COMBINED PROJECT INFORMATION DOCUMENTS / INTEGRATED SAFEGUARDS DATA SHEET (PID/ISDS)

Appraisal Stage

Report No.: PIDISDSA23709

Date Prepared/Updated: 24-Nov-2017

I. BASIC INFORMATION

A. Basic Project Data

Country:	China	**Project ID:**	P158713
		Parent Project ID (if any):	
Project Name:	China: Liaoning Safe and Sustainable Urban Water Supply Project (P158713)		
Region:	EAST ASIA AND PACIFIC		
Estimated Appraisal Date:	24-Apr-2017	**Estimated Board Date:**	30-Jan-2018
Practice Area (Lead):	Water	**Financing Instrument:**	Investment Project Financing
Borrower(s)	PEOPLE'S REPUBLIC OF CHINA		
Implementing Agency	Liaoning Urban Construction and Renewal Project Office (LUCRPO)		

Financing (in USD Million)

Financing Source	Amount
Borrower	136.29
International Bank for Reconstruction and Development	250.00
Financing Gap	0.00
Total Project Cost	386.29

Environmental Category:	B-Partial Assessment
Appraisal Review Decision (from Decision Note):	
Other Decision:	
Is this a Repeater project?	No

B. Introduction and Context

Country Context

China is making a shift towards resource conservation after a period of unprecedented economic growth and urbanization. China has experienced economic growth that averaged ten percent a year for

three consecutive decades. This was coupled with unprecedented level of urbanization, where half of the population was living in cities in 2016 compared to only one fifth in 1978, and is expected to reach 70% (about 1 billion people) by 2030. GDP growth has been strong, though declining in recent years, from more than ten percent in 2010 to almost seven percent in 2015. To ensure wider inclusion and shared prosperity, medium-term policy has shifted towards reducing the economic, environmental, and social imbalances from the period of rapid economic growth. As a result, the 12th Five-Year Plan (2011-2015) emphasized green growth models, aiming to reduce pollution and increase energy efficiency. Moreover, it was the first five-year plan to include a specific section on water, including a target of 95% urban water coverage, measures for water resource conservation, and promotion of new technologies, together with continued focus on infrastructure investment. As a continuation of the policy of green and equitable growth, the 13th Five-Year Plan (2016-2020) highlights innovative infrastructure and green development, and plans to reduce energy intensity by fifteen percent.

Liaoning Province is situated in the northeast of China, sharing a border with North Korea to the southeast. Prior to economic reforms in the late 1970s that saw unprecedented growth in China, Liaoning was one of the country's major industrial centers, focusing on heavy industry and mining. The province became one of China's most urbanized provinces. The urban population settled in a number of medium cities whose economies anchored around a small number of state-owned industrial and mining enterprises. By 2015, Liaoning Province had a total population of 43.9 million, of which 67% live in urban areas. On the other hand, infrastructure development in those medium cities had difficulty catching up with the population growth, and they often suffered from deterred infrastructure maintenance. Over the past decade, the central government has prioritized the economic revitalization of the northeast provinces, including Liaoning, where the challenges related to the availability of water resources as an indispensable input to the country's economic growth and sustainable development.

Water scarcity is recognized as a growing concern for cities in China, especially in northeastern provinces like Liaoning. China is the world's second largest economy and houses a fifth of the world's population, yet has only seven percent of the world's freshwater resources. Water scarcity, driven by both limited water availability and diminished water quality, remains one of the most pressing challenges to sustainable urban development. The urban water deficit is estimated at six billion cubic meters a year, with 420 cities having insufficient water supplies and 110 facing severe water shortages. Water resources are geographically unevenly distributed, with the northern regions being the most water scarce.

Liaoning Province's per capita water resources of 820 m3/year is a third of the national average and a twelfth of the world average. The quality of the Liao River, one of the seven main river systems in China, and the most important river system in Liaoning Province, is deteriorating. In the face of over-exploitation and pollution of groundwater sources, Liaoning Province has taken strong steps to phase out all groundwater use by 2020. A raw water supply system from Dahuofang Reservoir is being developed to facilitate this shift. The Dahuofang Water Delivery Project will supply 1.8 billion m3/year to the cities of Fushun, Shenyang, Liaoyang, Anshan, Yingkou, and Panjin.

Sectoral and Institutional Context

Generally, in China, water supply in cities is continuous, provided twenty-four hours a day, seven days a week. However, the challenges of maintaining service quality remain, for example, maintaining adequate pressures and supplying quality water that passes regulatory standards. In year 2012, the government of China applied strict criteria to drinking water quality and revised its Drinking Water Standards. As a result, the number of water quality parameters has been increased from 35 under the previous standard introduced in 1985 to 106 parameters, in line with the World Health Organization. Meeting the water quality standards is a major challenge in Liaoning as it is coupled with its aging

water assets, need for new technologies adaptation and building the operation and managerial capacities to ensure quality service delivery at high efficiency and effectiveness.

About 77% of the urban population of Liaoning Province has access to piped water supply, lagging behind the targeted 95% set by the Central Government. The slowing of the provincial economy resulted in under investment in water infrastructure. Hence, the deficiency of water treatment plants to meet new drinking water standards. Moreover, water distribution systems are outdated, and high levels of non-revenue- water (NRW), that reaches as high as 60% in some municipalities in the province, are putting additional constraints on meeting future demand in an already water scarce environment. Water utilities' management systems are outdated and there is a need for modernization of systems and processes to improve operation and maintenance, and specifically manage leakage.

