°54'43"N
	Longitude: 74°51'43"E
Full Reservoir Level (FRL) (m)	621
Minimum Draw Down Level (MDDL) (m)	610
Length of the Dam at the top(m)	560
Height of Dam (above RBL) (m)	27
Live Storage (Mcum)	22.8
Gross Storage (Mcum)	35.5

LOWER RESERVOIR (proposed):

Location	Latitude: 13°52'32"N
	Longitude: 74°48'46"E
Full Reservoir Level (FRL) (m)	98
Minimum Draw Down Level (MDDL) (m)	85
Length of the Dam at the top(m)	560
Height of Dam (above RBL) (m)	31
Live Storage (Mcum)	18.7
Gross Storage (Mcum)	29.4

HYDROLOGY:

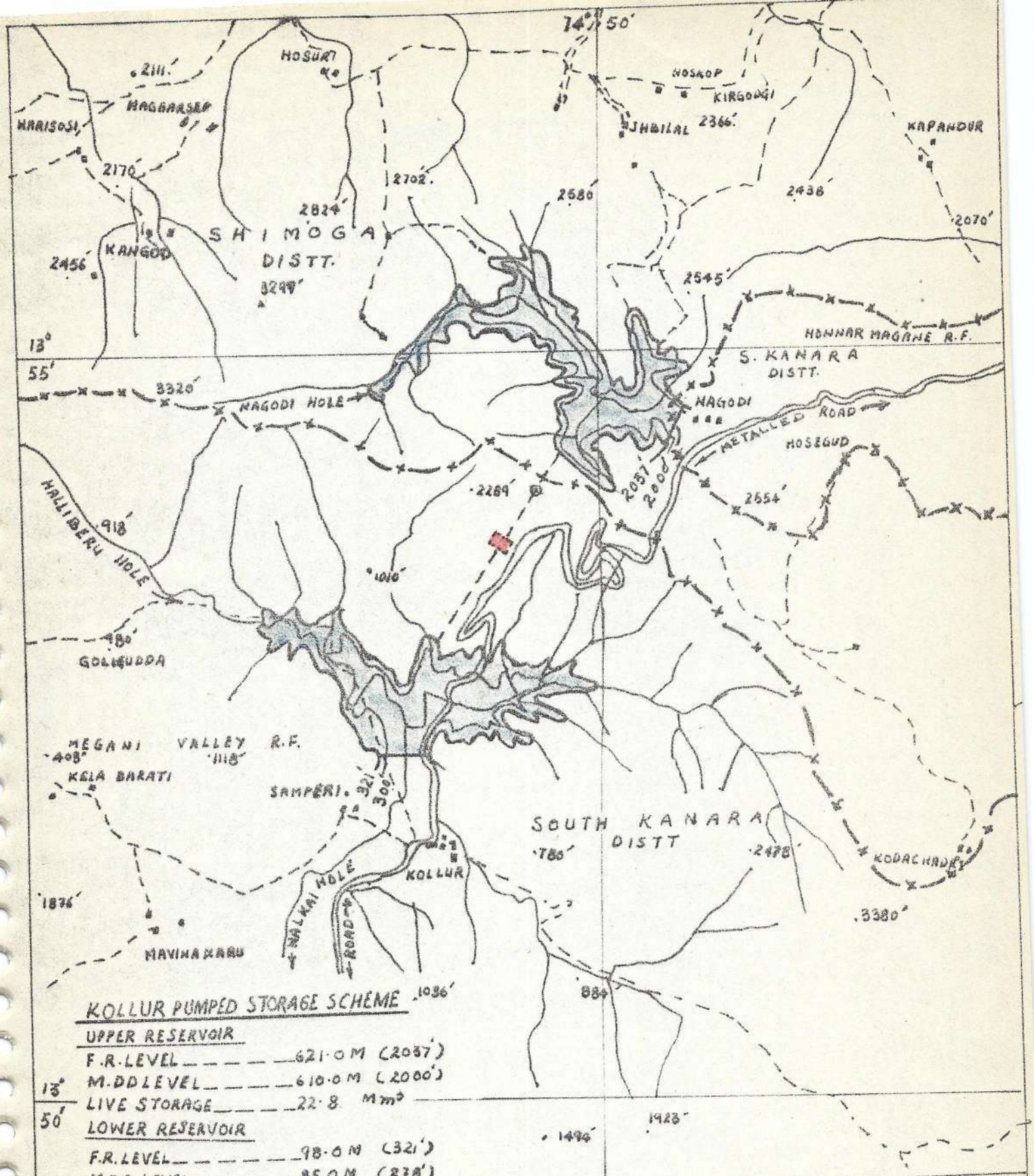
Catchment Area (Sq. Km)	55.7

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	1
Length (m)	1600
TAIL RACE TUNNEL	
Number	1
Length (m)	1600

POWER HOUSE

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	225
Installed Capacity (MW)	900
Gross Head(m)	523.7



KOLLUR PUMPED STORAGE SCHEME

UPPER RESERVOIR

F.R. LEVEL _____ 621·0 M (2037')
M.DD LEVEL _____ 610·0 M (2000')
LIVE STORAGE _____ 22·8 $M m^3$

LOWER RESERVOIR

F.R. LEVEL _____ 98·0 M (321')
M.D.D LEVEL _____ 85·0 M (278')
LIVE STORAGE _____ 18·7 $M m^3$

WATER CONDUCTOR SYSTEM

LENGTH OF SYSTEM _____ 2·8 KM
DISCHARGE _____ 216 Cumecs

POWER HOUSE

INS. CAPACITY _____ 900 MW
AV. GROSS HEAD _____ 523·7 M

DRN.		HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD.		कोल्लूर पम्प संचय योजना
SUBMD.		KOLLUR PUMPED STORAGE SCHEME
APPD.		
T.S. NO	48 K/13	
SCALE:.	1" = 1 MILE	CENTRAL ELECTRICITY AUTHORITY
MAY,	1984	DRG. NO HEPR-PS-WFR-1013

9. MINHOLE PUMPED STORAGE PROJECT (10X220MW=2200MW)

1. INTRODUCTION

Minhole Pumped Storage Project is located near small village Agumbe in Shimoga district of Karnatka. The project utilizes water of Minhole/Samekhlu a small tributary of Tunga River River for power generation harnessing gross head of 506.7 m. The powerhouse has 10 units of 220 MW having installed capacity of 2200 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Minhole River having upper reservoir at latitude of 13°40'34"N and longitude of 75°02'45"E and lower reservoir at latitude of 14°41'42"N and longitude of 75°02'3"E. The nearest railway station is Shomga and the Airport is Manglore International.

3. PROJECT FEATURES

Minhole Pumped Storage Project involves construction OF:

Upper Reservoir (proposed): Upper Reservoir is proposed to be a dam of Height 20 m with a live storage of 15.0 Mcum on Minhole hole a small tributary of Tunga River between a Full Reservoir Level (FRL) of 657 m and Minimum Draw down Level (MDDL) of 647 m.

Lower Reservoir (Proposed): Lower reservoir is proposed to be a dam of Height 45 m with a live storage of 11.7 Mcum on river Samekhlu between a Full Reservoir Level (FRL) of 152 m and Minimum Draw down Level (MDDL) of 137m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of 2 nos. Head race tunnel (HRT) of length 2400 m carrying water to the underground powerhouse. The Project to be operated under gross head of 506.7 m with installed capacity of 2200 MW.

4. HYDROLOGY

The Catchment area of the river is 18.8 Sq. Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Minhole Pumped Storage Project would be 2200 MW Utilizes the gross head of 506.7 m.

Note:- The project is presently Unexploitable at Present as Upper and Lower Reservior for Minhole Pumped Storage Project Falls in Western Ghat region. All the construction activities in Western Ghat have been stopped by MoEF.

SALIENT FEATURES
MINHOLE PUMPED STORAGE PROJECT

GENERAL:

State	Karnatka
District	Shimoga
River	Minhole/Samekhlu
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Shimoga
Nearest Airport	Manglore

UPPER RESERVOIR (proposed):

Location	Latitude: 13°40'34"N
	Longitude: 75°02'45"E
Full Reservoir Level (FRL) (m)	657
Minimum Draw Down Level (MDDL) (m)	647
Length of the Dam at the top(m)	400
Height of Dam (above RBL) (m)	20
Live Storage (Mcum)	15
Gross Storage (Mcum)	22.2

LOWER RESERVOIR (proposed):

Location	Latitude: 14°41'42"N
	Longitude: 75°02'3"E
Full Reservoir Level (FRL) (m)	152
Minimum Draw Down Level (MDDL) (m)	137
Length of the Dam at the top(m)	530
Height of Dam (above RBL) (m)	45
Live Storage (Mcum)	11.7
Gross Storage (Mcum)	16.9

HYDROLOGY:

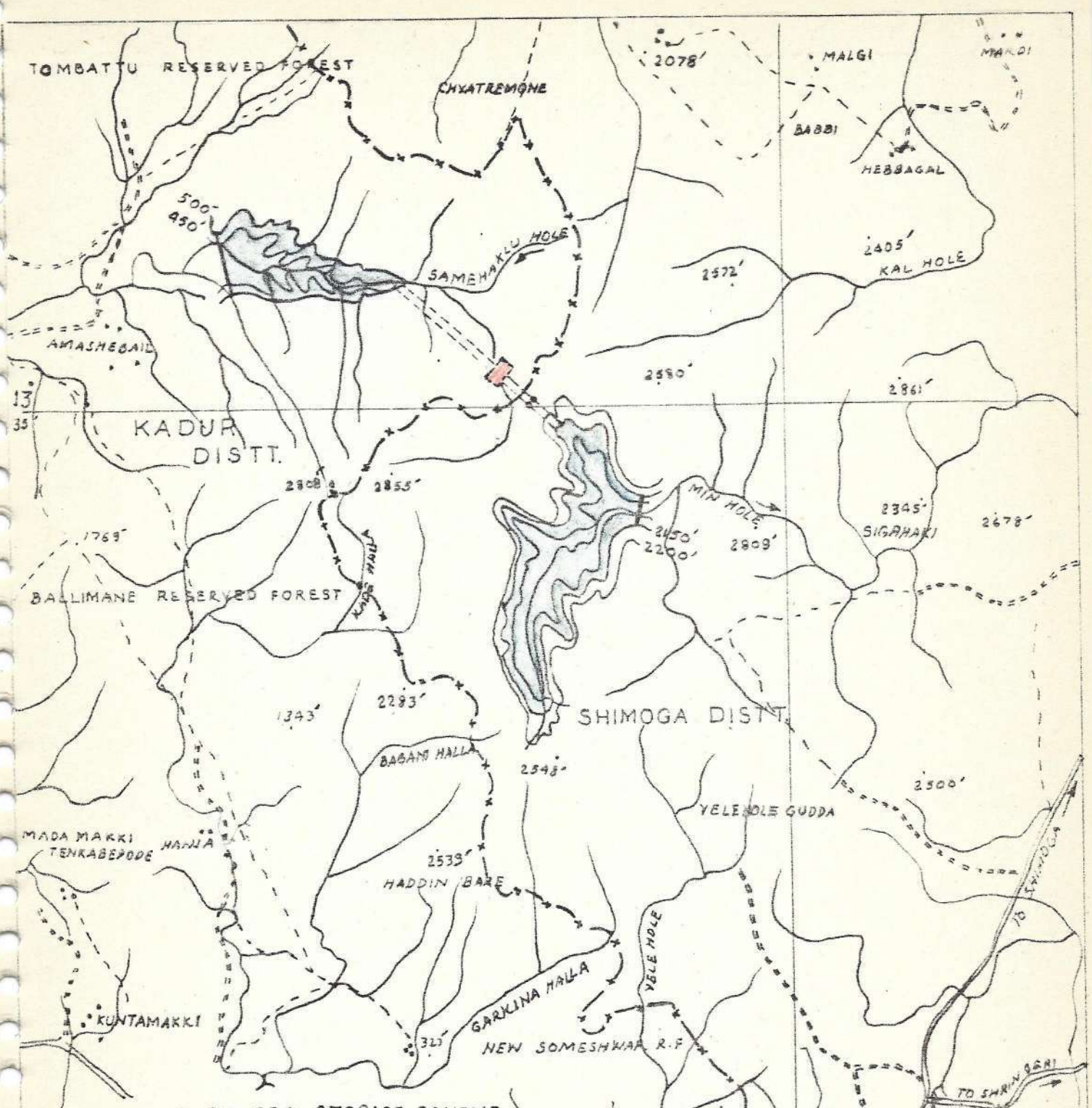
Catchment Area (Sq. Km)	18.8

WATER CONDUCTOR SYSTEM

Number	2
Length (m)	2400

POWER HOUSE

Type	Underground
No. of Generating Units	10
Capacity of each Unit (MW)	220
Installed Capacity (MW)	2200
Gross Head(m)	506.7



MIN HOLE PUMPED STORAGE SCHEME

UPPER RESERVOIR

F.R.L ..... 657 M (2155')

13° 30' M D D L ..... 647 M (2120')

LIVE STORAGE ..... 15·0 $M m^3$

LOWER RESERVOIR

F R L ..... 152 M (500')

M D D L ..... 137 M (450')

LIVE STORAGE ..... 11·7 $M m^3$

WATER CONDUCTOR SYSTEM

LENGTH OF SYSTEM ... 2·40 KM

DISCHARGE ..... 540 cumecs

POWER HOUSE

INS. CAP ..... 2200 MW

AV. GROSS HEAD ..... 506·7 M

DRN	H. SINGH	HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD.	Rsgill	मिनहोल पम्प संचय योजना
SUBMD.	M Singh	MINHOLE PUMPED STORAGE SCHEME
APPD.	[illegible]	
T.S. No	48 O/2	
SCALE	1" = 1 MILE	CENTRAL ELECTRICITY AUTHORITY
MARCH, 84		DRG. NO. HEPR-PS-EFR-1005

10. SITANADI PUMPED STORAGE PROJECT (10X260MW=2600MW)

1. INTRODUCTION

Sitanadi Pumped Storage Project is located near small village Kollur in Shimoga district of Karnatka. The project utilizes water of Agumbe Hole, a small tributary of Tunga River/Modi Hole, a small tributary of Sitanadi River for power generation harnessing gross head of 554 m. The powerhouse has 10 units of 260 MW having installed capacity of 2600 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Agumbe Hole River having upper reservoir at latitude of 13°29'47"N and longitude of 75°06'59"E and lower reservoir at latitude of 13°29'11"N and longitude of 75°06'26"E. There is a proposal of Underground type of Power house. The nearest railway station is Shomga and the Airport is Manglore International.

3. PROJECT FEATURES

Sitanadi Pumped Storage Project involves construction of Upper Reservoir.

Upper Reservoir (proposed): Upper Reservoir is proposed to be of Height 17 m with a live storage of 12.6 Mcum on Agumbe hole a small tributary of Tunga River between a Full Reservoir Level (FRL) of 689 m and Minimum Draw down Level (MDDL) of 680 m.

Lower Reservoir (Proposed): Height of the lower reservoir is 47 m with a live storage of 18.7 Mcum on river Modi hole between a Full Reservoir Level (FRL) of 137 m and Minimum Draw down Level (MDDL) of 122m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of 2 nos. Head race tunnel (HRT) of length 1200 m carrying water to the underground powerhouse. The Project to be operated under gross head of 554 m with installed capacity of 2600 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 600 m.

4. HYDROLOGY

The Catchment area of the river is 20 Sq. Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Sitanadi Pumped Storage Project would be 2600 MW.

NOTE- Sitanadi Pumped Storage Project is Unexploitable at present as project lies in Western Ghat region. All the construction activities in Western Ghat have been stopped by MoEF.

SALIENT FEATURES
SITANADI PUMPED STORAGE PROJECT

GENERAL:

State	Karnatka
District	Shimoga
River	Agumbe Hole/Modi Hole
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Shimoga
Nearest Airport	Manglore

UPPER RESERVOIR (proposed):

Location	Latitude: 13°29'47"N
	Longitude: 75°06'59"E
Full Reservoir Level (FRL) (m)	689
Minimum Draw Down Level (MDDL) (m)	680
Length of the Dam at the top(m)	240
Height of Dam (above RBL) (m)	17
Live Storage (Mcum)	12.6
Gross Storage (Mcum)	20.9

LOWER RESERVOIR (proposed):

Location	Latitude: 13°29'11"N
	Longitude: 75°06'26"E
Full Reservoir Level (FRL) (m)	137
Minimum Draw Down Level (MDDL) (m)	122
Length of the Dam at the top(m)	640
Height of Dam (above RBL) (m)	47
Live Storage (Mcum)	15.0
Gross Storage (Mcum)	23.9

HYDROLOGY:

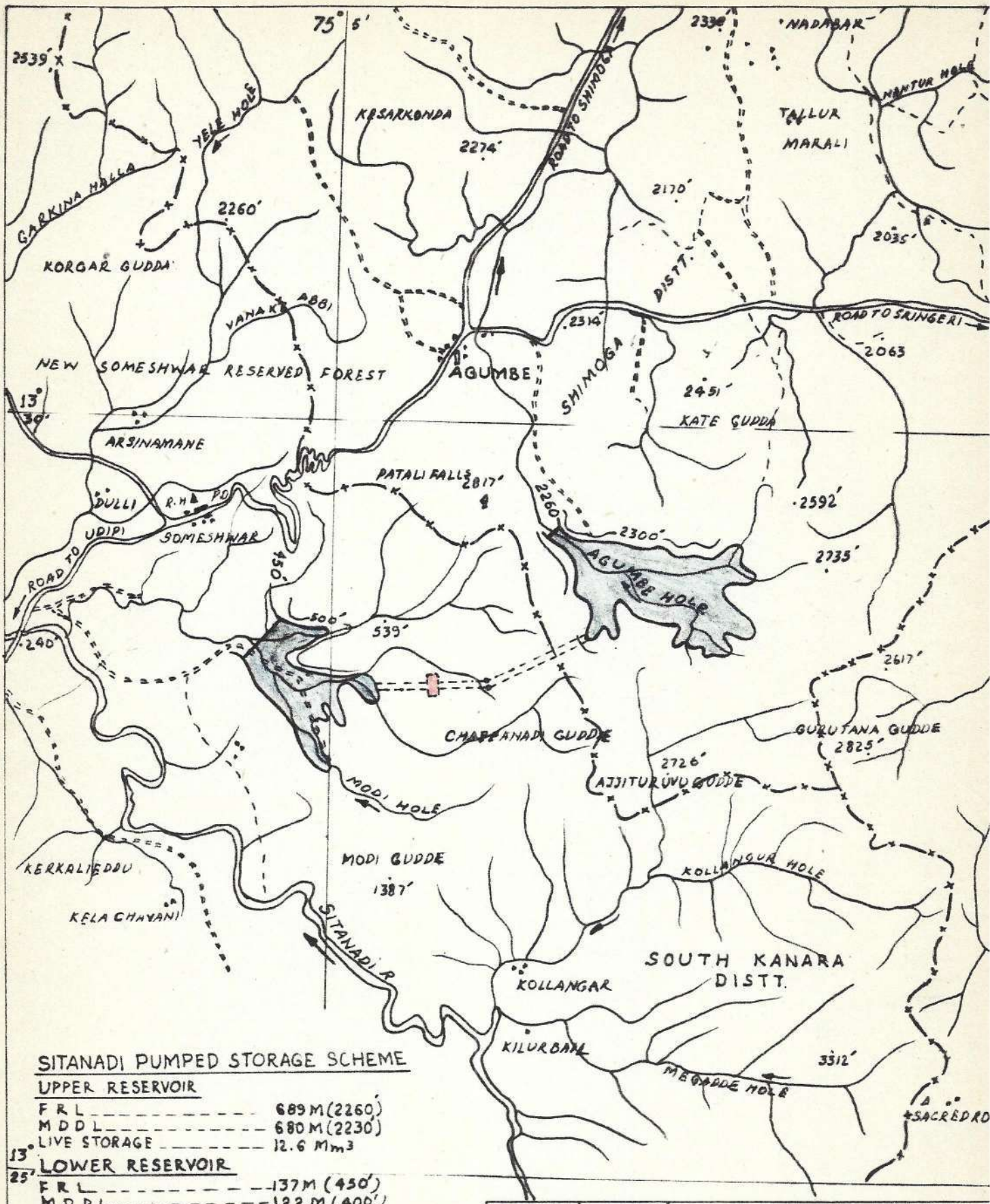
Catchment Area (Sq. Km)	20

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	2
Length (m)	1600
TAIL RACE TUNNEL	
Number	2
Length (m)	600

POWER HOUSE

Type	Underground
No. of Generating Units	10
Capacity of each Unit (MW)	260
Installed Capacity (MW)	2600
Gross Head(m)	554



SITANADI PUMPED STORAGE SCHEME

UPPER RESERVOIR

FRL ---------- 689 M (2260')
MDDL ---------- 680 M (2230')
LIVE STORAGE ---------- 12.6 Mm³

13° 25'

LOWER RESERVOIR

FRL ---------- 137 M (450')
MDDL ---------- 122 M (400')
LIVE STORAGE ---------- 15.0 Mm³

WATER CONDUCTOR SYSTEM

LENGTH OF SYSTEM ---------- 2.5 KM
DISCHARGE ---------- 580 Cumecs

POWER HOUSE

INST. CAP. ---------- 2600 MW
AV. GROSS HEAD ---------- 554 M

DRN.	H. SINGH	HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD	Rsgill	सीतानदी प्रम्प संचय योजन
SUBMD.	M.S.	SITANADI PUMPED STORAGE SCHEME
APPD.	[illegible]	
T.S. NO.	48 0/2,3	
SCALE	1" = 1 MILE	CENTRAL ELECTRICITY AUTHORITY
MARCH, 84.		DRG. NO. HEPR-PS-WFR-1014

11. HULAGI PUMPED STORAGE PROJECT (9X245MW=2200MW)

1. INTRODUCTION

Hulagi Pumped Storage Project is located near small village Gullanpete in Chikmanglur district of Karnatka. The project utilizes water of Hulagi Halla River for power generation harnessing gross head of 293 m. The powerhouse has 9 units of 245 MW having installed capacity of 2200 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Agumbe Hole River having upper reservoir at latitude of 13°11'03"N and longitude of 75°38'26"E and lower reservoir at latitude of 13°11'02"N and longitude of 75°36'16"E. There is a proposal of Underground type of Power house. The nearest railway station from the project site is Chikmanglore and the Airport is Manglore International.

3. PROJECT FEATURES

Hulagi Pumped Storage Project involves construction of

Upper Reservoir (Proposed): Upper Reservoir is proposed to be a dam of Height 55 m with a live storage of 13.4 Mcum on Hulagi Halla River between a Full Reservoir Level (FRL) of 1082 m and Minimum Draw down Level (MDDL) of 1067 m.

Lower Reservoir (Proposed): Lower Reservoir is proposed to be a dam of Height 29 m with a live storage of 16.8 Mcum on river Hulagi Halla between a Full Reservoir Level (FRL) of 776 m and Minimum Draw down Level (MDDL) of 640m.

Water Conductor System (Proposed): The proposed Water Conductor System comprises of 3 nos. Head race tunnel (HRT) of length 1400 m carrying water to the underground powerhouse. The Project to be operated under gross head of 554 m with installed capacity of 2200 MW.

4. HYDROLOGY

The Catchment area of the river is 50 Sq. Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Hulagi Pumped Storage Project would be 2200 MW utilizing the gross head of 293 m.

Note:-Hulagi Pumped Storage Project is presently Unexploitable as Upper and Lower Reservoir for Hulagi Pumped Storage Project is falls in Western Ghat region. All the construction activities in Western Ghat have been stopped by MoEF.

