Pre-Feasibility Report

(PFR)

Transfer of Rajasthan share of Yamuna Water at Tajewala Headworks to Churu and Jhunjhunu districts of Rajasthan by Underground Conveyance System

Submitted by:

PDCOR Limited

An ISO 9001:2015 certified Company &
QCI-NABET Accredited EIA Consultant Organization
(A project development company jointly promoted by IL&FS and Government of Rajasthan)
First Floor, LIC Jeevan Nidhi Building, Near Ambedkar Circle, Bhawani Singh Road, Jaipur – 302 005 (India)
Tel.: +91-141-4096666, 2747012-14 Fax: +91-141-2747045 Website : www.pdcor.com

Table of Contents

EXECUTIVE SUMMARY **1**

1. INTRODUCTION OF THE PROJECT **5**

1.1. Identification of Project Proponent: 5

1.2. Brief Information about the project: 5

1.2.1. Brief description of proposed work 5

1.2.2. Allocation of Water for Drinking & Irrigation: 6

1.2.3. Project Benefited Area: 7

1.3. Brief Description of nature of project: 7

1.4. Need for the project & its Importance to the country and or region 7

1.5. Demand- Supply Gap 7

1.6. Import vs. Indigenous Production 8

1.7. Export Possibility 8

1.8. Domestic/export markets 8

1.9. Employment generation (Direct & Indirect) due to project 8

2. PROJECT DESCRIPTION **9**

2.1. Type of Project including Interlinked & Interdependent Projects, if any 9

2.2. Location 9

2.3. Details of alternative sites 12

2.3.1. Details of Alternative for mode of Transfer of Yamuna Water: 12

2.3.2. Alternatives of offtake point from Canal: 13

2.4. Size/magnitude of Operation: 15

2.5. Project description with process details 17

2.6. Raw Material required alongwith estimated quantity, likely source, marketing area of final product/s, mode of transport of raw material and finished product 18

2.7. Resource optimization /recycling and reuse envisaged in the project, if any, should be briefly outlined. 19

2.8. Availability of water its source, Energy/power requirement and source should be given 19

2.9. Quantity of wastes to be generated (liquid and solid) and scheme for their management/disposal 19

2.10. Schematic representations of the feasibility drawing which give information of EIA purpose 19

3. SITE ANALYSIS **21**

3.1. Connectivity 21

3.2. Land form, land use and land ownership 21

3.3. Topography 22

3.4. Existing land use pattern 23

3.5. Existing Infrastructure 24

3.6. Soil Classification 24

3.7. Climate data from the secondary sources 24

3.8. Social infrastructure available 24

4. Planning Brief **25**

4.1. Planning Concept 25

4.2. Population projection 25

4.3. Land use planning (breakup along with green belt etc.) 25

4.4. Assessment of infrastructure demand (physical & social) 25

5. Proposed Infrastructure 26

6. Rehabilitation and Resettlement (R & R) plan 27

6.1. Applicable R&R Legislation and Policies 27

6.1.1. Land Acquisition Legal Framework: 27

6.1.2. Description of Applicable Key Legislation 27

7. Project Schedule & cost Estimates 37

7.1. Project Schedule 37

7.2. Cost Estimates: 37

8. Analysis of Proposal (Final recommendation) 38

LIST OF FIGURES

FIGURE 2-1: LOCATION MAP 10
FIGURE 2-2: PROCESS FLOW CHART 18

LIST OF TABLES

Table 1-1: Proposed Water Use 6
Table 2-1: Comparison between Alternatives 14
Table 2-2: Description of works proposed: 15
Table 3-1: Proposed Main RWR Connectivity 21
Table 3-2: LU of study area in Haryana 21
Table 3-3: LU of study area in Rajasthan 22
Table 3-4: Details of benefitted villages 22
Table 3-6: Rivers and Canals/road crossings of Conveyance Mains from Tajewala to Rajasthan Border 23
Table 5-1: Details of Proposed Infrastructure 26
Table 6-1: Applicability of Acts and Rationale 28
Table 6-2: Application of RFCTLARR Act, 2013 and Rationale 30

EXECUTIVE SUMMARY

1.1 Background:

Rajasthan is considered as one of the 6 basin states for Yamuna River as Chambal River which flows through Rajasthan is a major tributary to Yamuna. Other 5 states are Haryana, Himachal Pradesh, Delhi, Uttar Pradesh and Uttarakhand. The Government of India has constituted 'Upper Yamuna River Board' (UYRB), 'Upper Yamuna River Committee' (UYRC) and a steering committee for its management. Rajasthan, along with other basin states, is striving for its share in Yamuna water since 1955. Therefore, UYRB took up the task of allocating water to various basin states.

After considering the report of Central Water Commission on availability of water in Yamuna River up to Okhla Barrage, UYRB has allocated the water to various basin states. A Memorandum of Understanding (MoU) was signed on 12.05.1994 among the Chief Ministers of 5 basin states namely- Haryana, UP, Rajasthan, HP and Delhi in the presence of Union Minister for Water Resources. A total water of 11.983 BCM has been allocated amongst the 5 basin states, out of 13.00 BCM virgin flow of Yamuna up to Okhla, considering their irrigation and consumptive water requirements. The basin states agreed on following allocation for utilizable water resources of River Yamuna assessed on mean year availability:

Table 1: Basin states agreed allocation of water from River Yamuna

S. No.	State	Allocation of Yamuna water
1	Haryana	5.730 BCM (6417 Cusecs)
2	Utter Pradesh	4.032 BCM (4515 Cusecs)
3	Rajasthan	1.119 BCM (1253 Cusecs)
4	Himachal Pradesh	0.378 BCM (423 Cusecs)
5	Delhi	0.724 BCM (811Cusecs)
	TOTAL	**11.983 BCM (13419 Cusecs)**

Para no 7(1) of MoU further contemplates that till storage in the upper reaches of Yamuna River (Kishau Dam, Renuka Dam, Lakhwar-Vyasi Projects) are created, the seasonal allocations among the five basin states shall be as under:-

Table 2: Seasonal allocations among the five basin states

S. No.	States	cusecs (As per MoU)			
		July-Oct.	Nov-Feb	March-June	Annual
1.	Haryana	13647.88	2336.62	3139.25	6416.63
2.	Utter Pradesh	10687.01	1168.31	1584.70	4515.16

S. No.	States	cusecs (As per MoU)			
		July-Oct.	Nov-Feb	March-June	Annual
3.	Rajasthan	3198.00	238.43	288.12	1253.00
4.	Himachal Pradesh	631.38	367.87	268.03	423.30
5.	Delhi	1927.38	231.62	254.62	810.76
	TOTAL	**30091.65**	**4342.15**	**5534.72**	**13417.85**

- Accordingly, Rajasthan has been allocated 3198 cusecs (0.963 BCM) seasonal allocation from July to October. Rajasthan can utilize Yamuna water through two systems:

  a) From Okhla Barrage through -Agra Canal, Bharatpur Feeder, Gurgaon Canal system to be used in Bharatpur district and

  b) From Tajewala Head (Hathnikund Barrage) through a conveyance system not yet finalized to Jhunjhunu and Churu districts.

- The Upper Yamuna River Board in its twenty second meeting held on 21.12.2001 had approved the claim of Rajasthan for utilization of Yamuna Water through Ex-Tajewala and Ex-Okhla. Following allocations were made at these two points:

  a) Ex-Tajewala (Hathani-Kund Barrage) July -October 1917 cusecs

  b) Ex-Okhla Barrage 1281 cusecs

  Total **3198 cusecs**

- These allocations of 1917 cusecs and 1281 cusecs are 60% and 40% of total 3198 cusecs to be drawn from Tajewala Head and Okhala Head respectively.