Liaoning Province has established a target of 25% NRW, which will lead to tangible improvements in energy efficiency per unit water supplied, and associated reduction of greenhouse gas (GHG) emissions. Energy costs for water utilities in China are typically up to 50% of the total operations and maintenance costs, and predominantly from water distribution systems. Energy efficiency in Liaoning water utilities is 45% below the national average in terms of specific energy consumption (0.51 kW.hr/m3 compared to the national figure of 0.35 kW.hr/m3). This is largely due to aging water distribution infrastructure, including inefficiencies in pump operation, and inadequate pressure management exacerbated by high levels of leakage.

Water utilities are public, owned and run by the municipality. Tariffs are not linked to capital or operational expenditure, and funds for sector investment are generally through fiscal transfers. Water tariffs tend to be low despite legislation to set them at cost-recovery levels. Most water companies suffer from financial loss and are provided operational subsidies. Tariffs are generally low and adjustments are made infrequently, around once every four years, and mainly used to keep pace with inflation. Generally utility fees are fully affordable even for households with slowing disposable income growth. Local governments tend to have sufficient funds to subsidize water companies. The aforementioned presents a real challenge to water utilities in Liaoning province to maintain operational efficiency. A challenge that both the Central Government, the Provincial Government and the Local Governments have recognized, and led to partnering with the World Bank since 1985 to invest in, and build capacity, to improve the level of service in Liaoning.

Rationale for Bank involvement: Liaoning Province has a longstanding partnership with the Bank. In the water sector, the World Bank financed the Liaoning Environment Project (1995-2003) and the Liao River Basin Project (2002-2008), which supported sustainable and safe water supply, wastewater, and enhanced water quality management on the basis of an integrated river basin management approach. In more recent years, the Second Liaoning Medium Cities Infrastructure Project (LMC-2) (P092618), which was completed in 2015, financed investments in water supply, wastewater and solid waste management in six project cities (Anshan, Haicheng, Fushun, Yingkou, Panjin and Xingcheng). The major outcomes were improvement in performance and sustainability of water supply services through expanding the service coverage, developing network mapping by using GIS system, technical assistance to enhance the capacity of water utilities, and successful implementation of pilot NRW programs. The project was rated Satisfactory, and based on the successful results of LMC-2, the Liaoning Government intended to scale-up these activities and extend the scope in other cities in the province.

The project cities share common water supply challenges. Despite differences in their sizes and levels of development, the project cities share the following common water supply challenges:

(i) Water supply coverage and expansion of the distribution network is lagging behind the development of the city.

(ii) Water sources are increasingly polluted, the majority of water treatment plants have not been upgraded since they were first constructed, and higher drinking water quality standards requires plants modifications and some facility retrofit. Treatment plants do not have adequate treatment processes and technologies to treat the current raw water to the required standard.

(iii) Water pressure in city areas is insufficient beyond the first two or three floors, requiring booster pumps to lift it to higher floors. In some cases, booster pumps are operated and maintained by non-professional property management companies leading to poor maintenance compared to those operated and maintained by the water company.

(iv) Secondary distribution systems, in the older parts of the cities, have exceeded their service lifetime. Hence, pipe leaks and failures are common, leading to the ingress of sediment and pollutants and impacting pressures in the rest of the system. In addition, old pumps are no longer running at optimal levels, thereby increasing energy consumption.

(v) There is insufficient data collection and analysis capability to conduct network optimization to better manage the water pressure, monitor the distribution system efficiency and to make well informed decisions regarding asset management and upgrade. Management information and telemetry systems are outdated, brief and fragmented, making integrated system management very difficult.

C. Proposed Development Objective(s)

Development Objective(s)

The project development objectives are to improve water quality and operational efficiency of selected water supply utilities in the project areas.

Key Results

(i) Direct project beneficiaries (number), of which female (percentage);
(ii) Compliance with health quality standards (percentage);
(iii) Non-Revenue Water Reduction in each project city (percentage); and
(iv) Energy consumption reduction by the water utilities in each project city (kW.hr/m3).

D. Project Description

The proposed project intends to improve the water supply service in a total of five cities in Liaoning Province, namely Shenyang, Anshan, Fushun, Fuxin and Gaizhou. These five cities were chosen because (i) they have real demands to improve water supply systems; and (ii) they are large industrial cities, which are the primary focus of the Government's policy to invest in rehabilitation in Northeast provinces, including Liaoning. All five localities have experience with the implementation and management of projects financed by the World Bank, but mostly in other sectors.

Through the People's Republic of China, via on-lending agreements, the project will provide the participating water supply companies an IBRD loan of US$250 million in Investment Project Financing to improve the piped distribution network as well as its institutional ability to provide efficient services and cover its costs. As described in the "Introduction and Context" section of the Project Appraisal Document (PAD2096), the loan is aligned with Government and World Bank

priorities. The counterpart contribution is estimated at US$136.29 million. Moreover, the following key aspects have been considered during the project design:

Lessons learned from previous and similar operations: The project will benefit from the lessons learned from LMC-2 (P092618) and Jiangsu Water and Wastewater project (P096926). Namely this includes (i) ensuring the availability of counterpart funds before project Effectiveness to avoid implementation delays; (ii) identifying institutional weaknesses that may impede the pace of implementation; (iii) selecting performance targets that are consistent with the prevailing policy environment and precedents; (iv) having some detailed designs for sub-projects ready by the start of implementation and also develop some pre-screened standby spare sub-projects; (v) packaging similar works under one or few number of contracts; (vi) planning and implementing training and TA programs at an early stage to benefit the implementation; and (vii) soliciting effective and efficient implementation through the public private partnership. In this case, for some cities/counties, performance based service contracts can be outsourced to the private sector. This will also allow to compare the performance of public utilities and PPP arrangement in achieving certain targets like reduction in NRW and improving the energy efficiency.