SALIENT FEATURES
HULAGI PUMPED STORAGE PROJECT

GENERAL:

State	Karnatka
District	Chikmanglur
River	Hulagi Hole
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Chikmanglur
Nearest Airport	Manglore

UPPER RESERVOIR (proposed):

Location	Latitude: 13°11'03"N
	Longitude: 75°38'26"E
Full Reservoir Level (FRL) (m)	1082
Minimum Draw Down Level (MDDL) (m)	1067
Length of the Dam at the top(m)	800
Height of Dam (above RBL) (m)	55
Live Storage (Mcum)	13.4
Gross Storage (Mcum)	20.6

LOWER RESERVOIR (proposed):

Location	Latitude: 13°11'02"N
	Longitude: 75°36'16"E
Full Reservoir Level (FRL) (m)	788
Minimum Draw Down Level (MDDL) (m)	776
Length of the Dam at the top(m)	640
Height of Dam (above RBL) (m)	29
Live Storage (Mcum)	16.8
Gross Storage (Mcum)	25.3

HYDROLOGY:

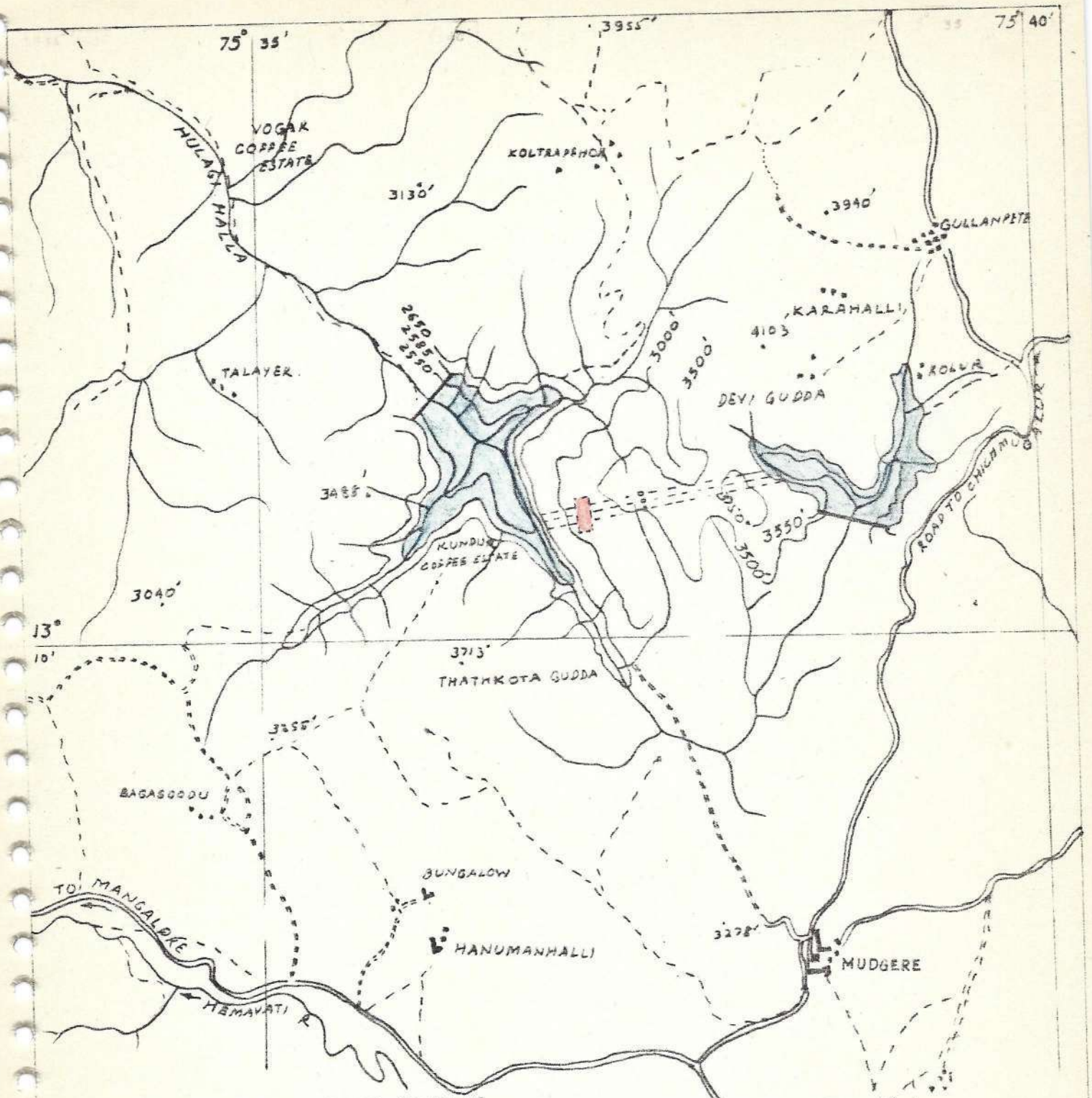
Catchment Area (Sq. Km)	50

WATER CONDUCTOR SYSTEM

Length (m)	03

POWER HOUSE

Type	Underground
No. of Generating Units	9
Capacity of each Unit (MW)	245
Installed Capacity (MW)	2200
Gross Head(m)	293



HULAGI PUMPED STORAGE SCHEME

FRL ---------- 1082 M (3550')
MDDL ---------- 1067 M (3500')
LIVE STORAGE ---------- 13.4 Mm^3

LOWER RESERVOIR.

FRL ---------- 788 M (2885')
MDDL ---------- 776 M (2545')
LIVE STORAGE ---------- 16.8 Mm^3

WATER CONDUCTOR SYSTEM

LENGTH OF SYSTEM ---------- 2.8 KM
DISCHARGE ---------- 934 Cumecs.

POWER HOUSE

INST. CAP. ---------- 2200 MW
AV. GROSS HEAD ---------- 293 M

DRN.	H. SINGH	HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD.	Rsgill	हुलागी पम्प संचय योजना HULAGI PUMPED STORAGE SCHEME
SUBMD.	MSy	
APPD.	[illegible]	
T. S. NO.	48 0/12	
SCALE	1" = 1 MILE	CENTRAL ELECTRICITY AUTHORITY
FEB, 1984.		DRG. NO. HEPR - PS - EFR - 1006

12. KUTTIYADI PUMPED STORAGE PROJECT (3x300MW=900MW)

1. INTRODUCTION

Kuttiyadi Pumped Storage Project is located in Kozhikode district of Kerala. The project utilizes water of Kuttiyadi River for power generation harnessing gross head of 732.037 m. The powerhouse has 3 units of 300 MW having installed capacity of 900 MW would generate the Annual Energy of 1260MU in 90% dependable year..

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Kuttiyadi River having upper reservoir at latitude of 11°33'04"N and longitude of 75°55'29"E and lower reservoir at latitude of 11°36'45"N and longitude of 75°49'27"E. There is a proposal of Underground type of Power house. The nearest railway station is Koyilandi and the nearest Airport is Karippoor Kozhikode.

3. PROJECT FEATURES

Kuttiyadi Pumped Storage Project involves construction of:

Upper Reservoir (Existing): Upper Reservoir is existing at a Height of 39.51 m with a live storage of 33.98 Mcum on Kuttiyadi River between a Full Reservoir Level (FRL) of 758.037 m and Minimum Draw down Level (MDDL) of 737.620 m.

Lower Reservoir (Existing): Lower Reservoir is existing at a Height of 35.36 m with a live storage of 113.44 Mcum on river Peruvannamoozhy between a Full Reservoir Level (FRL) of 44.410 m and Minimum Draw down Level (MDDL) of 25.520 m.

Water Conductor System : The Water Conductor System comprises of 1 no. Head race tunnel (HRT) of length 3538 m carrying water to the underground powerhouse. The Project to be operated under gross head of 732.037 m with installed capacity of 900 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 1083 m.

4. POWER & ENERGY BENEFITS

The installed capacity of Kuttiyadi Pumped Storage Project would be 900MW utilising the gross head of 732.037 m.

Note- Kuttiyadi Pumped Storage Project is Unexploitable at present as the project lies in Western Ghat region. All the construction activities in Western Ghat have been stopped by MoEF.

SALIENT FEATURES
KUTTIYADI PUMPED STORAGE PROJECT

GENERAL:

State	Kerala
District	Kazikode
River	Kuttiyadi
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Kozjikode
Nearest Airport	Karippoor

UPPER RESERVOIR (proposed):

Location	Latitude: 11°33'04"N
	Longitude: 75°55'29"E
Full Reservoir Level (FRL) (m)	758.037
Minimum Draw Down Level (MDDL) (m)	737.620
Length of the Dam at the top(m)	228.60
Height of Dam (above RBL) (m)	39.51
Live Storage (Mcum)	33.98
Gross Storage (Mcum)	38.40

LOWER RESERVOIR (proposed):

Location	Latitude: 11°36'45"N
	Longitude: 75°49'27"E
Full Reservoir Level (FRL) (m)	44.410
Minimum Draw Down Level (MDDL) (m)	25.520
Length of the Dam at the top(m)	35.36
Live Storage (Mcum)	113.44

HYDROLOGY:

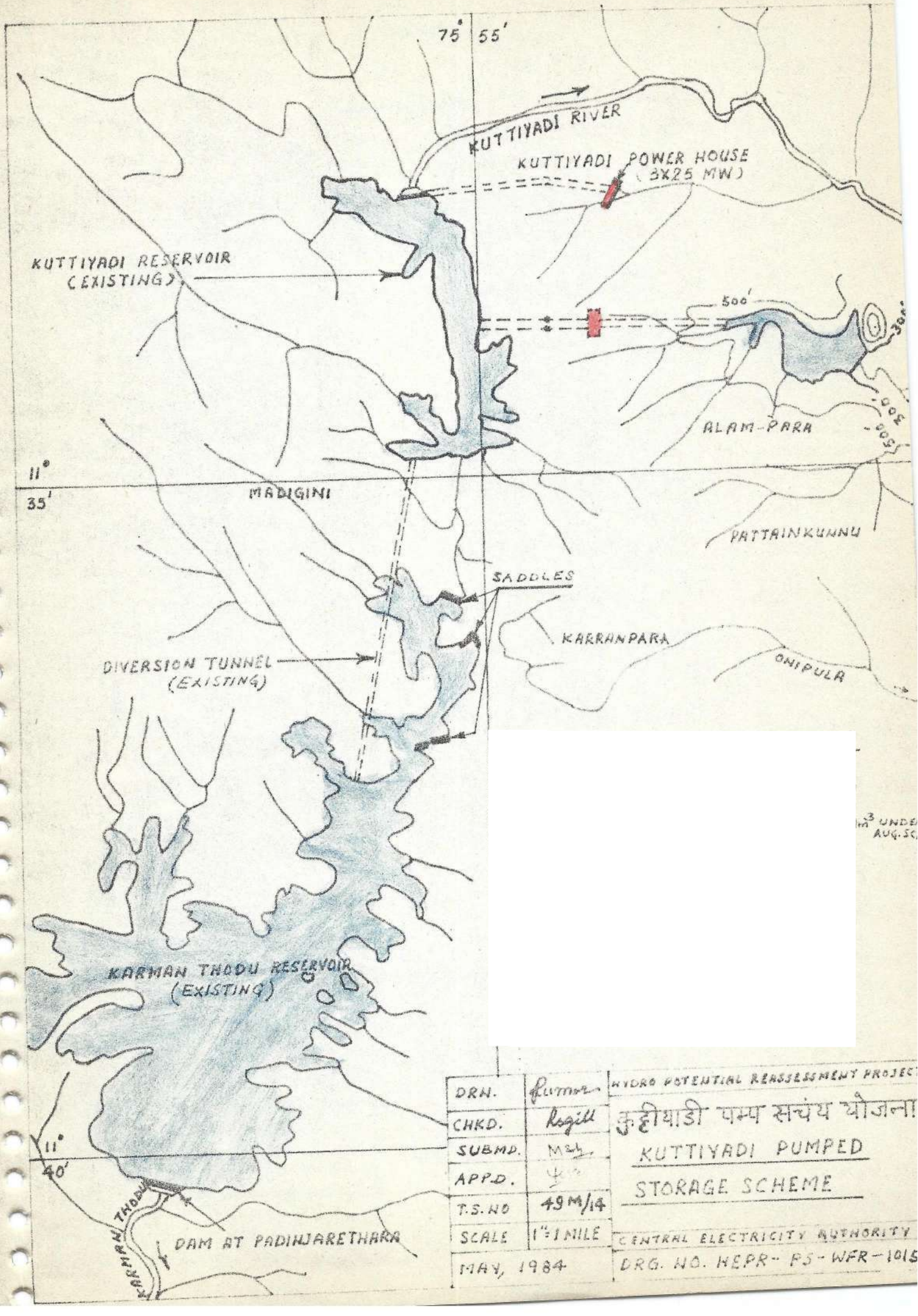
Catchment Area (Sq. Km)	38.50 (Kakkayam) 170.22 (Peruvannamoozhy)

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	1
Length (m)	3538
Diameter(m)	6.40
TAIL RACE TUNNEL	
Length (m)	1083
Diameter(m)	6.40

POWER HOUSE

Type	Underground
No. of Generating Units	3
Capacity of each Unit (MW)	300
Installed Capacity (MW)	900
Design Head(m)	700 (Turbine), 729 (Pump)
Gross Head(m)	732.037
Annual Energy (MU)	1260


75° 55'
KUTTIYADI RIVER
KUTTIYADI POWER HOUSE
(3X25 MW)
KUTTIYADI RESERVOIR
(EXISTING)
500'
300'
ALAM-PARA
11°
35'
MADIGINI
PATTAINKUNNU
SADDLES
KARRANPARA
DIVERSION TUNNEL
(EXISTING)
ONIPULA
KARMAN THODU RESERVOIR
(EXISTING)
11°
40'
KARMAN THODU
DAM AT PADINJARETHARA
DRN.
CHKD.
SUBMD.
APPD.
T.S. NO
49 M/14
SCALE
1" = 1 MILE
MAY, 1984
HYDRO POTENTIAL REASSESSMENT PROJECT
कुट्टियाडी पम्प सचंय योजना
KUTTIYADI PUMPED
STORAGE SCHEME
CENTRAL ELECTRICITY AUTHORITY
DRG. NO. HEPR-PS-WFR-1015

13. MARA PUMPED STORAGE PROJECT (4X275MW=1100MW)

1. INTRODUCTION

Mara Pumped Storage Project is located near small village Mara and in Sidhi district of Madhya Pradesh. The project utilizes water of Mayra River for power generation harnessing design head of 205 m. The powerhouse has 4 units of 275 MW having installed capacity of 1100 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Mayra River having upper reservoir at latitude of 23°52'35"N and longitude of 82°26'34"E and lower reservoir at latitude of 23°51'30"N and longitude of 82°27'34"E. The nearest railway station is Niwas Road Fort and the Airport is Jabalpur International.

3. PROJECT FEATURES

Mara Pumped Storage Project involves construction of :

Upper Reservoir (Proposed): Upper Reservoir is proposed to be of Height 70 m with a live storage of 12.2 Mcum on river Mayra between a Full Reservoir Level (FRL) of 590 m and Minimum Draw down Level (MDDL) of 565 m.

Lower Reservoir (Proposed): Height of the lower reservoir is 30 m with a live storage of 14.9 Mcum on river Mayra between a Full Reservoir Level (FRL) of 380 m and Minimum Draw down Level (MDDL) of 370 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 1700 m carrying water to the underground powerhouse. The Project to be operated under design head of 205 m with installed capacity of 1100 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 600 m.

4. HYDROLOGY

The Catchment area at Upper Dam is 20 Sq. Km

5. POWER & ENERGY BENEFITS

The installed capacity of Binauda Pumped Storage Project would be 1100 MW utilising the Design head of 205 m

NOTE- Mara Pumped Storage Project could not be developed due to issues of Forest Land, wild life clearance and coal mines

SALIENT FEATURES
MARA PUMPED STORAGE PROJECT

GENERAL:

State	Madhya Pradesh
District	Sidhi
River	Mayra
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Niwas Road
Nearest Airport	Jabalpur

UPPER RESERVOIR (proposed):

Location	Latitude: 23°52'35"N
	Longitude: 82°26'34"E
Full Reservoir Level (FRL) (m)	590
Minimum Draw Down Level (MDDL) (m)	565
Length of the Dam at the top(m)	325
Height of Dam (above RBL) (m)	70
Live Storage (Mcum)	12.2
Gross Storage (Mcum)	16.6

LOWER RESERVOIR (proposed):

Location	Latitude: 23°51'30"N
	Longitude: 82°27'34"E
Full Reservoir Level (FRL) (m)	380
Minimum Draw Down Level (MDDL) (m)	370
Type of Dam	
Length of the Dam at the top(m)	325
Height of Dam (above RBL) (m)	62
Live Storage (Mcum)	9.8

HYDROLOGY:

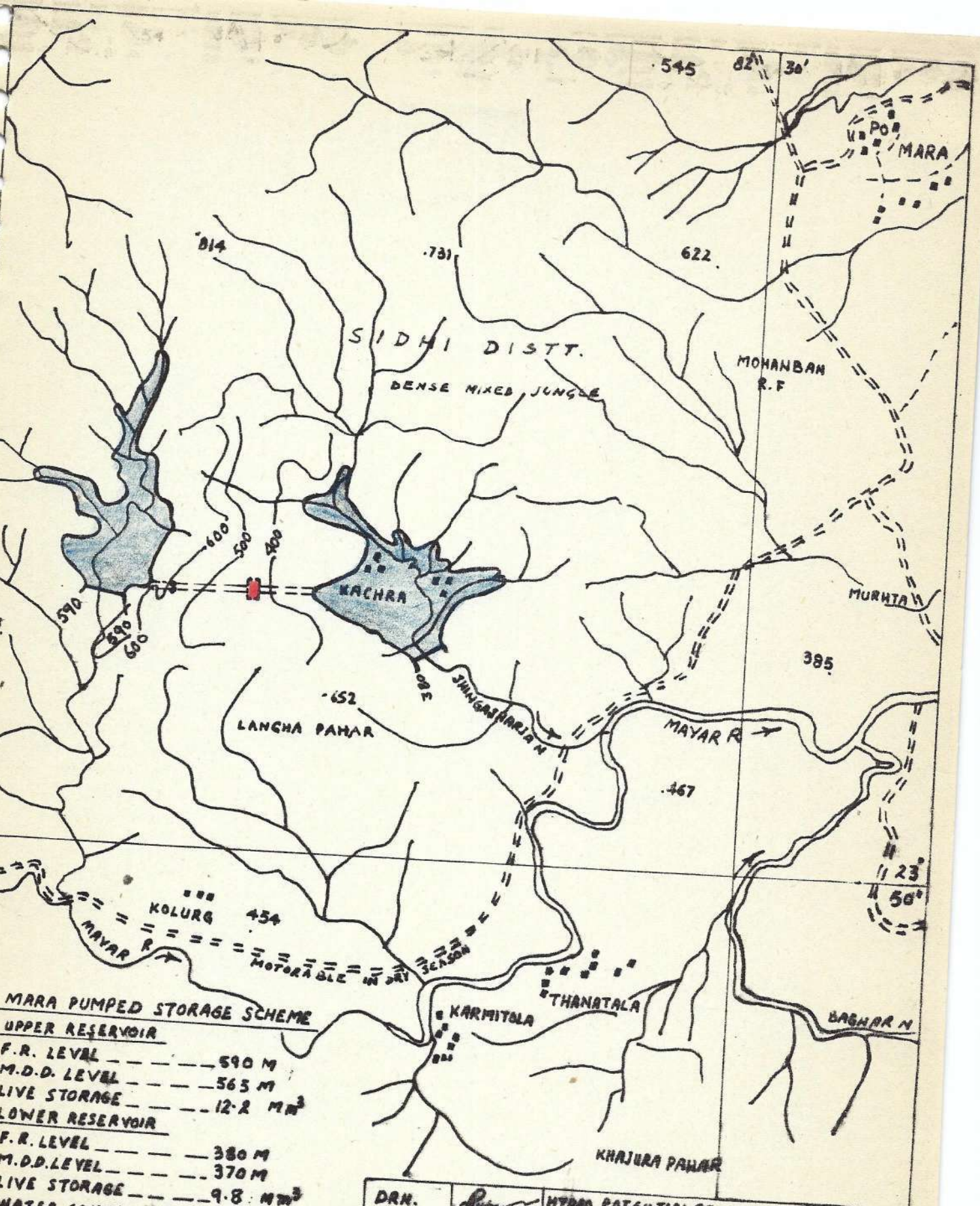
Catchment Area (Sq. Km) Upper Dam	20

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	1
Length (m)	1700
TAIL RACE TUNNEL	
Length (m)	600

POWER HOUSE:

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	275
Installed Capacity (MW)	1100
Gross Head(m)	205



MARA PUMPED STORAGE SCHEME

UPPER RESERVOIR

F.R. LEVEL ——— 590 M
M.D.D. LEVEL ——— 565 M
LIVE STORAGE ——— 12.2 Mm^3

LOWER RESERVOIR

F.R. LEVEL ——— 380 M
M.D.D. LEVEL ——— 370 M
LIVE STORAGE ——— 9.8 Mm^3

WATER CONDUCTOR SYSTEM

LENGTH OF SYSTEM ——— 1.70 KM
DISCHARGE ——— 680 Cumecs

POWER HOUSE

INS CAPACITY ——— 1100 MW
AV. GROSS HEAD ——— 205 M

DRN.		HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD.		मारा पम्प संचय योजना MARA PUMPED STORAGE SCHEME
SUBMD.		
APPD.		
T.S. NO	64 2/3	
SCALE	1:50,000	CENTRAL ELECTRICITY AUTHORITY
MARCH 1984		DRG. NO HEPR-PS-GAN-1012

14. BINAUDA PUMPED STORAGE PROJECT (6X375MW=2250MW)

1. INTRODUCTION

Binauda Pumped Storage Project is located near small village Budan and Karoli in Mandla district of Madhya Pradesh. The project utilizes water of Binauda River for power generation harnessing design head of 289.7 m. The powerhouse has 6 units of 375 MW having installed capacity of 2250 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Binauda River having upper reservoir at latitude of 23°12'35"N and longitude of 81°2'34"E and lower reservoir at latitude of 23°13'30"N and longitude of 81°03'34"E. The nearest railway station is Mandla Fort and the Airport is Jabalpur International.

3. PROJECT FEATURES

Binauda Pumped Storage Project involves construction of :.

Upper Reservoir (Proposed): Upper Reservoir is proposed to be of Height of 60 m with a live storage of 13.9 Mcum on river Binauda between a Full Reservoir Level (FRL) of 860 m and Minimum Draw down Level (MDDL) of 842 m.

Lower Reservoir (Proposed): Lower reservoir is proposed to be of Height of 62 m with a live storage of 16.3 Mcum on river Uttara between a Full Reservoir Level (FRL) of 572 m and Minimum Draw down Level (MDDL) of 549 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of a Head race tunnel (HRT) of length 1900 m carrying water to the underground powerhouse. The Project to be operated under design head of 289.7m with installed capacity of 2250MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 900 m.

4. HYDROLOGY

The Catchment area at Upper Dam is 28 Sq. Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Binauda Pumped Storage Project would be 2250 MW utilising the Design head of 289.7 m.

NOTE- Binauda Pumped Storage Project is Unexploitable at present as it could not be developed due to issues of Forest Land, wild life clearance and coal mines.

SALIENT FEATURES
BINAUDA PUMPED STORAGE PROJECT

GENERAL:

State	Madhya Pradesh
District	Mandla
River	Binauda
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Mandla Fort
Nearest Airport	Jabalpur

UPPER RESERVOIR (proposed):

Location	Latitude: 23°12'35"N
	Longitude: 81°2'34"E
Full Reservoir Level (FRL) (m)	860
Minimum Draw Down Level (MDDL) (m)	842
Length of the Dam at the top(m)	500
Height of Dam (above RBL) (m)	60
Live Storage (Mcum)	13.9
Gross Storage (Mcum)	20.2

LOWER RESERVOIR (proposed):

Location	Latitude: 23°13'30"N
	Longitude: 81°03'34"E
Full Reservoir Level (FRL) (m)	572
Minimum Draw Down Level (MDDL) (m)	549
Type of Dam	
Height of Dam (above RBL) (m)	62
Live Storage (Mcum)	16.3

HYDROLOGY:

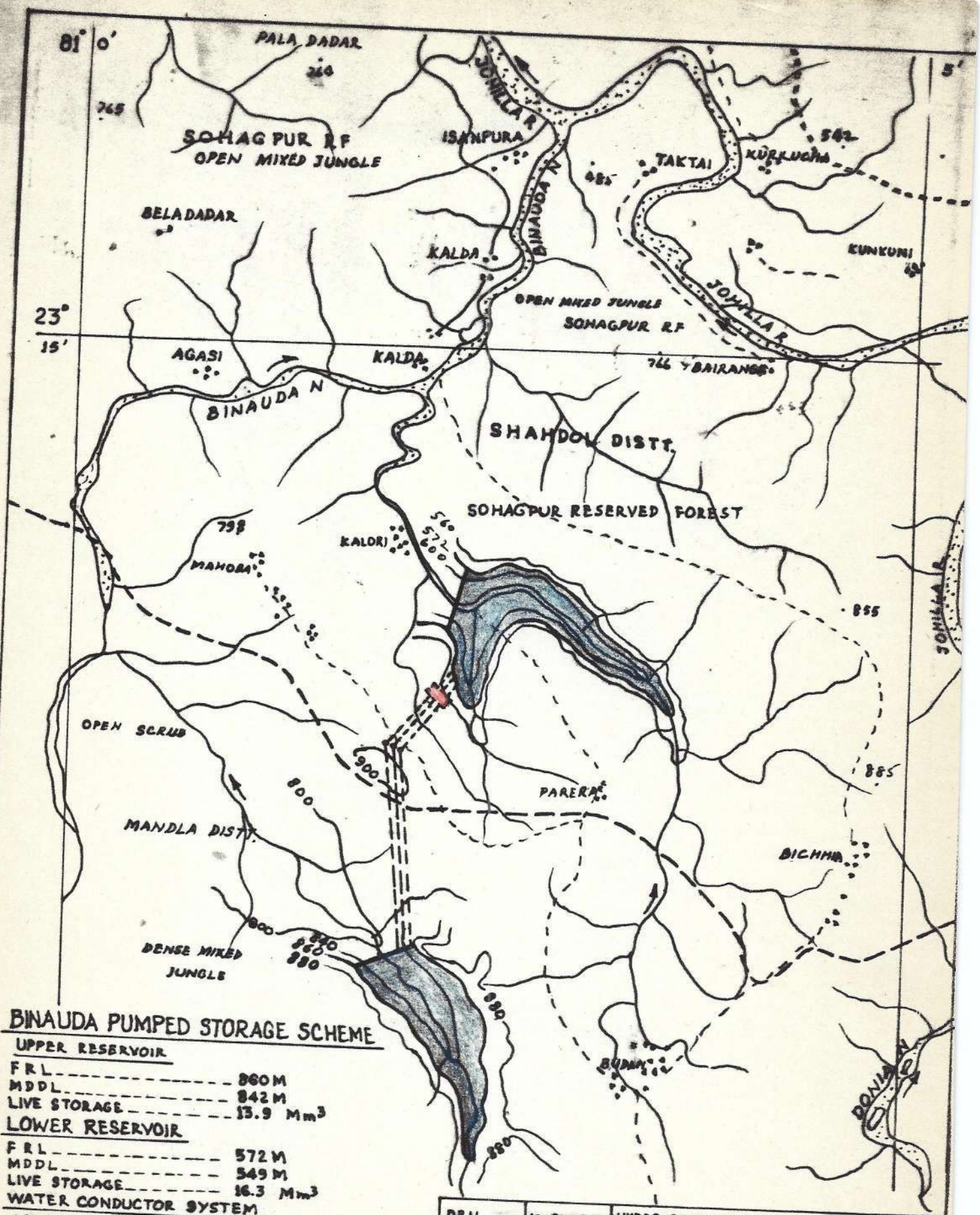
Catchment Area (Sq. Km) Upper Dam	28

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	3
Length (m)	1900
TAIL RACE TUNNEL	
Length (m)	601
Diameter (m)	5.30

POWER HOUSE

Type	Underground
No. of Generating Units	6
Capacity of each Unit (MW)	375
Installed Capacity (MW)	2250
Gross Head(m)	289.7



BINAUDA PUMPED STORAGE SCHEME

UPPER RESERVOIR

FRL	860 M
MDDL	842 M
LIVE STORAGE	13.9 Mm^3

LOWER RESERVOIR

FRL	572 M
MDDL	549 M
LIVE STORAGE	16.3 Mm^3

WATER CONDUCTOR SYSTEM

LENGTH OF SYSTEM	2.8 KM
DISCHARGE	966.0 Cumecs.