- On the similar principle, the flows of 238.43 cusec and 288.12 cusec in other two seasons have been distributed in a ratio of 60:40 accordingly at Tajewala & Okhla Heads respectively. This is tabulated as below:

Table 3: Seasonal distribution ratio at Tajewala and Okhla Heads

S. No.	Season/ Months	Total Flow		At Tajewala		At Okhala	
		Cusecs	MCM	Cusecs	MCM	Cusecs	MCM
1	July - Oct	3198	963	1917	577	1281	386
2	Nov - Feb	238.43	70	143	42	95	28
3	March - June	288.12	86	173	52	115	34
TOTAL			**1119**		**671**		**448**

1.2 Objective of the Project:

- The share of water in Yamuna River is intended to be made available to Rajasthan from Tajewala Head for Drinking & irrigation purpose. Considering conveyance of the water by gravity, geographically, it is feasible to bring it in Churu District (Rajgarh Tehsil) of Rajasthan. Hence, it is envisaged that water be

brought to Rajasthan in Rajgarh Block of Churu District. From this point, it can be further transmitted to adjoining districts for **irrigation** and **drinking** water purpose. The coverage area for irrigation and drinking water supply are as follows:

Table 4: Coverage area for irrigation and drinking water supply

Purpose	Districts of Rajasthan	Area Coverage
IRRIGATION *(Area- 1,05000 ha)*	Churu District	Rajgarh Block
	Part of Jhunjhunu District	Parts of Alsisar, Jhunjhunu, Chirawa & Surajgarh Blocks)
DRINKING PURPOSE	Jhunjhunu District	Complete Jhunjhnu District
	Part of Sikar District	Sikar, Dhond, Danta Ramgarh, Khandela, Neem ka Thana & Patan Blocks)

Further the complete project is conceptualize in two parts i.e. first transfer of water from Tajewala to Rajasthan through underground conveyance (265 km), its storage in a Raw Water Reservoir (RWR) within Rajasthan boundary and then its utilization for irrigation purpose only and second the available water proposed to be used for drinking water purpose, PHED will plan a separate project to distribute water in Jhunjhunu and Sikar Districts.

Table 5: Salient Features of the Project

Particulars	Details
Project Name	Transfer of Rajasthan share of Yamuna Water at Tajewala Headworks to Churu and Jhunjhunu districts of Rajasthan by underground conveyance system.
Location	Interstate (Haryana & Rajasthan) Main Pipeline: Haryana RWR & Distribution system: Rajasthan
Promoter	Water Resource Dept. Govt. of Rajasthan
Type & Category of Project	New Project (Drinking water cum irrigation project) **Category-A : 1(c) River & Valley Projects** (CCA >50,000 ha) as *per EIA Notification, 2006 & its subsequent amendment dated 14.08.2018*.
General Condition as per EIA Notification	**Yes,** (i) Protected Areas notified under the Wild Life (Protection) Act, 1972 area as follows: **a. Kalesar National Park** **b. Kalesar Wildlife Sanctuary** ***Above mentioned protected area are located at***

Particulars	Details
	Head works near Tajewala. (ii) Notified Eco-sensitive areas: **ESZ area of Kalesar National Park & Kalesar Wildlife Sanctuary** (iii) Inter-State Boundaries : **Haryana-Rajasthan Interstate Boundary**
Project Capacity	Total transfer of water : 671 MCM Gross Command Area (GCA) : 121695 ha Culturable command area (CCA) : 105000 ha
Project Cost	Rs. 23965.845 cr

****

1.INTRODUCTION OF THE PROJECT

1.1. IDENTIFICATION OF PROJECT PROPONENT:

Water Resources Department (WRD) under the Government of Rajasthan (GoR) is responsible for the planning, development & implementation of multipurpose irrigation scheme within the state of Rajasthan.

Correspondence address:

Executive Engineer, Water Resources Department, Government of Rajasthan Sikar Rajasthan

E-mail:- eewrdsikar@gmail.com

Telephone: 01572-248614

Through: Sh. Niwas Nehra (Executive Engineer-Sikar)

1.2. BRIEF INFORMATION ABOUT THE PROJECT:

WRD, GoR envisaged the Drinking water cum irrigation project for the district of Churu, Jhunjhunu & part of Sikar district of Rajasthan. As per interstate agreement held between Partner basin states of upper Yamuna River i.e Himachal, Haryana, UP, delhi & rajasthan held in 1994, 1119 MCm water has been allocated to Rajasthan, out of which 671 MCM is to be drawn from tajewala head works in Haryana on Yamuna river. WRD, GoR has proposed transfer of Rajasthan share of Yamuna Water at Tajewala Headworks (Haryana) to Churu and Jhunjhunu districts of Rajasthan by underground conveyance system of length of 263 km .storing the water in an artificial reservoir in churu district of Rajasthan and then pumping the stored water to irrigation command area in part of Churu and Jhunjhunu districts of Rajasthan and keeping 60% water reserved for drinking which will be supplied to Sikar district.

1.2.1. BRIEF DESCRIPTION OF PROPOSED WORK

S. No	Particulars	Details
1.	Allocation of Water for Drinking & Irrigation	671 MCM
2.	Conveyance system to Rajasthan (underground pipelines)	263 km
3.	Intake structure at Tajewala Head	Western Yamuna Canal
4.	Conveyance mains	5 rows of 3.2 m / 3.0 m diameter. of MS pipe

5.	Storage of Water at terminal point	Stored in an artificial reservoir near village Hansiyawas in Rajgargh Block of Churu District
6.	Construction of main pumping station near storage reservoir	Installation of 39 nos. pumps sets and motors along with other electrical accessories
7.	Laying of underground pipe line from main pump station to block level reservoirs.	Total 78.0 km for PM-01, 77.82 km for PM-02 and 91.90 km for PM-03 pipeline of diameter ranging from 500 mm to 2800 mm
8.	Construction of block level reservoirs	Ten nos. having average storage capacity of 26200 cum
9.	Construction of block level pump houses	Ten nos. having 9 pump sets and motors at each location
10.	Laying of underground pipe line from block level reservoir to chak level diggies	416.39 km DI/ MS pipe
11.	Construction of chak level diggies	253 nos. having average capacity of 500 cum
12.	Construction of pumps house at chak level diggies	253 nos, having 2 pump set at each location
13.	Laying of underground pipe from chak levl diggies to farm heads	4630 km HDPE pipes having dia ranging from 90 mm to 315 mm.

1.2.2. ALLOCATION OF WATER FOR DRINKING & IRRIGATION:

Total of 671 MCM quantity of water will be available for drinking & irrigation. Allocation of water is as follows:

Table 1-1: Proposed Water Use

S. No	Particulars	Volume in MCM
1.	Total Water Available	671
2.	Evaporation Losses in main Reservoir	53.68
3.	Seepage losses in the reservoir	33.55
4.	Net Water Available for Utilization	583.77
5.	Drinking water purpose @ 60%	350.26
6.	Net water available for irrigation @ 40%	233.50

1.2.3. PROJECT BENEFITED AREA:

The coverage area for irrigation and drinking water supply are as follows:

Purpose	Districts of Rajasthan	Area Coverage
IRRIGATION CCA : 105005 ha	Churu District	Rajgarh Block
	Part of Jhunjhunu District	Parts of Alsisar, Jhunjhunu, Chirawa & Surajgarh Blocks)
DRINKING PURPOSE	Jhunjhunu District	Complete Jhunjhnu District
	Part of Sikar District	Sikar, Dhond, Danta Ramgarh, Khandela, Neem ka Thana & patan Blocks

1.3. BRIEF DESCRIPTION OF NATURE OF PROJECT:

The proposed multipurpose irrigation project is categorized as ***category A (CCA> 50,000 ha) under item 1 (c) {River & Valley Projects} of Schedule - Gazette Notification dated Sept. 14th, 2006 and its subsequent amendment dated 14.08.2018*** for preparation of Environment Impact Assessment study and Environment Management Plan. General condition is also applicable to this project as alignment of pipeline crosses through Haryana & Rajasthan and there is also National Parks, Wildlife Sanctuary and ESZ area within the 10 km radius from the project.

This project is independent and is not linked with other project which may attract directly or indirectly any provisions of schedule of EIA notification 2006 amended to date.

1.4. NEED FOR THE PROJECT & ITS IMPORTANCE TO THE COUNTRY AND OR REGION

The project will enable creation of irrigation potential in 105000 ha area in part of Churu and partly Jhunjhunu districts of Rajasthan. The project will also facilitate the drinking water supply to the complete district of Jhunjhunu & partly Sikar district of Rajasthan.

1.5. DEMAND- SUPPLY GAP

At present the target is having no surface irrigation facility, entire are is dependent on ground water. The level of ground water is going down every year alarmingly. Similarly there is no drinking water facility except ground water, which is mostly

saline or brakish. The project will full fill the demand for irrigation and drinking water in the target area.

1.6. IMPORT VS. INDIGENOUS PRODUCTION

Project does not involve any imports & promotes indigenous agriculture production.

1.7. EXPORT POSSIBILITY

Not applicable

1.8. DOMESTIC/EXPORT MARKETS

The project will facilitate the development of domestic agricultural market.

1.9. EMPLOYMENT GENERATION (DIRECT & INDIRECT) DUE TO PROJECT

The project will generate direct & indirect employment during the construction as well as implementation phase of the project.

*****

2. PROJECT DESCRIPTION

2.1. TYPE OF PROJECT INCLUDING INTERLINKED & INTERDEPENDENT PROJECTS, IF ANY

It is a irrigation cum drinking water project. It is independent project not liked to any other projects.