Innovation: The project activities will enable an innovative approach of improving the efficiency of the water services that will place the participating cities of Liaoning among other globally recognized water supply utilities with best practices. Such innovation is demonstrated through the integrated and comprehensive approach to improve distribution system efficiency, and operational and management efficiency of the water company, while addressing the institutional and organizational aspects that converge towards achieving the project objectives. NRW will be addressed under one project from the various angles which covers the infrastructure investments, in addition to the managerial aspects.

In addition, the project will pioneer the use of durable pipelines with longer life erosion resistance that will be appropriate to the local conditions, like the use of pre-stressed concrete pipe, sand inclusion glass fiber reinforced plastic pipe, three stage pre-stressed pipe, and UPVC pipes.

The project will also address the energy efficiency and saving through the reduction in Non-Revenue-Water (NRW) as well as the utilization of more efficient pumps, reconfiguration of the distribution system and the pressure control.

Transformational merits: Based on the project data analysis, the project will impact the water supply services in five cities/counties totaling a significant population of around 5.698 million inhabitants. The project has the potential to save around 113 million cubic meter of water (of which 73.4 million cubic meter are directly from the project finance), 77.9 GW.hr/year of electricity, and to reduce 74.0 million kg/year of the CO2 emission in year 2022 (0.95 kg of CO2/kW.hr of electricity) that would be compounded to 3,518,833 tons of CO2 in 30 years assuming a supply growth of 3% per year. The annual saving of around 113 million cubic meter of water resources (estimated at 12.3% of the current production) will reduce the pressure on the surface water as well as the stressed groundwater and delay need to raise capital for the expansion of production capacity.

The project consists of the following three components:

Component 1: Water supply service infrastructure improvement (Cost US$287.14 million, of which IBRD Loan US$185.06 million)

The objective of this component is to support the infrastructure investment required to improve water supply services, reduce NRW and increase energy efficiency. It will focus on civil works construction

and rehabilitation that will directly increase the quantity and improve the quality of water supply, and improve the distribution network capacity and performance. This will include (i) water treatment plant upgrade and rehabilitation; (ii) water service reservoir/tank construction and rehabilitation; (iii) pump and pump station construction, replacement, repair and rehabilitation; (iv) pipe construction, replacement, repair and rehabilitation; (v) control valve construction, replacement, repair and rehabilitation; (vi) district, bulk and commercial customer meter construction and replacement; (vii) customer meter construction and replacement; and (viii) service connection construction and replacement. The project will pioneer the use of durable pipelines with longer life and higher corrosion resistance that will be appropriate to the local conditions, like the use of pre-stressed concrete pipe, sand inclusion glass fiber reinforced plastic pipe, three stage pre-stressed pipe, and UPVC pipes. In addition, all active and passive monitored equipment and facilities will be made ready for telemetry and/or online monitoring and control in order to be compatible with the management information systems (MIS), Supervisory Control and Data Acquisition Systems (SCADA) and other telemetry systems. .

Component 2: Water supply service management improvement (Cost US$57.08 million, of which IBRD Loan US$48.63 million)

The objective of this component is to enhance water supply service management through NRW reduction, water quality monitoring, energy savings, and effective asset management. Activities to be financed under this component are categorized as technical assistance to prepare plans and data collection, purchase of necessary software and computer programs and user licenses, supply and installation of systems hardware including computers and other networking and telemetry equipment and will include: (i) mapping and modeling of all water distribution systems in selected cities, using GIS and other hydraulic modeling software; (ii) development of comprehensive NRW reduction plans, covering the reduction of technical and commercial losses, including the development of on-line monitoring and analysis systems for pipeline operation and leakage control, the purchase of leak detection equipment and related monitoring and measuring instruments; (iii) development of comprehensive energy management plan; (iv) development and upgrading of computerized water supply management systems, including MIS and SCADA systems; and (v) enhancement of water quality monitoring schemes for all water treatment plants as well as monitoring along the distribution network and other system facilities.

In addition this component will finance equipping and upgrading sampling and testing capacity. Water testing laboratories will be upgraded to cope with the regulatory requirement for monitoring the increased number of parameters from 35 to 106, as required by the Drinking Water Standards; and building the capacity in provisions for Public-Private Partnership (PPP) arrangement that would involve preparation for appropriate PPP arrangement and the preparation of transaction draft tender documents and contract(s) for some feasible arrangements. The aforementioned activities are applicable to the five project cities with some tailored specifications related to the level of complexity and comprehensive of the SCADA system and the specific requirement for the water quality monitoring.