POWER HOUSE

INST. CAPACITY	2250 MW
AV. GROSS HEAD	289.7 M

DRN	H. SINGH	HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD	Rajgill	बिनौडा पम्प संचय योजना
SUBMD	MSh	BINAUDA PUMPED STORAGE SCHEME
APPD	Yell	
T.S. NO.	64E/3,4	
SCALE	1:50000	CENTRAL ELECTRICITY AUTHORITY
MARCH 1984		DRG. NO. HEPR - PS - GAN - 1011

15. KABRA PUMPED STORAGE PROJECT (6X200MW=1200MW)

1. INTRODUCTION

Kabra Pumped Storage Project is located near small village Bori in Hoshangabad district of Madhya Pradesh. The project utilizes water of Bori River for power generation harnessing design head of 182.3 m. The powerhouse has 6 units of 200 MW having installed capacity of 1200 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Totki River having upper reservoir at latitude of 22°26'35"N and longitude of 78°17'34"E and lower reservoir at latitude of 22°24'30"N and longitude of 78°16'30"E. The nearest railway station and the Airport is Bhopal International.

3. PROJECT FEATURES

Kabra Pumped Storage Project involves construction of:

Upper Reservoir (Proposed): Upper Reservoir is proposed to be of Height 45 m with a live storage of 12.1 Mcum on river Totki between a Full Reservoir Level (FRL) of 655 m and Minimum Draw down Level (MDDL) of 640 m.

Lower Reservoir (Proposed): Lower reservoir is proposed to be height of 24 m with a live storage of 16.1 Mcum on river Kabra between a Full Reservoir Level (FRL) of 481 m and Minimum Draw down Level (MDDL) of 471 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of 3 nos. Head race tunnel (HRT) of length 800 m carrying water to the underground powerhouse. The Project to be operated under design head of 182.3 m with installed capacity of 1200MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel.

4. HYDROLOGY

The Catchment area at Upper Dam is 93 Sq. Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Kabra Pumped Storage Project would be 1200 MW utilising the Design head of 182.3 m.

NOTE- Kabra Pumped Storage Project is Unexploitable at present it could not be developed due to issues of Forest Land, wild life clearance and coal mines.

SALIENT FEATURES
KABRA PUMPED STORAGE PROJECT

GENERAL:

State	Madhya Pradesh
District	Hoshangabad
River	Totki/Kabra
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Bhopal
Nearest Airport	Bhopal

UPPER RESERVOIR (proposed):

Location	Latitude: 22°26'35"N
	Longitude: 78°17'34"E
Full Reservoir Level (FRL) (m)	655
Minimum Draw Down Level (MDDL) (m)	640
Length of the Dam at the top(m)	720
Height of Dam (above RBL) (m)	45
Live Storage (Mcum)	12.1
Gross Storage (Mcum)	17.1

LOWER RESERVOIR (proposed):

Location	Latitude: 22°24'30"N
	Longitude: 78°16'30"E
Full Reservoir Level (FRL) (m)	481
Minimum Draw Down Level (MDDL) (m)	471
Length of the Dam at the top(m)	300
Height of Dam (above RBL) (m)	24
Live Storage (Mcum)	16.1
Gross Storage (Mcum)	24.0

HYDROLOGY:

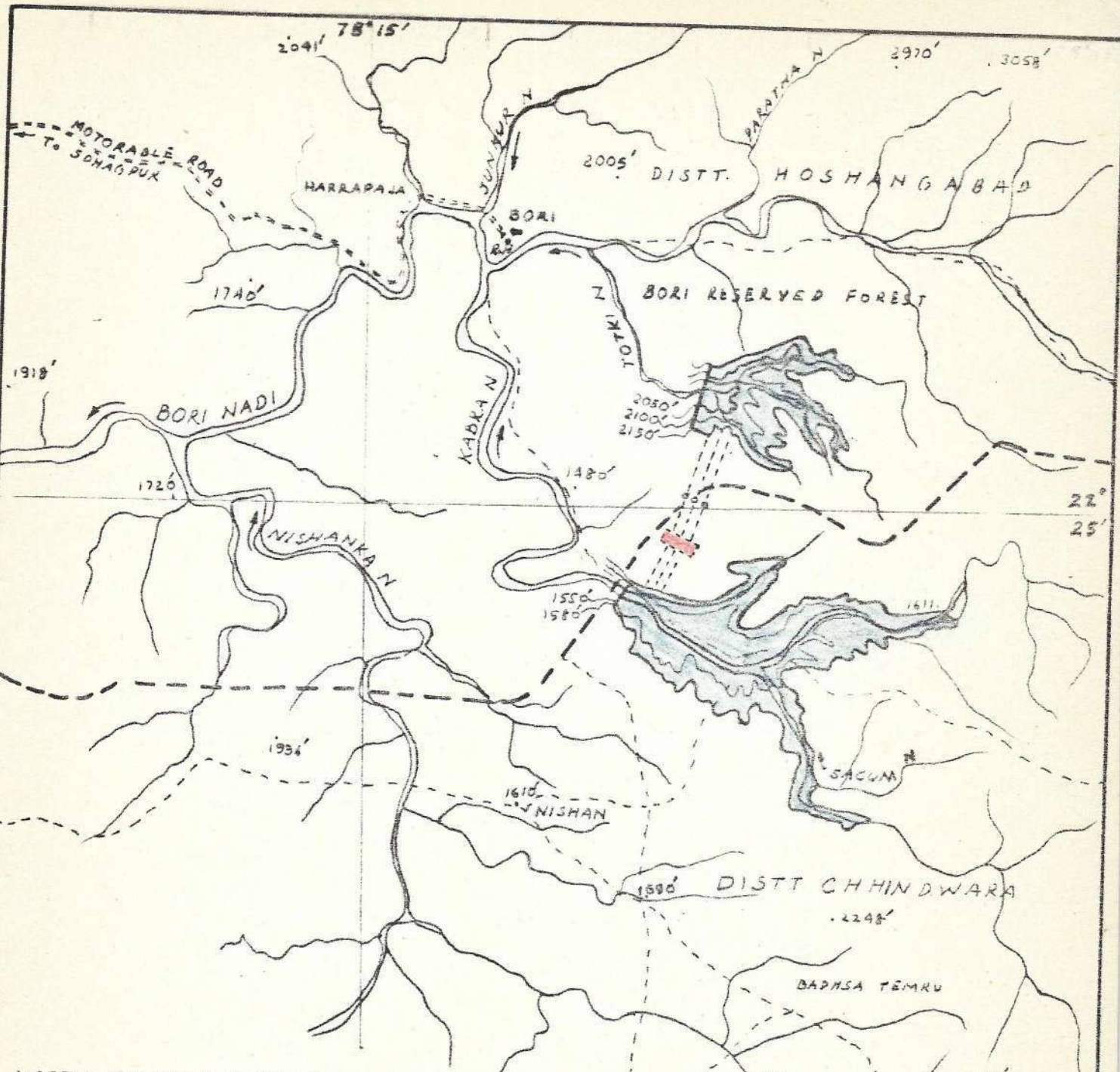
Catchment Area (Sq. Km) Upper Dam	93

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Length (m)	1700
TAIL RACE TUNNEL	
Length (m)	600
Diameter (m)	7

POWER HOUSE

Type	Underground
No. of Generating Units	6
Capacity of each Unit (MW)	200
Installed Capacity (MW)	1200
Gross Head(m)	182.3



KABRA PUMPED STORAGE SCHEME

FRL ..... 655 M (2150')
MDDL ..... 640 M (2100')
LIVE STORAGE ..... 12.1 Mm^3

LOWER RESERVOIR

FRL ..... 481 M (1580')
MDDL ..... 471 M (1545')
LIVE STORAGE ..... 16.1 Mm^3

WATER CONDUCTOR SYSTEM

LENGTH OF SYSTEM ..... 1.9 KM
DISCHARGE ..... 840 Cumecs.

POWER HOUSE

INST. CAP. ..... 1200 MW
AV. GROSS HEAD ..... 182.3 M

DRN	H. SINGH	HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD.	Rajik	काबरा पम्प संचय योजना KABRA PUMPED STORAGE SCHEME
SUBMD	MSh	
APPD.	[illegible]	
T.S NO	55J/3,7	
SCALE	1" = 1 MILE	CENTRAL ELECTRICITY AUTHORITY
APRIL, 84		DRG. NO. HEPR-PS-CIR-1001

16. TANBIA PUMPED STORAGE PROJECT (6X265MW=1600MW)

1. INTRODUCTION

Tanbia Pumped Storage Project is located near small village Keria in Chindwara district of Madhya Pradesh. The project utilizes water of Potia/Tanbia River for power generation harnessing design head of 226.7 m. The powerhouse has 6 units of 265 MW having installed capacity of 1600 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Potia River having upper reservoir at latitude of 22°10'30"N and longitude of 78°22'30"E and lower reservoir at latitude of 22°10'23"N and longitude of 78°19'58"E. The nearest railway station is Chindwara Junction and the Airport is Bhopal International.

3. PROJECT FEATURES

Tanbia Pumped Storage Project involves construction of:

Upper Reservoir (Proposed): Upper Reservoir is proposed to be of Height 61 m with a live storage of 12.7 Mcum on river Potia between a Full Reservoir Level (FRL) of 762 m and Minimum Draw down Level (MDDL) of 745 m.

Lower Reservoir (Proposed): Height of the lower reservoir is 28 m with a live storage of 17.7 Mcum on river Tanbia between a Full Reservoir Level (FRL) of 533 m and Minimum Draw down Level (MDDL) of 523 m.

Water Conductor System (Proposed): The proposed Water Conductor System comprises of 3 nos. Head race tunnel (HRT) of length 1500 m carrying water to the underground powerhouse. The Project to be operated under average gross head of 226.7 m with installed capacity of 1600 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 1000 m.

4. HYDROLOGY

The Catchment area at Upper Dam is 60 Sq. Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Tanbia Pumped Storage Project would be 1600 MW utilising the Design head of 226.7 m.

NOTE- Tabnia Pumped Storage Project is Unexploitable at present could not be developed due to issues of Forest Land, wild life clearance and coal mines.

SALIENT FEATURES
TANBIA PUMPED STORAGE PROJECT

GENERAL:

State	Madhya Pradesh
District	Chindwara
River	Potia/Tanbia
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Chindwara
Nearest Airport	Bhopal

UPPER RESERVOIR (proposed):

Location	Latitude: 22°10'30"N
	Longitude: 78°22'30"E
Full Reservoir Level (FRL) (m)	762
Minimum Draw Down Level (MDDL) (m)	745
Length of the Dam at the top(m)	560
Height of Dam (above RBL) (m)	61
Live Storage (Mcum)	12.7
Gross Storage (Mcum)	19.6

LOWER RESERVOIR (proposed):

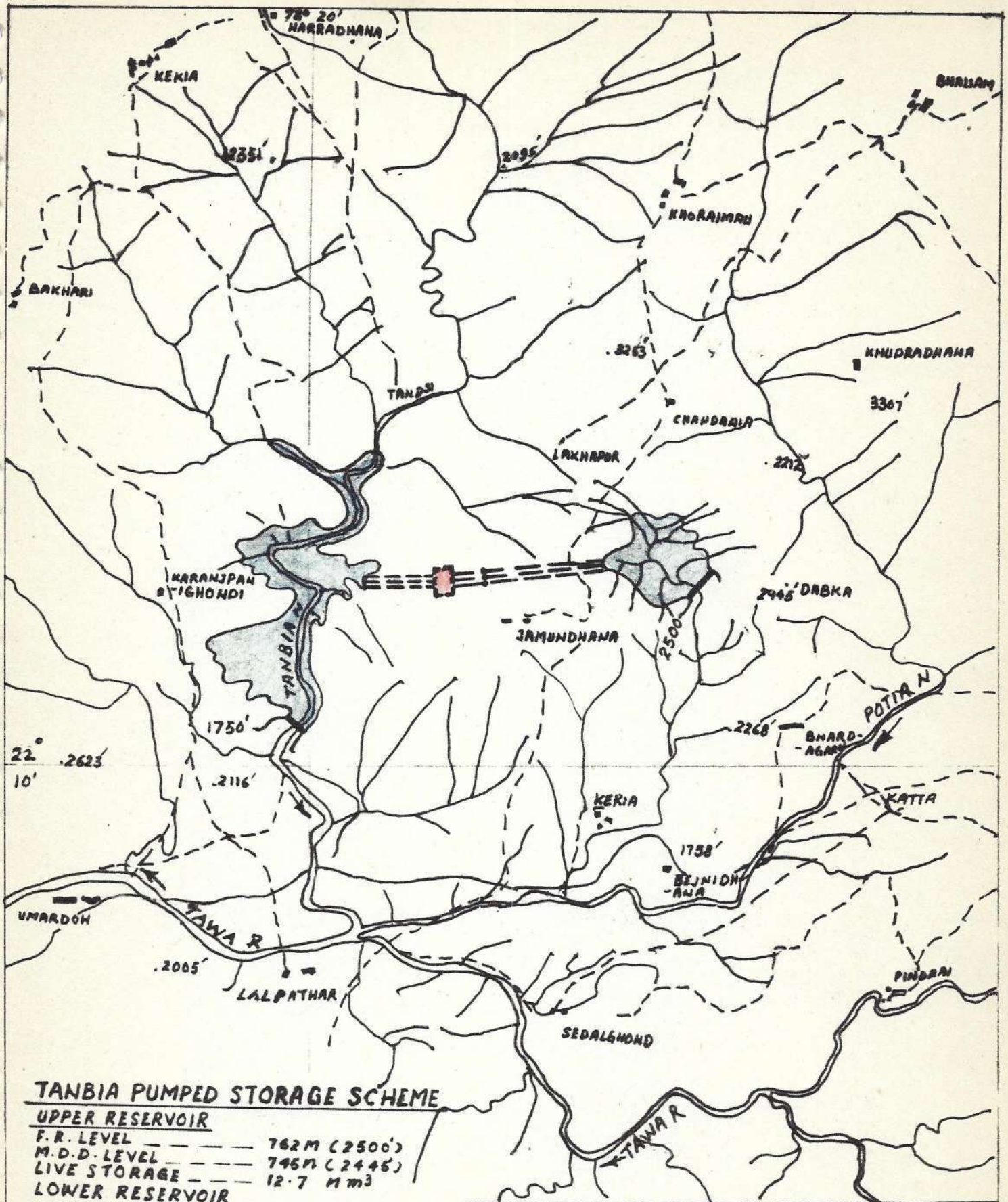
Location	Latitude: 22°10'23"N
	Longitude: 78°19'58"E
Full Reservoir Level (FRL) (m)	533
Minimum Draw Down Level (MDDL) (m)	523
Length of the Dam at the top(m)	290
Height of Dam (above RBL) (m)	28
Live Storage (Mcum)	17.7

WATER CONDUCTOR SYSTEM

HEAD RACE TUNNEL	
Number	3
Length (m)	1500
TAIL RACE TUNNEL	
Number	3
Length (m)	1000

POWER HOUSE

Type	Underground
No. of Generating Units	6
Capacity of each Unit (MW)	265
Installed Capacity (MW)	1600
Gross Head(m)	226.7



TANBIA PUMPED STORAGE SCHEME

UPPER RESERVOIR

F.R. LEVEL — — — — 762 M (2500')
M.D.D. LEVEL — — — 745 M (2445')
LIVE STORAGE — — — 12·7 M m³

LOWER RESERVOIR

F.R. LEVEL — — — — — 533 M (1750')
M.D.D. LEVEL — — — — 523 M (1715')
LIVE STORAGE — — — 17·7 M m³

WATER CONDUCTOR SYSTEM

LENGTH OF SYSTEM — 3·2 KM
DISCHARGE — — — — 880 cumecs.

POWER HOUSE

INS. CAPACITY — — — 1600 MW
AV. GROSS HEAD — — — 226·7 M

DRN.	Pattar	HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD	Rsgill	तांबिआ पम्प संचय योजना
SUBMD	MSh	TANBIA PUMPED
APPD.		STORAGE SCHEME
T.S. NO.	55 J/8	
SCALE	1" = 1 MILE	CENTRAL ELECTRICITY AUTHORITY
JUNE :- 1984		DRG. NO. HEPR - PS - GIR - 1017

17. CHIKALDARA PUMPED STORAGE PROJECT (2X200MW=400MW)

1. INTRODUCTION

Chikaldara Pumped Storage Project is located near Vidharbha locality in Amravati district of Maharashtra. The project utilizes water of a small tributary of Datpadi River for power generation harnessing average gross head of 350 m. The powerhouse has 2 units of 200 MW having installed capacity of 400 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Datpadi River having upper reservoir at latitude of 21°23'55"N and longitude of 77°21'05"E and lower reservoir at latitude of 21°22'35"N and longitude of 77°21'25"E. There is a proposal of underground type of Power house. The nearest railway station is Nagpur and the Airport is Amravati at Amravati district.

3. PROJECT FEATURES

Chikaldara Pumped Storage Project involves.

Upper Reservoir (proposed): Upper Reservoir with a live storage of 5.38 Mm^3 on a small tributary of Datpadi River between a Full Reservoir Level (FRL) of 1041 m and Minimum Draw down Level (MDDL) of 1006.74 m.

Lower Reservoir (proposed): Lower Reservoir with a live storage of 5.38 Mm^3 on Datpadi River between a Full Reservoir Level (FRL) of 691.50 m and Minimum Draw down Level (MDDL) of 655.05 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of 02 nos. of pressure shaft of length 1586 m and diameter 4.5 m carrying water to the underground powerhouse. The Project to be operated under gross head of 350 m with installed capacity of 400 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 380 m.

4. HYDROLOGY

The Catchment area of the river upto the upper dam site is 5.121 Sq.Km. and upto the lower dam site is 7.737 Sq.Km.

NOTE: Chikaldara Pumped Storage Project has been dropped as the boundaries of Melghat Tiger Reserve forest has been extended due to which the Upper Dam & Lower Dam comes under buffer zone.

SALIENT FEATURES

CHIKALDARA PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Amravati
River	Datpadi
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Amravati
Nearest Airport	Nagpur

UPPER RESERVOIR (Proposed):

Location	Latitude:21°23'55"N
	Longitude: 77°21'05"E
Full Reservoir Level (FRL) (m)	1041
Minimum Draw Down Level (MDDL) (m)	1006.74
Length of Dam (m)	248
Dam Height (m)	50.20
Live Storage (Mm^3)	5.38

LOWER RESERVOIR (Proposed):

Location	Latitude: 21°22'35"N
	Longitude: 77°21'25"E
Full Reservoir Level (FRL) (m)	691.50
Minimum Draw Down Level (MDDL) (m)	655.05
Length of Dam (m)	326
Dam Height (m)	75
Live Storage (Mm^3)	5.38

HYDROLOGY:

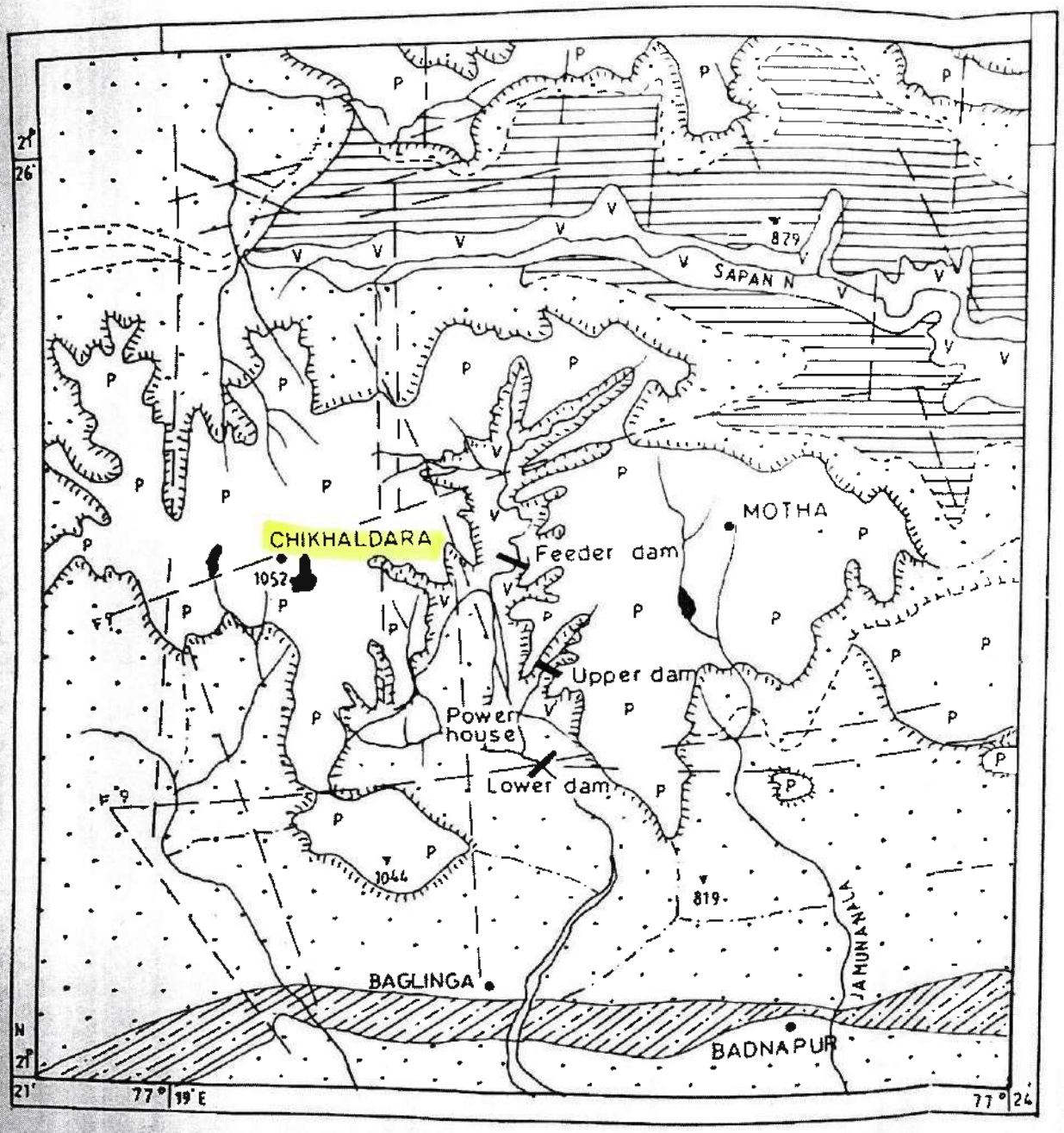
Catchment Area (Sq. Km) Upper Dam	5.121
Catchment Area (Sq. Km) Lower Dam	7.737

WATER CONDUCTOR SYSTEM

PRESSURE SHAFT	
No	2
Length (m)	1586
Diameter	4.50
TAIL RACE TUNNEL	
Length (m)	380
Diameter	7.30

POWER HOUSE

Type	Underground
No. of Generating Units	2
Capacity of each Unit (MW)	200
Installed Capacity (MW)	400
Average Gross Head (m)	350
Design Head pumping (m)	359
Annual Energy (MU)	721.20



PLATEAUX

BENCHES

VALLEY SLOPE/ SLOPE SEGMENTS

RIDGES

VALLEYS

MORPHO-LINEARS

0 2 Km

PART OF TOPOSHEET No. 55 G/7

FIGURE-3.3 GEOMORPHOLOGICAL MAP BASED ON AERIAL PHOTO INTERPRETATION

Scanned by CamScanner

18. ULHAS PUMPED STORAGE PROJECT (4X250MW=1000MW)

1. INTRODUCTION

Ulhas Pumped Storage Project is located near small village Kharvandi in Pune district of Maharashtra. The project utilizes water of Kundli, a small tributary of Indravani River/Ulhas River for power generation harnessing gross head of 585 m. The powerhouse has 4 units of 250 MW having installed capacity of 1000 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Kundli River having upper reservoir at latitude of 18°53'23"N and longitude of 73°26'10"E and lower reservoir at latitude of 18°51'45"N and longitude of 73°23'01"E. The nearest railway station and the Airport is Pune International.