2.2. LOCATION

(Map showing general location, specific location and project boundary & project site layout) with coordinates:

The proposed alignment of Underground Conveyance System for transfer of Rajasthan share of Yamuna water from Tajewala Headworks to Churu and Jhunjhunu districts of Rajasthan passes through 7 districts of Haryana and Churu district of Rajasthan on a chainage stretch of 263.0 km. up to main reservoir and then distribution net work of underground pipe line in the command area in Churu and Jhunjhunu districts of Rajasthan. Apart from the Underground Conveyance System, Reservoirs i.e. Main Raw water reservoir, main pump house, Block Level Raw water reservoirs and pump houses & Diggi, and pump houses , administrative & residential buildings are other main components of the project, in Churu and Jhunjhunu districts of Rajasthan. The location map of Project is enclosed as **Annexure-I**.

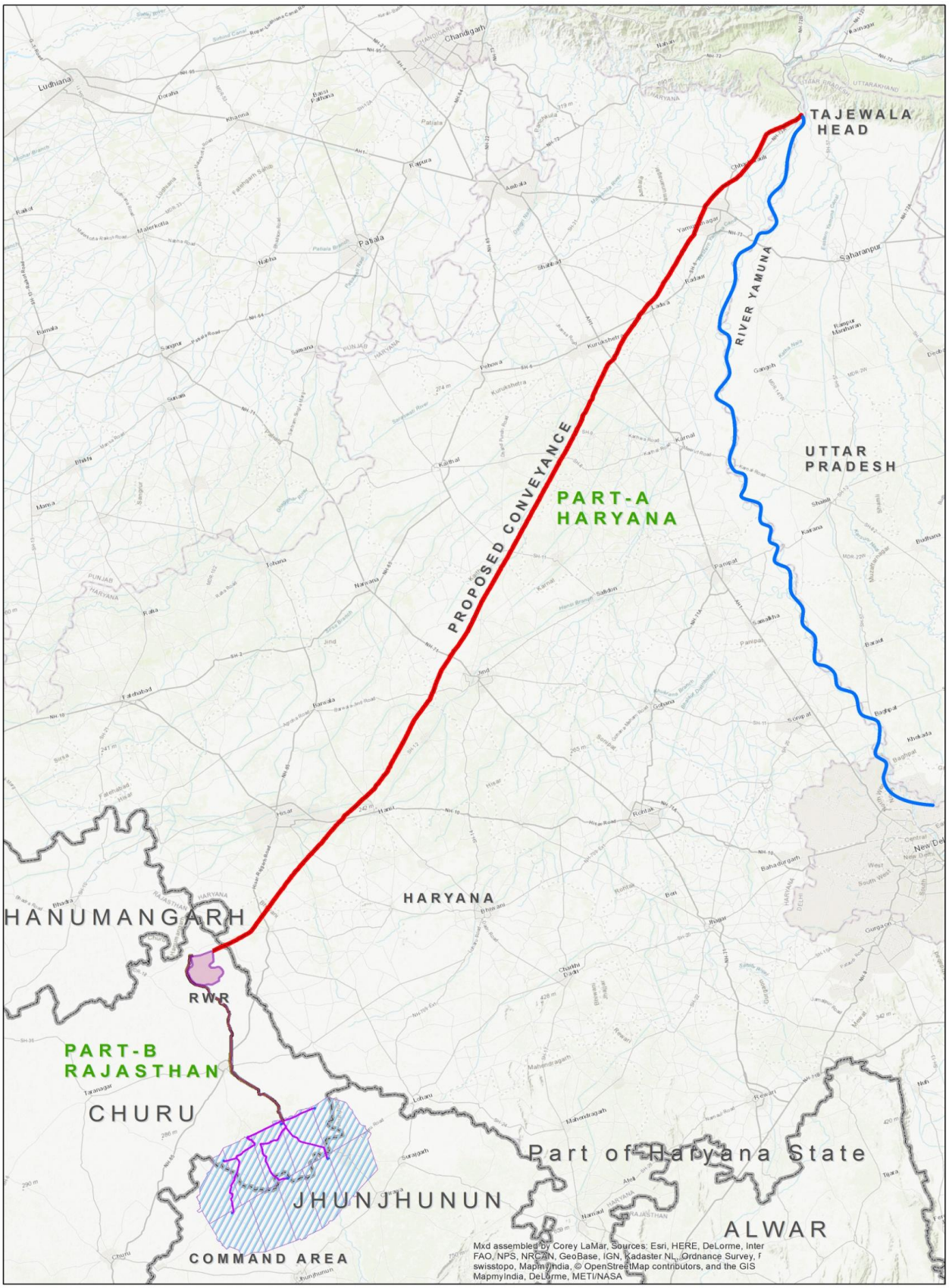

Figure 2-1: Location map

For transfer of Rajasthan Share of Yamuna Water at Tajewala Headworks to Churu and Jhunjhunu districts of Rajasthan by Underground Conveyance System, the Supply line passes through seven districts and various locations on a chainage stretch of 263 km from Tajewala Head, Haryana to Churu & Jhunjhunu districts of Rajasthan. Hence on the Course there are following Districts/villages/towns areas through which the Water Transfer Line is proposed to pass are:

Table 5: Areas through which the Water Transfer Line is proposed to pass

S. No.	State	Districts	Total No. Villages	District-Wise Chainage Length covered (Km)
1.	Rajasthan	Churu	02	2.95
2.	Haryana	Yamuna Nagar	57	56.92
		Kurukshetra	24	28.87
		Karnal	17	27.80
		Kaithal	08	22.82
		Jind	14	36.70
		Hisar	31	68.47
		Bhiwani	05	18.97
	Total		**158**	**263.5**

Table 5: District Wise Land Area affected in the Core Zone

District	Length of the Chainage in m	Width	Area in Sq.m	Area in Ha
Part in Haryana State				
Yamuna Nagar	57676	60.8	35,06,705	350.67
Kurkshetra	28442	60.8	17,29,266	172.93
Karnal	27832	60.8	16,92,210	169.22
Kaithal	23038	60.8	14,00,706	140.07
Jind	36568	60.8	22,23,342	222.33
Hisar	69551	60.8	42,28,673	422.87
Bhiwani	18863	60.8	11,46,874	114.69
Sub total	**261970**	**60.8**	**1,59,27,776**	**1592.78**
Part in Rajasthan State				
Churu	**3030**	**60.8**	**1,84,224**	**18.42**
Total	**265000**	**60.8**	**16112000**	**1611.20**

2.3. DETAILS OF ALTERNATIVE SITES

(CONSIDERED AND THE BASIS OF SELECTING THE PROPOSED SITE, PARTICULARLY THE ENVIRONMENTAL CONSIDERATION GONE INTO SHOULD BE HIGHLIGHTED)

2.3.1. DETAILS OF ALTERNATIVE FOR MODE OF TRANSFER OF YAMUNA WATER:

For conveyance of 671 MCM of water in a year for different seasons, following options were considered:

Option -1**:** Canal

Option -2: RCC Tunnel

Option- 3: A set of Underground Pipelines

Option -1: Canal

The proposal of constructing canal from Hathnikund Barrage (Tajewala Head) on Yamuna River to Rajasthan Territory was not agreed by Haryana Government for the reason of land acquisition of farmers and possibility of water theft from open canal. Therefore, this option is not feasible.

Option -2: RCC Tunnel

One RCC Tunnel of about 8.00 meter diameter may be constructed for carrying the volume of 671 MCM in a year as per the allocated flows in different seasons of the year.

In some other Countries, the RCC Tunnels are being constructed extensively for such a huge discharge of water. On the contrary, only open Canals or Underground Pipelines are being constructed / laid in India, as a traditional practice.

For construction of RCC Tunnel, a Tunnel Boring Machine (TBM) of suitable size shall be required and its operation can also be performed by expert workmen only. Moreover, the estimated cost of construction per meter could be huge which also is a matter of great concern to us.

Looking to above limitations, currently the option is not considered.

Option-3: Underground Pipelines

The only alternative left is to convey water through underground system. Under this option, a set of 5 Nos. of underground pipelines have been proposed to carry 671 MCM of water in a year as per allocated water to Rajasthan in different seasons. The size of pipelines is proposed as 3200 mm dia up to 200 Km chainage and 3000 mm

from 200 Km to 260 Km chainage. *This option has been found to be most suitable in the present context. Beyond main reservoir also the entire distribution net work is also underground pipe line, which will save seepage losses and possibility of any theft. More over the system of irrigation proposed is sprinkler irrigation which will further save seepage losses and wastage of water.*

Hence this option is considered to be the best among other two options.