Component 3: Project implementation support and institutional strengthening (Cost US$16.94 million, of which IBRD Loan US$15.69 million)

This will provide consultancy services for institutional capacity building of water supply companies in the participating cities and project implementation support as well as incremental operation costs. The institutional strengthening will emphasize on the water company reform in terms of its organizational arrangement (especially in regards to the leakage control and SCADA systems management) to cope

with achieving the project objectives. Activities will cover training (domestic and international), study tours and capacity building of water company staff, particularly in (i) utility management, which entails water company management, financial management and commercialization and PPP modalities, customer service and public engagement, and improved accountability and expansion of water company benchmarking system to enhance the competition between public utilities; (ii) operation and management of SCADA system, including GIS, mapping and hydraulic modeling, and asset management; (iii) water quality sampling and testing; (iv) operation and management of water treatment plants and secondary pump stations; (v) leakage detection and NRW and energy managements; and (vi) project management. Activities under the project implementation support will include: (i) office equipment; (ii) domestic and international training for the provincial project management office (PPMO) as well as the project implementation units (PIUs); (iii) project management consultants for design reviews and construction supervision; (iv) external monitoring of implementation of environmental and social safeguards; and (v) organization of conferences, workshops and meetings to enable knowledge sharing, dissemination of study results and peer to peer learning among the participating water companies as well as other interested water companies.

Gender considerations have been integrated in project design, in particular through the Social Assessment (SA) and RAP preparation. Citizen engagement was a key aspect of the project SA and RAP preparation. Consultation activities included two rounds of field investigations with a range of relevant government agencies, local residents and other stakeholders. Public consultation and participation will continue to draw on local people's views and feedback on project implementation. Under the project, water companies will carry out customer satisfaction surveys to measure the customers' perceptions of the quality of water services. Citizen engagement is part of the project's Results Framework through the following indicators: (i) percentage of customer satisfaction of the quality of water supply services; and (ii) grievances responded and/or resolved within the stipulated service standards for response times.

Component Name:
Component 1: Water supply service infrastructure improvement
Comments (optional)

Component Name:
Component 2: Water supply service management improvement
Comments (optional)

Component Name:
Component 3: Project implementation support and institutional strengthening
Comments (optional)

E. Project location and Salient physical characteristics relevant to the safeguard analysis (if known)

The proposed project is in Liaoning Province. The Province includes 14 prefecture-level cities and has an area of 145,900 km2 with a population of 43.91million people. The proposed project will be in five cities of Liaoning Province, i.e. Shenyang (capital city of Liaoning), Anshan, Fushun, Fuxin, and Gaizhou. The project mainly focuses on the rehabilitation and improvement of existing water distribution network and treatment facilities. Most of the physical investment under Component 1 will be in the urban area of the five selected cities, while some investment (e.g. water supply pipelines) will be in peri-urban areas running along existing roads/in agricultural lands. Two existing water treatment plants to be rehabilitated under the project draws directly from two existing reservoirs (i.e. Naodehai

Reservoir in Fuxin City, Tanghe Reservoir in Anshan City).

F. Environmental and Social Safeguards Specialists

Feng Ji, Environmental Safeguards Specialist

Feng Ji, Social Safeguards Specialist

Meixiang Zhou, Social Safeguards Specialist

Ximing Zhang, Social Safeguards Specialist

II. IMPLEMENTATION

The institutional and implementation arrangements for this project involves two levels: the provincial level and the city level. At the provincial level, the arrangements are very similar to those in the previous Bank-financed water project in Liaoning, Second Liaoning Medium Cities Infrastructure Project (LMC-2). Liaoning Provincial Government has established the Liaoning Provincial Leading Group (LPLG) to provide policy direction for the preparation and implementation of the project, which is led by Executive Vice Governor. Members include senior representatives from Liaoning Provincial Development and Reform Commission (LDRC), the Liaoning Provincial Department of Finance (LPDF), the Liaoning Provincial Construction Commission (LPCC), the Liaoning Provincial Environmental Protection Bureau, and the Liaoning Provincial Water Resource Conservancy Bureau. The LPLG has designated Liaoning Urban Construction and Renewal Project Office (LUCRPO), under Liaoning Construction Commission, to serve as a PPMO.

At the city level, respective city-owned water supply utilities, namely Shenyang Water Supply Company, Anshan Water Supply Company, Fushun Water Supply Company, Fuxin Water Supply Company, and Gaizhou Water Supply Company, will be in charge of managing day-to-day operations, implementation of subprojects and coordination with municipal governments, with close collaboration with LUCRPO. For this day-to-day management of the project implementation, each water company will establish a PIU.

Roles and responsibilities among key agencies are clearly defined in terms of project administration. For the subprojects under water supply service infrastructure improvement (Component 1) and the activities under the water supply service management improvement (Component 2), the respective water supply companies of five cities will be responsible. For activities under project implementation support and institutional strengthening (Component 3), LUCRPO will be responsible for the implementation.

LUCRPO will function as a focal point for project management, coordination among different government agencies, and reporting to the provincial government and the Bank. Its responsibilities include: (i) overall project coordination, management and monitoring; (ii) annual budget preparation; (iii) project-wide quality assurance; (iv) progress reporting (on physical implementation, achievements towards targets in the results framework, safeguards implementation (see Section IV.A.4), and financial management) to the Liaoning Provincial Government and the Bank, including cost management, project impact and environmental improvement; (v) interagency coordination and procurement support; (vi) resolving various issues related to technical, social and environmental problems during the project

implementation; and (vii) implementation of cross-city activities, such as training and capacity building of utility staff.