3. PROJECT FEATURES

Ulhas Pumped Storage Project involves construction:-

Upper Reservoir (proposed): The height of a dam on Upper Reservoir is proposed to be 33 m with a live storage of 18.8 Mcum on Kundli a small tributary of Indravani River between a Full Reservoir Level (FRL) of 690 m and Minimum Draw down Level (MDDL) of 675 m.

Lower Reservoir (Proposed): Height of the dam on lower reservoir is proposed to be of 27 m with a live storage of 13 Mcum on river Ulhas between a Full Reservoir Level (FRL) of 105 m and Minimum Draw down Level (MDDL) of 93m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of 1 no. Head race tunnel (HRT) of length 2500 m carrying water to the underground powerhouse. The Project to be operated under gross head of 585 m with installed capacity of 1000 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel.

4. POWER & ENERGY BENEFITS

The installed capacity of Ulhas Pumped Storage Project would be 1000 MW utilising the gross head of 585 m.

Note-

The project is presently Unexploitable as Upper and Lower Reservoir for Ulhas Pumped Storage Project is not feasible. **Based on the evaluation Report this Project is not feasible**.

SALIENT FEATURES

ULHAS PUMPED STORAGE PROJECT

GENERAL:

State	Mharashtra
District	Pune
River	Kundli/Ulhas
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Pune
Nearest Airport	Pune

UPPER RESERVOIR (Proposed):

Location	Latitude: 18°53'23"N
	Longitude: 73°26'10"E
Full Reservoir Level (FRL) (m)	690
Minimum Draw Down Level (MDDL) (m)	675
Length of the Dam at the top(m)	800
Height of Dam (above RBL) (m)	33
Live Storage (Mcum)	18.8

LOWER RESERVOIR (Proposed):

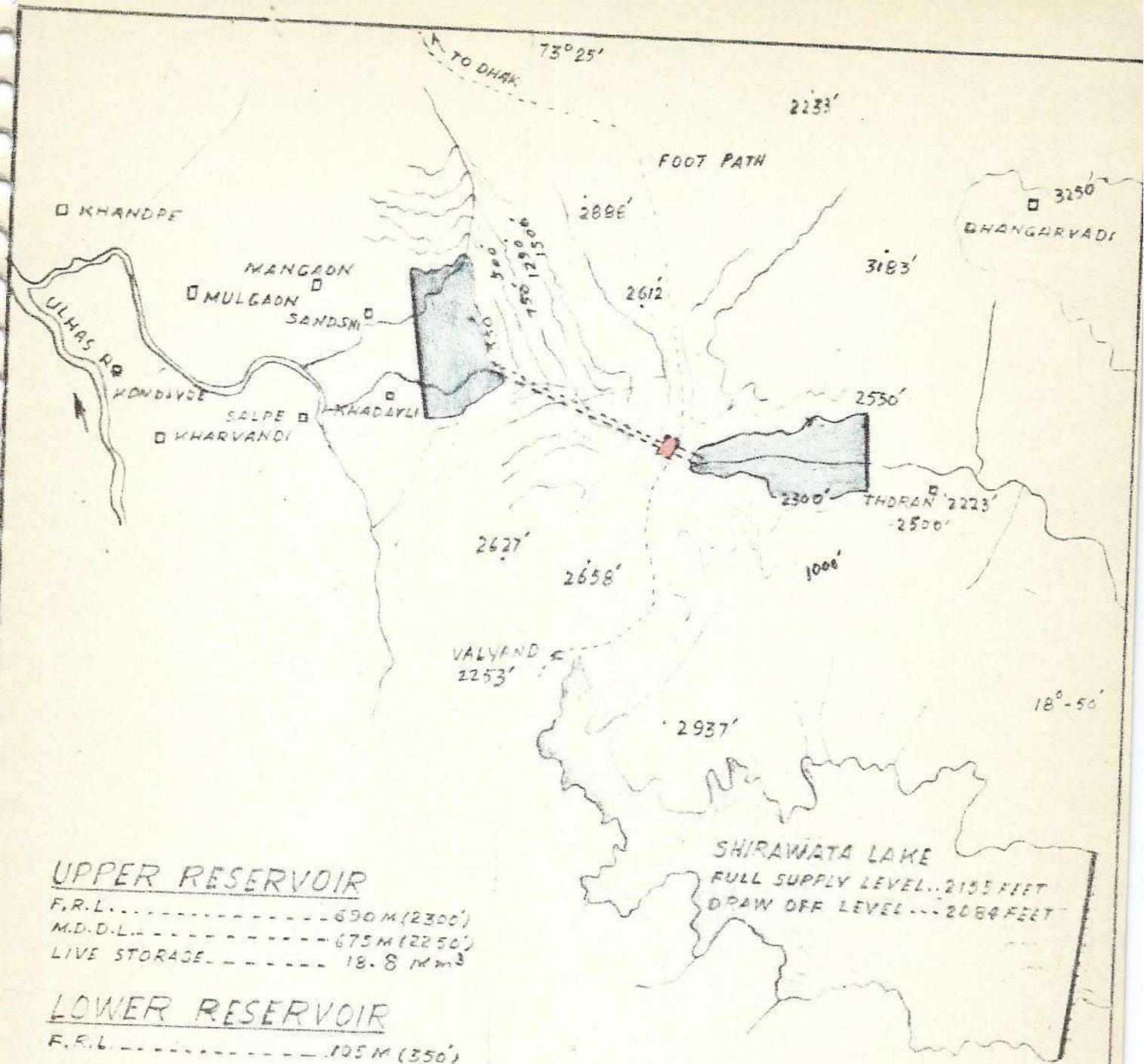
Location	Latitude: 18°51'45"N
	Longitude: 73°23'01"E
Full Reservoir Level (FRL) (m)	105
Minimum Draw Down Level (MDDL) (m)	93
Length of the Dam at the top(m)	1500
Height of Dam (above RBL) (m)	27
Live Storage (Mcum)	13

WATER CONDUCTOR SYSTEM (proposed):

HEAD RACE TUNNEL	
Number	1
Length (m)	2500

POWER HOUSE (proposed):

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	250
Installed Capacity (MW)	1000
Gross Head(m)	584



UPPER RESERVOIR

F.R.L. ---------- 690 M (2300')
M.D.D.L. ---------- 675 M (2250')
LIVE STORAGE ------- 18.8 Mm^3

LOWER RESERVOIR

F.R.L. ---------- 105 M (350')
M.D.D.L. ---------- 93 M (310')
LIVE STORAGE ------- 13.0 Mm^3

POWER HOUSE

INST. CAPACITY ------ 1000 MW
AV. GROSS HEAD ------ 584 M

DRN.		CENTRAL ELECTRICITY AUTHORITY
CHECKED		उल्हास पम्प संचय परियोजना
RECMED		ULHAS PUMPED STORAGE SCHEME
APPRD		
T.S.NO.	47 F/5	
SCALE	1" = 1 MILE	
JULY, 1980		DRG. NO. HEPR-PS-WFR-523

19. PINJAL PUMPED STORAGE PROJECT (700 MW)

1. INTRODUCTION

Pinjal Pumped Storage Project is located near small village Khodala in Thane district of Maharshtra. The project utilizes water of Nasere nadi, a small tributary of Pinjal River/Pinjal River for power generation harnessing gross head of 125 m. The powerhouse having installed capacity of 700 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Pinjal River having upper reservoir at latitude of 19°50'42"N and longitude of 73°35'28"E and lower reservoir at latitude of 19°49'05"N and longitude of 73°30'19"E. The nearest railway station is Thane and the Airport is Mumbai International.

3. PROJECT FEATURES

Pinjal Pumped Storage Project involves construction of :

Upper Reservoir (Proposed): Upper Reservoir is proposed to be of Height 39 m with a live storage of 9.8 Mcum on Naser Nadi a small tributary of Pinjal River between a Full Reservoir Level (FRL) of 360 m and Minimum Draw down Level (MDDL) of 345 m.

Lower Reservoir (Proposed): Lower reservoir is proposed to be of Height 60 m with a live storage of 125 Mcum on river Pinjal between a Full Reservoir Level (FRL) of 240 m and Minimum Draw down Level (MDDL) of 210 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of 1 nos. Head race tunnel (HRT) of length 100 m carrying water to the underground powerhouse. The Project to be operated under gross head of 125 m with installed capacity of 700 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 100 Sq. Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Pinjal Pumped Storage Project would be 700 MW utilising the gross head of 125 m.

NOTE: Pinjal Pumped Storage Project is not exploitable at present as it has low head and high L/H ratio.

SALIENT FEATURES

PINJAL PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Thane
River	Nasere Nadi/Pinjal
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Thane
Nearest Airport	Mumbai

UPPER RESERVOIR (proposed):

Location	Latitude: 19°50'42"N
	Longitude: 73°35'28"E
Full Reservoir Level (FRL) (m)	360
Minimum Draw Down Level (MDDL) (m)	345
Length of the Dam at the top(m)	400
Height of Dam (above RBL) (m)	39
Live Storage (Mcum)	9.8
Gross Storage (Mcum)	15.2

LOWER RESERVOIR (Proposed):

Location	Latitude: 19°49'05"N
	Longitude: 73°30'19"E
Full Reservoir Level (FRL) (m)	240
Minimum Draw Down Level (MDDL) (m)	122
Length of the Dam at the top(m)	210
Height of Dam (above RBL) (m)	60
Live Storage (Mcum)	125
Gross Storage (Mcum)	174.5

HYDROLOGY:

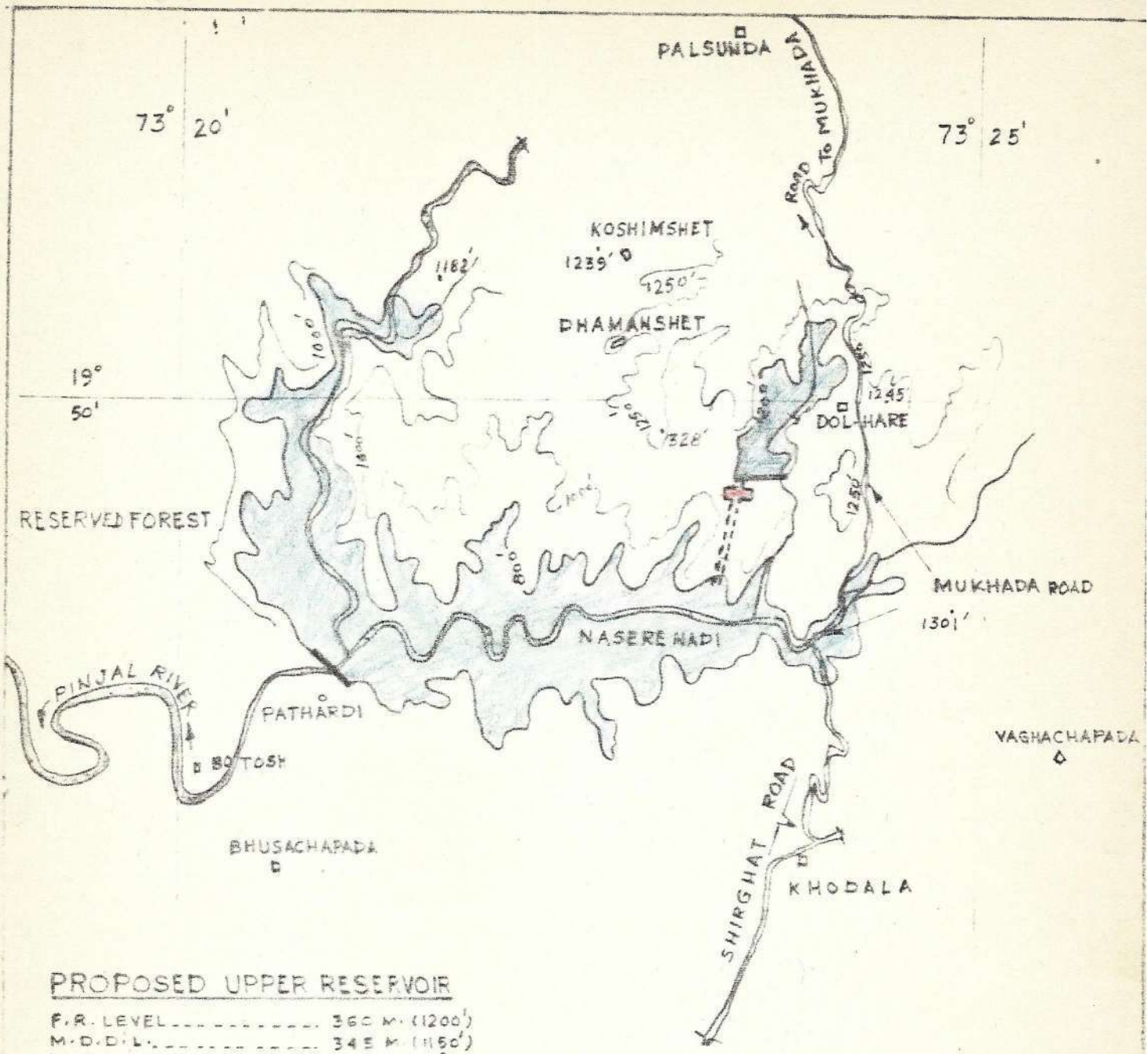
Catchment Area (Sq. Km) Upper Dam	100

WATER CONDUCTOR SYSTEM (proposed):

HEAD RACE TUNNEL	
Number	1
Length (m)	1500

POWER HOUSE (proposed):

Type	Underground
Installed Capacity (MW)	700
Gross Head(m)	125



PROPOSED UPPER RESERVOIR

F.R. LEVEL ..... 360 M. (1200')
M.D.D.L. ..... 345 M. (1150')
LIVE STORAGE ..... 5.8 Mm^3

PROPOSED LOWER RESERVOIR

F.R. LEVEL ..... 240 M (800')
M.D.D.L. ..... 210 M (700')
LIVE STORAGE ..... 12.5 Mm^3

POWER HOUSE

INS. CAPACITY ..... 700 MW
AV GROSS HEAD ..... 125 M.

NOTE

THE LOWER RESERVOIR WILL ALSO BE UTILISED FOR A CONVENTIONAL H.E. SCHEME IDENTIFIED BY H.E.P.(R.) DTE.

DRAWN		CENTRAL ELECTRICITY AUTHORITY
CHECKED		पिन्जल पम्प संचय योजना
RECMD.		PINJAL PUMPED STORAGE SCHEME
APPED.		
T.S. NO:	47E/5	
Scale:-	1" = 1 Mile	
JUNE, 1980		DRG. NO: HEPR-PS-WFR-520

20. KOLMONDAPADA PUMPED STORAGE PROJECT (4X200MW=800MW)

1. INTRODUCTION

Kolmondapada Pumped Storage Project is located near small village Ghatghar in Ahmednagar district of Maharashtra. The project utilizes water of Pravara River /Chornai River for power generation harnessing gross head of 481 m. The powerhouse has 4 units of 200 MW having installed capacity of 800 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Pravara River having upper reservoir at latitude of 19°34'59''N and longitude of 73°39'41.03''E and lower reservoir at latitude of 19°35'28.44''N and longitude of 73°36'52.80''E. The nearest railway station is Thane and the Airport is Pune International.

3. PROJECT FEATURES

Kolmondapada Pumped Storage Project involves construction of :

Upper Reservoir (Proposed): Upper Reservoir is proposed to be of Height 30 m with a live storage of 22.50 Mcum on Pravara River between a Full Reservoir Level (FRL) of 780 m and Minimum Draw down Level (MDDL) of 765 m.

Lower Reservoir (Proposed): Lower reservoir is proposed to be of Height 45 m with a live storage of 18.9 Mcum on river Chornai between a Full Reservoir Level (FRL) of 300m and Minimum Draw down Level (MDDL) of 282m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of 1 nos. Head race tunnel (HRT) of length 2500 m carrying water to the underground powerhouse. The Project to be operated under gross head of 481 m with installed capacity of 2600 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 8.40 Sq. Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Sitanadi Pumped Storage Project would be 800 MW utilising the gross head of 481 m.

NOTE: Kolmondapada Pumped Storage Project is Unexploitable at present it is falling in Wildlife Sanctuary therefore PFR Not Prepared.

SALIENT FEATURES

KOLMONDAPADA PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Ahmednagar
River	Pravara/Chornai
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Thane
Nearest Airport	Pune

UPPER RESERVOIR (proposed):

Location	Latitude: 19°34'59''N
	Longitude: 73°39'41.03''E
Full Reservoir Level (FRL) (m)	780
Minimum Draw Down Level (MDDL) (m)	765
Length of the Dam at the top(m)	550
Height of Dam (above RBL) (m)	30
Live Storage (Mcum)	22.50
Gross Storage (Mcum)	33

LOWER RESERVOIR (Proposed):

Location	Latitude: 19°35'28.44''N
	Longitude: 73°36'52.80''E
Full Reservoir Level (FRL) (m)	300
Minimum Draw Down Level (MDDL) (m)	282
Length of the Dam at the top(m)	900
Height of Dam (above RBL) (m)	45
Live Storage (Mcum)	18.9
Gross Storage (Mcum)	29.7

HYDROLOGY:

Catchment Area (Sq. Km) Upper Dam	8.40

WATER CONDUCTOR SYSTEM (proposed):

HEAD RACE TUNNEL	
Number	1
Length (m)	2500

POWER HOUSE (proposed):

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	200
Installed Capacity (MW)	800
Gross Head(m)	481

UPPER RESERVIOR (PARVARA RIVER)

F.R.LEVEL ..... 780 MTS (2600')
M.D.D.L. ..... 763 MTS (2535')
LIVE STORAGE ..... 22.50 Mm³

LOWER RESERVOIR

F.R.L. ..... 300 MTS (1000')
M.D.D.L. ..... 282 MTS (940')
LIVE STORAGE ..... 18.9 Mm³

POWER HOUSE

INS. CAPACITY ..... 800 MW
AV. GROSS HEAD ..... 483 MTS

DRAWN		CENTRAL ELECTRICITY AUTHORITY
CHECKED		कोलमोंडापाड़ा पम्प संचय योजना
RECMD		
APPRD.		KOLMONDAPADA PUMPED STORAGE SCHEME
T.S.NO.	47 E/10	
Scale	1"=1 mile	
JUNE, 1980		DRG.No. HEPR-PS-WFR-526

21. SIDGARH PUMPED STORAGE PROJECT (1500 MW)

1. INTRODUCTION

Sidgarh Pumped Storage Project having proposed upper reservoir and lower reservoir with installed capacity of 1500MW. The project is located in Thane district of Maharashtra. The project utilizes water of Gohari/Sidgarh River for power generation harnessing a gross head of 648 m. The powerhouse would have installed capacity of 1500MW.

2. LOCATION/ACCESSIBILITY

The upper dam site of the project is located on Gohari River having upper reservoir at latitude of 19°09'36''N and longitude of 73°34'40''E and lower reservoir is located on Sidgarh River at latitude of 19°09'37.76''N and longitude of 73°29'45.49''E. The nearest railway station and the nearest Airport is Pune.

3. PROJECT FEATURES

Sidgarh Pumped Storage Project involves construction of

Upper Reservoir (Proposed): Upper Reservoir would be created on Gohari River by providing dam height of 15 m with a live storage of 8.0Mm^3. The Upper Reservoir has a Full Reservoir Level (FRL) of 870 m and Minimum Draw down Level (MDDL) of 863 m.

Lower Reservoir (Proposed): Lower Reservoir would be created on Sidgarh River with a dam site about 3 km downstream on this river with a dam height of 36 m with a live storage of 4.2Mm^3. The lower reservoir has a Full Reservoir Level (FRL) of 225 m and Minimum Draw down Level (MDDL) of 210 m.

Water Conductor System: The proposed Water Conductor System would comprise of tunnel about1500 m long

4. POWER & ENERGY BENEFITS

The installed capacity of Sidgarh Pumped Storage Project would be 1500MW utilizing the gross head of 648 m.

NOTE: The project is presently Unexploitable as Upper and Lower Reservoir lies within Bheema Shankar Jyotirilinga Sanctuary.

SALIENT FEATURES

SIDGARH PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Thane
River	Gohari/Sidgarh
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Pune
Nearest Airport	Pune

UPPER RESERVOIR (Proposed):

Location	Latitude: 19°09'36"N
	Longitude: 73°34'40"E
Full Reservoir Level (FRL) (m)	870
Minimum Draw Down Level (MDDL) (m)	863
Length of the Dam at the top(m)	550
Height of Dam (above RBL) (m)	15
Live Storage (Mm^3)	8.0
Gross Storage (Mm^3)	11.3

LOWER RESERVOIR (Proposed)

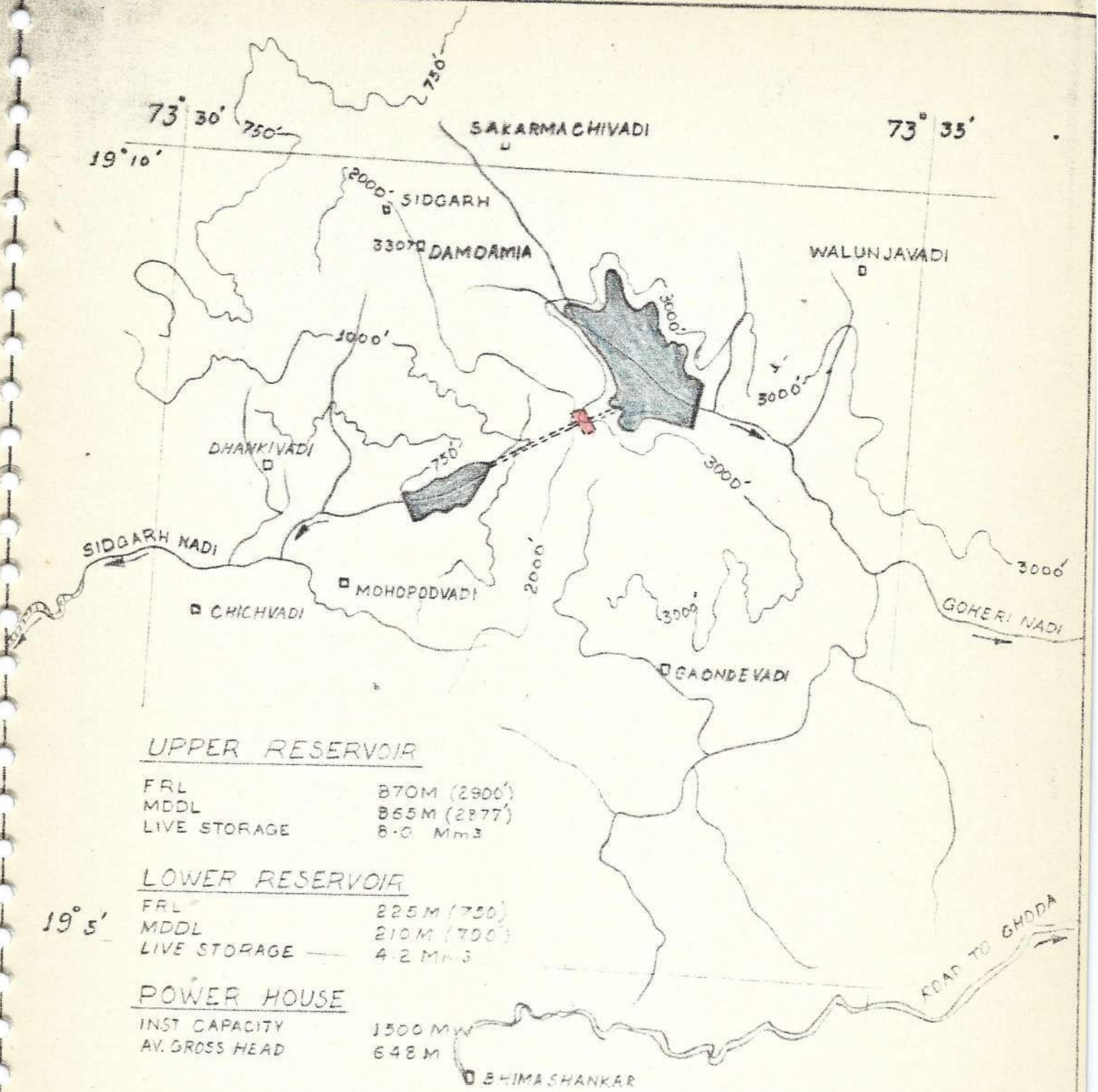
Location	Latitude: 19°09'37.76"N
	Longitude: 73°29'45.49"
Full Reservoir Level (FRL) (m)	225
Minimum Draw Down Level (MDDL) (m)	210
Length of the Dam at the top (m)	400
Height of Dam (above RBL) (m)	36
Live Storage (Mm^3)	4.2
Gross Storage (Mm^3)	5.9

WATER CONDUCTOR SYSTEM (proposed):

Length (m)	1500
Discharge Capacity (Cumecs)	292

POWER HOUSE:

Type	Underground
Installed Capacity (MW)	1500
Gross Head (m)	648



UPPER RESERVOIR

FRL	870M (2900')
MDDL	865M (2877')
LIVE STORAGE	8.0 Mm3

LOWER RESERVOIR

FRL	225M (750')
MDDL	210M (700')
LIVE STORAGE	4.2 Mm3

POWER HOUSE

INST CAPACITY	1500 MW
AV. GROSS HEAD	648 M

DRN.		CENTRAL ELECTRICITY AUTHORITY
CHECKED		सिदगढ़ पम्प संचय परियोजना
RECMD		
APPRD.		
T S NO.	47 E/12	SIDGARH PUMPED STORAGE SCHEME
SCALE	1" = 1 MILE	
JULY, 1980.		DRG NO. HEPR - PS - WFR - 514

22. CHORNAI PUMPED STORAGE PROJECT (2000MW)

1. INTRODUCTION

Chornai Pumped Storage Project having proposed upper reservoir and lower reservoir with installed capacity of 2000MW. The project is located in Thane district of Maharashtra. The project utilizes water of Pravara/Chornai River for power generation harnessing a gross head of 452 m. The powerhouse would have installed capacity of 2000MW.