2.3.2. ALTERNATIVES OF OFFTAKE POINT FROM CANAL:

For conveyance of Yamuna Water (671 MCM) of Rajasthan share to its territory, the site of Tajewala Head and alignment of Western Yamuna Canal from its off take point at Tajewala Head to Karnal Town was visited and Various Alternatives were considered. The details are as under:

Alternative – 1

In this alternative, it has been proposed to construct an off take/ Intake structure at RD :900 m of Western Yamuna Canal, near Tajewala Head and then to lay 5 Nos. rows of MS Pipelines from Intake structure to Raw Water Reservoir (RWR) at Rajasthan border near village Hansiyawas in Rajgarh Block of Churu District. The size of pipelines has been so designed that the pipelines would work under gravity as the available static head between initial and terminal points is 124.00 m, which is sufficient for working under gravitational system.

Alternative – 2

In this alternative, it has been proposed to construct an Off take/ intake structure on Western YamunaCanal, near Dadupur village (Karnal) and to construct a Head Regulator on Main Canal and then to lay 5 nos. rows of MS Pipelines from Intake structure to a Junction Point at about 50 Km distance. The pipelines would work under gravity up to this junction point. MS pipelines (5 Nos. of rows) from the Junction Point to Raw Water Reservoir (RWR) at Rajasthan border near village Hansiyawas in Rajgarh Block of Churu District would work as Pumping Mains, as enough static head is not available for gravitational system.

Looking to various pros and cons, the comparison between the alternatives has been done for selection of best suitable alternative.

Comparison between the Alternatives

The comparison of the above two alternatives have been made in a table below:

Table 2-1: Comparison between Alternatives

S. No.	Particulars	Alternative- 1	Alternative- 2
1	Availability of water in full quantity	Availability of water in full quantity assured, as off take point is at origin of Western Yamuna Canal (WYC).	Available of water in full quantity is doubtful at any point downstream to RD : 900 m of W Y C.
2	Availability of difference in head for gravity system	Difference in head between off take point and reservoir is 114 m	Difference in head between off take point and reservoir is much less then option 1
3	Acquisition of Required Land for Intake Structure and RWR/Head Works in Haryana	Only a small land is required at RD: 900 m of WYC (near Tajewala Head), which is comparatively easy in acquisition.	Land is required at two places- (i) At Off take point near Dadupur village (Karnal) and (ii) at the Junction Point, from where Pumping would be required. Land in huge quantity would be needed at second point. This task would be very much difficult in Haryana State.
4	Requirement of Power Connection at Head Works	As the pipeline system would work under gravity, power for only lighting load would be required.	Power connection of tremendous load would be required at the Head Works (at 50 Km Chainage). To take the connection and to maintain the same is difficult and highly un-economical as well. This would create an additional point of O & M in the system on recurring basis.
5	Recurring Charges of Power	No charges as there is no. Pumping Station.	Heavy recurring charges due to provision of

S. No.	Particulars	Alternative- 1	Alternative- 2
	consumption and yearly O & M of Pumping station.		Pumping Station at Junction Point.

It is important to mention here that availability of water in the canal up to its limit of declared/ agreed share to Rajasthan state is very essential, otherwise the complete proposal would be futile. In such situation, the Alternative-2 does not seem to be workable. *Therefore, looking through the above facts, the proposal under **ALTERNATIVE- 1** has been proposed to be adopted and detailed project reports & cost Estimates have been prepared accordingly*.

2.4. SIZE/MAGNITUDE OF OPERATION:

Project involves development of multipurpose irrigation scheme in state of Rajasthan. Mainly project involve the two component i.e. first Transfer of Water form Tazewala Head to main RWR in Churu District of Rajasthan and secondly construction of block RWR, doggies and distribution pipeline network in the command area.

Table 2-2: Description of works proposed:

S. No	Work proposed	Details
1.	Total water allocation to Rajasthan	1119 MCM
2.	Allocation from Tajewala Head	671MCM
3.	Periodic allocation by UYRB	
4.	July-Oct	550 MCM or 51.75 cumecs
5.	Nov-June	12 MCM or 5.78 cumecs
A.	**Conveyance System form Tazewala Haryana to Churu, Rajasthan**	
i.	Intake structure at Tajewala Head	RD 900 M of western Yamuna canal (WYC) off taking from Tajewala head
ii.	Total Length of transmission mains	263 km
iii.	Mode of conveyance of water	Underground Pipeline
iv.	No. of pipes (Conveyance mains)	5 nos.(MS pipes)
v.	Size of Pipes as per Design	3200 mm Dia. (15 mm thick) up to 200 km.
		3200 mm Dia. (15 mm thick) from 200 km to 265 km

S. No	Work proposed	Details
	Line to work as	Gravity Main
B.	**Storage & Utilization of Water for Irrigation**	
i.	Location of main storage reservoir at Rajasthan	Between village Thambahera and Hansiyawas of Rajgarh tehsil of Churu district
ii.	Storage capacity of main reservoir	333 MCM plus 5% siltation total 349.65 MCM
iii.	Top level of main reservoir	321 M
iv.	Water spread area at FRL of main reservoir	46 sq km
v.	No of villages under submergence	7 of Rajgarh Tehsil of Churu district
vi.	Total land required for reservoir including embankment	50 sq km
C.	**Details of Earthen Embankment around main storage reservoir**	
i.	Max Height	16 M at deepest ground level
ii.	Total peripheral length of main reservoir	30.6 Km
iii.	Total volume of earth work	70.61 Lac cum
iv.	Top width	6 m
v.	Measures to prevent seepage from reservoir bed	Clay grouting all around the periphery upto to bottom RL 190 M
D.	**Details of Block Reservoir**	
i.	No of Block Reservoir proposed	10 nos.
ii.	Inner & Outer Slopes	1.5:1
	Total Depth of Water	3 m
iii.	Free Board	0.5 m
iv.	Capacity excl. Dead Storage	26200 Cum
v.	Area of Land required	1.25 ha
E.	**Details of Diggies**	
i.	No. of diggies proposed	253 nos.
ii.	Inner & Outer Slopes	1.5:1 m
iii.	Total Depth of Water	3 m

S. No	Work proposed	Details
iv.	Free Board	0.5 m
v.	Capacity excl. Dead Storage	500 Cum
vi.	Area of Land required	625 sq. m
F.	**Command Area Details**	
i.	Gross command area (GCA)	121695 ha
ii.	Cultivable command area (CCA)	1,05, 000 ha
iii.	Gross Command area in Churu district	39523 ha
iv.	Gross Command area in Jhunjhunu district	82171 ha
v.	Name, number of blocks and villages in Churu	One Rajgarh block-46 villages
vi.	Name, number of blocks and villages in Jhununhu district	Total nos. of villages- 151 nos. ➢ Malsisar -65 ➢ Surajgarh -36 ➢ Chirawa -41 ➢ Jhunjhunu-9
vii.	No of blocks in command area	10 nos.
viii.	Average CCA of each block command	Approx. 10500 ha

2.5. PROJECT DESCRIPTION WITH PROCESS DETAILS

(A SCHEMATIC DIAGRAM/WITH FLOW CHART SHOWING THE PROJECT LAYOUT COMPONENT OF THE PROJECT ETC

Flow chart of Project is as follows:

