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Jilin Urban Development Project, Peoples Republic of China

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Summary

Jilin Province is located in the middle of the northeastern part of the Peoples Republic of China (PRC). The province is positioned as major transportation hub linking the fourth Europe-Asia transportation corridor from Russia and Mongolia to the port cities along Pacific Ocean. However, the major cities Baicheng and Baishan have been faced with challenges of poor waste management, urban infrastructure development and water supply. To address these problems, a five year Jilin Urban Development project was formulated to provide safe and secure potable water, improve urban infrastructure in the two prefecture level cities, Baishan and Baicheng. The cost of the project was estimated at USD 386.84 million. The Peoples Republic of China (PRC) was granted an USD150.0 million loan from the ADB's ordinary capital resources to finance the project. The rest of the project would be counterpart funded by the Baicheng Municipal Government and the Baishan Municipal Government at USD 176.12 million and USD 61.88 million, respectively. The Jilin Urban Development project objectives include upgrading the urban infrastructures in Baicheng and Baishan, improving the urban environment and living condition, promoting a 3R based integrated municipal solid waste management, improving water supply management and operation efficiency, reducing non-revenue water loss (NRW) loss.

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Acronyms and Abbreviations

PRC	The Peoples Republic of China
NBS	National Bureau of Statistics
DPRK	Democratic People's Republic of Korea
ADB	Asian Development Bank
BMG	Baicheng Municipal Government
NRWL	Non-Revenue Water Loss
MSW	Municipal Solid Waste
USD	United States Dollar
WACC	Weighted Average Cost of Capital
EIRR	Economic Internal Rate of Return
FIRR	Financial Internal Rate of Return
NPV	Net Present Value
OCR	The Ordinary Capital Resources
ISWM	Integrated Solid Waste Management
LAR	Land Acquisition and Resettlement
DDR	Due Diligence Report
ECOC	Economic Cost of Capital
SPS	Safeguard Policy Statement
WTE	Waste to Energy
GHG	Green House Gas

1 Introduction

Jilin Province of the Peoples Republic of China (PRC) is located in the middle of the northeastern part of the country. The province holds about 2% shares of the total land area (approximately 187,400 km^2) of the country and an estimated population of 22.95 million in 2016 (NBS, 2016). Jilin Province is bordered to the north by the Heilongjiang Province and Liaoning Province to the south. On the western side is Inner Mongolia and to the east, Russia and the Democratic People's Republic of Korea (DPRK). At the southeastern part of Jilin Province is the Yalu River. Jilin Province has seven prefecture level cities namely Jilin, Siping, Tonghua, Baishan, Liaoyuan, Baicheng, and Songyuan cities with an autonomous state; Yanbian Korean State and a capital Jilin City. The provincial government has sought to create a sustainable economic and social development aligned with the larger national five year plan for economic development. The Jilin Urban Development Project was implemented in two prefecture level cities of the Jilin Province; Baicheng City and Baishan City.

Figure 1. Map showing the Location of Baicheng and Baishan in Jilin Province, China (CFGUIDE, 2013)

Baishan is a prefecture level city with an area of about 17,485 km^2 and is the center for administration, expansive tourism services and major development activities. Baishan is located west of Changbai Mountain in the southeastern part of Jilin. The urban area of Baishan comprises two separate districts; Huijiang and Jiangyuan. Jiangyuan District's water treatment plant supplies about 30,000 m^3/d potable water, having a raw water intake sourced from the Taiyangcha River. However, the river suffers frequent pollution from mining activities located upstream of the river which is a great challenge to treatment for drinking water. In addition, water demand was not often met because of the limited capacity of the existing reservoirs. Consequently, new water transmission lines from a newly built Xibeicha reservoir have been built to supply clean water to Jiangyuan district, to replace the amount of water sourced from the Taiyangcha River.

In Hunjiang District, there are four water sources. There is the Qujiaying reservoir located along the Hunjiang tributary of the Hongtu'ai River extending 9 km from the center of Hunjiang. Qujiaying reservoir operates at a capacity of 60,000 m^3/d with feed water from surface water and a 24,000 m^3/d sourced from a shallow groundwater well (ADB, 2014). Also, the existing Zhenzhumen and Kucanggou reservoirs having capacities of 9,000 m^3/d and 5,000 m^3/d, respectively, rely on groundwater sources which are considered as polluted. The situation was exacerbated when the Jinyingmen water source was closed because of pollution and also by a drop in the groundwater yield. As a result, Qujiaying reservoir became the only active water source serving the whole of Hunjiang District. This has led to a significant water stress in the Hunjiang District. Water treatment and supply was carried out by the Nanshan Water Supply Plant, located in the southern part of Hunjinag District. However, the plant operated at a capacity lower than the installed 80,000 m^3/d due to the dilapidated state of some of the equipment and the high water loss rate in the system. The plant was unable to meet the water demand leading to mandatory water rationing in summer, especially at during peak hours. Beside the problems with water supply, there was the need for the general improvement in the urban environment and living conditions of the inhabitants of Baishan city. The lack of proper waste management practices posed a great threat to the public health and general sanitation of the city.