2. LOCATION/ACCESSIBILITY

The upper dam site of the project is located on Chornai River having upper reservoir at latitude of 19°32'46"N and longitude of 73°39'20"E and lower reservoir is located on Sidgarh River at latitude of 19°33'17"N and longitude of 73°36'6"E. The nearest railway station and the nearest Airport is Pune.

3. PROJECT FEATURES

Chornai Pumped Storage Project involves construction of

Upper Reservoir (Proposed): Upper Reservoir would be created on Pravara River by providing dam height of 18 m with a live storage of 15.8Mm^3. The Upper Reservoir has a Full Reservoir Level (FRL) of 765 m and Minimum Draw down Level (MDDL) of 756 m.

Lower Reservoir (Proposed): Lower Reservoir would be created on Chornai River with a dam height of 39 m with a live storage of 12.6Mm^3. The lower reservoir has a Full Reservoir Level (FRL) of 315 m and Minimum Draw down Level (MDDL) of 300 m.

Water Conductor System: The proposed Water Conductor System would comprise of tunnel about 2000 m long

4. POWER & ENERGY BENEFITS

The installed capacity of Chornai Pumped Storage Project would be 2000MW utilizing the gross head of 452 m.

NOTE: The project is presently Unexploitable as Upper and Lower Reservoir lies within Bheema Shankar Jyotirilinga Sanctuary.

SALIENT FEATURES

CHORNAI PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Thane
River	Pravara/Chornai
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Pune
Nearest Airport	Pune

UPPER RESERVOIR (Proposed):

Location	Latitude: 19°32'46"N
	Longitude: 73°39'20"E,
Full Reservoir Level (FRL) (m)	765
Minimum Draw Down Level (MDDL) (m)	756
Length of the Dam at the top(m)	960
Height of Dam (above RBL) (m)	18
Live Storage (Mm^3)	15.8
Gross Storage (Mm^3)	22.5

LOWER RESERVOIR (Proposed)

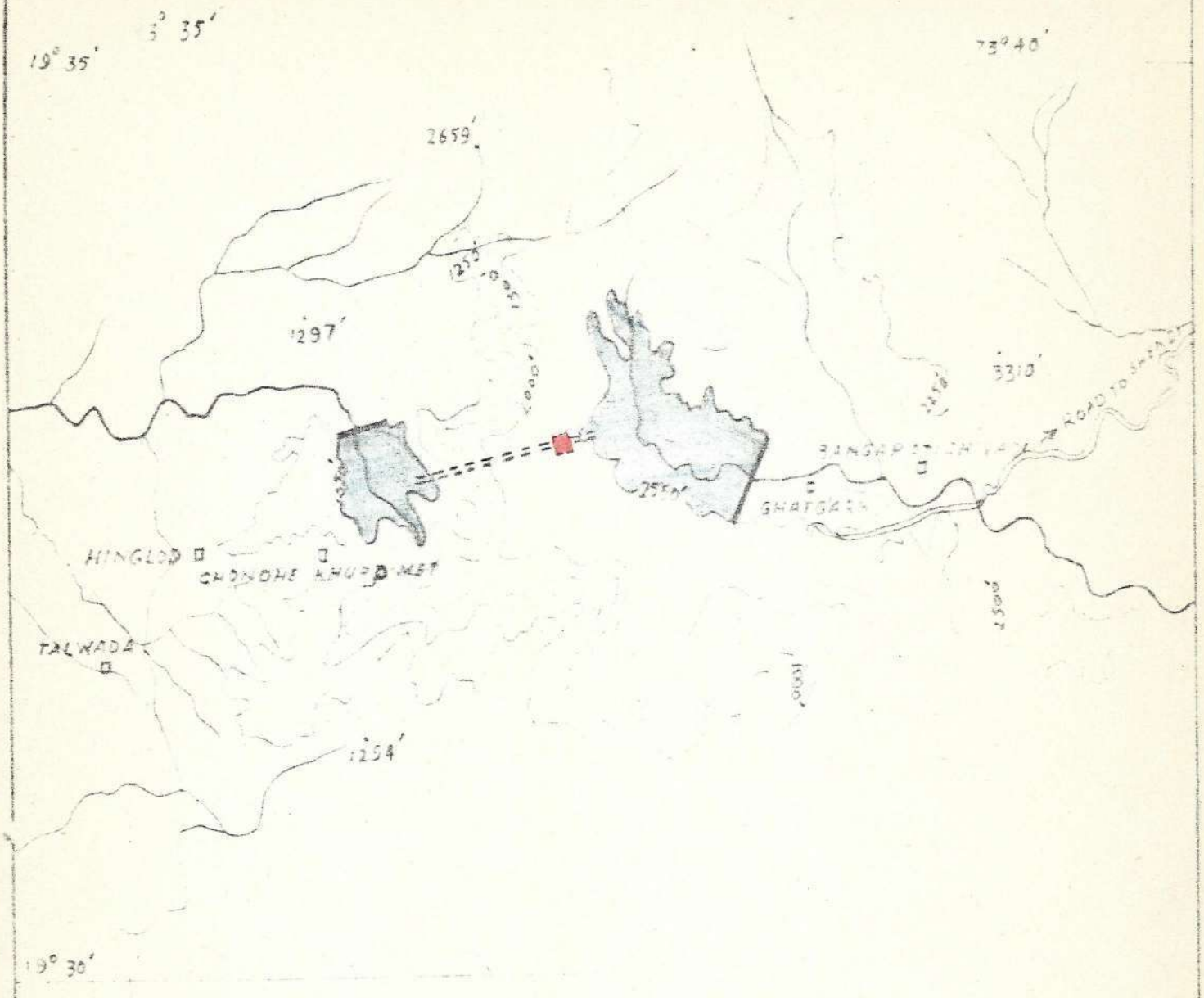
Location	Latitud:,19°33'17"N
	Longitude: 73°36'6"E
Full Reservoir Level (FRL) (m)	315
Minimum Draw Down Level (MDDL) (m)	300
Length of the Dam at the top (m)	500
Height of Dam (above RBL) (m)	39
Live Storage (Mm^3)	12.6
Gross Storage (Mm^3)	18.6

WATER CONDUCTOR SYSTEM (proposed):

Length (m)	2000
Discharge Capacity (Cumecs)	580

POWER HOUSE:

Type	Underground
Installed Capacity (MW)	2000
Gross Head (m)	452



LOWER RESERVOIR

F.R.L. ..... 315 M (1050')
M.D.D.L. ..... 300 M (1000')
LIVE STORAGE ..... 12.6 M m³

UPPER RESERVOIR

F.R.L. ..... 765 M (2550')
M.D.D.L. ..... 756 M (2520')
LIVE STORAGE ..... 15.8 M m³

POWER HOUSE

INST. CAPACITY ..... 2000 MW
AV. GROSS HEAD ..... 452.0 M

DRN.		CENTRAL ELECTRICITY AUTHORITY
CHECKED		चोरनई पम्प संचय परियोजना
RECMTD		CHORNAI PUMPED
APPRD.		STORAGE SCHEME
T.S. NO	47E/10	
SCALE	1" = 1 mile	
JULY, 1980		DRG. NO. HEPR:-PS-WFR-525

23. BAITARNI PUMPED STORAGE PROJECT (1800 MW)

1. INTRODUCTION

Baitarni Pumped Storage Project having proposed upper reservoir and lower reservoir with installed capacity of 1800MW. The project is located in Satara/Ratnagiri district of Maharashtra. The project utilizes water of Koyna/Baitarni River for power generation harnessing a gross head of 449 m. The powerhouse would have installed capacity of 1800MW.

2. LOCATION/ACCESSIBILITY

The upper dam site of the project is located on Koyna River having upper reservoir at latitude of 17°36'01.41''N and longitude of 73°41'48.82''E and lower reservoir is located on Baitarni River at latitude of 17°37'29.95''N and longitude of 73°41'38.11''E. The nearest railway station and the nearest Airport is Pune.

3. PROJECT FEATURES

Baitarni Pumped Storage Project involves construction of

Upper Reservoir (Proposed): Upper Reservoir would be created on Koyna River by constructing a dam of height 45 m with a live storage of 9.0 Mm^3. The Upper Reservoir has a Full Reservoir Level (FRL) of 660 m and Minimum Draw down Level (MDDL) of 643 m.

Lower Reservoir (Proposed): Lower Reservoir would be created on Baitarni River by constructing a dam of height 36 m with a live storage of 7.20 Mm^3. The lower reservoir has a Full Reservoir Level (FRL) of 210 m and Minimum Draw down Level (MDDL) of 195 m.

Water Conductor System: The proposed Water Conductor System would comprise of tunnel of 2000 m long.

4. POWER & ENERGY BENEFITS

The installed capacity of Baitarni Pumped Storage Project would be 1800MW utilizing the gross head of 449 m.

NOTE: The Project is presently Unexploitable as Upper and Lower Reservoir for Baitarni Pumped Storage project falls within Koyna Wildlife Sanctuary.

SALIENT FEATURES

BAITARNI PUMPED STORAGE PROJECT

GENERAL:

State	Maharashtra
District	Satara/Ratnagiri
River	Koyna/Baitarni
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Pune
Nearest Airport	Pune

UPPER RESERVOIR (Proposed):

Location	Latitude: 17°36'01.41''N
	Longitude: 73°41'48.82''E
Full Reservoir Level (FRL) (m)	660
Minimum Draw Down Level (MDDL) (m)	643
Length of the Dam at the top(m)	450
Height of Dam (above RBL) (m)	45
Live Storage (Mm^3)	9.0
Gross Storage (Mm^3)	13.50

LOWER RESERVOIR (Proposed)

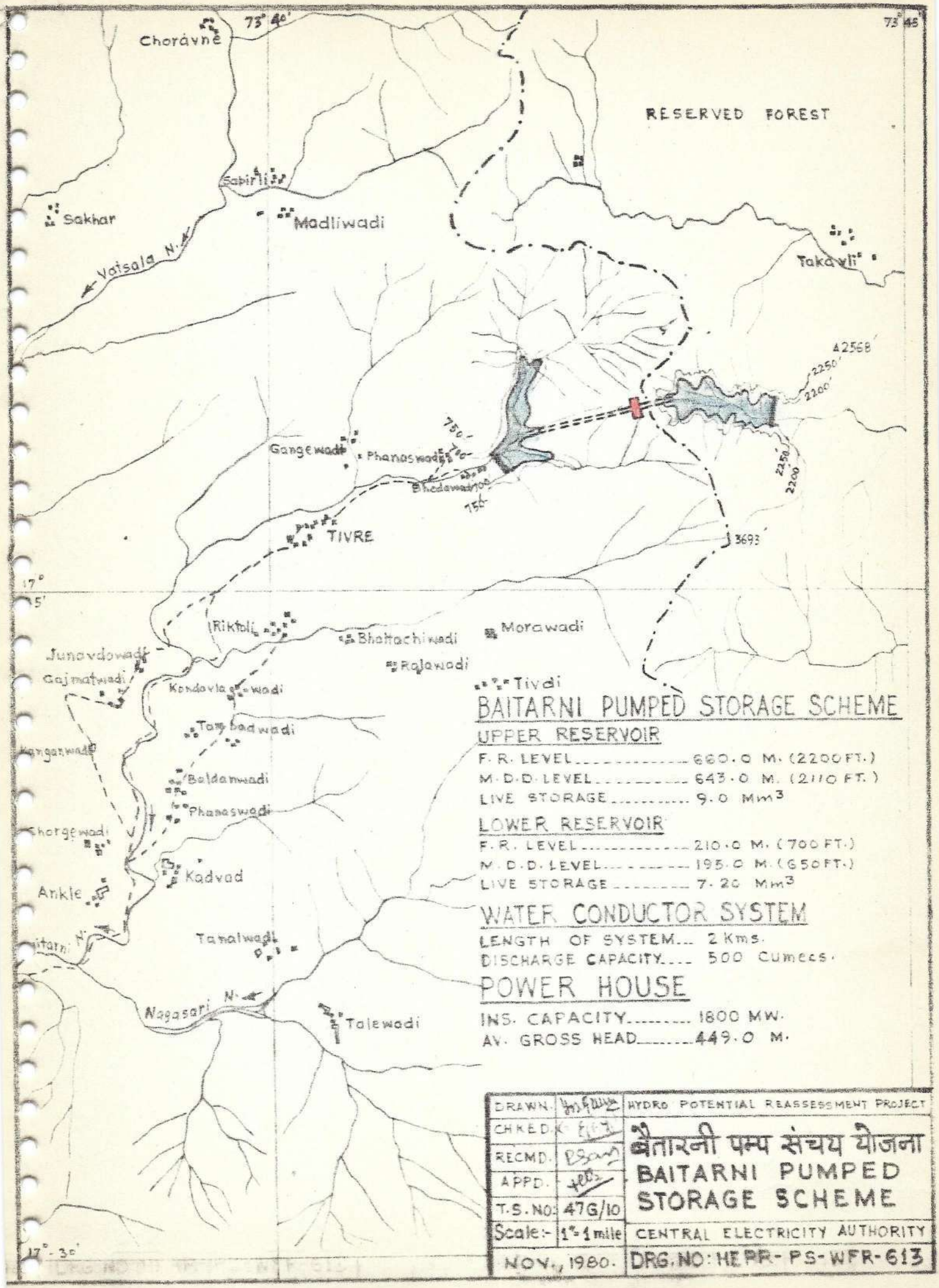
Location	Latitude: 17°37'29.95''N
	Longitude: 73°41'38.11''E
Full Reservoir Level (FRL) (m)	210
Minimum Draw Down Level (MDDL) (m)	195
Length of the Dam at the top (m)	450
Height of Dam (above RBL) (m)	36
Live Storage (Mm^3)	7.20
Gross Storage (Mm^3)	10.8

WATER CONDUCTOR SYSTEM (proposed):

Length (m)	2000
Discharge Capacity (Cumecs)	500

POWER HOUSE:

Type	Underground
Installed Capacity (MW)	1800
Gross Head (m)	449


73° 40'
73° 45'
Chorávne
RESERVED FOREST
Sabirli
Sakhar
Madliwadi
Vaisala N.
Takavli
42568
2250
2200
Gangewadi
Phanaswadi
Bhedawadi
TIVRE
3693
17° 5'
Rikholi
Bhattachiwadi
Morawadi
Junavdowadi
Gajmatwadi
Rajawadi
Tivdi
Kondavlawadi
Tambadwadi
Kangarwadi
Baldanwadi
Phanaswadi
Shorgewadi
Kadvad
Ankle
Tanalwadi
Nagasari N.
Talewadi
17° 3'
BAITARNI PUMPED STORAGE SCHEME
UPPER RESERVOIR
F. R. LEVEL ..... 660.0 M. (2200 FT.)
M. D. D. LEVEL ..... 643.0 M. (2110 FT.)
LIVE STORAGE ..... 9.0 Mm³
LOWER RESERVOIR
F. R. LEVEL ..... 210.0 M. (700 FT.)
M. D. D. LEVEL ..... 195.0 M. (650 FT.)
LIVE STORAGE ..... 7.20 Mm³
WATER CONDUCTOR SYSTEM
LENGTH OF SYSTEM ... 2 Kms.
DISCHARGE CAPACITY ... 500 Cumecs.
POWER HOUSE
INS. CAPACITY ..... 1800 MW.
AV. GROSS HEAD ..... 449.0 M.
DRAWN.
CHKED.
RECMD.
APPD.
T.S. NO: 47G/10
Scale:- 1" = 1 mile
NOV., 1980.
HYDRO POTENTIAL REASSESSMENT PROJECT
बैतारनी पम्प संचय योजना
BAITARNI PUMPED STORAGE SCHEME
CENTRAL ELECTRICITY AUTHORITY
DRG. NO: HEPR-PS-WFR-613

24. TUIVAI PUMPED STORAGE PROJECT (10X150MW=1500MW)

1. INTRODUCTION

Tuivai Pumped Storage Project is located in Churchandpur District of Manipur. The project utilizes water of Tuivai River for power generation harnessing design head of 89.89 mThe project would have installed capacity of 1500MW.

2. LOCATION/ACCESSIBILITY

The Project having upper reservoir at latitude of 24°14'05"N and longitude of 93°21'46"E and lower reservoir at latitude of 24°03'07"N and longitude of 93°19'33"E. The nearest railway station is Dimaphur and the Airport is Imphal.

3. PROJECT FEATURES

Tuivai Pumped Storage Project involves construction of Upper and Lower Reservoirs.

Upper Reservoir (proposed): The height of the dam of Upper Reservoir is proposed to be 110 m with a live storage of 281.19 Mcum on river Tuivai between a Full Reservoir Level (FRL) of 592 m and Minimum Draw down Level (MDDL) of 560 m.

Lower Reservoir (proposed): The height of the dam of Lower Reservoir is proposed to be 32 m with live storage of 65.87 Mcum on Tuivai River between Full Reservoir Level (FRL) of 494 m and Minimum Draw down Level (MDDL) of 478 m.

Water Conductor System (proposed): The proposed length of Water Conductor System would comprises of 10 Nos. of Pressure Shaft of length 800 m and diameter of 7.6 m.

HYDROLOGY

The total Catchment area of Project is 1383 Sq. km.

4. POWER & ENERGY BENEFITS

The installed capacity of Tuivai Pumped Storage Project would be 1500 MW utilising the Design head of 89.89 m.

SALIENT FEATURES

TUIVAI PUMPED STORAGE PROJECT

GENERAL:

State	Manipur
District	Churchandpur
River	Tuivai
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Dimapur
Nearest Airport	Imphal

UPPER RESERVOIR (proposed):

Location	Latitude: 24°14'05"N
	Longitude: 93°21'46"E
Full Reservoir Level (FRL) (m)	592
Minimum Draw Down Level (MDDL) (m)	560
Height of Dam (above RBL) (m)	110
Live Storage (Mcum)	281.89
Gross Storage (Mcum)	380.80

LOWER RESERVOIR (proposed):

Location	Latitude: 20°03'07"N
	Longitude: 93°19'33"E
Full Reservoir Level (FRL) (m)	494
Minimum Draw Down Level (MDDL) (m)	478
Height of Dam (above RBL) (m)	32
Live Storage (Mcum)	65.87
Gross Storage (Mcum)	

HYDROLOGY:

Catchment Area (Sq. km)	1383

WATER CONDUCTOR SYSTEM (proposed):

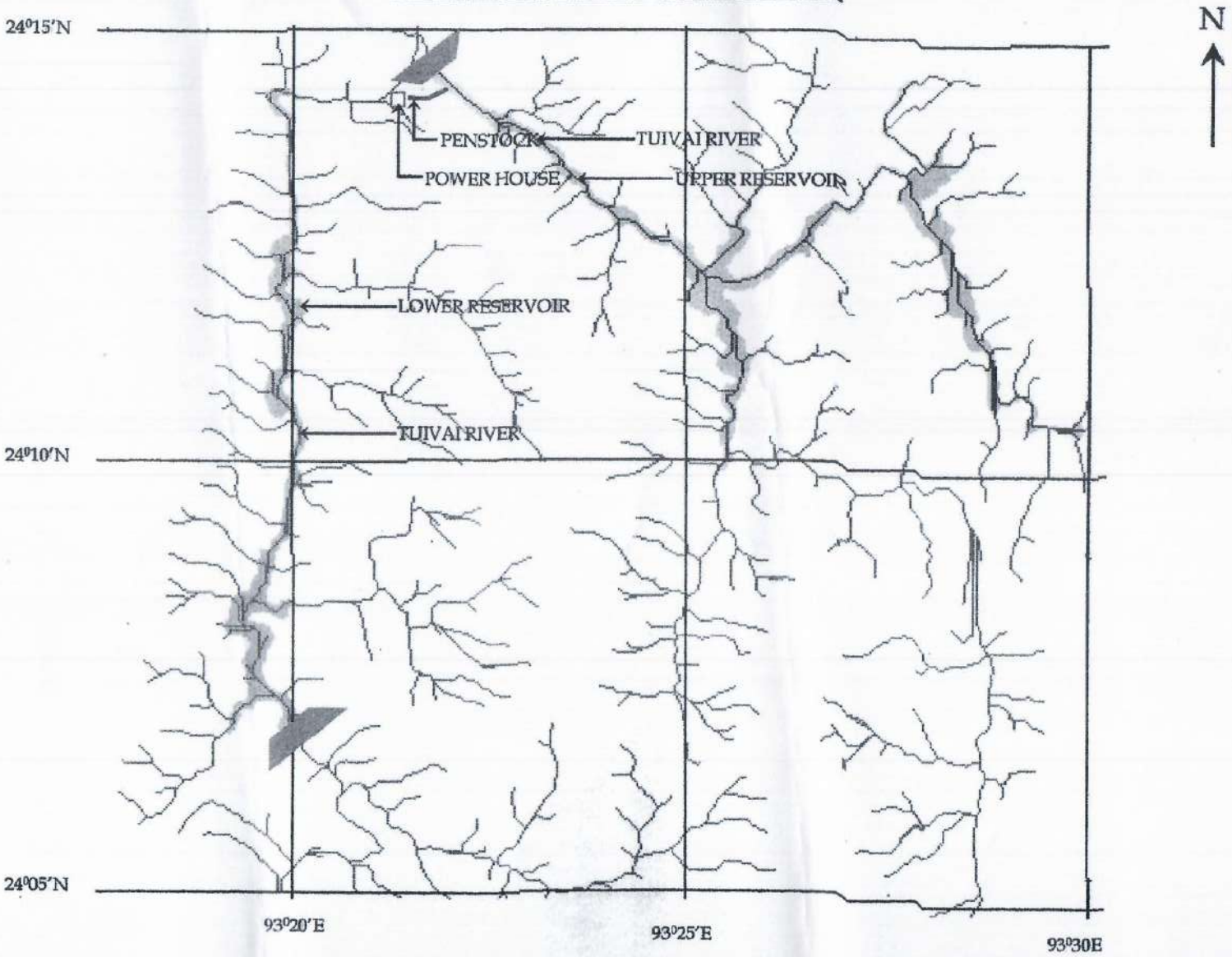
PRESSURE SHAFT/PENSTOCK	
Number	10
Length (m)	800
Diameter (m)	7.6

POWER HOUSE (proposed):

No. of Generating Units	10
Capacity of each Unit (MW)	150
Installed Capacity (MW)	1500
Design Head (m)	89.89
Gross Head(m)	92.67

Annexure-9

PRELIMINARY OUTLINE OF PROPOSED TUIVAI PUMP STORAGE PROJECT(1500MW),MANIPUR



25. HENGTAM PUMPED STORAGE PROJECT (5X100MW=500MW)

1. INTRODUCTION

Hengtam Pumped Storage Project is located in Churchandpur District of Manipur. The project utilizes water of Tuivai River for power generation harnessing gross head of 88.33 m. The Project would have installed capacity of 500MW.

