

Due Diligence Report

Project Number: 47176-002
March 2017

Project Loan

India: Delhi Water Supply Improvement Investment Program

Subproject: Transmission System Improvements- Providing, Laying, and Maintaining New DI Transmission Pipelines from Wazirabad WTP to Various UGRs, and Providing, Installing, and Maintaining SCADA System in 11 UGR Command Areas

Package 4, Project 1
DWSIIP/04

Prepared by the Delhi Jal Board for the Asian Development Bank.

This is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

CURRENCY EQUIVALENTS

(as of 01 March 2017)

Currency Unit	–	Indian Rupee (INR)
INR 1.00	=	\$0.01498
\$1.00	=	INR 66.7720

ABBREVIATIONS

ADB	–	Asian Development Bank
BPL	–	below poverty line
CWPS		clear water pumping stations
DH	–	displaced households
DJB	–	Delhi Jal Board
DP	–	displaced person
DWSIIP	–	Delhi Water Supply Improvement Investment Program
EA	–	executing agency
IA	–	implementing agency
MFF	–	multitranches financing facility
NGO	–	non-governmental organization
PIU	–	program implementation unit
PMC	–	project management consultancy
PMU	–	program management unit
RF	–	resettlement framework
RFCTLARRA	–	Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act
SPS	–	Safeguard Policy Statement
UGR	–	underground reservoir
WTP	–	water treatment plant

NOTES

- (i) The fiscal year (FY) of the Government of India and its agencies ends on 31 March.
- (ii) In this report, "\$" refers to US dollars.

CONTENTS

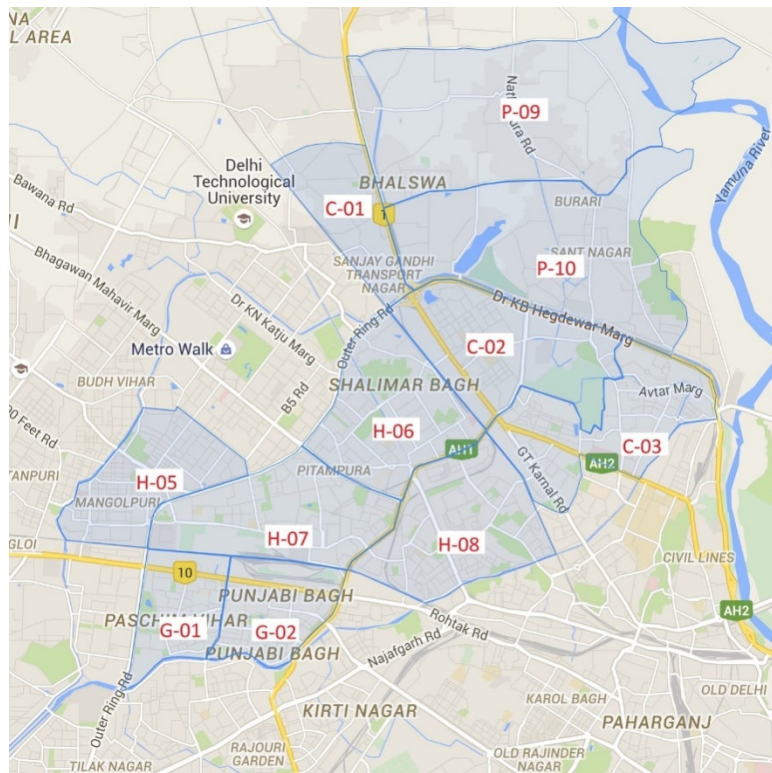
	Page
I. INTRODUCTION	1
A. Overview of the Investment Program	1
II. SUBPROJECT DESCRIPTION	5
A. Key Components of the Subproject	5
II. PROPOSED TRANSMISSION SYSTEM–PRELIMINARY SIZING	6
III. PROPOSED TRANSMISSION SYSTEM–PROJECT SCOPE	6
IV. CLEAR WATER PUMPING AND SCADA–PROJECT SCOPE	7
V. METHODOLOGY FOR MINIMIZING IMPACTS	7
IV. CONSULTATION, PARTICIPATION AND DISCLOSURE	10
V. FINDINGS	10
VI. CONCLUSION AND RECOMMENDATION	10
 Annex 1: Transmission Routes, with Sections Showing Availability of Road Width Section for Laying of Pipelines	

