

Technical Report

The administrative & Financial Proposal amounting to Rs. 1595.06 Crore is submitted for *Construction of Navnera Barrage across River Kalisindh near village Abra Tehsil Digod distt. Kota (Rajasthan) under Eastern Rajasthan Canal Project (ERCP) phase -I (A).*

1.

INTRODUCTION

The Government of Rajasthan is intending to formulate a scheme namely, **Eastern Rajasthan Canal Project (ERCP)** for intra-basin transfer of water within the Chambal basin to utilize surplus water resources available in some of the sub-basins of Chambal River viz. Kalisindh Sub-basin & Parwati Sub-basin to ensure sustainable water resources development and fulfilling the various water demand as well as mitigating draught situation in water deficit sub-basins viz. Banas Sub-basin in same river catchment area. The output expected is to identify the type and locations of Barrage which will be required to be constructed across various sub-basins of Chambal River and also to suggest possible economical routes for diversion of water from surplus sub-basins to deficit sub-basins.

The consultancy work to formulate the project report was awarded to WAPCOS Ltd., amounting to Rs. 22,07,56,000/- vide letter no. F.2(49)AS/I/Cell/2016/1987 dated 04-04-2016 (copy enclosed). In continuations that the WAPCOS submitted Pre-Feasibility Report (PFR) amounting to Rs. 40,441.50 Crore and after examination the Govt.of Rajasthan submitted the PFR to Central Water Commission (CWC) for examination and to ascertain the viability of the project proposal for preparation of DPR.

The pre-feasibility report (PFR) has been considered and examined by the specialized directorate of CWC.The PFR is clear for from Hydrology, International and project planning aspects and CWC conveyed in principle consent vide there letter no. F.No. RAJ/84/2017-PAC/1483-85 dated 06.10.2017 (Copy Enclosed).

The main objectives of the proposed ERCP project are to provide safe drinking water to targeted population of 13 districts (viz. Alwar, Bharatpur, Dholpur,

Karauli, SawaiMadhopur, Dausa, Jaipur, Ajmer, Tonk, Bundi, Kota, Baran, Jhalawar) of Eastern Rajasthan and en-route towns, tanks and villages as well as industrial water demand for the industries in and around basin area. Apart from it, the proposed scheme will also provide irrigation water to more than 2.0 lakh ha of new command area in Dholpur and SawaiMadhopur districts as well as stabilising the existing command area of en-route tanks and reservoirs of about 2.30 lakh ha.

The object of this proposal for Administrative sanction is to construct a barrage across river kalisindh, near Village Abra which lies in distt. Kota of Rajasthan, to store and divert the flow in a carrier channel, to transfer surplus water as a source and providing targeted quantum of water for drinking and industrial uses as well as to en-route tanks, villages, towns and supplementing some of the existing/proposed irrigation schemes. The said proposal is a part of Eastern Rajasthan Canal Project (ERCP) which is named as Phase -I (A).

2. CHAMBAL RIVER SYSTEM AND THE CATCHMENT AREA

Chambal River, a principal tributary of Yamuna River, originates in the Vindhyan range near Mhow in Indore District of Madhya Pradesh, at an elevation of 354 m above msl, at latitude $22^{\circ} 27'$ and longitude $73^{\circ} 20'$. The river flows through the States of Madhya Pradesh, Rajasthan and Uttar Pradesh. Chambal Basin lies between longitudes $73^{\circ} 20'$ and $79^{\circ} 20'$ and latitudes $22^{\circ} 27'$ and $27^{\circ} 20'$.

The basin is roughly rectangular in shape, its maximum length being 560 Km in a northeast - southwest direction. The river flows for some 320 Km in a generally northerly direction before entering a deep gorge in Rajasthan at Chourasigarh, about 96 Km upstream of Kota. The deep gorge extends up to Kota. The river flows for about 226 Km in Rajasthan in a north-easterly direction, and then forms the boundary between Madhya Pradesh and Rajasthan in a length of about 252 Km. Thereafter, the river forms the boundary between Madhya Pradesh and Uttar Pradesh for about 117 Km, entering UP near Charak Nagar village and flows for about 40 Km before joining Yamuna River.

There are eight Sub-basins in Chambal Basin within Rajasthan, namely: Banas (47,060 Km²), Chakan (747.94 Km²), Chambal Downstream (4,571.56 Km²), Chambal Upstream (4,254.99 Km²), Kalisindh (10,068.86 Km²), Kunu (774.57 Km²), Mej (5,803.76 Km²) and Parwati (5,020.82 Km²).

(a) Banas River

Banas River originates in the Khamnor hills of the Aravali range (about 5 km from Kumbhalgarh) and flows generally in a southwest-northeast direction. Entire length of the river is about 512 km, which lies in Rajasthan State. It is a major tributary of the River Chambal, to which it meets near village Rameshwar in the Khandar Block in SawaiMadhopur District.

Banas Basin having catchment area of 47,060 Km² within Rajasthan lies between latitudes 24° 15' and 27° 20' and longitudes 73° 25' and 77° 00'. The main tributaries of Banas are Berach and Menali on the right, and Kothari, Khari, Dai, Dheel, Sohadara, Morel and Kalisil on the left.