2. LOCATION/ACCESSIBILITY

The Project having upper reservoir at latitude of 24°01'44"N and longitude of 93°34'33"E and lower reservoir at latitude of 24°02'24"N and longitude of 93°34'01"E. The nearest railway station is Dimaphur and the Airport is Imphal.

3. PROJECT FEATURES

Hengtam Pumped Storage Project involves construction of Upper and Lower Reservoirs.

Upper Reservoir (proposed): The height of the dam of Upper Reservoir is proposed to be 84 m with a live storage of 32.69 Mcum on river Tuivai between a Full Reservoir Level (FRL) of 830 m and Minimum Draw down Level (MDDL) of 780 m.

Lower Reservoir (proposed): The height of the dam of Lower Reservoir is proposed to be 44 m with live storage of 22.89 Mcum on Tuivai River between Full Reservoir Level (FRL) of 730 m and Minimum Draw down Level (MDDL) of 715 m.

Water Conductor System (proposed): The proposed length of Water Conductor System would comprise of 4 Nos. of Pressure Shaft with length 650 m and diameter 7.2 m.

4. HYDROLOGY

The total Catchment area of Project is 300.37 Sq. km.

NOTE: Hengtam Pumped Storage Project is Unexploitable at present considering lesser head, higher dam in poor geology and smaller live storage.

SALIENT FEATURES

HENGTAM PUMPED STORAGE PROJECT

GENERAL:

State	Manipur
District	Churchandpur
River	Tuivai
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Dimapur
Nearest Airport	Imphal

UPPER RESERVOIR (proposed):

Location	Latitude: 24°01'44"N
	Longitude: 93°34'33"E
Full Reservoir Level (FRL) (m)	830
Minimum Draw Down Level (MDDL) (m)	780
Height of Dam (above RBL) (m)	84
Live Storage (Mcum)	32.69
Gross Storage (Mcum)	36.38

LOWER RESERVOIR (proposed):

Location	Latitude: 24°02'24"N
	Longitude: 93°34'01"E
Full Reservoir Level (FRL) (m)	730
Minimum Draw Down Level (MDDL) (m)	715
Height of Dam (above RBL) (m)	44
Live Storage (Mcum)	22.89

HYDROLOGY:

Catchment Area (Sq. km)	300.37

WATER CONDUCTOR SYSTEM (proposed):

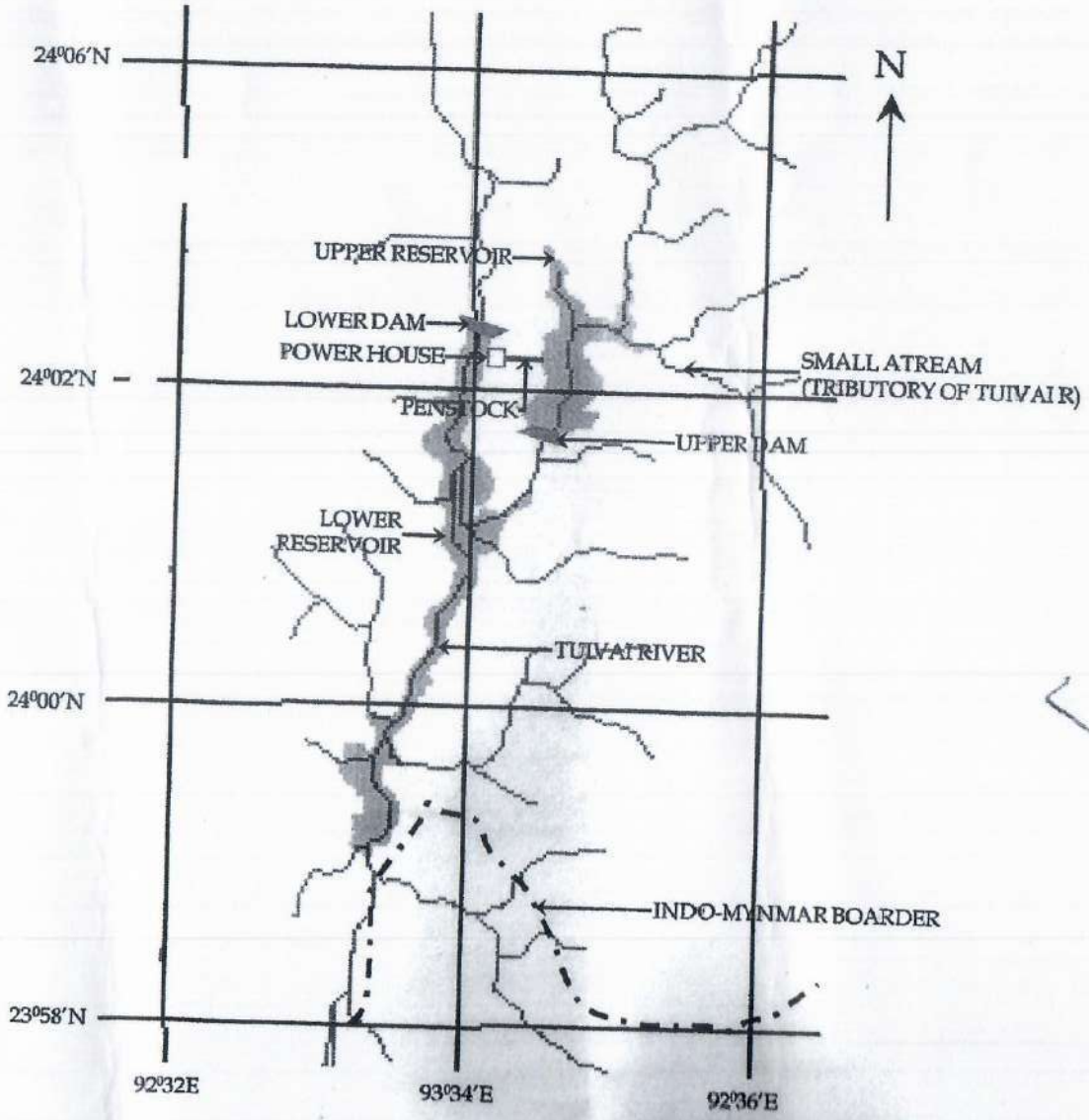
PRESSURE SHAFT/PENSTOCK	
Number	4
Length (m)	650
Diameter (m)	7.2

POWER HOUSE (proposed):

Type	
No. of Generating Units	5
Capacity of each Unit (MW)	100
Installed Capacity (MW)	500
Design Head (m)	85.68
Gross Head(m)	88.33

Annexure-10

PRELIMINARY OUTLINE OF PROPOSED HENGTAM PUMP STORAGE PROJECT(500MW),MANIPUR



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26. KHUAI LUI PUMPED STORAGE PROJECT (8X262.5MW=2100 MW)

1. INTRODUCTION

Khuai Lui Pumped Storage Project is located in Kolasib District of Mizoram The project utilizes water of Pualhrang River for power generation harnessing average gross head of 187 m.

2. LOCATION/ACCESSIBILITY

The Project having upper reservoir at latitude of 23°55'52.0"N and longitude of 92°40'10.4"E and lower reservoir at latitude of 23°55'07.3"N and longitude of 92°41'31.3"E. There is a proposal of underground type of Power house. The nearest Railway Station is Bairabi and Airport is Lengpui.

3. PROJECT FEATURES

Khuai Lui Pumped Storage Project involves.

Upper Reservoir (proposed): The height of the dam of Upper Reservoir is proposed to be 60 m with a live storage of 20.9 Mm^3 on river Pualhrang between a Full Reservoir Level (FRL) of 390 m and Minimum Draw down Level (MDDL) of 320 m.

Lower Reservoir (proposed): The height of the dam of Lower Reservoir is proposed to be 42 m with live storage of 23.3 Mm^3 on Khuai Lui River between Full Reservoir Level (FRL) of 201 m and Minimum Draw down Level (MDDL) of 182 m.

Water Conductor System (proposed): The proposed length of Water Conductor System is 1600m.

4. HYDROLOGY

The Catchment area of the river is 17.98 Sq. Km.

Note: Khuai Lui Pumped Storage Project is Unexploitable at present considering lesser head, higher dam in poor geology and smaller live storage.

SALIENT FEATURES
KHUAI LUI PUMPED STORAGE PROJECT

GENERAL:

State	Mizoram
District	Kolasib
River	Pualhrang
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Bairabi
Nearest Airport	Lengpui Airport

UPPER RESERVOIR (proposed):

Location	Latitude: 23°55'52.0"N
	Longitude: 92°40'10.4"E
Full Reservoir Level (FRL) (m)	390
Minimum Draw Down Level (MDDL) (m)	365
Length of the Dam at the top(m)	320
Height of Dam (above RBL) (m)	60
Live Storage (Mm3)	20.4
Gross Storage (Mm3)	30.9

LOWER RESERVOIR (proposed):

Location	Latitude: 23°55'07.3"N
	Longitude: 92°41'31.3"E
Full Reservoir Level (FRL) (m)	201
Minimum Draw Down Level (MDDL) (m)	182
Length of the Dam at the top(m)	480
Height of Dam (above RBL) (m)	42
Live Storage (Mm^3)	23.3
Gross Storage (Mm^3)	35.5

HYDROLOGY:

Catchment Area (Sq. Km)	39

WATER CONDUCTOR SYSTEM

Length (m)	1600
Design Discharge (Cumecs)	1415

POWER HOUSE

Type	Underground
No. of Generating Units	8
Capacity of each Unit (MW)	262.5
Installed Capacity (MW)	2100
Gross Head (m)	187

KHUAI PUMPED STORAGE SCHEME

UPPER RESERVOIR

F. R. LEVEL ..... 390.0 M.
M. D. D. LEVEL ..... 365.0 M.
LIVE STORAGE ..... 20.4 M. m^3

LOWER RESERVOIR

F. R. LEVEL ..... 201.0 M.
M. D. D. LEVEL ..... 182.0 M.
LIVE STORAGE ..... 23.3 M. m^3

WATER CONDUCTOR SYSTEM

LENGTH OF SYSTEM ..... 1.6 K.M.
DISCHARGE ..... 1415 Cumecs

POWER HOUSE

INS. CAPACITY ..... 2100.0 MW.
AV. GROSS HEAD ..... 187.0 M.

DRN.		HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD.		खुवाइ पम्प संचय योजना (बारक बेसिन)
SUBMD		KHUAI PUMPED STORAGE SCHEME (BARAK BASIN)
APPD.		
T. S. NO:	83D/S.E. 84A/N.E.	
Scale:	1" = 2 Miles	CENTRAL ELECTRICITY AUTHORITY
SEP. 1982		DRG. NO: HEPR-PS-BHM-729

27. PAKWA PUMPED STORAGE PROJECT (4X250MW=1000MW)

1. INTRODUCTION

Pakwa Pumped Storage Project is located in Aizawl District of Mizoram. The project utilizes water of Suangsau Lui/Pakwa River for power generation harnessing gross head of 500 m. The Project would have installed capacity of 1000MW.

2. LOCATION/ACCESSIBILITY

The Project having upper reservoir at latitude of 23°53'15.8"N and longitude of 92°26'57.7"E and lower reservoir at latitude of 23°53'17.3"N and longitude of 92°25'59.3"E. There is a proposal of underground type of Power house. The nearest railway station is Silchar and Airport is Lengpui.

3. PROJECT FEATURES

Pakwa Pumped Storage Project involves construction of Upper and Lower Reservoirs.

Upper Reservoir (proposed): The height of the dam of Upper Reservoir is proposed to be 50 m with a live storage of 15 Mm^3 on river Suangsau Lui between a Full Reservoir Level (FRL) of 600 m and Minimum Draw down Level (MDDL) of 580 m.

Lower Reservoir (proposed): The height of the dam of Lower Reservoir is proposed to be 50 m with live storage of 14.5 Mm^3 on Pakwa River between Full Reservoir Level (FRL) of 100 m and Minimum Draw down Level (MDDL) of 80 m.

Water Conductor System (proposed): The proposed length of Water Conductor System is 2000 m.

4. HYDROLOGY

The total Catchment area upto dam site of lower reservoir is about 27.2 Sq. Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Pakwa Pumped Storage Project would be 1000 MW. Utilising the gross head of 500 m. Based on the Evaluation Report these projects have been assessed as Not Feasible.

SALIENT FEATURES

PAKWA PUMPED STORAGE PROJECT

GENERAL:

State	Mizoram
District	Aizawl
River	Suangsau Lui/Pakwa River
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Silchar
Nearest Airport	Lengpui

UPPER RESERVOIR (proposed):

Location	Latitude:, 23°53'15.8"N
	Longitude: 92°26'57.7"E
Full Reservoir Level (FRL) (m)	600
Minimum Draw Down Level (MDDL) (m)	580
Length of the Dam at the top(m)	150
Height of Dam (above RBL) (m)	50
Live Storage (Mm^3)	15
Gross Storage (Mm^3)	22.5

LOWER RESERVOIR (proposed):

Location	Latitude: 23°53'17.3"N
	Longitude: 92°25'59.3"E
Full Reservoir Level (FRL) (m)	100
Minimum Draw Down Level (MDDL) (m)	80
Length of the Dam at the top(m)	250
Height of Dam (above RBL) (m)	50
Live Storage (Mm^3)	14.5
Gross Storage (Mm^3)	21.3

HYDROLOGY:

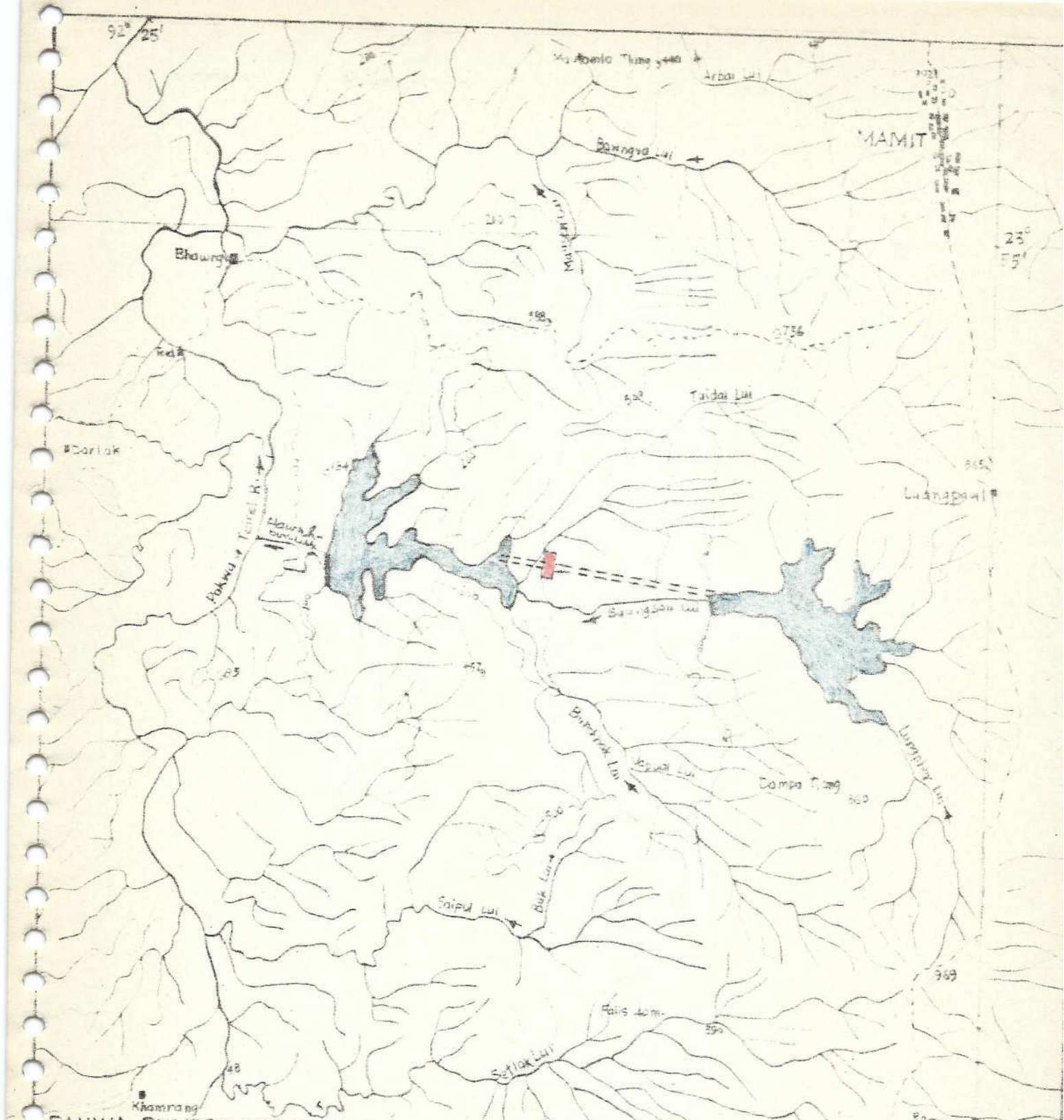
Catchment Area (Kms.) Lower Dam	27.2

WATER CONDUCTOR SYSTEM (proposed):

Length (m)	2000
Design Discharge (Cumecs)	250

POWER HOUSE (proposed):

Type	Underground
No. of Generating Units	4
Capacity of each Unit (MW)	250
Installed Capacity (MW)	1000
Gross Head (m)	500



PAKWA PUMPED STORAGE SCHEME

UPPER RESERVOIR

F.R. LEVEL ..... 600.0 M.
M.D.D. LEVEL ..... 580.0 M.
LIVE STORAGE ..... 15.0 M.m^3

LOWER RESERVOIR

F.R. LEVEL ..... 100.0 M.
M.D.D. LEVEL ..... 80.0 M.
LIVE STORAGE ..... 14.5 M.m^3

WATER CONDUCTOR SYSTEM

LENGTH OF SYSTEM ..... 2.0 K.M.
DISCHARGE ..... 250.0 Cumecs.

POWER HOUSE

INS. CAPACITY ..... 1000.0 MW.
AV. GROSS HEAD ..... 500.0 M.

DRN.		HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD.		पाकवा पम्प संचय योजना
SUBMD.		PAKWA PUMPED STORAGE SCHEME
APPD.		
T.S. NO:	84A/5,9.	
SCALE:	1: 50,000	CENTRAL ELECTRICITY AUTHORITY
FEB., 1982.		DRG. NO: HEPR-PS-BHM-724.

28. TUITHO LUI PUMPED STORAGE PROJECT (3X350MW=1050MW)

1. INTRODUCTION

Tuitho Lui Pumped Storage Project is located near Vapar Tlang in Aizawl district of Mizoram. The project utilizes water of Tuithing Lui/ Tuitho Lui River for power generation harnessing average gross head generation of 530 m. The powerhouse has 3 units of 350 MW having installed capacity of 1050 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Tuithing Lui River having upper reservoir at latitude of 23°37'35.98"N and longitude of 93°20'27.46"E and lower reservoir at latitude of 23°38'42.80"N and longitude of 93°20'31.81"E. There is a proposal of underground type of Power house. The nearest railway station is Agartala and the Airport is Lengpui at Aizawl district.

3. PROJECT FEATURES

Tuitho Lui Pumped Storage Project involves.

Upper Reservoir (proposed): Upper Reservoir with a live storage of 21.8 Mm^3 on Tuithing Lui River between a Full Reservoir Level (FRL) of 1600 m and Minimum Draw down Level (MDDL) of 1579 m.

Lower Reservoir (proposed): Lower Reservoir with a live storage of 22.9 Mm^3 on Tuitho Lui River between a Full Reservoir Level (FRL) of 1070 m and Minimum Draw down Level (MDDL) of 1047 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of length 2000 m carrying water to the underground powerhouse. The Project to be operated under gross head of 530 m with installed capacity of 1050 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel.

4. POWER & ENERGY BENEFITS

Tuitho Lui Pumped Storage Project has been dropped as the project is located very near to Murlen National Park and therefore, the scheme appears to be not feasible.

SALIENT FEATURES

TUITHO LUI PUMPED STORAGE PROJECT

GENERAL:

State	Mizoram
District	Aizawl
River	Tuithang Lui/ Tuitho Lui
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Agartala
Nearest Airport	Lengpui Airport

UPPER RESERVOIR (Proposed):

Location	Latitude: 23°37'35.98"N
	Longitude: 93°20'27.46"E
Full Reservoir Level (FRL) (m)	1600
Minimum Draw Down Level (MDDL) (m)	1579
Length of Dam (m)	300
Dam Height (m)	60
Live Storage (Mm^3)	21.8

LOWER RESERVOIR (Proposed):

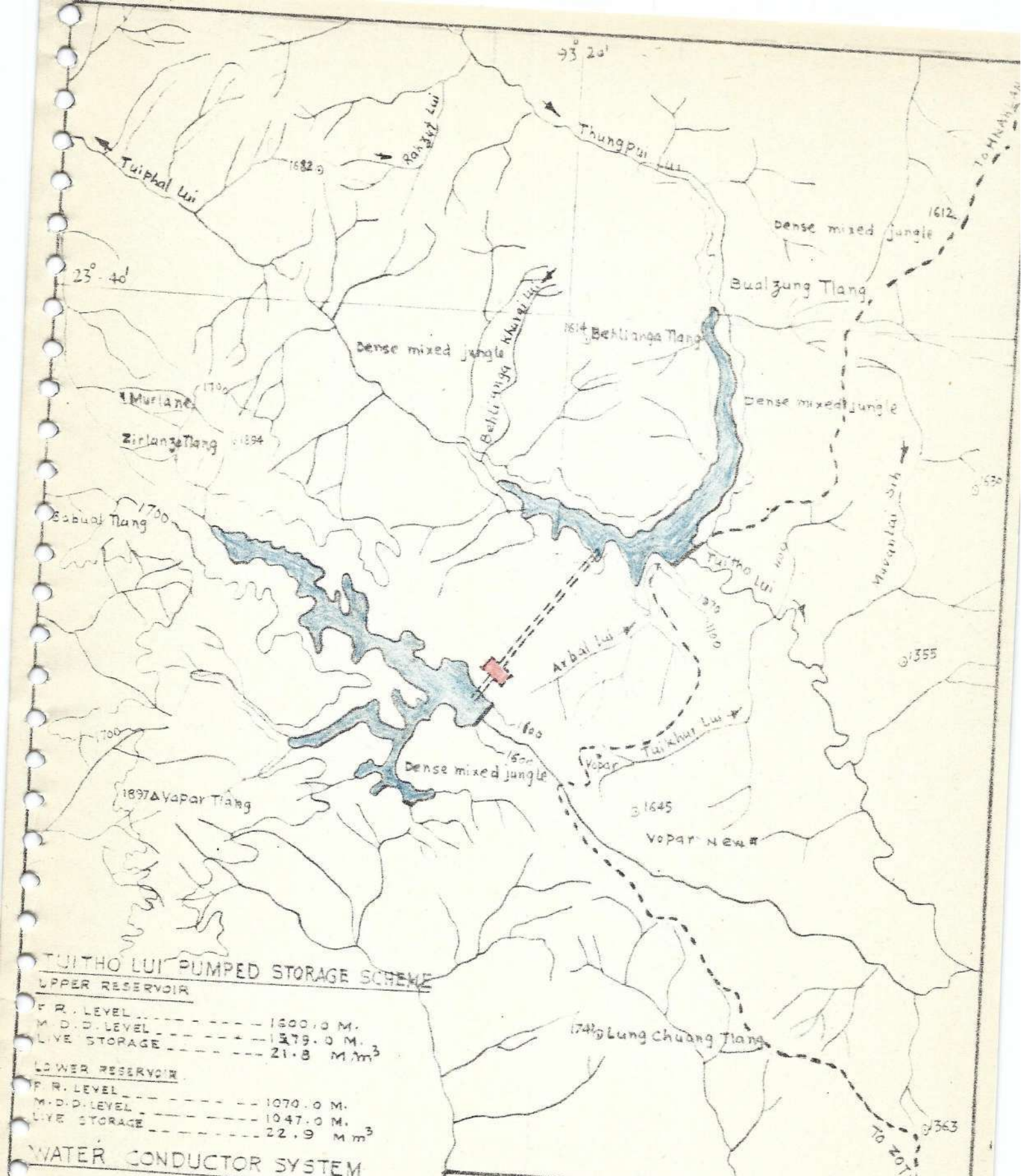
Location	Latitude: 23°38'42.80"N
	Longitude: 93°20'31.81"E
Full Reservoir Level (FRL) (m)	1070
Minimum Draw Down Level (MDDL) (m)	1047
Length of Dam (m)	300
Dam Height (m)	60
Live Storage (Mm^3)	22.9

WATER CONDUCTOR SYSTEM

Length (m)	2000

POWER HOUSE

Type	Underground
No. of Generating Units	3
Capacity of each Unit (MW)	350
Installed Capacity (MW)	1050
Average Gross Head (m)	530



TUITHO LUI PUMPED STORAGE SCHEME

UPPER RESERVOIR

F. R. LEVEL ..... 1600.0 M.
M. D. D. LEVEL ..... 1379.0 M.
LIVE STORAGE ..... 21.8 M.m³

LOWER RESERVOIR

F. R. LEVEL ..... 1070.0 M.
M. D. D. LEVEL ..... 1047.0 M.
LIVE STORAGE ..... 22.9 M.m³

WATER CONDUCTOR SYSTEM

LENGTH OF SYSTEM ..... 2.0 K.M.
DISCHARGE ..... 250.0 cumecs

POWER HOUSE

INS. CAPACITY ..... 1050 MW
AV. GROSS HEAD ..... 530.0 M.