I. INTRODUCTION

A. Overview of the Investment Program

1. The Delhi Water Supply Improvement Investment Program (DWSIIP) will be implemented over a eight -year period and will improve the infrastructure, management and performance of the water supply services in the proposed Wazirabad Water Treatment Plant (WTP) command area located in North Delhi and having a 2051 design population of 2.64 million (approximately 10 percent of Delhi's projected population by that time). The DWSIIP will help achieve the National Capital Territory of Delhi Water Supply Master Plan¹ objectives of reduced non-revenue water and equitable access to water supply services. The investment program will include the rehabilitation, upgrading and/or replacement of key water supply infrastructure, improvements in the management of the infrastructure and improved customer related services within the Wazirabad WTP command area. The DWSIIP will be implemented as a multi-tranche financing facility (MFF) having two projects. The Wazirabad WTP command area location is presented in Figure 1.

Figure 1: Location Map of the Wazirabad WTP Command Area



2. The impact of the DWSIIP will be improved water supply services in the Wazirabad WTP Command Area. The outcome will be improved access to reliable, continuous and sustainable water supply services in the Wazirabad WTP command area.

¹ Study on Improvement of Water Supply System in Delhi in the Republic of India; Japan International Cooperation Agency September 2011.

3. The DWSIIP will have three outputs.

4. **Output 1: Distribution network improved in the Wazirabad WTP Command Area.** This will include (i) establishment and commissioning of DMAs for NRW reduction; (ii) provision of house service connections to residents, especially the poor and female-headed households; (iii) provision of 24-hour water supply; and (iv) improvement of water supply efficiency by reducing NRW and energy losses of electromechanical machinery.

5. Output 1 will support smart water management in the Wazirabad WTP command area to a prospective population of 2.41 million by year 2025.² The key activities of constructing new water supply pipelines, establishing and commissioning DMAs, and providing metered house service connections will benefit the residents through continuous pressurized water supply and reduction of NRW to less than 15%. Appropriate long-term (at least 10 years) operation and maintenance (O&M)-embedded performance-based contracts will be put in place to ensure operational sustainability.

6. **Output 2: Water treatment and transmission systems improved in the Wazirabad WTP command area.** This will include (i) rehabilitation and upgrading of the existing 120 million gallons per day (MGD) WTP; (ii) rehabilitation and construction of clear water pumping stations, underground reservoirs (UGRs) and booster stations; and (iii) rehabilitation and construction of new transmission mains.

7. Output 2 will support increasing energy efficiency in clear water pumping, reduction of clear water transmission losses, rehabilitation or construction of the WTP, as appropriate, and avoidance of shut down of the WTP to consistently meet the drinking water quality standards. Old pumping system in the clear water pump stations shall be upgraded with energy efficient pumps and the transmission pipelines shall be replaced. With use of instrumentation and automation through supervisory control and data acquisition (SCADA) at treatment, transmission, storage, and supply, operational efficiency is expected to be improved.

8. **Output 3: Institutional capacity, DMA management and program management strengthened.** This will include (i) implementation of capacity development plans including training on gender and establishment of a training center or institute; (ii) organizational restructuring for effective and sustainable DMA management; (iii) establishment of PDF to prepare future projects; (iv) preparation and implementation of an effective community mobilization plan and gender equity and social inclusion (GESI) action plan; (v) preparation and implementation of asset management plan through use of geographic information system (GIS), hydraulic modelling and SCADA system; (vi) implementation of O&M-embedded performance-based contracts; (vii) establishment and operationalization of water quality monitoring system; and (viii) strengthening of program management capacities.

9. Output 3 will focus promotion of a customer-focused culture within the DJB that includes measures to improve customer satisfaction, accurate and regular meter reading, billing, revenue collection, and an effective customer complaints mechanism. A comprehensive public outreach campaign under the community mobilization component will be the driver under the DWSIIP to mobilize community and enable consumers' involvement in the provision of services by the DJB.