The monitoring and evaluation system for the project will monitor implementation progress and outcomes and will provide special monitoring for safeguards compliance. These tasks will be undertaken by LUCRPO, PIU and the provincial LDRC. LUCRPO and PIUs, supported by an implementation support consultant team, will undertake monitoring and reporting of progress and results (outputs and outcomes). Outcome indicators for the project and each component with baseline values and target values are provided the Project Appraisal Document (PAD). Progress toward achieving the targets of the indicators will be presented in the semiannual progress reports, which will be provided to the Bank. The semi-annual implementation support missions by the World Bank will support the monitoring and evaluation and assist in providing professional recommendation to facilitate the project implementation towards the achieving of its development objective. At the project closure, the Implementation Completion and Results (ICR) report will be prepared, reflecting on the project design, implementation and results achieved. A mid-term review will be carried out no later than June 30, 2020.

III. SAFEGUARD POLICIES THAT MIGHT APPLY

Safeguard Policies	**Triggered?**	**Explanation (Optional)**
Environmental Assessment OP/BP 4.01	Yes	It is confirmed that the policy on Environmental Assessment (OP 4.01) is triggered, as there may be potential adverse impacts resulting from project-financed activities. Overall, however, the project's environmental and social impacts are expected to be positive: The proposed project will reduce leakage rate of water distribution networks, improve the capacity and performance of the distribution network, improve drinking water quality for water users, and enhance the urban water supply management capacity in five selected cities of Liaoning province. This will overall lead to a more efficient use of water, and the energy required for its distribution. Potential negative impacts are predictable and manageable with readily available, standard safeguards methods and tools. They relate mainly to construction activities and include airborne dust, exhaust emissions from vehicles and machinery, noise, waste management (disposal of spoil materials and construction waste) and risks to the health and safety of local communities, especially due to increased traffic, especially from heavy machinery and trucks. During project operation, there will be

		among other things the need for handling and use of chemical agents (i.e. disinfectants) at the WTPs, and noise reduction management for pumping stations. Due to the limited scope and magnitude of the anticipated impacts, the project is proposed as safeguards Category B. The following factors were taken into consideration: (i) the project mainly focuses on the rehabilitation and improvement of existing water distribution networks and the existing treatment facilities (see EMP's Chapter II-project description for detail); (ii) new proposed facilities (i.e. pumping stations) are of small scale and not located in areas with sensitive receptors which could be adversely impacted by their construction or operation; and (iii) all environmental issues associated with construction and operation for water distribution networks and the rehabilitation of WTPs are of limited extent, reversible and can be readily managed with well-known good construction management.(see Section IV-A-1 for detail).
Natural Habitats OP/BP 4.04	No	The project mainly focuses on improvement of existing water distribution and treatment facilities. The proposed new facilities such as pumping stations are located in urban or peri-urban areas which have been heavily influenced by human activities. The project activities will not affect protected areas, natural habitats, or established or proposed critical natural habitats. This policy is not triggered.
Forests OP/BP 4.36	No	The project mainly focuses on the improvement of existing water distribution and treatment facilities. The project will not have impacts on the health and quality of forests, nor affect the rights and welfare of people and their level of dependence upon or interaction with forests, nor aim to bring about changes in the management, protection, or utilization of natural forest or plantations. This policy is not triggered.
Pest Management OP 4.09	No	The project will not include any procurement of pesticides or pesticide application equipment; nor introduce any new pest management practices, or expand/alter

		existing pest management practices; nor lead to substantially increased pesticide use and subsequent environmental and health risks. This policy is not triggered.
Physical Cultural Resources OP/BP 4.11	Yes	The rehabilitation of water supply network in Shenyang could have potential adverse effects on Nanguan Catholic Church (a provincial level PCR). This church is located at a distance of 180m from the anticipated construction sites for the rehabilitation of water supply network in Shenyang. Construction will cause short-term disturbance of accessibility to the church. Public consultation with the affected church has been conducted, based on which no construction will be allowed during religious festivals. This requirement as well as Chance Find Procedures are included in the EMP.
Indigenous Peoples OP/BP 4.10	No	The social assessment has confirmed that the IP policy will not be triggered as most of the project sites are in urban areas and even in rural villages of Fuxin Mongolian autonomous county there is no IP presence in project areas. Specifically, the project sites in Shenyang, Anshan and Fushun are in urban areas with no presence of indigenous peoples. At potential rural areas of project sites in Gaizhou and Fuxin where project will fund water pipe networks, local residents are also Han people. Ethnic minorities such as Mongol people are well integrated with the majority Han people. The ethnic population in the area will not be affected. This summary assessment results from a consolidated social assessment which has been done in accordance with the Bank's requirements. A social assessment report was prepared by professional consultants and deemed satisfactory to the Bank requirements.
Involuntary Resettlement OP/BP 4.12	Yes	This policy is triggered due to construction activities related to the potential expansion of existing plants, water pipe networks, and pump stations. While most of the civil works will be carried out on existing plots on public land, 3.024 mu (about 0.2 ha) additional collective land will be acquired from a village for the construction of water pump stations and access roads in Fuxin. This will affect one village collectively but no individual household will be affected. Furthermore,