(b) Kalisindh River

River Kalisindh originates in the northern slopes of the Vindhya hills. It flows in MP and enters Rajasthan near Binda village in Jhalawar District. It flows for about 145 Km north in Rajasthan before joining river Chambal near Navnera village in Kota District. The catchment in Rajasthan extends over parts of Jhalawar and Kota Districts. Important tributaries of the Kalisindh are Ahu, Amjhar and Parwan.

(c) Parwati River

Parwati River originates in the northern slopes of the Vindhyan hills in MP. It enters Rajasthan near Chatarpura village in Baran District, where it forms the boundary between MP and Rajasthan for about 18 Km, then flows for about 83 Km in Rajasthan before again forming the boundary between MP and Rajasthan for a length of about 58 Km up to Pali village in Kota District, where it joins the Chambal. The river catchment in Rajasthan is situated in Kota and Jhalawar Districts. The important tributaries of the Parwati River are Lhasi, Berni, Bethli, Andheri, Retri, Dubraj, Bilas and Kunu.

(d) Kunnu River

River Kunu originates north of Guna town in MP. It flows for 48 Km in MP before entering Rajasthan near Museri village in Baran District. The river enters again MP and flows north for about 24 Km before again re-entering Rajasthan near Gordhanpura village in Kota District and joins Chambal river. The main tributaries of river Kunu are Karal and Rempi.

(e) Mej River

River Mej originates east of Mandalgarh Tehsil in Bhilwara District and joins river Chambal near BhaiusKhana village in Kota District. The catchment extends over Bhilwara, Bundi, and Tonk Districts.

PROJECT COMPONENTS

Keeping the objectives in mind, some of the structural interventions in the form of Storage/diversion structures/Barrage and water conductor system are proposed for this scheme in order to be able to divert and deliver the require quantum of water for the scheme. The proposed structural intervention in the form of barrages are primarily meant for diversion of surplus water with optimal diversion capacity of the water conductor system and also in the form of reservoirs which will act as a storage for supplying the water during the non-monsoon and lean period. The details of Navnera Barrage proposed structural intervention in the form of barrages is/as under Proposed structural intervention in the form of barrages in the proposed scheme. **The Navnera Barrage across river kalisindh near Village Abra Distt Kota is to be constructed in the ERCP Phase-I (A) –**

Kota is to be constructed in the ERCP Phase-I (A) –

Sl. No.	Structure Name	River	Location	Height of structure (m)	FRL (m)	Gross Storage (MCM)
1	Navnera Barrage	Kalisindh	25°29'03" N, 76°18'58" E	26.0	217	226.65

Salient Features, Capacity Table and Capacity Curve are enclosed separately

In this proposal for construction of Navnera Barrage, pond level is kept at 217 m. Provision of under sluice is made to release about 20% of discharge to the downstream in order to create a silt free zone in the reservoir.

In other bays, a crest of 9.0 m height has been proposed at El. 202.0 m. The u/s floor has been kept at El 193.0 m. Proposed HFL is 208 m corresponding to river discharge of 44600 cumec, i.e., 1 in 100 return year flood. As the Pond Level is high and required gate height is 15 m and 16 m in other bays & under sluices respectively, radial gates has been proposed for smooth and trouble-free operation. The length of the proposed barrage is 609m.

An afflux of 0.75 meter has been considered for this barrage structure. Having already fixed the crest of the structure as EL 202.0 m & 203.0, the length of the structure has to be worked out to limit the afflux created to 0.75 m. In this barrage, cistern-levels in other bays and under sluices have been adopted as El. 183.50 m and El. 183.60m respectively. In this barrage 4.0 m thick piers have been proposed due to high FRL and radial gates.

(A) The construction of barrage mainly consists of three Components:-

- i) Construction of Gated Barrage across river Kalisindh.
- ii) Construction of Earthen Guide Bunds.
- iii) Construction of Head-regulator to divert the flow in the channel.

In the Phase-I only construction of gated barrage in the river portion will be taken up which does not exist under forest land. Meanwhile necessary clearances from forest department will be taken from construction of Earthen Bund and Head Regulator.

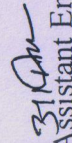
The drawing design & the cost estimation in the proposal is adopted as submitted by WAPCOS Ltd. via e-mail on dated 04.07.2018 to the office of The Chief Engineer WR Zone Kota.

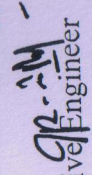
(B) The major financial provisions taken under this estimate are as follows:-

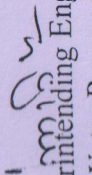
- i) B- Land: Compensation of private land 1192 Ha@ 22.00Lacs per Ha.
- ii) C- Works: (a) Construction of Barrage – 105881.91 Lacs.
(b) Construction of Guide Bund – 154.81 Lacs.
- iii) X-Environment and Ecology: Approx. 300 Ha land likely to be submerged / used for this barrage hence provision of 7588.00 Lacs has been taken in this proposal.

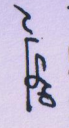
To initiate the necessary clearances i.e. forest clearance, Environmental Clearance and to proceed acquisition of land, the administrative sanction of the project is essential, hence the drawing, design and cost estimation is adopted in the project as submitted by WAPCOS Ltd.

The proposal Submitted for Approval Please.


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