² The NCTD's current population, estimated to be 17.81 million, is expected to grow to 27 million by 2051 as per Water Policy for Delhi (footnote 25).

10. Capacity development under Output 3 will help improve organizational efficiencies through data collection and assessment, review and updating of the master plan, network modelling, asset condition assessments, updating the existing GIS, conducting a comprehensive NRW survey, developing a SCADA system for the WTP, transmission main and distribution system, preparing recommendations for institutional development and DMA-based organizational restructuring.

11. Project 1 of the DWSIIP will include (i) a project management consultant (PMC); (ii) a civil works package (DWSIIP/01) for improvement of distribution network, UGR, clear water pumping station, DMA feeder mains and distribution pipes, bulk flow meters and house service connections for UGR command areas C-02 (Chitraranjan Das Park Jahangirpuri) and C-03 (Model Town); (iii) a civil works package (DWSIIP/02) for improvement of distribution network, UGR, clear water pumping station, DMA feeder mains and distribution pipes, bulk flow meters and house service connections for UGR command areas G-02 (Punjabi Bagh), H-07 (Shakur Basti) and H-08 (Lawrence Road); and (iv) a civil works package (DWSIIP/04) for transmission mains and clear water pumping stations, and instrumentation and automation (SCADA).

12. Project 2 of the DWSIIP will include (i) a civil works package (DWSIIP/03) for rehabilitation or construction of the Wazirabad WTP; (ii) a civil works package (DWSIIP/05) for improvement of distribution network, UGR, clear water pumping station, DMA feeder mains and distribution pipes, bulk flow meters and house service connections for UGR command areas G-01 (Piragarhi), H-05 (Avantika), H-06 (Pitampura); and (iii) a civil works package (DWSIIP/06) for improvement of distribution network, UGR, clear water pumping station, DMA feeder mains and distribution pipes, bulk flow meters and house service connections for UGR command areas C-01 (Sanjay Gandhi Transport Nagar), P-09 (Burari-A) and P-10 (Burari Transport Planning Authority).

Table 1: Summary of Works Packages Table

Sl. No.	Package	Project	Description
1	DWSIIP/01	1	Distribution Network Improvement in UGR Command Areas C-02 and C-03 Targeting Continuous Pressurized Water Supply and DMA-Based NRW Reduction and Providing House Service Connections.
2	DWSIIP/02	1	Distribution Network Improvement in UGR Command Areas G-02, H-07 and H-08 Targeting Continuous Pressurized Water Supply and DMA-Based NRW Reduction and Providing House Service Connections.
3	DWSIIP/03	2	Augmentation of water supply–Modernization and Operational Improvements of Wazirabad Water Treatment Plant SCADA System in 11 UGR Command Areas.
4	DWSIIP/04	1	Transmission System Improvements-Providing, Laying and Maintaining New Ductile Iron Transmission Pipelines from Wazirabad WTP to various UGRs and , and Automation and Instrumentation: Providing, Installing and Maintaining.
5	DWSIIP/05	2	Distribution Network Improvement in UGR Command Areas G-01, H-05 and H-06 Targeting Continuous Pressurized Water Supply and DMA-Based NRW Reduction and Providing House Service Connections.
6	DWSIIP/06	2	Distribution Network Improvement in UGR Command Areas C-01, P-09 and P-10 Targeting Continuous Pressurized Water Supply and DMA-Based NRW Reduction and Providing House Service Connections.

4. The PMC will be responsible for the technical and financial management and coordination of the DWSIIP including the undertaking of a public outreach program and ensuring safeguard compliance in line with ADB requirements. The Delhi Jal Board (DJB) will also recruit a community mobilization and resettlement plan implementation assistance consultant (CMRC) to assist in the

implementation of any land acquisition and resettlement issues arising, including temporary impacts.

5. The UGR command areas included under the DWSIIP are summarized in Table 2, together with population estimates and the number of district metering areas (DMAs).