Baicheng has two districts (Taonan and Taobei), two counties (Tongyu and Zhenfen), and two cities, (Taonan and Daan) spanning a land area of 25,692 km^2. Baicheng city is considered an auspicious transportation hub in the west of northeastern China connecting Jilin to Liaoning, Inner Mongolia and Heilongjiang Province. Baicheng harbors the fourth Europe-Asia transportation corridor from Russia and Mongolia to the port cities along Pacific Ocean, involving Japanese Sea to the east and Chinese Bo Sea to west (ADB, 2014). The location of Bacheng, thus, presents it with unique prospects for industrial and economic development. To take advantage of these prospects, the Municipal government seeks to transform Baicheng city into an urbanized and modern city that would serve as an important logistics and transportation transit point for adjoining provinces and cities. Within Baicheng is a heavy industry for renewable energy, automobile parts manufacturing, textile and clothing production, among others. The rapid urbanization needs could not be contained by the existing infrastructure and amenities of Baicheng City, therefore, the Baicheng Municipal Government (BMG) decided to create an industrial park and Taobei Industrial Park at the eastern and western sides of the city to accommodate the rapid industrial development demands. Further, the state of solid waste management also needed an improvement to include sorting centers and recycling and other waste facilities.

Figure 2. Urban infrastructure development in Baicheng City (Jilin Daily, 2018)

The Jilin Urban Development project objectives include upgrading the urban infrastructures in Baicheng and Baishan, improving the urban environment and living condition, promoting a 3R based integrated municipal solid waste management, improving water supply management and operation efficiency, reducing non-revenue water loss (NRW) loss, and promoting people centered urban transport system with emphasis on pedestrian and bicycle traffic and public transportation (ADB, 2014). Table 1 shows a summary of the Jilin Urban Development Project.

Table 1: Overview of the water supply project (ADB, 2014)

Items		Description
Project Name	:	Jilin Urban Development Project
Type	:	Water Supply and Urban Infrastructure
Donor Name	:	i. Asian Development Bank (ADB), ii. Baicheng Municipal Government iii. Baisan Municipal Government
Project rationale and objectives	:	i. To improve the effectiveness and efficiency of solid waste management system in the two cities, an integrated municipal solid waste management would be introduced in Baicheng and Baishan. ii. To address water supply shortage and poor quality in Baishan, a 24 hour reliable and potable water supply source would be provided in both Hunjiang and Jiangyuan district. iii. To upgrade the urban infrastructures in Baicheng and Baishan by improving urban environment and living condition, transport system with emphasis on pedestrian and bicycle traffic and public transportation. iv. To provide support for project implementation through project institutional strengthening and capacity development component.
Project Fund	:	Total: USD 386.84 million Asian Development Bank: USD 150.0 million Baicheng Municipal Government: USD 176.12 million Baishan Municipal Government: USD 61.88 million
Project Duration	:	May 2014 – June 2019 (revised) Closure (originally November 2013)

2 Technical and Technological Brief

The Jilin Urban Development Project would focus on addressing the drinking water supply issues in Baishan; improving urban living conditions and the municipal solid waste management models

of the two main municipalities, Baishan and Baichang. The MSW handling method in Baishang was no more suitable for managing the volume and type of waste generated in the Municipality, hence the need to upgrade to the 3R based integrated municipal solid waste management approach (reduce, reuse and recycle). Similarly, the improvements to the collection, transportation, and disposal of MSW would also be done. The subproject would also focus on improving the urban environment and the living condition of the municipality by improving the municipal solid waste management system and providing reliable and safe water supply.

The subproject components to be implemented in Baishan comprises the following:

1. Improvement of water supply management in Baishan

a) Provision of new and upgraded municipal services for new urban areas in Jiangbei and Tienan.
b) Provision of reliable water supply for urban residents of Baishang
c) Improvement of drinking water quality in Baishan by sourcing raw water from a new protected water source.
d) Upgrade of the existing water supply and piping and distribution network and also extending the service area to new urban areas
e) Improvement of operation and maintenance services to eliminate the high nonrevenue NRW loss. Also, high energy consumption in operation would be lowered, unsafe, and high operation cost would be addressed.