DRN.		HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD.		तुईथोलुई पम्प संचय योजना
SUBMD.		TUITHO LUI PUMPED STORAGE SCHEME
APPD.		
T.S.NO:	84E/6	
Scale:	1:50,000	CENTRAL ELECTRICITY AUTHORITY
DEC. 1981		DRG.NO: HEPR-PS-BHM-717.

29. MAT PUMPED STORAGE PROJECT (1400 MW)

1. INTRODUCTION

Mat Pumped Storage Project is located near Thenzawl locality in Serchhip district of Mizoram. The project utilizes water of Mat & Lao Lui River for power generation harnessing average gross head generation of 308 m. The powerhouse is having installed capacity of 1400 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Mat/ Lao Lui River having upper reservoir at latitude of 23°16'45.04"N and longitude of 92°46'45.70"E and lower reservoir at latitude of 23°05'47.38"N and longitude of 93°59'55.29"E. There is a proposal of Power house. The nearest railway station is Aizawl and the Airport is Lengpui.

3. PROJECT FEATURES

Mat Pumped Storage Project involves.

Upper Reservoir (proposed): Upper Reservoir with a live storage of 8 MCM on a small tributary of Mat River with a Full Reservoir Level (FRL) of 760 m.

Lower Reservoir (proposed): Lower Reservoir with a live storage of 7.8 MCM on a small tributary of Lao Lui River between a Full Reservoir Level (FRL) of 450 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of length 8380 m carrying water to the powerhouse. The Project to be operated under gross head pumping of 308 m with installed capacity of 1400 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel.

4. HYDROLOGY

The Catchment area of the river upto the upper dam site is 0.5 Sq.Km. and upto the lower dam site is 1.11 Sq.Km.

5. POWER & ENERGY BENEFITS

Mat Pumped Storage Project has been dropped as it is unviable considering close proximity of Thenzwal Town, lesser gross storage. The installed capacity of 1400 MW.

SALIENT FEATURES

MAT PUMPED STORAGE PROJECT

GENERAL:

State	Mizoram
District	Serchhip
River	Mat/ Lao Lui
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Aizawl
Nearest Airport	Lengpui

UPPER RESERVOIR (Proposed):

Location	Latitude: 23°16'45.04"N
	Longitude: 92°46'45.70"E
Full Reservoir Level (FRL) (m)	760
Dam Height (m)	24
Live Storage (MCM)	8

LOWER RESERVOIR (Proposed):

Location	Latitude: 23°05'47.38"N
	Longitude: 93°59'55.29"E
Full Reservoir Level (FRL) (m)	450
Dam Height (m)	15
Live Storage (MCM)	7.8

HYDROLOGY:

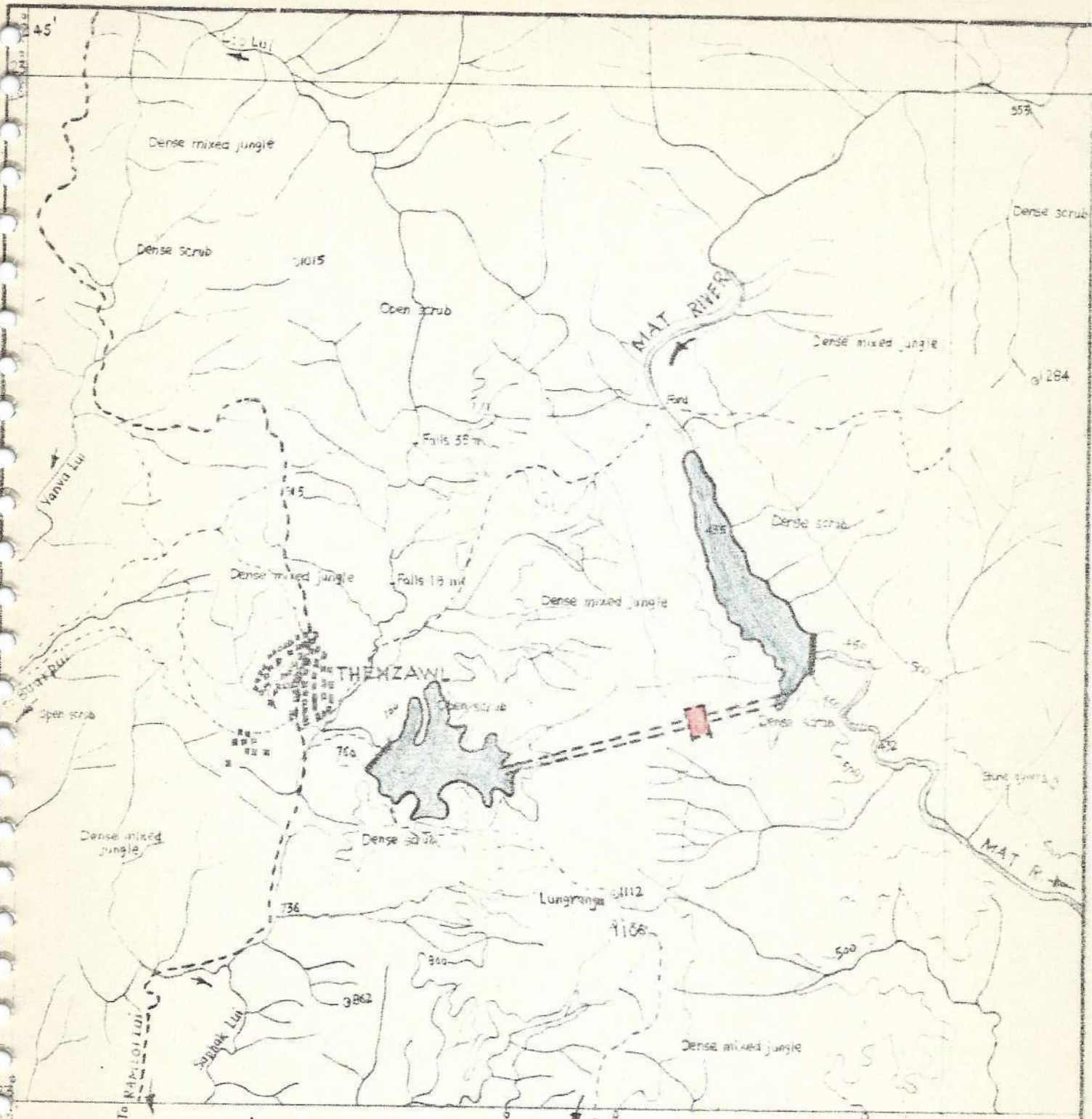
Catchment Area (Sq. Km) Upper Dam	0.5
Catchment Area (Sq. Km) Lower Dam	1.11

WATER CONDUCTOR SYSTEM

Length (m)	8380

POWER HOUSE

Installed Capacity (MW)	1400
Average Gross Head (m)	308



MAT PUMPED STORAGE SCHEME

UPPER RESERVOIR

F.R. LEVEL ---------- 760.0 M.
M.D.D. LEVEL ---------- 749.0 M.
LIVE STORAGE ---------- 8.0 M. m^3

LOWER RESERVOIR

F.R. LEVEL ---------- 450.0 M.
M.D.D. LEVEL ---------- 444.0 M.
LIVE STORAGE ---------- 9.5 M. m^3

WATER CONDUCTOR SYSTEM

LENGTH OF SYSTEM ---------- 2.5 K.M.
DISCHARGE ---------- 560.0 Cumecs.

POWER HOUSE

INS. CAPACITY ---------- 1400.0 MW
AV. GROSS HEAD ---------- 308.0 M.

DRN.		HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD.		मॉट पम्प संचय योजना
SUBMD.		MAT PUMPED STORAGE SCHEME
APPD.		
T.S.NO:	84A/15	
Scale:	1: 50.000	CENTRAL ELECTRICITY AUTHORITY
JAN., 1982		DRG.NO: HEPR-PS-BHM-721

30. JHARLAMA PUMPED STORAGE PROJECT (9X280MW=2500MW)

1. INTRODUCTION

Jharlama Pumped Storage Project is located in Sambalpur/Raipur district of Odisha/ Madhya Pradesh. The project utilizes water of Jonk River/Son Nadi for power generation harnessing gross head of 262.7 m. The powerhouse has 9 units of 280 MW having installed capacity of 2500 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Jonk River/Son Nadi having upper reservoir at latitude of 20°36'42.8"N and longitude of 82°23'58.9"E and lower reservoir at latitude of 20°33'29.9"N and longitude of 82°20'01.0"E. There is a proposal of underground type of Power house. The nearest railway station is Lakhna and the Airport is Raipur.

3. PROJECT FEATURES

Jharlama Pumped Storage Project involves construction of Upper and Lower Reservoirs.

Upper Reservoir (proposed): The height of the dam of Upper Reservoir is proposed to be 34 m with a live storage of 26 Mm^3 on Jonk river between a Full Reservoir Level (FRL) of 660 m and Minimum Draw down Level (MDDL) of 648 m.

Lower Reservoir (proposed): The height of the dam of Lower reservoir is proposed to be 20 m with a live storage of 42.3 Mm^3 on Son Nadi between a Full Reservoir Level (FRL) of 396 m and Minimum Draw down Level (MDDL) of 388 m.

Water Conductor System (proposed): The proposed length of Water Conductor System is 1600 m.

4. HYDROLOGY

Total Catchment Area (Sq. Km) Upto the dam site of two reservoirs is about 79 Sq.Km

NOTE: The installed capacity of Jharlama Pumped Storage Project would be 2500 MW Utilising the Gross head of 262.7 m. Based on the Evaluation Report these projects have been assessed as Not Feasible.

SALIENT FEATURES

JHARLAMA PUMPED STORAGE PROJECT

GENERAL:

State	Odisha/Madhya Pradesh
District	Sambalpur/Raipur
River	Jonk River/Son Nadi
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Lakhna
Nearest Airport	Raipur

UPPER RESERVOIR (proposed):

Location	Latitude: ,20°36'42.8"N
	Longitude: 82°23'58.9"E
Full Reservoir Level (FRL) (m)	660
Minimum Draw Down Level (MDDL) (m)	648
Length of the Dam at the top(m)	720
Height of Dam (above RBL) (m)	34
Live Storage (Mm^3)	26
Gross Storage (Mm^3)	38.9

LOWER RESERVOIR (proposed):

Location	Latitude: 20°33'29.9"N
	Longitude: 82°20'01.0"E
Full Reservoir Level (FRL) (m)	396
Minimum Draw Down Level (MDDL) (m)	388
Height of Dam (above RBL) (m)	20
Live Storage (Mm^3)	42.3

HYDROLOGY:

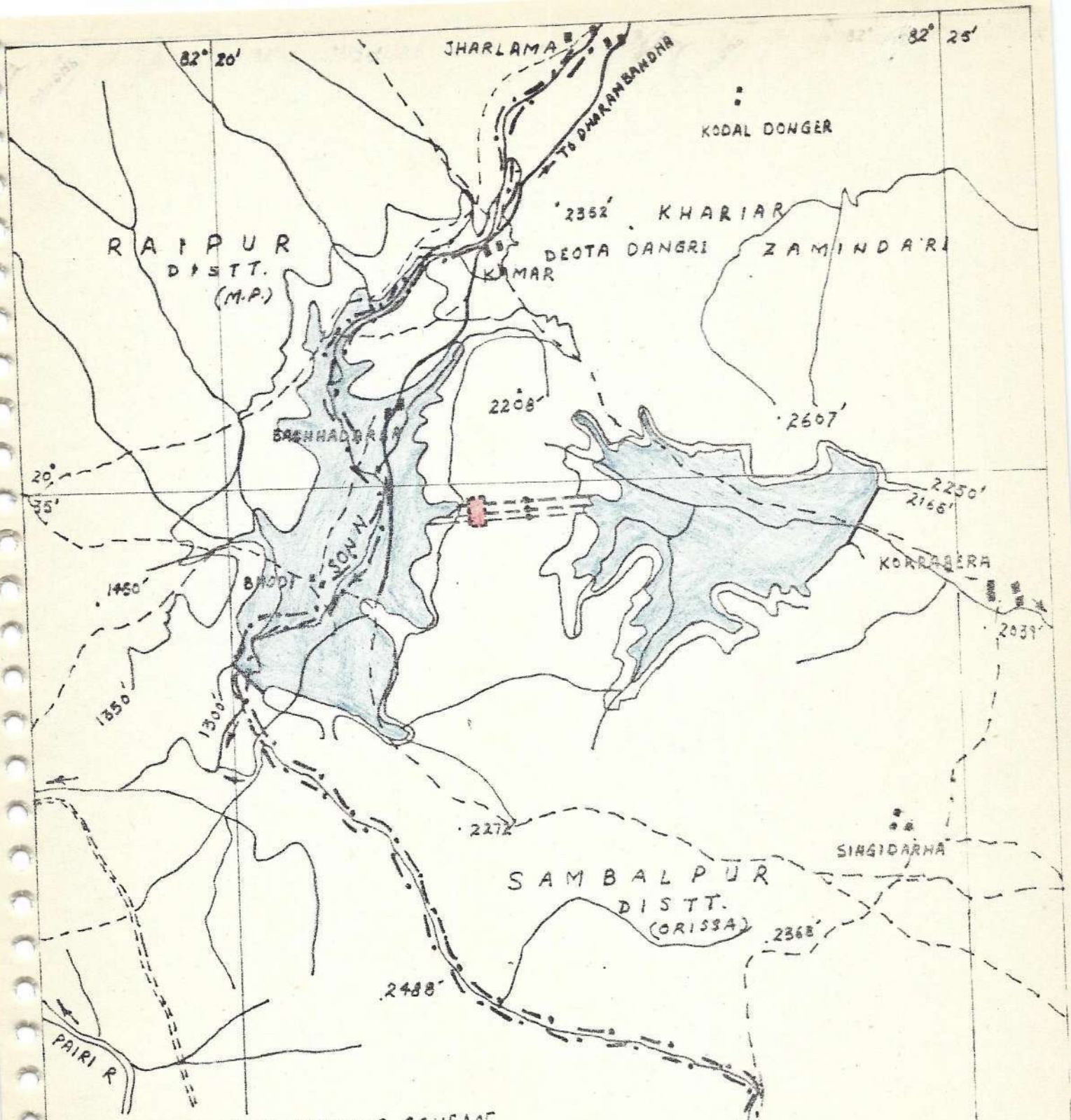
Total Catchment Area (Sq. Km) Upto the dam site of Two reservoirs	79

WATER CONDUCTOR SYSTEM (proposed):

Length (m)	1600
Design Discharge (Cumecs)	1203

POWER HOUSE (proposed):

Type	Underground
No. of Generating Units	9
Capacity of each Unit (MW)	280
Installed Capacity (MW)	2500
Gross Head(m)	262.7



JHARLAMA PUMPED STORAGE SCHEME

UPPER RESERVOIR

F.R. LEVEL — — — — — 660 M (2165')
M.D.D. LEVEL — — — — 648 M (2125')
LIVE STORAGE — — — — 26·6 Mm^3

20° 30'

LOWER RESERVOIR

F.R. LEVEL — — — — 396M (1300')
M.D.D. LEVEL — — — — 388M (1272')
LIVE STORAGE — — — — 42·3 Mm^3

WATER CONDUCTOR SYSTEM

LENGTH OF SYSTEM — — — 1·6 KM
DISCHARGE — — — — 1206 M^3/Sec.

POWER HOUSE

INS. CAPACITY — — — 2500 MW
AV GROSS HEAD — — — 262·7 M

DRN.	[illegible]	HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD.	Rsgill	झारलामा पम्प संचय योजना
SUBMD.	MSh	JHARLAMA PUMPED
APPVD.	[illegible]	STORAGE SCHEME
T.S.NO	64 L/6	
SCALE:-	1" = 1 MILE	CENTRAL ELECTRICITY AUTHORITY
MAY,	1984	DRG. NO. HEPR-PS-CIR-1009

31. BADRINAGAR PUMPED STORAGE PROJECT (9X220MW=1980MW)

1. INTRODUCTION

Badrinagar Pumped Storage Project is located near small village kalyanpura in Alwar district of Rajasthan. The project utilizes water of Banganga/Ruperel River for power generation harnessing gross head of 164 m. The powerhouse has 9 units of 220 MW having installed capacity of 1980 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Banganga River having upper reservoir at latitude of 27°34'38"N and longitude of 76°27'17"E and lower reservoir at latitude of 27°35'30"N and longitude of 76°29'13"E. The nearest railway station is Alwar and the Airport is Jaipur International.

3. PROJECT FEATURES

Badrinagar Pumped Storage Project involves construction of:

Upper Reservoir (Proposed): Upper Reservoir is proposed to be of Height 60 m with a live storage of 25.8 Mcum on river Banganga between a Full Reservoir Level (FRL) of 500 m and Minimum Draw down Level (MDDL) of 470 m.

Lower Reservoir (Proposed): Lower reservoir is is proposed to be of Height 22 m with a live storage of 27 Mcum on river Tanbia between a Full Reservoir Level (FRL) of 332 m and Minimum Draw down Level (MDDL) of 320 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of 3 nos. Head race tunnel (HRT) of length 1700 m carrying water to the underground powerhouse. The Project to be operated under gross head of 164 m with installed capacity of 1980 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 700 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 71.5 Sq. Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Badrinagar Pumped Storage Project would be 1980 MW.utilising the Gross head of 164 m,

NOTE: Badrinagar Pumped Storage Project is presently Unexploitable at present as covered under reserve Tiger Forest Sariska (Wild Life Sanctuary).

SALIENT FEATURES

BADRINAGAR PUMPED STORAGE PROJECT

GENERAL:

State	Rajasthan
District	Alwar
River	Banganga/Ruperel
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Alwar
Nearest Airport	Jaipur

UPPER RESERVOIR (Proposed):

Location	Latitude: 27°34'38"N
	Longitude: 76°27'17"E
Full Reservoir Level (FRL) (m)	500
Minimum Draw Down Level (MDDL) (m)	470
Length of the Dam at the top(m)	600
Height of Dam (above RBL) (m)	60
Live Storage (Mcum)	25.8
Gross Storage (Mcum)	31.2

LOWER RESERVOIR (Proposed):

Location	Latitude: 27°35'30"N
	Longitude: 76°29'13"E
Full Reservoir Level (FRL) (m)	332
Minimum Draw Down Level (MDDL) (m)	320
Length of the Dam at the top(m)	1000
Height of Dam (above RBL) (m)	22
Live Storage (Mcum)	27
Gross Storage (Mcum)	30.2

HYDROLOGY:

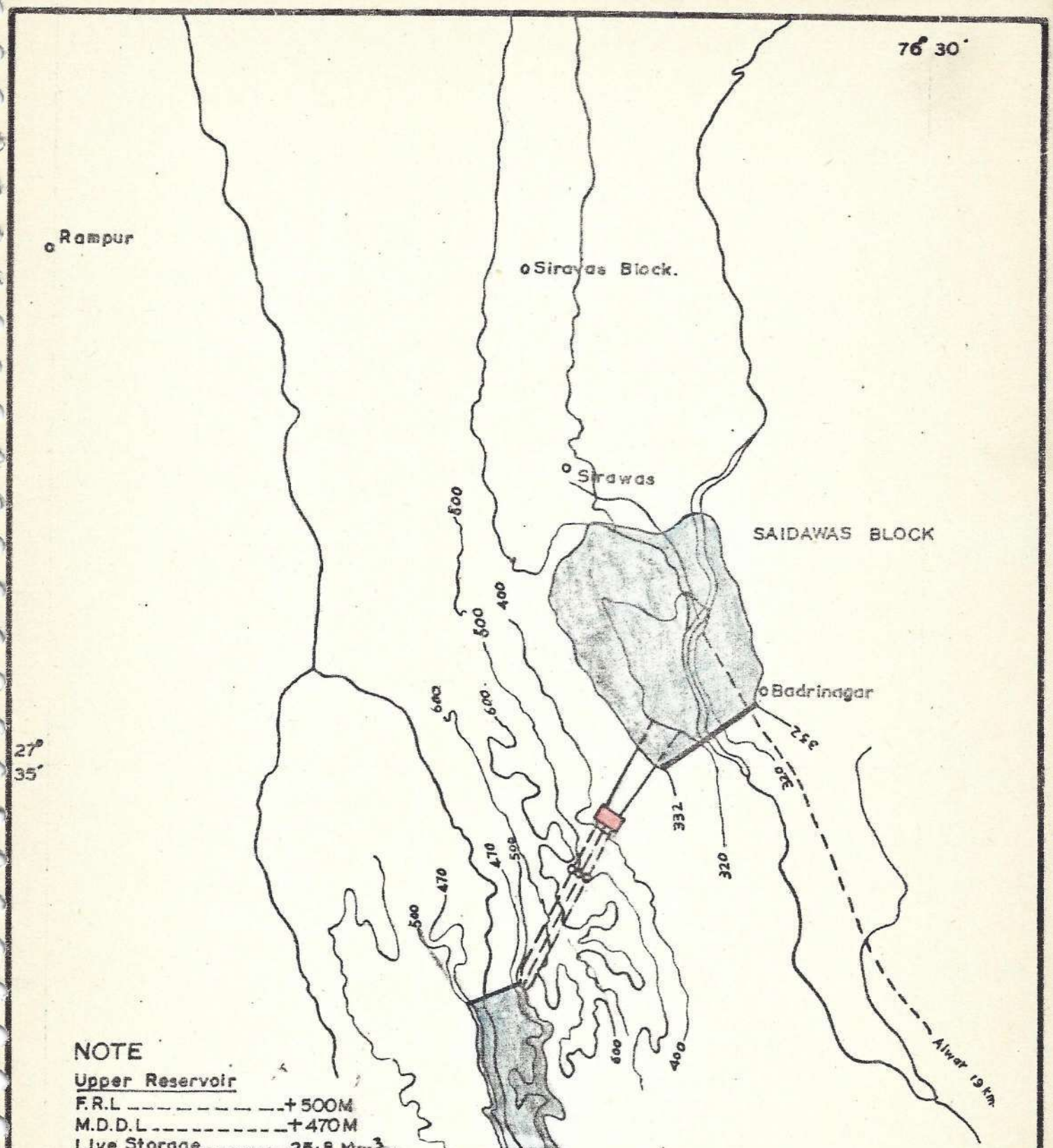
Catchment Area (Sq. Km) Upper Dam	67

WATER CONDUCTOR SYSTEM (proposed):

HEAD RACE TUNNEL	
Number	3
Length (m)	1700
TAIL RACE TUNNEL	
Number	1
Length (m)	700

POWER HOUSE (proposed):

Type	Surface
No. of Generating Units	9
Capacity of each Unit (MW)	220
Installed Capacity (MW)	1980
Gross Head(m)	164



NOTE

Upper Reservoir

F.R.L ---------- +500M
M.D.D.L ---------- +470M
Live Storage ------ 25·8 Mm³

Lower Reservoir

F.R.L ---------- 332M.
M.D.D.L ---------- 320M.
Live Storage ------ 27 Mm³

Power House

Ins. Capacit ------ 9x220MW.
Av. Gross Head ------ 164M.

Hydro Potential Reassessment Project

बदरीनगर पम्प सचयं योजना

BADRINAGAR PUMP STORAGE SCHEME

Central Electricity Authority

DRG. NO. HEPR-PS-GAN-579

32. BARAH PUMPED STORAGE PROJECT (10X180MW=1800MW)

1. INTRODUCTION

Barah Pumped Storage Project is located near small village Bairawas in Alwar district of Rajasthan. The project utilizes water of Barah Nallah River for power generation harnessing gross head of 214 m. The powerhouse has 10 units of 180 MW having installed capacity of 1980 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project is located on Barah River having upper reservoir at latitude of 27°28'37"N and longitude of 76°24'13"E and lower reservoir at latitude of 27°27'37"N and longitude of 76°22'13"E. The nearest railway station is Alwar and the Airport is Jaipur International.

3. PROJECT FEATURES

Barah Pumped Storage Project involves construction of :

Upper Reservoir (proposed): Upper Reservoir is proposed to be of Height 60 m with a live storage of 18 Mcum on river Barah between a Full Reservoir Level (FRL) of 580 m and Minimum Draw down Level (MDDL) of 550 m.

Lower Reservoir (Proposed): Lower Reservoir is proposed to be height of 22 m with a live storage of 21.1 Mcum on river Barah between a Full Reservoir Level (FRL) of 362 m and Minimum Draw down Level (MDDL) of 350 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of 2 nos. Head race tunnel (HRT) of length 700 m carrying water to the underground powerhouse. The Project to be operated under gross head of 214 m with installed capacity of 1800 MW. The discharged water from powerhouse is carried back to the river by Tail race tunnel of length 1800 m.

4. HYDROLOGY

The Catchment area of the river upto upper dam site is 53 Sq. Km.