Table 1: UGRs Proposed Under the DWSIIP

Works Package	UGR Ref.	UGR Name	Area (Ha)	Maximum Population (million)	Population (million)		DMAs (No.)
					2011	2051	
P1	C-02	CD Park Jahangirpuri	1018	0.255	38	0.264	38
P1	C-03	Model Town	948	0.237	33	0.226	33
Sub Total			1966	0.492	0.398	0.490	71
P2	G-02	Punjabi Bagh	532	0.133	24	0.168	24
P2	H-07	Shakur Basti	947	0.237	34	0.234	34
P2	H-08	Lawrence Road	972	0.243	44	0.305	44
Sub Total			2451	0.613	0.608	0.707	102
P3	G-01	Piragarhi	484	0.121	17	0.121	17
P3	H-05	Avantika	706	0.177	46	0.319	46
P3	H-06	Pitampura	926	0.231	34	0.240	34
Sub Total			2116	0.529	0.624	0.680	97
P4	C-01	SGT Nagar	537	0.134	17	0.118	17
P4	P-09	Burari A	2356	0.589	42	0.289	42
P4	P-10	Burari TPA	3531	0.883	51	0.358	51
Sub Total			6423	1.606	0.571	0.765	110
Total			12956	3.239	2.201	2.643	380

Note: Maximum population based on 250 persons/ Ha.

6. This Involuntary Resettlement Due Diligence Report covers Package 4, under Project 1- Transmission System Improvements-Providing, Laying and Maintaining New Ductile Iron Transmission Pipelines from Wazirabad WTP to various UGRs.

B. Methodology of Study

8. The detailed design for this package is yet to be done. The methodology adopted for the preparation of this report included the (i) study of design and alignment proposals put forth in the Technical Due Diligence Report prepared by the PPTA for the project³, and (ii) field visits and transect walk was carried out. Field visits have been made to routes of the proposed transmission mains, all of which follow the existing roads or right of ways, and are free of encumbrances. Field visits to the project area were carried out in different points in time between May 2014 to February 2017. The due diligence field visits were carried out by the PPTA team members.⁴

³ The Technical Due Diligence Report has been prepared based on the Master Plan for Delhi's water supply prepared for Delhi Jal Board with support from Japanese International Cooperation Agency (JICA) in the year 2011.

⁴ Including the resettlement specialist, team leader and water supply specialist. It also included specialists from the advance project preparation team, which included a water supply specialist, support engineer, and engineers from the office of the Executive Engineer, Dwarka WTP.