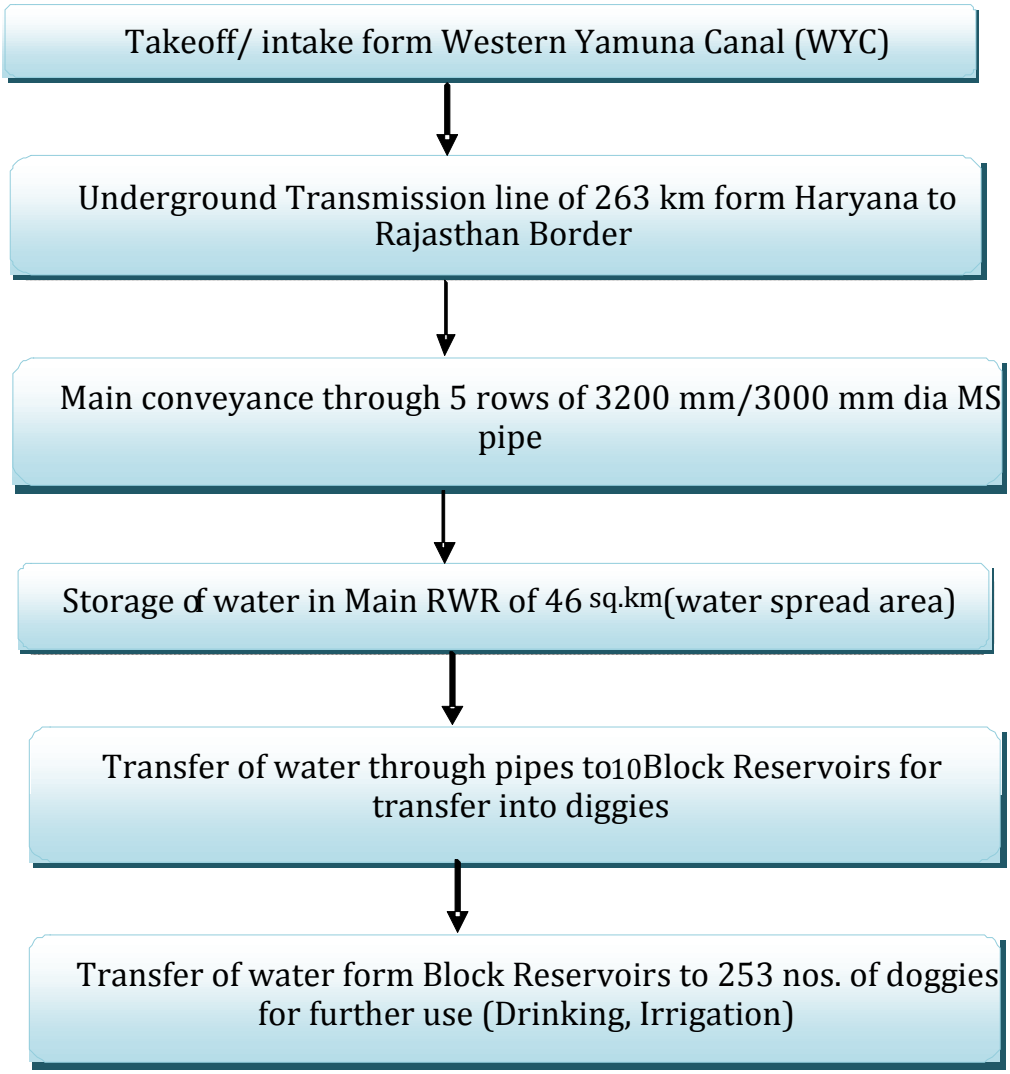

Figure 2-2: Process Flow Chart

2.6. RAW MATERIAL REQUIRED ALONGWITH ESTIMATED QUANTITY, LIKELY SOURCE, MARKETING AREA OF FINAL PRODUCT/S, MODE OF TRANSPORT OF RAW MATERIAL AND FINISHED PRODUCT

Raw Material: Construction material like sand, soil, stone, aggregates, cement, MS pipes etc will be required to construct project. Estimation of quantities of material will be provided in EIA-EMP report.

Source: Local market

Final product: Final product anticipated from project is in the form of agriculture production and water for drinking.

2.7. RESOURCE OPTIMIZATION /RECYCLING AND REUSE ENVISAGED IN THE PROJECT, IF ANY, SHOULD BE BRIEFLY OUTLINED.

No recycling/reuse is targeted under the project. Construction material will be optimally utilized.

2.8. AVAILABILITY OF WATER ITS SOURCE, ENERGY/POWER REQUIREMENT AND SOURCE SHOULD BE GIVEN

Water requirement for construction will be met from the canal at Tajewala Head and Tankers in the transmission line area and from adjoining proposed command area. Construction energy/power requirement will be met from diesel generators which is readily available at market.

2.9. QUANTITY OF WASTES TO BE GENERATED (LIQUID AND SOLID) AND SCHEME FOR THEIR MANAGEMENT/DISPOSAL

Solid Waste:

Municipal solid waste: Generated form labour camps during construction phase will be stored, collected and disposal as per ***Solid Waste Management Rules 2016.***

Construction & Demolition waste: For laying down the underground pipeline and pumping stations along with construction of main reservoir leads to generation of C & D waste. The management of construction & Demolition waste will be done according to ***Construction & Demolition Waste Management Rules, 2016.***

Earthwork: Approx. 70.61 Lac cum will be generated for the excavation of main reservoir.

Waste water treatment & management: Waste water will be generated from the labour camps will be treated and disposed off through septic tank followed by soak pit at construction sites.

2.10. SCHEMATIC REPRESENTATIONS OF THE FEASIBILITY DRAWING WHICH GIVE INFORMATION OF EIA PURPOSE

As per the EIA notification dated 14th September, 2006, it is mandatory for the proposed activity to get Environmental Clearance (EC) before setting up any project or expansion/modernization of any project. The detailed chart delineating the process is given below:

Environmental Impact Assessment (EIA) is a well planned process to predict the environmental consequences of any kind of development, which is a result of human

activities and to suggest appropriate measures in order to reduce adverse effects and also to augment positive effects. The EIA procures a rational and ethical approach for sustainable development. However, it is more scientific process because it not only tells the past, present and the future consequences of on-going developments, but also predicts the future events which are likely to change due to various reasons.

In terms of the EIA notification of the MoEF & CC dated 14th September 2006, the generic structure of EIA documents shall be as under:-

- Introduction
- Project Description
- Analysis of Alternatives (Technology & Site)
- Description of the Baseline Environment
- Anticipated Environmental Impact & mitigation Measures
- Environmental Monitoring Programme
- Risk Assessment And Disaster Management Plan
- Social Impact Assessment and R& R Plan
- Environmental Management Plan (EMP)
- Project Benefits
- Public Hearing
- Summary & Conclusion
- Disclosure of Consultant Engaged

****

3.SITE ANALYSIS

3.1. CONNECTIVITY

The proposed alignment of underground pipeline passes through state of Haryana and finally ended in the Rajgarh Block of Churu District in the state of Rajasthan. The location of main Raw Water Reservoir (RWR) is in the Rajgarh Block of Churu District (Raj.). The proposed RWR site is well connected. Hereby discuss only the connectivity of main RWR site, because the proposed alignment of underground pipeline is a continuous structure. Proposed main RWR connectivity is as follows:

Table 3-1: Proposed Main RWR Connectivity

S. No	Particulars	Distance & Direction
1.	Airport	• Jaipur Airport is at 225 km towards south
2.	Railway Station (RS)	• Hansiawas RS is at 7.0 km towards west • Narwasi RS is at 7.50 km towards SSW • Sidhmukh RS is at 10 km towards west
3.	National Highway (NH)	• NH-65 9.65 km is at towards SSE
4.	State Highway (SH)	• SH-6 is at 23.50 km towards SSW

3.2. LAND FORM, LAND USE AND LAND OWNERSHIP

Land use Classification:

LU of study area in Haryana

The land use of study area is mostly agricultural land. Aerial Survey Imagery and SOI toposheet at 1:50 k scale is used to classify land use/cover of the project area. The detailed classification is stated below for buffer area (60m) of pipeline alignment crossing through seven districts of Haryana State.

Table 3-2: LU of study area in Haryana

S. No	Land Use/Cover	Area (Sq.km)	%
1.	Agricultural Land	125.67	95.37
2.	Built-up area	2.08	1.58
3.	Forest	1.67	1.27
4.	Wasteland	1.59	1.21
5.	Water body	0.76	0.58
	Grand Total	**131.78**	**100**

LU of study area in Rajasthan:

Agriculture activity has been noted on both sides of the project alignment for majority section. The project alignment does not pass through the settlements. The alignment and main reservoir is designed in such a way that the settlements could not be impacted.

Table 3-3: LU of study area in Rajasthan

S. No	Land Use/Cover	Area (ha)	%
1.	Agricultural Land	88419.58	83.96
2.	Built-up area	5170.35	4.91
3.	Forest	11.06	0.01
4.	Wasteland	11597.21	11.01
5.	Water body	111.42	0.11
	Grand Total	**105309.62**	**100**

Details of benefitted villages of the project are as follows:

Table 3-4: Details of benefitted villages

<table>
<tr><th>State</th><th>SN</th><th>Districts</th><th>Total No. Villages</th></tr>
<tr><td rowspan="2">Rajasthan</td><td>1.</td><td>Jhunjhunun
<table>
<tr><th>Tehsil</th><th>Block</th><th>No. Of Village</th></tr>
<tr><td>Malsisar</td><td>Alsisar</td><td>64</td></tr>
<tr><td>Chirawa</td><td>Chirawa</td><td>41</td></tr>
<tr><td>Jhunjhunun</td><td>Jhunjhunun</td><td>8</td></tr>
<tr><td>Surajgarh</td><td>Surajgarh</td><td>36</td></tr>
<tr><td colspan="2">Total</td><td>149</td></tr>
</table></td><td>149</td></tr>
<tr><td>2</td><td>Rajgarh, Churu</td><td>45</td></tr>
<tr><td colspan="3">Total number of Command area Villages benefitted:</td><td>194</td></tr>
</table>

3.3. TOPOGRAPHY

Project area in Rajasthan is a part of Great Indian Thar Desert. Surface is covered with sand and characterized by dunes. The general topography is almost an undulating plain area except some hillocks. Project area is part of Shekhawati River basin. Sikar district contributes maximum area (2883.9 sq km) of Shekhawati River basin followed by Jhunjhunu (2313.2 sq km) and Churu District. Churu is part of Outside Basin and its small part is coming under Shekhawati River basin (26.8 sq km).