		354.9 mu of collective land will be acquired for temporary use of pipe line network and 1308.3 mu of state-owned land will be also temporarily used in project sites in Fuxin and Gaizhou, which will temporarily affect 275 households with 902 people. The rest project sites are in urban areas with no need for land acquisition. A linked project is identified in in LXB Water Supply Supporting Project in Fuxin City because the Bank supported water pipe line will need to use the water treatment plant and connecting pipe network for water supply. This project is going to construct 2 water treatment plants with capacity of 104,000 m3/day each, and 45km of water distribution pipe networks. The land acquisition of the project will affect Fumeng County, Xinqiu County, Xihe District, Qinghemen District, Science & Technology Park of Fumeng County and High Tech Park in Fuxin City. The total land occupation area is 2789.86mu, of which, there are 226.62mu of permanent land acquisition and 2563.24 mu of temporary land occupation. There will be 1820 people from 521 households affected. A resettlement action plan (RAP) has been prepared to address land acquisition and resettlement for both Gaizhou and Fuxin. For any other potential land demands under the project that may become known after appraisal, a resettlement policy framework (RPF) has been prepared as an annex of the RAP and ESMF. The RAP delineates the project's land requirements and the associated social impacts and risks, contains social and economic survey results for the affected stakeholders, as well as descriptions of compensation packages, and provides procedures of land acquisition, mechanism for grievance redress, implementation time frame, budget and implementation agencies. A professional experienced consulting firm will be contracted to monitor and evaluate the implementation of the RAP, ESMF and or other planned social actions.
Safety of Dams OP/BP 4.37	Yes	The project does not finance construction of dams. However, some assets financed under

		the project, such as new WTP, improvement of existing WTPs and water transfer pipelines, would depend on water from four existing reservoirs formed by 4 dams: Dahuofang Dam in Fushun City, Shimen Dam in Gaizhou City, Naodehai Dam in Fuxin City and Tanghe Dam in Liaoyang City. The policy is triggered becausethe proper performance of these dams directly impacts the functioning of the Bank-financed investments. As required by OP4.37 the client hired an independent dam expert to (i) inspect and evaluate the safety status of the existing dams, their appurtenances, and their performance history; (ii) review and evaluate the owner's operation and maintenance procedures (e.g. Operation and Maintenance (O&M) and Emergency Preparedness Plan); and (iii) provide written reports of findings and recommendations for any remedial work or safety-related measures necessary to upgrade the existing dam to an acceptable safety standard. The independent dam expert prepared dam safety review reports and submitted to the Bank. The Bank team reviewed the reports and concurred the results and recommendations of the reports: All four dams are structurally and operationally safe. The Bank task team and client will keep monitoring dam safety aspects of the project to ensure the Bank OP4.37 is properly followed.
Projects on International Waterways OP/BP 7.50	No	The project is not associated with an international waterway. This policy is not triggered.
Projects in Disputed Areas OP/BP 7.60	No	The project is not located in disputed areas. This policy is not triggered.

IV. Key Safeguard Policy Issues and Their Management

A. Summary of Key Safeguard Issues

1. Describe any safeguard issues and impacts associated with the proposed project. Identify and describe any potential large scale, significant and/or irreversible impacts:
Environmental Assessment (OP4.01): The project mainly focuses on the rehabilitation of existing water supply and treatment facilities in five major cities of Liaoning Province. Most of the physical investment under the project will be in urban areas, while some investment (e.g. water supply pipelines) will be in peri-urban areas. Negative impacts are predictable and manageable with readily available standard safeguards methods and tools. They relate to

construction activities and include airborne dust, exhaust emissions from vehicles and machinery, noise, waste management (disposal of spoil materials and construction waste) and risks to the health and safety of local communities, especially due to increased traffic, especially from heavy machinery and trucks. During project operation, there will mainly be the handling and use of chemical agents (i.e. disinfectants) at the WTPs to be rehabilitated by the project, and noise reduction management for pumping stations. During operation, the project brings about positive impacts, for example, the improved access to quality water supply services will benefit 5.69 million people, the rehabilitation of the existing water supply system will reduce water leakage rate by 114 million m3/year, and the improvement of the operational efficiency of water supply utilities would lead to 77.9 million kWh/year electricity savings. There would be limited adverse impacts such as noise from the pumping stations, and the risk associated with the leakage of disinfectant (e.g. chlorine) at the WTPs. These will be addressed and mitigated as part of routine operations and with well-established technical procedures. As part of the EA process, due diligence for the existing WTPs and the water sources has been conducted. The issues identified such as the aging of equipment/treatment units/pipes will be addressed by the project and included in the project design.

Physical Cultural Resources (OP4.11): The rehabilitation of water supply network along an existing street (i.e. Xishuncheng) in Shenyang would cause traffic disturbance to Nanguan Catholic Church, which was re-built in 1912 with a footprint of 1,100 m2. The Church was classified as a municipal level PCR in February 1985 and a provincial level PCR in December 1988. It is the catholic community center in Shenyang serving religious services for about 2,000 catholic believers. The church is in the vicinity (with a separation distance of 180 m) of the rehabilitation of water supply network. The network rehabilitation will not acquire land or encroach on the property of the church and will provide better service for the local communities after the construction is completed. But, the construction will cause short disturbance to local traffic and of the accessibility to the church.

Dam Safety policy (OP4.37): The project does not finance construction of dams. However, some assets financed under the project, such as new WTP, improvement of existing WTPs and water transfer pipelines, would depend on water from four existing reservoirs formed by 4 dams. Thus, an assessment of the dams' functioning and safety was conducted by a qualified engineer. The result of the assessment confirmed that the dams are structurally sound and operated in a safe manner. The dams will be monitored throughout project implementation.