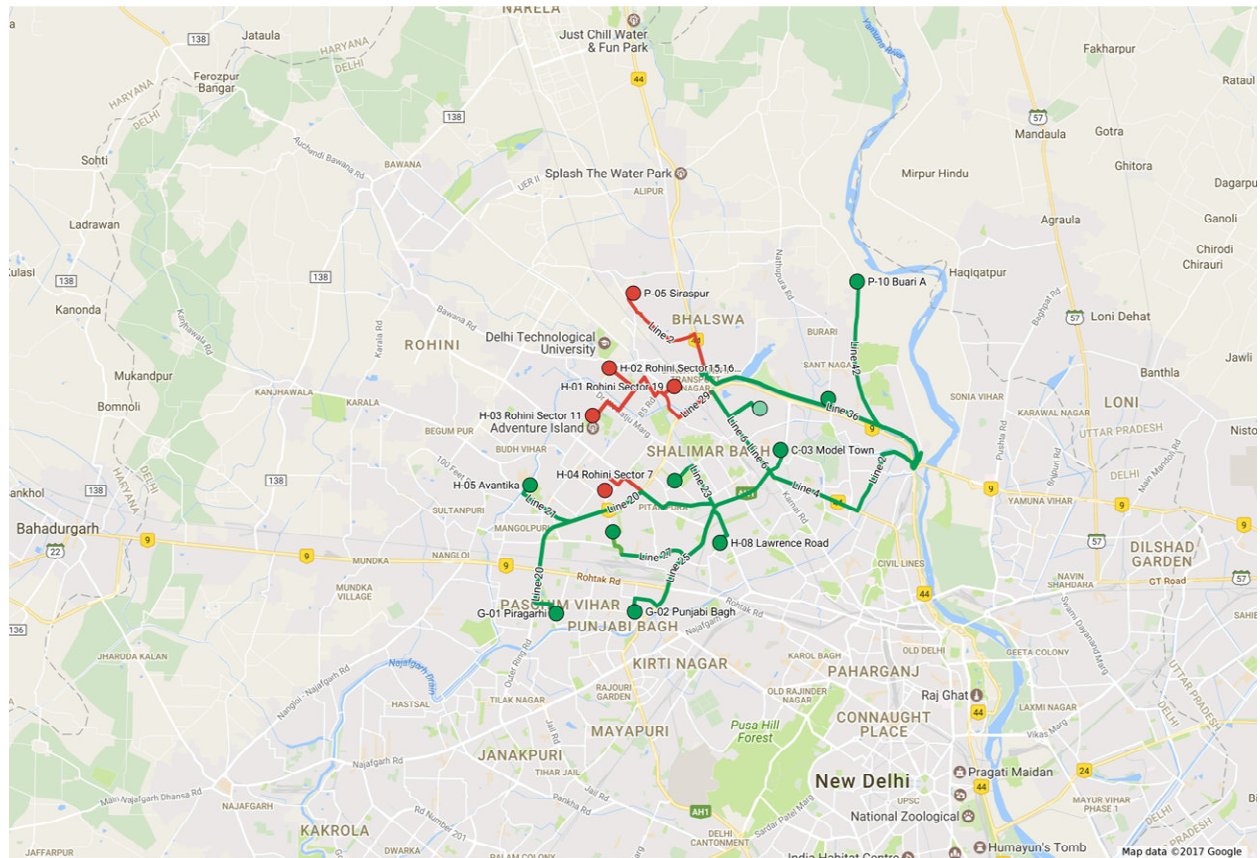
II. SUBPROJECT DESCRIPTION

A. Key Components of the Subproject

1. Proposed Transmission System–Alignment

9. JICA Master Plan proposed two transmission mains starting from Wazirabad with one primarily catering to the outer Delhi areas. The route suggested in the plan is found to be based on most feasible shortest alignment. In preliminary design also the same alignment is considered. A satellite image of proposed transmission alignment is presented in **Error! Reference source not found.**

Figure 2: Proposed Transmission Main Alignment



10. Transmission Main 1 starts from Wazirabad WTP and runs parallel to the Outer Ring Road (ORR). After Jharoda near the Tomur Colony it branches and goes along Santi Swaroop Tyagi Marg to feed UGR P-10 Burari TPA and P-09 Burari A. After the branching point the main continues along the same alignment parallel to ORR up to Mukarba Chowk and then turns and moves along the Grand Trunk Road (NH1). A branch takes off along Bawana Road to feed the UGR C-01 Sanjay Gandhi Transport Nagar. It further continues along NH1 and near Adarsh Senior Secondary School it turns to Libaspur Road to feed UGR P-05 Siraspur. Transmission Main 2 starts from Wazirabad WTP, crosses ORR and moves along Banda Bahadur Marg to NH1. At the junction of NH1 and Mahatma Gandhi Road (Inner Ring Road–IRR) three branches take off. The right branch goes on below Azadpur flyover along IRR to feed UGR C-03 Model town.