2. Integrated solid waste management system in Baishan

a) The MSW subcomponent would establish a solid waste sorting facility and a new sanitary landfill with a capacity of 330 ton/day.
b) Construction of a 30 ton/day kitchen waste sorting and composting facility;
c) Two trash bin system for recyclable and non-recyclable solid wastes.
d) The subproject component would provide the much needed sanitary landfill site for the disposal of waste.
e) Upgrading 15 MSW transfer stations;
f) Improved municipal solid waste collection and transportation would add a compressing facility, and introduce the enclosed garbage transport facilities to improve the garbage management system.

The subproject components to be implemented in Baicheng comprises the following:

1. Improved urban infrastructure in Baicheng

a) Provision of new and upgraded urban infrastructures and municipal service for urbanization
b) Improving urban road network by improving the existing urban road network and provide the missing links so that the road network would function properly so as to facilitate transport and logistics development needs of Baichang
c) Establishment of the transportation hub the Europe – Asia transportation corridors connecting Russia and Mongolia to the port cities along the Pacific Ocean.
d) Provision of new urban infrastructures to facilitate the industrial development for agricultural products, auto part manufacturing, and textiles and clothing, with new businesses and enterprises moving in gradually.

e) Promotion of pedestrian/bicycle and public transport oriented urban transport to provide a people and environmentally friendly urban transport system, reducing air pollution and traffic congestion.

2. Integrated solid waste management system in Baicheng

a) Provision of an integrated waste management system that would incorporate the 3R based integrated municipal solid waste management method based on the best international practices, i.e. reduce, reuse and recycle, to improve the current practice in collection, transportation, and disposal.
b) Provision of MSW sorting facility and a new sanitary landfill would be constructed, to undertake sorting and separation of MSW into kitchen and organic waste for composting, plastic and other usable items for recycling, hazardous items for safe disposal and the non-usable items for final disposal in the sanitary landfill.
c) Two trash bin system for recycling – the two trash bin system for recycle and non-recycle solid wastes will be incorporated in the proposed ISWM to promote recycling and reduce the MSW.

3. Improved capacity and institutional arrangements

This subcomponent involves the provision of the needed support for project implementation management and institutional strengthening and capacity development and training. This would include the provision of technical and financial management support necessary to ensure the smooth implementation of all project components.

3 Financial brief

The Peoples Republic of China (PRC) was granted USD150.0 million loan from the ADB's ordinary capital resources to help finance the project. The loan would have a 25-year term repayment period including a grace period of 6 years (ADB, 2014). An annual interest rate of 0.15% per annum would be paid on the loan following the terms and conditions set forth in the draft loan and project agreements. The ADB loan would also be applied to finance taxes and duties for eligible ADB-financed expenditures, and transportation and insurance costs included in the base cost for ensuring smooth project implementation. The loan would be applied to finance 37.4% of the total project cost while the government would finance the remaining USD 251.5 million through counterpart funds from the two project cities. For Baishan subproject, which comprises both water supply and ISWM components, an estimated cost of USD 127.7 million would be applied. About loan USD 50 million (39.2% of total subproject cost) of the ADB loan would be applied. In the case of Biacheng the total cost of the subproject stands at USD 274.9 million, including ADB assistance of USD100.0 million (36.4% of the subproject cost) (ADB, 2014). The Ministry of Finance would re-lend the funds from ADB to the project cities through the province for 25 years with a 5 years grace period. The project city governments would however, assume the foreign exchange and interest variation risks of the ADB loan. The People's Republic of China, Jilin Provincial Government, and the project city would provide timely counterpart funding and any additional funding required for any shortfall of funds or cost overruns during project implementation. Table 2 shows the Jilin Urban Development Project investment plan.