The project will not have negative impacts that are of large scale, significant and/or irreversible.

Social:

The project will have significant positive social impacts from improvement of water services and quality. I t will support a number of water pumping stations and wide pipe networks with limited impact in terms of temporarily occupying land.

Involuntary resettlement (OP4.12): While most of the civil works will be built on existing plots on public land, 3.024 mu (about 0.2 ha) additional collective land will be acquired from

a village in Fuxin for the construction of water pumping stations and pipe lines. This will affect one village collectively but no individual household will be affected. Furthermore, 354.9 mu of collective land will be acquired for temporary use of pipe line network and 1308.3 mu of state-owned land will be also temporarily used in project sites in Fuxin and Gaizhou. This will temporarily affect 275 households with 902 people. The rest of the project sites are in urban areas with no need for land acquisition.

A linked project is identified in LXB Water Supply Supporting Project in Fuxin City because the Bank supported water pipe line will need to use the WTP and connecting pipe network for water supply. This project is going to construct 2 WTPs with capacity of 100,000 m3/day each, and 45km of water distribution pipe networks. The land acquisition from this linked project will affect Fumeng County, Xinqiu County, Xihe District, Qinghemen District, Science & Technology Park of Fumeng County and High Tech Park in Fuxin City. The total land occupation area is 2789.86mu, of which, there are 226.62mu of permanent land acquisition and 2563.24 mu of temporary land occupation; there will be 1820 people from 521 households affected.

2. Describe any potential indirect and/or long term impacts due to anticipated future activities in the project area:

The improved water supply capacity (e.g. from the reduction of water leakage rate) would help to meet future water demand from domestic, commercial and industrial users. This could lead to increased wastewater quantities from the cities. After reviewing the wastewater treatment capacity of the five cities, the EMP shows that the cities can accommodate the maximum anticipated increased quantity of the wastewater without negative impacts on effluent quality.

3. Describe any project alternatives (if relevant) considered to help avoid or minimize adverse impacts.

Alternative Analysis (e.g. pipe construction methods) was carried out for the investment components during the feasibility study to minimize environmental impacts.

4. Describe measures taken by the borrower to address safeguard policy issues. Provide an assessment of borrower capacity to plan and implement the measures described.

Environmental Assessment: (OP4.01)
An Environmental Management Plan (EMP) has been developed for the project covering each of the cities in accordance with Chinese environmental policy frameworks as well as the Bank safeguard policies. Mitigation measures consist of (i) Environmental Code of Practices to address general construction related impacts; for example, civil work contractors are requested to water construction sites during dry and windy seasons, mitigate noisy construction activities and avoid night time construction, and manage traffic around construction sites; (ii) specific mitigation measures during design, construction and operation phase, for example, (i) the project will install energy efficient and water saving equipment; (ii) non-trenching methods (e.g. pipe jacking/drawing) are proposed to minimize construction impacts on streams and public facilities; (iii) the replaced pipes, pumps and water meters will be sent to the designated sites for recycling and utilization; and (iv) an emergency plan has been proposed for the leakage of disinfectant at the WTPs. Measures for the construction phase will be entered into bidding documents and civil works contracts. The EMP also

includes applicable policies, environmental standards, monitoring plan, institutional arrangement, capacity building and the estimated budget for the mitigation measures and monitoring programs for both construction and operation phases.

Physical Cultural Resources (OP4.11): Public consultation with the affected church has been conducted, based on which no construction will be allowed during the religious festivals. This requirement and Chance Find Procedures are included in the EMP.

Involuntary Resettlement: (OP4.12)
A resettlement action plan (RAP) has been prepared to address land acquisition and resettlement for both Gaizhou and Fuxin. The RAP delineates the project's land requirements and the associated social impacts and risks, contains social and economic survey results for the affected stakeholders, as well as descriptions of compensation standards and provides packages, procedures of land acquisition, mechanism for grievance redress, implementation time frame, budget and implementation agencies. A professional experienced consulting firm will be contracted to monitor and evaluate the implementation of the RAP, ESMF and or other planned social actions.

The Project may include small additional investments under Component I (e.g. water distribution pipes, pumping stations) which are not known during project preparation. To accommodate for such additional activities impacts, an Environmental and Social Management Framework (ESMF) has been prepared. The ESMF sets out the guidelines and procedures to screen, assess and address environmental and social impacts of the proposed activities, as well as guidance on their management and mitigations. The ESMF includes, among others things, safeguards policies and guidelines and procedures to address safeguards issues caused by physical activities financed by the Project. Each of the proposed investments will be screened to identify/define its potential social and environmental impacts; safeguards policies triggered; EA category; safeguards' instruments to be prepared; and consultation and disclosure requirements.