The central branch along IRR is explained in Paragraph 6. The left branch moves along IRR up to Maharaja Nahar Singh Marg where it branches into three. The branch along Maharaja Nahar Singh Marg goes on to feed UGR H-08 Lawrence Road. The left branch along IRR moves up to the junction point of Britannia Road where it branches into two with the right branch moving onto Guru Harkishan Marg to feed UGR H-07 Shakur Basti/Harsh Vihar and the right branch goes along IRR to Vashisht Kumar Gulla Marg and to S Manohar Singh Marg to feed UGR G-02 Punjabi Bagh. The third branch from Maharaja Nahar Singh Marg junction branches into two and the one along Muni Maya Ram Jain Marg meets the ORR again and the other going on to Maharaja Agrasen Marg to feed UGR H-06 Pitampura. At the meeting point of ORR, a branch takes off to feed UGR H-04 Rohini Sector 7. The one along ORR further proceeds to Junction with Guru Gowalkar Marg where a branch takes off to feed UGR H-05 Avantika along Guru Gowalkar marg. The main further moves along ORR to the junction with Saiyyad Nangloi Marg where it turns to Road No. 30 and onto Bhao Rao Devars Marg to feed UGR G-01 Piragarhi. The central branch at the junction of NH1 and IRR indicated above moves on along NH1. A branch takes of along Jahangirpuri Road to feed UGR C-02 CD Park Jahangirpuri. The main moves along NH1 till Mukarba Chowk where it enters ORR. It continues over ORR and then on to Dr M C Devar Marg. After crossing the Badli Road a branch takes off to feed UGR H-01 Rohini Sector 19. The main continues to M C Dewar Marg and to B5 Road and onto B3 Road where it branches into two with the right branch along Ramakrishna Marg feeding UGR H-02 Rohini Sector 15, 16 and 17. The other goes to Dr K N Katju Marg and Rammamurti Passi Marg to feed UGR H-03 Rohini Sector 11. The clear water pumping station (CWPS) is located within the Wazirabad WTP site which belongs to the DJB.

II. PROPOSED TRANSMISSION SYSTEM–PRELIMINARY SIZING

12. With the available information an effort is made to size the transmission system. Based on discussion with DJB, it was decided that the transmission system shall be designed to cater to the requirement of 16 UGRs listed under the 925 scenario in JICA Master Plan. It was also decided that the demand will be computed at 44.65 GPCD including losses as discussed earlier in this report. However, as it is critical to size the transmission main afresh in view of the change in project horizon from 2021 to 2051, a preliminary hydraulic model is attempted using WaterGEMS. In absence of any primary field data the input is mainly drawn from satellite imagery available in public domain.

III. PROPOSED TRANSMISSION SYSTEM–PROJECT SCOPE

12. The total length under the project shall be around 54 km and is predominantly of Ductile Iron K9 pipe. The diameter varies from 500mm to 2000 mm. **Table 3** presents the diameter and material abstract of transmission main to be considered under the project.

Table 3: Details of Proposed Transmission main Under Project

Material	Diameter (mm)	Length in m	Road Width	Road Width
Ductile Iron				
	500	2447	16 m	The transmission main alignment follows main roads. The minimum road width observed along the
	600	7355	30 m	
	700	6660	28 m	
	800	10391	12 m	

Material	Diameter (mm)	Length in m	Road Width	Road Width
	900	2063	28 m	alignment is mostly 15m and the maximum is over 45m. There is small 9 m stretch for about the initial 400m stretch close to the WTP.
	1000	5459	45 m	
	1100	332	45 m	
	1200	1067	45 m	
Ductile Iron Total		35774		
Mild Steel				
	1400		30 m	
	1600		42 m	
	1800		28 m	
	2000		12 m*	
Mild Steel Total		18638		
Grand Total		54412		

* 1This is minimum width on a stretch of about 300 m close to WTP. Rest of the alignment is through wider roads.

IV. CLEAR WATER PUMPING AND SCADA-PROJECT SCOPE

13. Apart from the pipeline, the package also includes rehabilitation/ upgradation of the existing clear water pumping station at Wazirabad by replacing the pump sets with new 950 HP pump sets 6 working and 3 stand by. The operation of the transmission main is proposed to be monitored and controlled from a master control centre to be established at Wazirabad through a full-fledged SCADA system.

V. METHODOLOGY FOR MINIMIZING IMPACTS

14. The anticipated impacts of the project will be:

- i. Accessibility and traffic disruptions: This is likely to happen in sections where the work is being carried out due to the movement of labour and machinery and actual zones of digging trenches, especially along narrow, internal roads.
- ii. Access disruptions to residents and customers to shops: During construction access can be hindered due to digging and collection of excavated soil along the road, especially in areas with narrow roads and congested areas.