The general topographic elevation in Churu district is between 250 m to 300 m above mean sea level. Elevation ranges from a minimum of 199.2 m above mean sea level in Rajgarh block in the north-eastern part of the district and maximum of 470.7 m above mean sea level In Sujangarh block in southern part of the district.

Haryana is very hot in summer and cold in winters. The temperature falls to the lowest in January and reaches upto 50oC during the months of May and June. Winter months have average temperatures in the range 3oC to 9oC and the summer months temperatures are higher in the range of 48oC to 35oC. Haryana has limited rainfall

ranging from 300 mm in the southwest to 1,100 mm in the northeast in the state. Meteorological data from nearest IMD station will be procured and analysis of the same will be carried out during the EIA-EMP study.

3.4. EXISTING LAND USE PATTERN

[AGRICULTURE, NON-AGRICULTURE, FOREST WATER BODIES, (INCLUDING AREA UNDER CRZ)], SHORTEST DISTANCES FROM THE PERIPHERY OF THE PROJECT TO PERIPHERY OF THE FOREST, NATIONAL PARK, WILD LIFE SANCTUARY, ECO SENSITIVE AREAS, WATER BODIES (DISTANCE FROM HFL OF THE RIVER), CRZ. NOTIFIED INDUSTRIAL AREA, A COPY OF GAZETTE NOTIFICATION SHOULD BE GIVEN]

i. CRZ Region

Project area does not involve CRZ region

ii. Forest, National park, Wildlife Sanctuary, eco sensitive areas

No part of the project (covering Haryana and Rajasthan sections of the project) involve any National Park, Wildlife Sanctuary or Biosphere Reserve. However, a small portion of Conveyance Mains at headwork near Tajewala is within the Eco Sensitive Zone (ESZ) of Kalesar National Park and Wildlife Sanctuary in Yamuna Nagar district of Haryana.

The total no. of 8 forest crossings will involve by Conveyance Mains (MS Pipelines), from Tajewala to Rajasthan Border.

iii. Surface Water Bodies:

Conveyance System alignment of the project is crossing a number of Rivers, streams and Canals in the state of Haryana. There is no surface water body in the project area except a dam built at the Kumbha Ram Arya lift canal project near Malsisar town of Jhunjhunu district within project command area. The Katli River is a rainfed seasonal river of Shekhawati region and mostly flows through Jhunjhunu District for entire of its length.

The no. of Rivers and Canals crossings of Conveyance Mains (MS Pipelines), from Tajewala to Rajasthan Border, is tabulated as below:

Table 3-5: Rivers and Canals/road crossings of Conveyance Mains from Tajewala to Rajasthan Borde

S. No	Type of crossing	Nos.
1	Railway track crossing	7
2	NH/SH/MDR crossing	25
3	Canal crossing	31
4	Other road crossing (open cut crossing)	134

3.5. EXISTING INFRASTRUCTURE

The command area is having a good network of roads and railway lines, sufficient electrical lines are also avialble.but there are no surface irrigation facility drinking water and irrigation is dependent on ground water, which is going down alarmingly.

3.6. SOIL CLASSIFICATION

A major part of the command area forms an undulating plain characterized by various types of dunes and inter-dune area. Most dominant dunes are longitudinal and transverse dunes. The dunes have stabilized inner core and highly mobile upper surface. The information on soils of the proposed command area of the proposed project is available from the Soil Survey Report published by Soil Survey Organization, Rajasthan.

3.7. CLIMATE DATA FROM THE SECONDARY SOURCES

Climatology of Rajasthan Region:

Project area districts (Churu, Sikar and Jhunjhunu) of Rajasthan are part of arid and semi-arid region. These districts have dry climate and the area is well known for both highest in the country (Churu) and lowest in the peninsular India recording below freezing point temperature in the winters to over 50° C in the summers. There is a great variation in minimum and the maximum temperature of Churu. Average rainfall in Churu, Sikar and Jhunjhunu is 353.9mm, 440mm and 485.6mm respectively. The total annual potential evapo-transpiration in Jhunjhunu district is 1502.6mm

3.8. SOCIAL INFRASTRUCTURE AVAILABLE

Details will be provided during EIA-EMP report preparation.

***

4. PLANNING BRIEF

4.1. PLANNING CONCEPT

The complete project is planned in two parts, first is to transfer of Rajasthan share of Yamuna water from Tajewala Head works to Churu districts of Rajasthan through the underground pipeline by gravity means and second storage of water at terminal point into the main reservoir and finally distribution of water for irrigation and drinking purpose to Churu District and Jhunjhunu & Sikar districts respectively.
Project will create irrigation potential in 105000 ha Culturable command area (CCA).

4.2. POPULATION PROJECTION

Project does not involve large influx of people. The project will not affect any population projection.

4.3. LAND USE PLANNING (BREAKUP ALONG WITH GREEN BELT ETC.)

The project aims sustainable irrigated agriculture in 105,000 Ha areas.

4.4. ASSESSMENT OF INFRASTRUCTURE DEMAND (PHYSICAL & SOCIAL)

Project aims towards development of infrastructure required for transfer of Yamuna water share of Rajasthan form Haryana to Churu district of Rajasthan and storage of water and distribution network for irrigation and drinking purpose.

- One side road along the transmission & distribution pipeline network
- Dedicated power supply line along pipe network in command area for pumping of water from one reservoir to other reservoir.

****

5. PROPOSED INFRASTRUCTURE

5.1. CONSTRUCTION OF TEMPORARY ROAD

Laying of pipe line from Tajewala to main reservoir in Rajasthan and distribution net work from main reservoir to command area will require construction of a temporary road for carriage of pipes.

5.2. LAYING OF DEDICATED POWER LINE

The entire irrigation system is sprinkler irrigation system and supply of water is through pumping. The irrigation pumps will run for 24 hrs. The command area is rural area where 24 hr power supply is not available; hence a dedicated power line shall have to be laid for all pumping stations located at main reservoir, block reservoir and doggies.

Table 5-1: Details of Proposed Infrastructure

S.NO	Particulars	Details
1.	Road along Tajewala to main reservoir	263 KM
2.	Road along distribution net work from main reservoir to block reservoir	50 KM
3.	GSS at main reservoir	220/132 KV GSS
4.	Dedicated power line with in command area	11 kv power lines on lattice tower for diggi's (253 no's) for the length of about 416 km.

6. REHABILITATION AND RESETTLEMENT (R & R) PLAN

6.1. APPLICABLE R&R LEGISLATION AND POLICIES

6.1.1. LAND ACQUISITION LEGAL FRAMEWORK:

Applicable Government

S.N.	Act/ Rules	Citation	Applicability
For the Acquisition purposes:			
1.	As per the RFCTLARR Act, 2013 Under Section 3 of e (i) to (v) the	The project is the Acquisition of Land for public purposes in more than one state, "the Central government, in consultation with the concerned state governments" will be the applicable appropriate Government.	The Central Government
For the temporary Rights of User, Land for Laying of Pipelines:			
2.	The Haryana Underground Pipelines (Acquisition of Right of User Inland)Act, 2008	Haryana State Government's Rule 2010 as applicable.	The Haryana State Government
3.	Rights of Way, Rajasthan	Various rules/government orders issued by state governments of Rajasthan.	The Rajasthan State Government

6.1.2. DESCRIPTION OF APPLICABLE KEY LEGISLATION

The Policy Framework and Entitlements for the program are based on the following Legal framework:

i. Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013 (RFCTLARR Act 2013);

ii. The Rajasthan Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Rules 2016

iii. Haryana Underground Pipelines (Acquisition of Rights of User in Land) Act, 2008.

iv. Rights of Way, Rajasthan

v. Various rules/government orders issued by state governments of Rajasthan & Haryana for issues related to R&R and land acquisition.

i. Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act (RFCTLARR), 2013

The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (RFCTLARR) Act, 2013, provides for a transparent process and just and fair compensation to the affected families whose land is acquired or proposed to be acquired or are affected by such acquisition and provides for rehabilitation and resettlement of the affected families.

The Act provides for three methods of valuation and a solatium of 100% is payable on the market value of land multiplied by the factor and demurrage to standing crops, if any and trees and plants.

ii. The Rajasthan Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Rules 2016

The Rules framed and notified by the Government of Rajasthan for the RFCTLARRR Act, 2013 details the process of preparing and publishing the rehabilitation and resettlement scheme. The State Rules do not deviate from the RFCTLARRR Act 2013 and only provides the specifics for its implementation.