The Liaoning Provincial Leading Group (LPLG), chaired by a Vice Governor of Liaoning, will provide high-level guidance to the project, and coordinate on policy and institutional issues related to the project. A well-established office under the Liaoning Provincial Construction Department (LPCD), called the Liaoning Urban Construction and Renewal Project Office (LUCPRO), will provide overall project management. The LUCPRO has obtained rich experience with the World Bank financed projects since 1989. The LUCPRO has designated one staff for the overall environmental management and one staff for overall social risk management for the project and for the supervision of the safeguards documents implementation. LUCPRO will engage a project management company including experienced environmental specialists to provide LUCPOR and city-owned utility with technical guidance. All water supply projects will be implemented by the respective city-owned utility. All five localities have experience with the projects financed by the World Bank and have designated staff for social and environmental safeguards management. Under the supervision of LUCPRO and local EPBs, the city-owned utility will be responsible for implementing the safeguards documents, ensuring that safeguards clauses are integrated into the construction contracts. City-owned utility will hire on-site supervision company to monitor the

performance and compliance of the safeguards documents during construction. Grievance mechanism has been established at local EPBs and will be established at city-owned utility and civil work contractors. During project preparation, the client has engaged experienced environmental and social consultants to prepare safeguards document. During project implementation, external monitoring consultants will be engaged by city-owned utility to monitor and report the compliance of the safeguards documents. The capacity of the borrower is deemed to be satisfactory.
5. Identify the key stakeholders and describe the mechanisms for consultation and disclosure on safeguard policies, with an emphasis on potentially affected people.
Public Consultations and Information Disclosure: In accordance with OP4.01 and OP4.12, public consultations have been conducted during the safeguards preparation process, including questionnaire and meetings with project affected people. The consultation was undertaken mainly in November 1-December 31, 2016. Feedback and concerns from the consultation have been addressed in the safeguards documents. The safeguards documents were locally disclosed at the governmental website on March 7, 2017 and disclosed on the Bank website on March 30, 2017.

B. Disclosure Requirements

Environmental Assessment/Audit/Management Plan/Other	
Date of receipt by the Bank	07-Mar-2017
Date of submission to InfoShop	30-Mar-2017
For category A projects, date of distributing the Executive Summary of the EA to the Executive Directors	
"In country" Disclosure	
China	07-Mar-2017
Comments:	
Resettlement Action Plan/Framework/Policy Process	
Date of receipt by the Bank	07-Mar-2017
Date of submission to InfoShop	30-Mar-2017
"In country" Disclosure	
China	28-Mar-2017
Comments:	
If the project triggers the Pest Management and/or Physical Cultural Resources policies, the respective issues are to be addressed and disclosed as part of the Environmental Assessment/Audit/or EMP.	
If in-country disclosure of any of the above documents is not expected, please explain why::	

C. Compliance Monitoring Indicators at the Corporate Level

OP/BP/GP 4.01 - Environment Assessment						
Does the project require a stand-alone EA (including EMP) report?	Yes	[X]	No	[]	NA	[]
If yes, then did the Regional Environment Unit or Practice Manager (PM) review and approve the EA report?	Yes	[X]	No	[]	NA	[]
Are the cost and the accountabilities for the EMP incorporated in the credit/loan?	Yes	[X]	No	[]	NA	[]
OP/BP 4.11 - Physical Cultural Resources						
Does the EA include adequate measures related to cultural property?	Yes	[X]	No	[]	NA	[]
Does the credit/loan incorporate mechanisms to mitigate the potential adverse impacts on cultural property?	Yes	[X]	No	[]	NA	[]
OP/BP 4.12 - Involuntary Resettlement						
Has a resettlement plan/abbreviated plan/policy framework/process framework (as appropriate) been prepared?	Yes	[X]	No	[]	NA	[]
If yes, then did the Regional unit responsible for safeguards or Practice Manager review the plan?	Yes	[X]	No	[]	NA	[]
Is physical displacement/relocation expected?	Yes	[]	No	[X]	TBD	[]
Is economic displacement expected? (loss of assets or access to assets that leads to loss of income sources or other means of livelihoods) 902 Provide estimated number of people affected to date, or to be affected.	Yes	[X]	No	[]	TBD	[]
OP/BP 4.37 - Safety of Dams						
Have dam safety plans been prepared?	Yes	[X]	No	[]	NA	[]
Have the TORs as well as composition for the independent Panel of Experts (POE) been reviewed and approved by the Bank?	Yes	[]	No	[]	NA	[X]
Has an Emergency Preparedness Plan (EPP) been prepared and arrangements been made for public awareness and training?	Yes	[]	No	[X]	NA	[]
The World Bank Policy on Disclosure of Information						
Have relevant safeguard policies documents been sent to the World Bank's Infoshop?	Yes	[X]	No	[]	NA	[]

Have relevant documents been disclosed in-country in a public place in a form and language that are understandable and accessible to project-affected groups and local NGOs?	Yes	[X]	No	[]	NA	[]
All Safeguard Policies						
Have satisfactory calendar, budget and clear institutional responsibilities been prepared for the implementation of measures related to safeguard policies?	Yes	[X]	No	[]	NA	[]
Have costs related to safeguard policy measures been included in the project cost?	Yes	[X]	No	[]	NA	[]
Does the Monitoring and Evaluation system of the project include the monitoring of safeguard impacts and measures related to safeguard policies?	Yes	[X]	No	[]	NA	[]
Have satisfactory implementation arrangements been agreed with the borrower and the same been adequately reflected in the project legal documents?	Yes	[X]	No	[]	NA	[]

V. Contact point

World Bank

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VII. Approval

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Practice Manager:	Name: Sudipto Sarkar (PMGR)	Date: 13-Nov-2017
Country Director:	Name: Harold Luis Bedoya (CD)	Date: 29-Nov-2017