15. To minimize involuntary resettlement impacts during construction the proposed pipelines will be laid below the blacktop section of the road and trenchless technology will be used. To minimize involuntary resettlement impacts during construction the proposed pipelines will be laid below the blacktop section of the road using trenchless pipe laying technology. This technology ensures that roads are not cut open to lay the pipes and hence reduces health and safety risks associated with deep excavations such as risk of falling, dust, and traffic disruptions. As the area required to conduct trenchless pipelaying is minimal, the technology helps to minimize involuntary resettlement impacts such as livelihood loss to people conducting business alongside the road (as temporary relocation during construction is greatly minimized). The methodology used for mitigating the identified impacts during construction period as given in the Environmental Management Plan for the project will be as follows:

Table 4: Mitigation impacts for Anticipated Impacts

Anticipated Impact	Mitigation Measures
Accessibility and Traffic Disruptions	<p>Prepare Traffic Management Plan (TMP) in consultation with the Traffic Police – a generic plan to be prepared, and it shall be made specific to meet the conditions at each section/road taking into consideration diameter of pipe, work area and road width</p> <p>Type of roads and measures for fine tuning the alignment of pipelines:</p> <ul style="list-style-type: none"> (i) Finalize the alignment to have least disturbance to the traffic; in many main roads, one line on each side (either on main carriage way or on service roads) is used for parking; this location may be ideal if the parking is temporarily disallowed for the duration of work. Barricade and confine the work to parking lane. This will avoid any disturbance to traffic movement. (ii) In roads where there is a road shoulder, align the pipeline in the shoulder (iii) In roads where there is no parking lane or shoulder, pipe will have to be laid on the carriage way. As far as possible, align the pipeline into the edge of the road; if this requires closure of one traffic lane, take precautions to reduce the traffic (by informing people about the work, and alternative routes that can be taken etc.,) (iv) In narrow roads, pipeline works will completely disturb the traffic (mainly 2-wheelers, 3-wheelers, pedestrians, limited cars). In such cases, works shall be undertaken from junction to junction (about 100 m), so that traffic can be stopped and diverted to other parallel roads. Barricade the area with reflectors (if hard barricading is not feasible) and provide dust screens (3m height) (v) In internal narrow roads of most of the localities, roads are less than 3 m width in most cases. In these roads, small diameter pipelines will be laid, mostly in the middle of the road. Existing traffic is only of 2-wheelers and rickshaws, which will be disturbed during the work. In such cases, work shall be conducted section wise (one road from junction to junction at a time) and completing the work in minimum possible time (2 days). <p>Measures to minimize traffic and accessibility disruptions:</p> <ul style="list-style-type: none"> (i) Barricade and confine the work area; (ii) Minimize the work area / barricaded area along the roads to the minimum possible width; adopt vertical trench cutting, where required, using shoring; (iii) Confine all the activities within in the barricaded area, including material & waste/surplus soil stocking; (iv) Avoid material/surplus soil stocking in congested areas – immediately remove from site/ or brought to the site as and when required; (v) Transport material, waste etc., during low traffic periods (eg, before 8 AM); (vi) Minimize access disruptions to adjacent properties; vehicle access may be controlled however, pedestrian access should