Table 6-1: Applicability of Acts and Rationale

Land Parcels Required For	Act Applicable with Section	Associated Reasons & applicability of the Acts / Rule under respective sections
State of Haryana		
Underground Conveyance system	Haryana Underground Pipelines (Acquisition of Rights of User In Land) Act, 2008 & subsequent rules 2010. Various other rules/ government orders issued by state government of Haryana for issues related temporary using ROW Land parcels for laying of Underground water pipelines	Land to be taken **Temporarily** for laying of Underground conveyance system in the 7 Districts of Haryana for transferring of Rajasthna Share of Yamuna Water.
Road Side & for Laying of Underground Conveyance system	RFCTLARR Act, 2013 Under Section 2 (1)(a) to 2 (1)(f) categorised as per the Harmonised master list of infrastrucutre sub-sectors, issued by Department of Economic affairs number 13/0/2009-INF : • Irrigiation (Dams,Channels,Embankments, Etc.)	• Land to be taken **Permanently** for the road • laying of Underground conveyance system in the 7 Districts of Haryana and 1 district of Churu for transferring of Rajasthna Share of Yamuna Water(RSYW). • Laying of Main Pumping Line for tranferring RSYW from

Land Parcels Required For	Act Applicable with Section	Associated Reasons & applicability of the Acts / Rule under respective sections
	• Water Supply Line ***Section 6(2):*** Irrigation projects where EIA is required under other laws, provisions of SIA shall not be applicable.	Main MAIN RESERVOIR to Jhunjhunun. Hence 70% -80% consent required of local villagers is not applicable as the project is not under Section 2 (2) but under Section 2 (1) SIA may be exempted by Government in case of urgency provisions.
Road Side & for Laying of Underground Conveyance system	As per the point (e) Section 10A in the amenment dated 31 December 2014 and its subsequent amendment dated 3rd April 2015. <u>Non-application</u> of Chapter II: requiring "Determination of Social Impact and Public Purpose" & Chapter III: "Special provisions to safeguard food security".	Chapter II & Chapter III of the Act is exempted For projects under : "Infrastrucutre & Social Infrastrucutre projects (includng projects under PPP) where the ownership of Land continues to vest with the Government" Hence Chapter II & Chapter III is exepmted.
State of Rajasthan		
Land Parcels Required For	**Act Applicable with Section**	**Associated Reasons & applicability of the Acts / Rule under respective sections :**
Reservoirs / Storage Tanks & Underground Conveyance system	RFCTLARR Act, 2013 Under Section 2 (1))(a) to 2 (1)(f) categorised as per the Harmonised master list of infrastrucutre sub-sectors, issued by Department of Economic affairs number 13/0/2009-INF : • Irrigiation (Dams,Channels,Embankments, Etc.) • Water Supply Line	Government Own Use • Government, for its own use, hold and control. • Bare minimum area to be acquired • Minimum Land area required displacement • Minimum loss of crops • No Loss of Permanent structures Hence 70% -80% consent required of local villagers is not applicable as the project is not under Section 2 (2)
Underground Conveyance & distribution system	Rajasthan Underground Pipelines Rules under the Rights of Way & Various rules/government orders issued by state governments of Rajasthan for issues related to laying of Underground	Land to be taken temporarily for laying of Water Supply Line in Districts of Churu & Jhunjhunu for transferring of Rajasthna Share of Yamuna Water for irrigation and potable purposes.

Land Parcels Required For	Act Applicable with Section	Associated Reasons & applicability of the Acts / Rule under respective sections
	water pipelines	
Reservoirs / Storage Tanks	As per the point (e) Section 10A in the amenment dated 31st December 2014 and its subsequent amendment dated 3rd April 2015. Non-application of Chapter II: requiring "Determination of Social Impact and Public Purpose" & Chapter III: "Special provisions to safeguard food security".	Chapter II & Chapter III of the Act is exempted For projects under : "Infrastrucutre & Social Infrastrucutre projects (includng projects under PPP) where the ownership of Land continues to vest with the Government". Hence Chapter II & Chapter III is exempted.
Reservoirs / Storage Tanks	As per Section 9 of the Act: Where land is proposed to be acquired invoking the urgency provisions Under Section 40, The Government may exempt the SIA study. ***Section 6(2):*** Irrigation projects where EIA is required under other laws, provisions of SIA not applicable.	SIA may be exempted by Government in case of urgency provisions hence Non-application of Chapter II.
For Reservoirs / Storage Tanks & Water Supply Line	RFCTLARR Act, 2013 Section 104	Option to take On Lease for Projects referred in Sub-section 1, of Section 2 of the Act.

Table 6-2: Application of RFCTLARR Act, 2013 and Rationale

Topics / Areas	Application of RFCTLARR Act, 2013	Rationale
Application of LA	***Section 2(1)*** Applicable to projects where government acquires land for its own use, hold and control, including PSU and for public purpose; As per Section 2 (2) For PPP, 70% consent is required of local people, where ownership of land continues to vest with govt. or for private companies where 80% of l**and owners** have to give consent.	The Project is not under the Section 2(2) PPP or private entity, Hence Consent is not required / Applicable. The Project is Under Section 2 (1)(a) to 2 (1)(f) as per the Harmonised master list of infrastrucutre sub-sectors, issued by Department of Economic affairs number 13/0/2009-INF : • Irrigiation (Dams,Channels,Embankments, **Etc**.) • Water Supply Line
Principle of	Alternatives to be considered as	Yes the Land proposed is the

Topics / Areas	Application of RFCTLARR Act, 2013	Rationale
avoidance	per, Section # 4 of sub section 4(d) says "extent of land proposed for acquisition is the absolute bare minimum needed for the project; and 4(e) says land acquisition at an alternate place has been considered and found not feasible.	bare minimum required area as given in this report Yes, the Alternative Locations studied are given in this report
Application of R&R	In addition to the above, ***Section 2(3)*** land purchased by private company as prescribed by Govt. or when part acquired by govt.	Not Applicable as, No private entity purchases the land.
Affected area	***Section3(b)***: Area notified for acquisition'	Available on demarcation.
Family	***Section 3(m)*** includes person, his and her spouse, minor children, minor brothers and sisters dependent. Widows, divorcees, abandoned women will be considered as separate family.	Considering the Age wise Project affected Families data need to be collected for standardization of the PAF.
Affected family for eligibility	***Section 3 c (i)to 3c (vi)***: • Whose land and other immovable property acquired. • Who may not own the land but has been working in the affected area for 3 (three) years prior to the acquisition of the land, and whose primary source of livelihood stands affected by the acquisition of land. • Family residing in affected area such as laborers, tenants, dependent on forest and water bodies, etc whose primary source of livelihood is affected due to acquisition. • Scheduled tribes and other forest dwellers whose rights recognized under the Forest Dwellers Act 2006. • Family assigned land by state or central government under any schemes • Family residing on any land in urban area that will be acquired or primary source of	Considering the section, details of the Livelihood activities equal to or more than 3 years preceding the acquisition will be gathered for eligibility towards land acquisition award.

Topics / Areas	Application of RFCTLARR Act, 2013	Rationale
	livelihood affected by acquisition.	
Non-application of Chapter II	As per Section 9 of the Act: Where land is proposed to be acquired invoking the urgency provisions Under Section 40, The Government may exempt the SIA study. ***Section 6(2):*** Irrigation projects where EIA is required under other laws, provisions of SIA not applicable. SIA may be exempted for such by Government in case of urgency provisions.	Chapter II may be exempted by appropriate Government in cases of urgency provisions.
Minimize impact on multi-crop land	***Section 10:*** In case irrigated multi-crop land is to be acquired under exceptional circumstances, the area to be acquired cannot exceed aggregate of land of all projects in district or state. The area to be acquired cannot exceed the total net sown area of the district or state. Wasteland equivalent to twice the area acquired will be developed.	The provisions of this section shall not apply for projects linear in nature, mentioning irrigation canals and the like.
Information dissemination of preliminary notice.	***Section 11 (1), (2) & (3)***: Notice published in local language and meetings called of Gram Sabah's, municipalities to provide full information about the purpose of the project.	The Chapter IV regarding "Notification & Acquisition" shall be followed as per the Collector Guidelines and approach Chapter V for R & R Award.
Updating land records	***Section 11 (5)***: Once established that the land is required for public purpose, accordingly notice to be issued ***under section 19 following which land records to be updated within two months.***	An updated Land Bank records shall be used for title ownership.
Census and preparation of R&R schemes	***Section 16 (1) (2)***: carry out census of affected people and their assets to be affected, livelihood loss and common property to be affected; R&R scheme including time line for implementation.	100% baseline census shall be carried out for the purpose of Land Acquisition.
Land for Land in case of	**As per Point 2 of the THE SECOND SCHEDULE of the**	The Land Acquisition shall be preferably Land for Land instead