Table 2 Project Investment Plan

Item	Project component	Amount (USD million)
A.	**Base Cost**	
	1. Baicheng Municipal Services	238.05
	a. Urban infrastructures	202.48
	b. Municipal solid waste management	31.57
	2. Baishan Water Supply	63.55
	3. Baishan Municipal Solid Waste	30.85
	4. Capacity Development and institutional strengthening	3.0
	Subtotal (A)	**331.44**
B.	**Contingencies**	**47.8**
C.	**Financing charges during implementation**	**7.60**
	Total (A+B+C)	**386.84**

4 Project Features

4.1 Technical and technological features (ADB, 2014)

1	Improved Urban Roads, Bridges, and Municipal Services in Baicheng	i. Construction of nine urban roads with a total length of 32.4 km ii. Construction of two 20 m span bridges and one twin cell railroad underpass; iii. Installation of a 36.9 km water supply piping network; iv. Installation of a 63.2 km sanitary sewer piping network, including a pump station; v. Installation of a 59.9 km stormwater piping network with two pump stations; vi. Installation of a 33.0 km 10 KV power line; vii. Installation of a 33.0 km communication line; viii. Installation of a 28.2 km primary heating pipe network; installation of 1582 street lights; ix. Installation of traffic control and traffic management system; x. Construction of landscaping and other associated facilities; and xi) provision of a people centered urban transport system with emphasis on developing pedestrian/bicycle and public transport
2	Integrated Solid Waste Management in Baicheng	i) Construction of a 50 ton/day MSW sorting center; ii) Establishment of a 20 ton/day composting facility; iii) Procurement of one construction material recycling machine;

		iv) Construction of 12 new MSW transfer stations; v) Upgrading MSW handling equipment including 12 self-loading trucks, 30 movable MSW compaction containers, 12 MSW compaction trucks, 4 kitchen garbage collection trucks, and 50 MSW carts; vi) Upgrading city cleaning and maintenance vehicles and equipment including 36 street cleaning and sweeping vehicles, 20 snow cleaning trucks, 10 water spray trucks, 10 sewer suction trucks and 5 sewer cleaning trucks, 10 construction waste trucks, MSW carts, trash and recycling bins, etc.
3	Integrated Solid Waste Management (ISWM) System in Baishan	i) Construction of a new MSW sanitary landfill with a daily capacity of 330 ton/day; ii) Construction of a 30 ton/day MSW sorting plant; iii) Establishment of a 20 ton/day composting site; iv) Procurement of one construction waste recycling machine; v) Upgrading 15 MSW transfer stations; vi) Upgrading MSW handling equipment including 15 self-loading trucks, 30 MSW compaction containers, 2 MSW compaction trucks, 4 kitchen garbage collection trucks, and 15 MSW carts; and vii) Upgrading city cleaning vehicles and equipment including 4 sewer suction trucks, 15 street sweeping vehicles, 18 snow cleaning trucks, two moveable toilets, sewer pipe cleaning pipe, trash collection carts and tricycles, trash and recycle bins.
4	Improved Water Supply Management in Baishan	i) Construction of a 6.8 km water transmission line to Jiangyuan supplying water to an existing water treatment plant; ii) Construction of a 21.1 km water transmission line to Hunjiang new water treatment plant; iii) Construction of a new 50,000 tons/day water treatment plant with SCADA system; iv) Upgrade 11.1 km existing water supply piping network; iv) Construction of 44.2 km new water supply piping network; v) Construction of 4 pump stations; vi) Leaking detection equipment;

		vii) Manholes, valves, flow meters and other associated facilities; and viii) Improve management, operation and maintenance of the existing water supply management system to reduce NRW loss and better service.
5	Improved Capacity and Institutional Arrangement	i) Provide support for project implementation on project management, institutional strengthening, capacity development and training. ii) Capacity development on technical support, management support, financial management support, and other tasks to ensure the smooth implementation of all project components, including the soft components

4.2 Economic and financial features

The financial analysis of the project covers four components in the project cities; integrated solid waste management (ISWM) in Baishan; Improved water supply system in Baishan; improved urban road network and improved municipal services in Baicheng, and institution and capacity strengthening. The financial analysis of the project was carried out considering an amortization period of 25 years including a 5-year grace period. A commitment charge of 0.15% per annum and an interest rate of 2.03% was applied during construction with a straight line repayment method starting from 2020. The construction period and the residual value of the project was excluded from the financial analysis. The analysis also assumed revenues would be derived from water sales while expenses would comprise depreciation at 4% of net fixed assets. Further, 5-year swap rate was used (adding maturity premium and plus ADB margin of 0.4%, maturity premium of 0.1%) for the interest rate during construction periods and debt service projection made considered a 20-year swap rate and a 20-year repayment period for the ordinary capital resources (OCR) loan. The cost of equity was calculated at 7% at a risk free rate of return of 6.0% and a 1.0% margin. The weighted average cost of capital (WACC) for the entire project was calculated on an after tax basis at a 25% income tax assumption using domestic inflation and international inflation rate of 3.0% and 1.90%, respectively. The financial viability of the project was further tested by estimating the financial internal rate of return. The FIRR for Baishan water supply subproject was calculated as 6.64%, which is higher than the WACC at 2.42%. Sensitivity analysis revealed the project is most sensitive to capital cost overrun of showing a FIRR fall to 5.46% should the estimated revenue generation fall by 5% (ADB, 2014). The operation and maintenance of the non-revenue generating components, and debt servicing were about 0.03% to 0.23% of annual projected revenues until 2030. This suggests the project must ensure the availability of enough counterpart funds during implementation and operation and maintenance costs for non-generating components and debt service during operation. The results of the sensitivity analysis are shown in the Table 3 below.