	<p>always be available; if necessary provide temporary pedestrian access (eg, over the trench) using wooden planks/metal sheets;</p> <p>(vii) Plan transportation (for material and waste) routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites;</p> <p>(viii) Schedule transport and hauling activities during non-peak hours;</p> <p>(ix) Locate entry and exit points in areas where there is low potential for traffic congestion;</p> <p>(x) Keep the site free from all unnecessary obstructions;</p> <p>(xi) Drive vehicles in a considerate manner;</p> <p>(xii) Coordinate with Traffic Police for temporary road diversions, where necessary, and for provision of traffic aids if transportation activities cannot be avoided during peak hours;</p> <p>(xiii) Notify affected public by public information notices, providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints. Provide information to the public through media – newspapers and local cable television (TV) services;</p> <p>(xiv) At work site, public information/caution boards shall be provided including contact for public complaints;</p> <p>(xv) Immediately consolidate the backfilled soil and restore the road surface; if immediate road restoration is not possible, provide a layer of plain cement concrete (PCC) of suitable mix on the backfilled trench so that dust generation, erosion is arrested and it will also provide a smooth riding surface for the traffic until the road is properly restored;</p>
<p>Disruption of access to residents and customers to shops</p>	<p>(i) Inform all businesses and residents about the nature and duration of any work well in advance so that they can make necessary preparations;</p> <p>(ii) Do not block any access; leave spaces for access between barricades/mounds of excavated soil and other stored materials and machinery, and providing footbridges so that people can crossover open trenches;</p> <p>(iii) Adopt trenchless technology to avoid any blockage of access;</p> <p>(iv) Barricade the construction area and regulate movement of people and vehicles in the vicinity, and maintain the surroundings safely with proper direction boards, lighting and security personnel – people should feel safe to move around;</p> <p>(v) Control dust generation;</p> <p>(vi) Immediately consolidate the backfilled soil and restore the road surface; if immediate road restoration is not possible, provide a layer of plain cement concrete (PCC) of suitable mix on the backfilled trench so that dust generation, erosion is arrested and it will also provide a smooth riding surface for the traffic until the road is properly restored. This will also avoid any business loss due to dust and access inconvenience of construction work;</p> <p>(vii) Employ best construction practices, including trenchless technology, speed up construction work with better equipment,</p>

	increase workforce, etc in predominantly commercial area, and with sensitive features like hospitals, and schools; (viii) Consult businesses and institutions regarding operating hours and factoring this in work schedules; and (ix) Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints;
--	---

15. If any impacts, permanent or temporary, are identified after the completion of the final scheme design or during construction, the affected persons will be compensated or assisted in accordance with the DWSIIP resettlement framework.

IV. CONSULTATION, PARTICIPATION AND DISCLOSURE

16. Public consultation and participation for the DWSIIP has not yet been carried out. This section will therefore be updated at the appropriate time.

17. Following ADBs SPS 2009 requirements this Involuntary Resettlement Due Diligence Report will be posted on the official website of the DJB and the website of the ADB after approval and endorsement of the report by the DJB and the ADB.

V. FINDINGS

18. The transmission line will be laid below the existing blacktop of roads, predominantly using trenchless technology. Based on the information provided in **Table 3**, the existing blacktop width on the transmission route is sufficient for laying of the pipelines. The UGRs and the pumping station are all located within the property of the DJB. Any expansion work can be accommodated within the existing facilities and no land acquisition will be required. The transmission route pictures are given in **Annex 1**, showing sufficient road width at all sections.

VI. CONCLUSION AND RECOMMENDATION

19. This due diligence report will have to be updated and disclosed on the completion of the detailed design of the package. The cutoff date for the package will be established after the detailed design and before the contract of civil works. Meaningful consultation involving various stakeholders in the project areas will have to be conducted and recorded. The community mobilization and resettlement team will assist the activities.

ANNEX 1: TRANSMISSION ROUTES, WITH SECTIONS SHOWING AVAILABILITY OF ROAD WIDTH SECTION FOR LAYING OF PIPELINES



Entrance to Water Treatment Plant at Wazirabad, with shops on either side.



Starting of line 36

Transmission route at the junction from the entrance of the Water Treatment Plant: narrowest section in the transmission route.



Line 36

Transmission line to run parallel to existing route close to Harith Vihar.



Line 6

Transmission route section between Mukarba Chowk and Model Town.



Line 6

Vendors on the section to the Azadpur Fruit and Vegetable Mandi, congested due to vendors and movement of various modes of transport.



Line 6
Towards Kewal Park.



Line 20
Transmission route leading to Mongolpuri, Peeragarhi, and Paschim Vihar area.



Line 23
Route from Ashok Vihar to Punjabi Bagh.



Line 36
Sanjay Gandhi Transport Nagar.