5. POWER & ENERGY BENEFITS

The installed capacity of Barah Pumped Storage Project would be 1800 MW Utilising the Gross head of 214 m.

NOTE: Barah Pumped Storage Project is covered under reserve Tiger Forest Sariska (Wild Life Sanctuary).

SALIENT FEATURES

BARAH PUMPED STORAGE PROJECT

GENERAL:

State	Rajasthan
District	Alwar
River	Barah
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Alwar
Nearest Airport	Jaipur

UPPER RESERVOIR (proposed):

Location	Latitude: 27°28'37"N
	Longitude: 76°24'13"E
Full Reservoir Level (FRL) (m)	580
Minimum Draw Down Level (MDDL) (m)	550
Length of the Dam at the top(m)	250
Height of Dam (above RBL) (m)	60
Live Storage (Mcum)	18.8
Gross Storage (Mcum)	21

LOWER RESERVOIR (Proposed):

Location	Latitude: 27°27'37"N
	Longitude: 76°22'13"E
Full Reservoir Level (FRL) (m)	362
Minimum Draw Down Level (MDDL) (m)	350
Length of the Dam at the top(m)	1000
Height of Dam (above RBL) (m)	60
Live Storage (Mcum)	21.1
Gross Storage (Mcum)	26.6

HYDROLOGY:

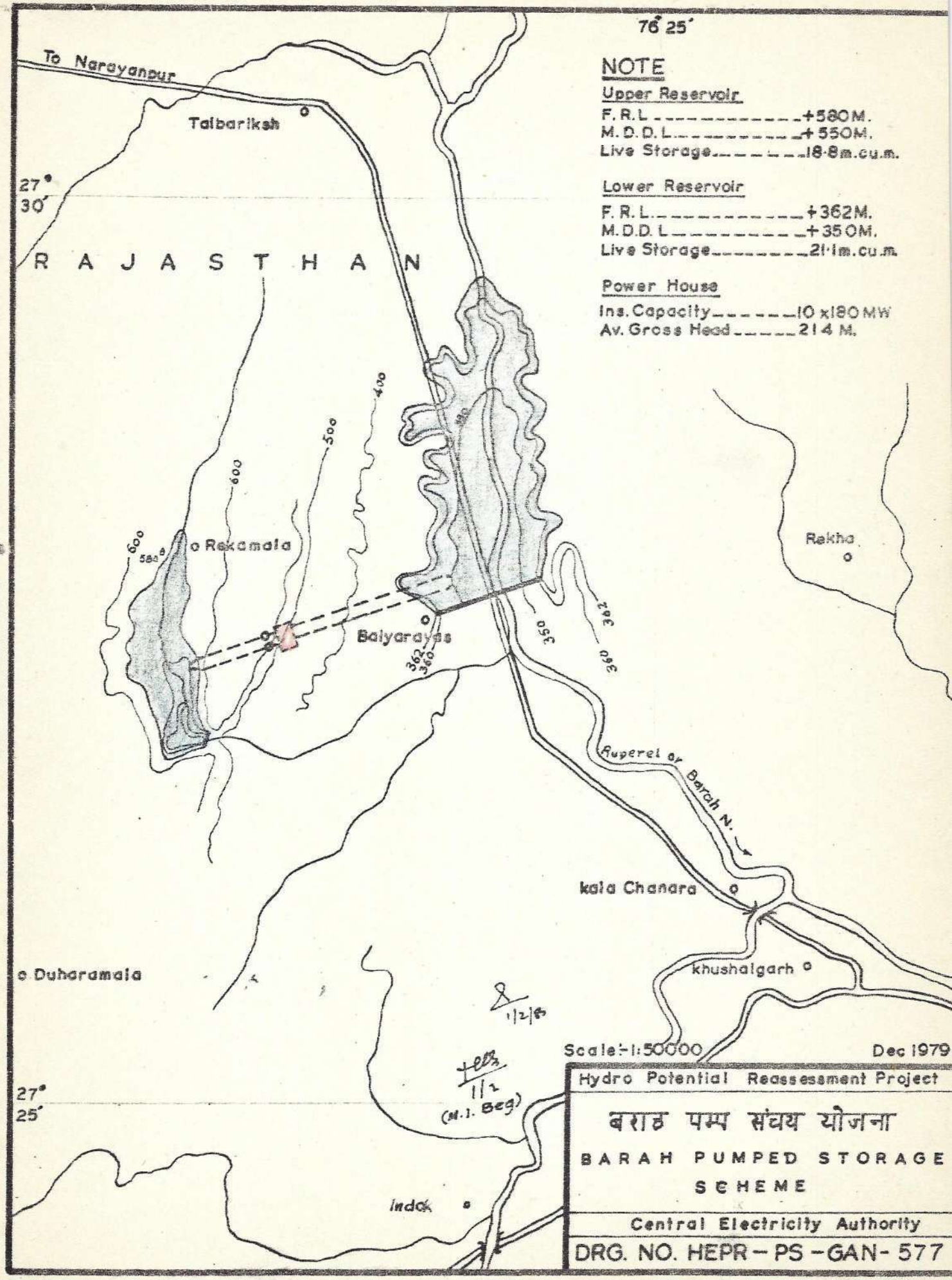
Catchment Area (Sq. Km) Upper Dam	53

WATER CONDUCTOR SYSTEM (proposed):

HEAD RACE TUNNEL	
Number	2
Length (m)	700
TAIL RACE TUNNEL	
Number	2
Length (m)	1800

POWER HOUSE (proposed):

Type	Surface
No. of Generating Units	10
Capacity of each Unit (MW)	180
Installed Capacity (MW)	1800
Gross Head(m)	214


76° 25'
To Narayanpur
Talbariksh
27° 30'
R A J A S T H A N
NOTE
Upper Reservoir
F.R.L ----------+580M.
M.D.D.L ----------+550M.
Live Storage ------18·8m.cu.m.
Lower Reservoir
F.R.L ----------+362M.
M.D.D.L ----------+350M.
Live Storage ---------21·1m.cu.m.
Power House
Ins. Capacity -------10 x 180 MW
Av. Gross Head ------214 M.
400
500
600
600
580
Rekamala
Balyarayas
362
360
350
360
362
Rakha
Ruperel or Barah N.
kala Chanara
khushalgarh
Duharamala
1/2/80
Scale:-1:50000
Dec 1979
27° 25'
1/2
(M.I. Beg)
Indok
Hydro Potential Reassessment Project
बराह पम्प संचय योजना
BARAH PUMPED STORAGE SCHEME
Central Electricity Authority
DRG. NO. HEPR-PS-GAN-577

33. NALLAR PUMPED STORAGE PROJECT (2700MW)

1. INTRODUCTION

Nallar Pumped Storage Project is located in Coimbatore district of Tamil Nadu. The project utilizes water of Tail race of of Power house of Thirumoorthy reservior River for power generation harnessing design head of 231.10 m. The powerhouse has 4 units of 125 MW having installed capacity of 500 MW.

2. LOCATION/ACCESSIBILITY

The dam site of the project having upper reservoir at latitude of 10°25'25.42"N and longitude of 77°05'20.81"E and lower reservoir at latitude of 10°17'19"N and longitude of 77°2'20.40"E. The nearest railway station and the Airport is Coiambatore International.

3. PROJECT FEATURES

Nallar Pumped Storage Project involves construction of

Upper Reservoir (proposed): The upper reservoir has Full Reservoir Level (FRL) of 980 m and Minimum Draw down Level (MDDL) of 940 m.

Water Conductor System (proposed): The proposed Water Conductor System comprises of 1 nos. of Head race tunnel (HRT) of length 14400 m

4. POWER & ENERGY BENEFITS

The installed capacity of Nallar Pumped Storage Project would be 500 MW.

NOTE:

Nallar Pumped Storage is presently Unexploitable at present because Cost of Generation will be very high and Break even period will be more than 25 years.

SALIENT FEATURES

NALLAR PUMPED STORAGE PROJECT

GENERAL:

State	Tamilnadu
District	Coimbatore
River	Nallar
Type of Scheme (On-River/Off-River)	On
Nearest Railhead	Coimbatore
Nearest Airport	Coimbatore

UPPER RESERVOIR (proposed):

Location	Latitude: 10°25'25.42"N
	Longitude: 77°5'20.81"E
Full Reservoir Level (FRL) (m)	980
Minimum Draw Down Level (MDDL) (m)	940

LOWER RESERVOIR (Proposed):

Location	Latitude: 10°17'19"N
	Longitude: 77°2'20.40"E

HYDROLOGY:

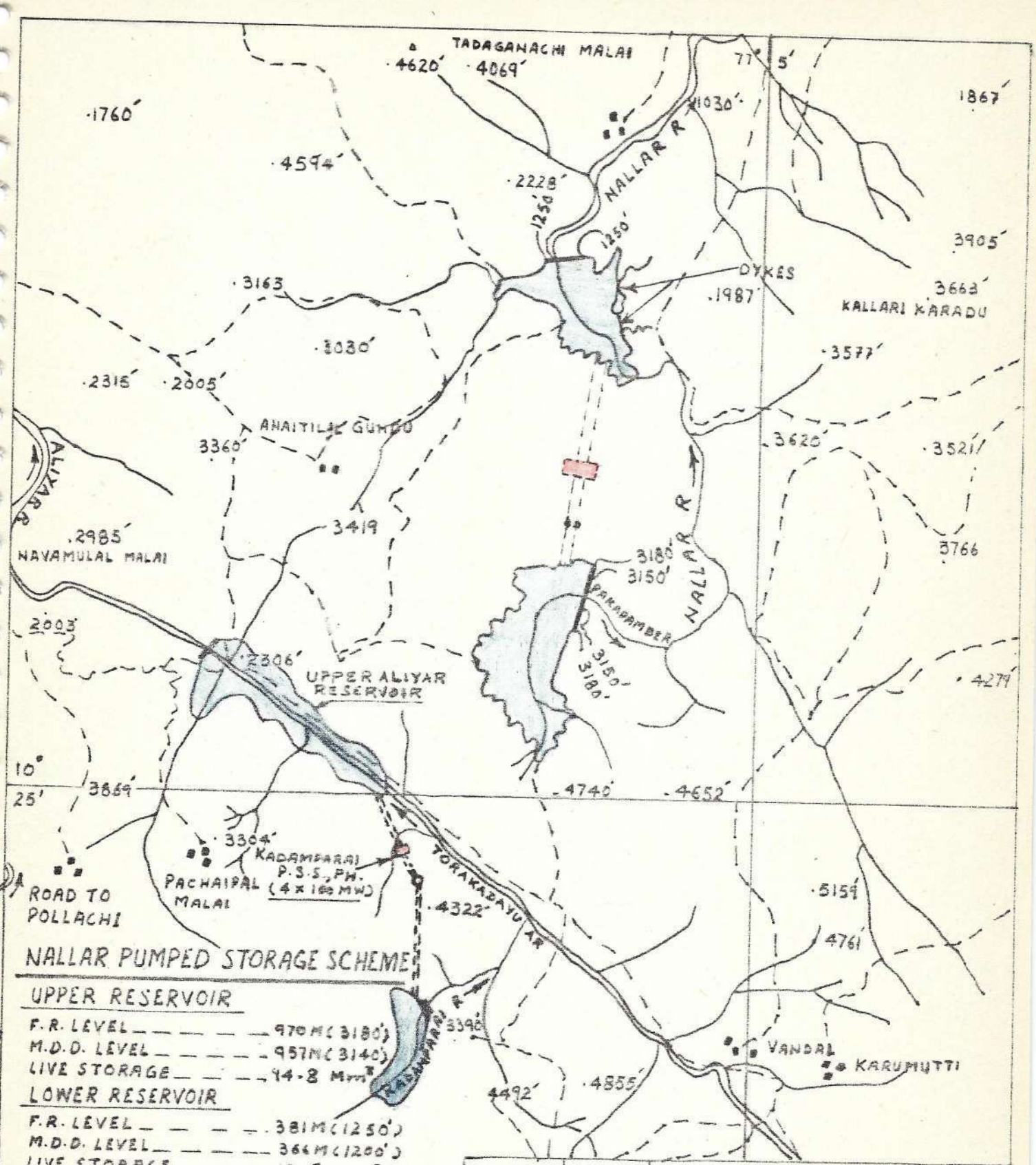
Catchment Area (Sq. Km) Upper Dam	
Catchment Area (Sq. Km) Lower Dam	

WATER CONDUCTOR SYSTEM (proposed):

HEAD RACE TUNNEL	
Number	1
Length (m)	14400

POWER HOUSE (proposed):

Type	Surface
No. of Generating Units	10
Capacity of each Unit (MW)	180
Installed Capacity (MW)	1800
Gross Head(m)	214



NALLAR PUMPED STORAGE SCHEME

UPPER RESERVOIR

F.R. LEVEL — 970 M (3180')
M.D.D. LEVEL — 957 M (3140')
LIVE STORAGE — 14.8 Mm^3

LOWER RESERVOIR

F.R. LEVEL — 381 M (1250')
M.D.D. LEVEL — 366 M (1200')
LIVE STORAGE — 12.5 Mm^3

WATER CONDUCTOR SYSTEM

LENGTH OF SYSTEM — 2.4 KM.
DISCHARGE — 580 Cumecs.

POWER HOUSE

INS. CAPACITIY — 2700 MW
AV. GROSS HEAD — 589.7 M

DRN.		HYDRO POTENTIAL REASSESSMENT PROJECT
CHKD.		नलार पम्प संचय योजना
SUBMD.		NALLAR PUMPED STORAGE SCHEME
APPD.		
T.S.NO	58 F/3	
SCALE:	1" = 1 MILE	CENTRAL ELECTRICITY AUTHORITY
MAY, 1984		DRG. NO HEPR-PS-WFR-1007

34. JASPALGARH PUMPED STORAGE PROJECT (1935 MW)

1. INTRODUCTION

Jaspalgarh Pumped Storage Project have a proposed upper reservoir and lower reservoir with installed capacity of 1935MW. The project is located in Garhwal district of Uttarakhand. The project utilizes water of Lunisot, a tributary of Rawsang Nadi and the other on the Rawasang Nadi for power generation harnessing average gross head of 190 m. The powerhouse would have installed capacity of 1935 MW.

2. LOCATION/ACCESSIBILITY

The proposed upper dam site of the project is located on Lunisot, a tributary of Rawasang Nadi having upper reservoir at latitude of 29°53'49.47''N and longitude of 78°24'22.99''E and lower dam site is located on Rawasang Nadi at latitude of 29°53'07.81''N and longitude of 73°46'18''E. The nearest railway station is Kotdwar and the Airport is Dehradun.

3. PROJECT FEATURES

Jaspalgarh Pumped Storage Project involves construction of

Upper Reservoir (Proposed): Upper Dam/Reservoir is proposed across Rawasang Nadi with dam Height of 90 m with a live storage of 24.2Mm^3 between a Full Reservoir Level (FRL) of 780 m and Minimum Draw down Level (MDDL) of 720 m.

Lower Reservoir (Proposed: Lower Dam/Reservoir is proposed with dam height of 60 m with a live storage of 22.9Mm^3 on Ramasang Nadi between a Full Reservoir Level (FRL) of 580 m and Minimum Draw down Level (MDDL) of 550 m.

Water Conductor System (Proposed): The proposed Water Conductor System comprises of a 3 nos. of Head race Tunnel (HRT) of length 1250 m each. Each tunnel would further trifurcated near the power house. Two or three tail race tunnel of suitable capacity and about 0.5 km long would be provided to connect the common tail race with the lower reservoir. The Project to be operated under average gross head of 190 m with installed capacity of 1935MW.

4. POWER & ENERGY BENEFITS

The installed capacity of Jaspalgarh Pumped Storage Project would be 1935MW utilizing the average gross head of 190 m.

NOTE:

Jaspalgarh Pumped Storage is presently Unexploitable at present because the project lies within the Rajaji National Park and its Buffer Zone.

SALIENT FEATURES
JASPALGARH PUMPED STORAGE PROJECT

GENERAL:

State	Uttarakhand
District	Garhwal
River	Rawasang Nadi/Ramasang Nadi
Type of Scheme (On-River/Off-River)	On River
Nearest Railhead	Kotdwar
Nearest Airport	Dehradun

UPPER RESERVOIR (Proposed):

Location	Latitude: 29°53'49.47''N
	Longitude: 78°23'02.28''E
Full Reservoir Level (FRL) (m)	780
Minimum Draw Down Level (MDDL) (m)	720
Length of the Dam at the top(m)	500
Height of Dam (above RBL) (m)	90
Live Storage (Mm^3)	24.2

LOWER RESERVOIR (Proposed)

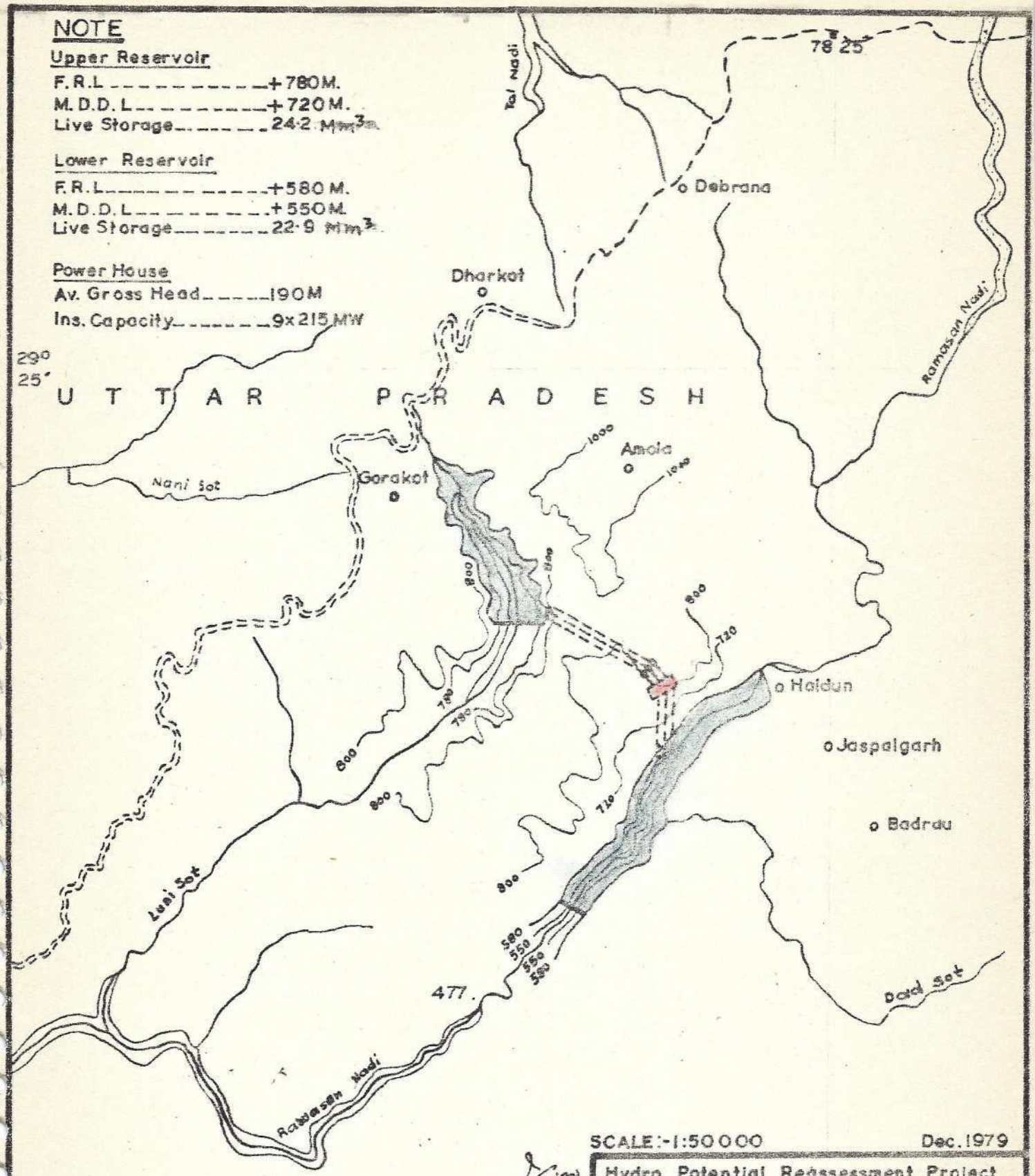
Location	Latitude: 29°53'07.81''N
	Longitude: 78°24'22.99''E
Full Reservoir Level (FRL) (m)	580
Minimum Draw Down Level (MDDL) (m)	550
Height of Dam (above RBL) (m)	350
Live Storage (Mm^3)	22.9

WATER CONDUCTOR SYSTEM:

HEAD RACE TUNNEL	
Number	3
Length (m)	1250
TAIL RACE TUNNEL	
Length (m)	500

POWER HOUSE:

Type	Underground
Installed Capacity (MW)	1935
Average Gross Head(m)	190



SCALE:-1:50000 Dec.1979

Hydro Potential Reassessment Project

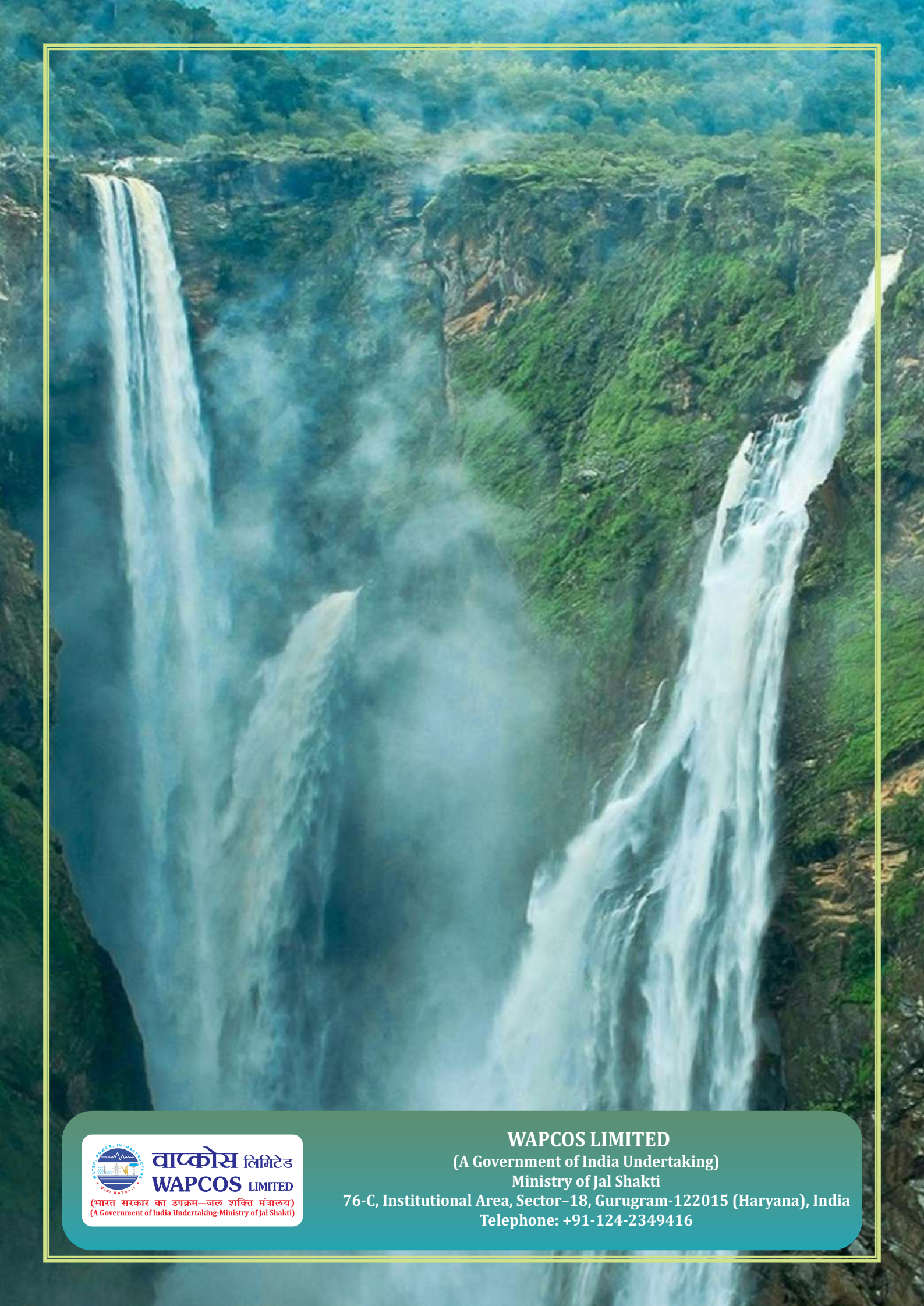
जसपालगढ़ पम्प संचय योजना

JASPALGARH PUMPED STORAGE SCHEME

Central Electricity Authority

DRG. NO. HEPR—PS—GAN—578

(M.I. Beg)



वाप्कोस लिमिटेड
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(भारत सरकार का उपक्रम–जल शक्ति मंत्रालय)
(A Government of India Undertaking-Ministry of Jal Shakti)

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