Table 3 Sensitivity Analysis of the Jilin Urban Development Project (ADB, 2014)

Scenario	EIRR (%)	NPV (USD million)
Base case	15.5	83.4
I. Benefits reduce 10%	14.3	52.1
II. Investment cost increase 10%	14.5	62.9
III. Delay one year	14.3	58.78
IV. Combination of (i), (ii), and (iii)	12.1	2.05

The economic Internal Rate of Return (EIRR) was used to test the economic viability of the project. The EIRRs for the Baishan improved coverage of urban roads and municipal service, Baishan improved water supply management, and Baishan efficient ISWM were 15.8%, 14.3%, and 15.2%, respectively. The Net Present Value (NPV) for the whole project was calculated as USD 83.40 million for a foreign exchange rate of USD 1.0 to CNY 6.08. The base case EIRR for the whole project was 15.5%, which exceeds the economic cost of capital (ECC). The results of the sensitivity analysis performed at different scenarios show a robust EIRR against negative impacts from benefit reduction, cost overrun and project implementation delay. Base on the results of the EIRR and the FIRR, the project was considered economically and financially viable.

4.3 Social and environmental features

The Jilin Urban Development Project promises immense environmental benefits to the project cities and the municipalities as a whole. The subprojects were designed to address solid waste pollution in the cities by improving the collection, handling and disposal of municipal solid waste that would otherwise pollute the environment. The implementation of the project subprojects in Baishan would make available good quality drinking water. The potential project impacts identified to both project cities include traffic noise and air pollution at some sensitive areas along the construction sites. However, it was estimated that minimal noise and air quality impact would result from the construction activities. Other potential impacts include accidental spills that may occur as a result of hazardous goods transportation on the bridges and on nearby surface water bodies. However, environmental health and safety plans have been detailed out to contain and mitigate the potential impacts caused by the project activities where possible. Further, environmental monitoring programs (EMP) have been set out to minimize project environmental impacts. Some other estimated environmental benefits associated with the project include greenhouse gas (GHG) emission reduction through low carbon transportation modes and efficient energy saving bulb utilization for street lights. The use of LED street lights, are expected to save 530,000 KWh per year of electricity and a yearly 528 tonne CO_2 emission reduction compared to conventional street lighting. Other GHG emission reductions would be achieved through the construction of low carbon water supply system that could lower emissions by 5,685 tCO_2/y and with electricity saving potential of 7.3 million kWh electricity. The project supports environmentally sustainable 3R MSW disposal as well as increasing the availability of urban sanitation facilities. According to the gender and action plan of the project, 49% the total direct beneficiary populations would be women while 16.5% live under the local urban poverty lines. Public awareness programs associated with the project include changing residents' personal behavior and changing public buying habits to reduce the amount of wastes and packaging waste (ADB, 2018).

The social impacts of the project would include improvement of the environmental conditions and the living standard of inhabitants. Also, higher urbanization levels are expected as improved

urban infrastructure would be built in the project cities. The livelihood strategies of the project cities would be positively impacted as the cities become open to more external influence through urbanization. It is also expected that economic activities would receive a boom due to the provision of improved urban infrastructure and utilities. Further, the project would increase employment opportunities for inhabitants which would lead to increased income levels and economic benefits. The provision of water supply infrastructure in Baishan would improve the water quality standards of the municipality. Beside those benefits, other spin-offs of the project include the reduction in water poverty in the Baishan municipality. The four project components would involve land acquisition and resettlement (LAR) for the project construction. As a result, resettlement plan (RP) or a due diligence report (DDR) have been prepared in accordance with ADB Safeguard Policy Statement (2009), and relevant national laws and local regulations of the PRC. For example, the expansion of the existing landfill sites and the construction of the waste collection and transfer would result in demolishing of 5,270 m^2 of rural houses. About 236 m^2 of simple structures involving 129 people from 36 households would be affected. Rural households affected by land acquisition and demolition, with property rights exchange for areas within demarcated standard relocation area, and appropriate monetary compensation granted.