Topics / Areas	Application of RFCTLARR Act, 2013	Rationale
Irrigation Projects	**Act, In case of Irrigation Projects as far as possible and in lieu of compensation to be paid for Land acquired, each affected family owning agricultural land in the affected area and whose land has been acquired or lost, or who has, as a consequence of the acquisition or loss of land been reduced to the status of a marginal farmer or Landless, shall be allotted, in the name of each person included in the records of rights, a minimum of 1 acre of Land in the command area of the project for which the land is acquired.**	of Land for Cash as per the appropriate government to standardize.
Time period stipulated for declaring the award	***Section 25:*** It is required to announce the award ***within 12 months of issue of Section19 (final declaration to acquire land, approved R&R scheme)*** after completing land acquisition plans, hearing of objection, settling individual claims for declaration of the award. If award not made within the stipulated time, the entire proceedings will lapse.	Hence the Land Acquisition process shall be initiated prior one year, when the government intends to acquire the holdings for the project proposed.
Methodology for determining market value for land	***Section 26 and First Schedule:*** Recognizes 3 methods and whichever is higher will be considered which will be multiplied by a factor given in Schedule I; Compensation given earlier will not be considered; if rates not available floor price can be set; steps to be taken to update the market value.	The Act provides for three methods of valuation and a solatium of 100% is payable on the value of land multiplied by the factor and demurrage to standing crops, if any and trees and plants. The Multiplying factor of the appropriate government shall be taken in calculation.
Valuation of structures	***Section 29 (1)*** without deducting the depreciated value.	There are negligible built up structures as they have been avoided to the extent as possible in the process of Land Acquisition of the project proposed.
Solatium and	***Section 30(1)*** 100% of the	To be determined as per the

Topics / Areas	Application of RFCTLARR Act, 2013	Rationale
Interest	compensation amount ***Section 30(3)***: 12% per annum on the market rate from the date of notification of SIA to the date of ward or land taken over.	directives of the appropriate government.
R&R Award	***Section 31, As per Second Schedule:*** land for land in irrigation projects in lieu of compensation to PAF either whose land has been acquired or Lost or who has been reduced to the status of either a marginal farmer (holding less than 1.0 hectare) or landless, to be awarded minimum 1.0 acre of Land in the command area for the project in consideration. *(*1 Acre = 0.404 hectares)*	Land areas required for Main MAIN RESERVOIR Reservoirs & Diggis shall be undertaken for and the Awards will be made as per the records of rights. The Block Reservoirs are proposed on Government Land.
Possession of land	***Section 38(1)***: Land will be taken over by the government within three months of compensation and 6 months of R&R benefits disbursed; in case of irrigation and hydel projects, being a public purpose, R&R shall be completed six months prior to submergence of the land parcels acquired.	If the time lag between, acquisition (post award of compensation) and operations, is more than 6 months then the WRD administration has to monitor that post acquisition, there are no encroachments (either agriculture / housing) on the acquired Core Zone Land parcels.
Acquisition for emergency purpose	***Section 40 (5)***: In case of urgency, The Government so directs the collector on the expiration of 30 days from the publication of the notice period mentioned in section 21, take possession of any land needed for public purpose and such land shall thereupon vest absolutely in the Government, free from all encumbrances. With the direction of 75% additional compensation to be paid over and above the compensation amount if acquired under this section.	The Appropriate government shall take decisions on the applicability of the section mentioned.
Development plans for SC and ST	***Section 41: For SC/ ST's*** Separate development plans to be prepared, settle land rights before acquisition; 1/3rd compensation amount to be	The Land parcels are not in the scheduled areas. The no. SC / ST Land areas will be negligible but will be granted

Topics / Areas	Application of RFCTLARR Act, 2013	Rationale
	paid as first installment and rest at the time of taking possession; land alienation will be null and void and ST and SC considered for R&R benefits; fishing rights restored in irrigation and hydel projects for SC/ST Affected; if wish to settle outside the district additional benefits to be provided in monetary terms; all rights enjoyed under other laws will continue. ***Second Schedule***: additional provisions for SC&ST for land for land in irrigation projects, additional sum over and above the subsistence grant.	the Records of Rights as per applicability.
Change of land use	***Section 46(4):*** Land will not be transferred to the requisitioning authority till R&R is not complied with in full.	Hence Land acquisition process should be ascertained with a timeline as per the acquisition proceeds land parcels are put in operation.
No change in status of land acquired	***Section 99***: Once the land is acquired for a particular purpose, its purpose cannot be changed.	Utmost precision is laid in the uses of the proposed acquisition of Areas : • Roads (for laying pipelines) • Main Reservoirs • Main Pumping Lines • Block Reservoirs • Diggis
Option of Government to Lease	***Section104***: Notwithstanding anything contained in this act, the appropriate government shall, wherever possible, be free to exercise the option of taking the land on lease, instead of acquisition, for any public purpose referred in sub-section (1) of section 2.	Option of Government to Lease.

For conveyance of Rajasthan share of Yamuna water from Tajewala Haryana to Rajgarh (District Churu), Rajasthan, it is proposed to lay 5 Rows of MS Pipelines of 3200 mm / 3000 mm diameter each requiring an area of approx. 60.6 m width. The proposed alignment of Underground Conveyance System for transfer of Rajasthan share of Yamuna water from Tajewala Headworks to Churu and Jhunjhunu districts of Rajasthan passes through 7 districts of Haryana and one district Churu of Rajasthan on a chainage stretch of 265.0 km length. For the proposed alignment of

underground pipeline will require mostly temporary land acquisition throughout the length of the pipeline.

Apart from it, there is land acquisition will be done for construction of main storage reservoir/ main RWR and block reservoir, diggies and distribution pipeline network for irrigation and drinking purpose.

The brief details of project component alongwith required land area are as follows:

i. **Roads:** Required permanently (approx. with a 12.0 m Width) for Underground Conveyance System from Tajewala, Haryana to Churu District (for Maintenance & laying pipelines)

ii. Required permanently (approx. with a 7.5 m Width) for Laying of Main Pumping Supply Line System from Pump House in Churu to Jhunjhunu District (for Maintenance)

iii. **Main Reservoirs**: Required for the Submergence Area in District Churu.

iv. **Main Pumping Lines**: Temporary areas for laying of pipelines.

v. **Block Reservoirs**: Required for the Submergence Area in District Churu & Jhunjhunu.

vi. **Diggis:** Required for the Submergence Area in District Churu & Jhunjhunu both.

The complete details of the land acquisition and R & R plan will be provided in the EIA-EMP report.

***

7. PROJECT SCHEDULE & COST ESTIMATES

7.1. PROJECT SCHEDULE

Considering the huge volume of work and cost of the Project, the Time Scheduling is proposed as under:-

S. NO	Particulars	Time
1.	Time for Initial Preparations	1 year,
2.	Time for Land Acquisitions	2 years
3.	Time for Construction Activities	6 yrs and 6 months
4.	Time for Commissioning & Taking over Activities	6 Months
	TOTAL TIME FOR ALL ACTIVITIES	**10 Years**

7.2. COST ESTIMATES:

Total estimated cost of project is Rs. 23965.845 cr. (at 2018 price level). Out of which cost chargeable to various sectors is as under

1 Irrigation sector 12532.653 cr

2 Drinking water sector 11433.192 cr

****

8.ANALYSIS OF PROPOSAL (FINAL RECOMMENDATION)

The share of water in Yamuna River is intended to be made available to Rajasthan from Tajewala Head. Considering conveyance of the water by gravity, geographically, it is feasible to bring it in Churu District of Rajasthan. Hence, it is envisaged that water be brought to Rajasthan in Rajgarh Block of Churu District. From this point, it can be further transmitted to adjoining districts for irrigation and drinking water purpose.

- ✓ The project envisages extending benefits to following two districts for providing irrigation facilities in about 105,000 hectare area:

  (a) Rajgarh Block of Churu District

  (b) Part of Jhunjhunu District (Parts of Alsisar, Jhunjhunu, Chirawa & Surajgarh Blocks)

- ✓ The project will also make water available for drinking water purpose in following districts:

  (a) Jhunjhunu District complete

  (b) Part of Sikar District (Sikar, Dhond, Danta Ramgarh, Khandela, Neem ka Thana & Patan Blocks)

Benefits:

A. The local people will be benefitted by introduction of irrigated agriculture in the area which in turns uplift socio-economic status of the area.

1. The project will produce – tones of food grains annually
2. The project will ensure qualitative & quantitative living standards.
3. The project will enable groundwater recharge in area.
4. Besides upliftment of local people, state/nation will be benefitted by agriculture production.

B. The proposed project will keep 350 MCM water reserved for drinking per year to be made available to Jhunjhunu and Sikar districts of the state. Thus, regional population of the Shekhawati region of the Rajasthan State will derive benefits from the project.

****