5 Project Benefits

The Jilin Urban Development Project would provide significant direct and indirect benefits to the inhabitants of the two cities. According to feasibility studies estimates about 1.12 million urban residents would benefit directly from the project. This includes about 0.6 million population in Baishan and 0.52 million in Baicheng having access to improved and reliable drinking water, urban infrastructures and environmentally sustainable 3R MSW disposal along with increasing urban sanitation facilities. GHG emission reduction and electricity saving potentials, the project would improve the living conditions of the municipalities. The provision of modern urban infrastructure would promote economic development of the project cities. The project would identify and reduce NRW losses reduce NRW from 70% to 30%. This would promises to increase the profitability of the water supply business while at the same time would contribute towards adequate water supply coverage in the city.

The integrated municipal solid wastes (MSW) components of the project in the two cities would garbage collection facilities, transfer stations, sorting units, aerobic composting and the expansion of sanitary landfills. In principle, it would in principle promote the waste reduction and waste and disposal cost and minimization of negative environmental impacts associated with improper waste disposal. The proposed public awareness program which involves i) changing the behavioral patterns of residents. e.g., changing public consumption patterns and habits so towards waste reduction and limiting packaging waste; ii) promote reuse and recycling of the MSW are very beneficial to maintaining clean and healthy environment.

The infrastructure development components would help Baishan City move towards a more sustainable and safe urban transport system which would limit emission into the environment. The completion of the roads would afford the opportunities to complete and expand municipal services through the installation of pipelines and conduits for water supply, better sewer collection, and storm water drainage systems, which will benefit the local economies and health and safety. Also, the project would provide the two project cities with opportunities to strengthen

their institutional capacity for project implementation, water supply management, environmental protection and municipal solid wastes management and subsequent projects within the Jilin province.

6 Implementation status of the project

The Jilin Urban Development project is currently active and project activities are ongoing. The major contracts for equipment supply and installation has been awarded. The awarded contracts include; the ITS and traffic controls, Storm water and sewer pump station installation, Heating pipe networks installation, street lighting, MSW handling equipment, trash and recycle bins supply, snow cleaning vehicles supply, MSW transfer station equipment have been awarded. Civil works for the Baicheng Infrastructure works has also began with contracts for the construction of the Xiangyang Street I (Third Ring Road - Mianfang Road), Xiangyang Street II (Mianfang Rd - Xinyi Rd) and Xinhua Xi Road, Shengli Road, Nanyi Road and Taoerhe Road (including the bridge) and Xinggong Road. Xinggong Road construction has been completed while Xiangyang Street II and Xinggong Road are expected to be completed by September 2019. The rest are scheduled to be completed by 2021 (ADB, 2018). Baicheng integrated solid waste management contracts for street lighting and trash and recycle bins supply have been awarded and goods duly supplied.

However, the MSW transfer stations were implemented by the government initiatives and thus was removed from the project procurement list. Also, the MSW sorting and composting center civil works and equipment packages were proposed and considered for cancellation during the review mission in May 2018. MSW sorting and composting center civil works, sanitary landfill, and MSW sorting and composting center equipment have also been cancelled as Baishan and Baicheng have entered into public-private partnership agreements for construction of incinerators for waste-to-energy (WTE) following the PRC's Thirteenth Five-Year Plan indicating increased emphasis by MSW managers on increasing WTE facilities, recycling, and reducing water and air emissions. Notwithstanding, Baishan integrated solid waste management contracts for the supply of bins, MSW handling equipment has been awarded.

Regarding Baishan water supply management components, water transmission line I (reservior to Jiangyuan) and water transmission line II (Jiangyuan to Hunjiang) are under construction. The detailed geotechnical survey for the water treatment plant has been completed in December 2017. However, project reports noted that the completion of detailed designs for the water treatment plant and water distribution network have been delayed due to heavy snow. The procurement of water transmission pipes, distribution pipes and other related equipment and packages have been delayed as well. Local training on project planning and monitoring systems, reporting system, and filing system have also been conducted in July and October 2015, and April 2016. Other forms of training include the provision of technical support and training for water supply sector road map implementation the national NRW expert in May 2016. Storm water management capacity building training and funds disbursement trainings have been conducted in March and May of 2018, respectively.

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