INTEGRATED SAFEGUARDS DATASHEET
UPDATED for
PROJECT RESTRUCTURING STAGE

I. Basic Information

Date prepared/updated: 03/04/2014 Report No.: 87832

1. Basic Project Data

Country: People's Republic of China	Project ID: P092618
Project Name: Second Liaoning Medium Cities Infrastructure Project	
Task Team Leader: Suhail J. S. Jme'an	
Appraisal Date: October 27, 2006	Board Date: June 26, 2007
Managing Unit: EASUR	Lending Instrument: Specific Investment Loan
Sector: Sewerage (37%); Water supply (41%); Solid waste management (22%)	
Theme: Pollution management and environmental health (P)	
IBRD Amount (US$m.): 173.00 IDA Amount (US$m.): 0.00 GEF Amount (US$m.): 5.00 PCF Amount (US$m.): 0.00 Other financing amounts by source: BORROWER 240.80 418.80	
Environmental Category: A - Full Assessment	
Simplified Processing Simple [X] Repeater []	
Is this project processed under OP 8.50 (Emergency Recovery) Yes [ ] No [X]	

2. Project Objectives

The project development objective is to improve the performance and sustainability of water supply, wastewater, and solid waste services in the LMC-2 cities. Enhanced wastewater and solid waste services will also help reduce pollution into the Bohai Sea and contribute to improving Bohai Sea water quality.

3. Project Description

The Project currently supports improvements in three sectors covering 7 medium cities in Liaoning Province summarized as follows: i) Wastewater (US$157.44 million) in Panjin, Yingkou, Fushun, and Gaizhou; ii) Water Supply (US$172.24 million) in Panjin, Yingkou, Anshan, Haicheng, and Xingcheng; and, iii) Solid Waste (US$84.39 million) in Panjin and Fushun.

Component 1: Wastewater Infrastructure component covers four cities and includes the construction of new and rehabilitated wastewater collection systems in all four cities; the construction of new wastewater treatment plants in Yingkou, Panjin, and Gaizhou; and the rehabilitation of riverbank in Gaizhou.

Component 2: Water Supply Infrastructure component covers five cities and includes the renovation of water distribution pipelines in all cities; installing around 200,000 water supply meters; upgrading treatment plants in Anshan and Haicheng; and the construction a new water treatment plant and transmission lines in Yingkou.

Component 3: Solid Waste Infrastructure component includes the construction of new sanitary landfills in Panjin and Fushun; closure of existing open dump in Fushun; and solid waste collection and transfer works and equipment in Panjin.

Component 4: Institutional Development component covers the following activities:

- Design Review, Advisory and Construction Management Technical Assistance. This assignment also includes assistance in the development and implementation of asset management planning for water supply and wastewater.

- Public Utility Program which includes training and capacity building in public utility regulation and management at both the national and provincial levels. It also pilot activities in LMC-2 cities to demonstrate new approaches in utility benchmarking, private-sector participation, and utility regulation.

- Solid Waste Technical Assistance to prepare strategic solid waste sector studies for Fushun, Yingkou, and Panjin.

- Water Pollution Control Planning to prepare strategic wastewater sector studies for Fushun, Yingkou, Gaizhou and Panjin.

4. Project Location and salient physical characteristics relevant to the safeguard analysis

Location: Liaoning is a coastal province Northeast China. It covers a total area of 145,900 km2 and has a total population of 42 million. The province has jurisdiction over 14 cities, 17 county level towns and 17 counties. The provincial capital is Shenyang. The Liao River Basin (LRB), with a total catchment area of 220,000 km2 accounts for 48% of the total land area of Liaoning Province. The rivers in the basin drain through 11 of the most important industrial urban centers and cross large areas of agricultural land before discharging into the Bohai Sea.

Climate: The climate in the basin is characterized by distinct seasons. Spring and summer are mild and the winter period from November to March is extremely cold, with minimum temperatures in January as low as -30C. This is reflected in the long frost periods for the project cities, ranging from 130 to 150 days. The average annual precipitation in the LRB is between 350 and 1200 mm and increases from northwest to southeast.

Water Resources: The combination of the dry season and sub-zero periods during winter result in extremely low flows in the rivers, with low dilution of organic pollution. The phenomenon is exacerbated by the reduced self-cleaning capacity of the river and the low

efficiency of WWTPs because of the low temperature, resulting in high pollution levels in the rivers during winter. The denomination of LRB in Liaoning Province includes 3 independent river basins that discharge into the Bohai Sea: the Liao River proper, the Daliao River and the Xiaoling River. The available water resources in the LRB are limited. Average surface water resource in the catchment area is 535 m3 per capita per year, which is only 20% of the national average. Water resource available for agriculture is 220 m3 per mu (3,300 m3 per hectare) or 12% of the national average. River flows in the LRB vary dramatically in different months and seasons. In a typical year, July and August flows amount to 60% of the annual flow while that in the driest month (February) amounts only to 0.1% of the yearly total. In many stretches of LRB rivers in Liaoning province, there is little natural flow whereas wastewater flows are discharged from various industrial, municipal and area sources during the dry season (December to March).

Bohai Sea: Bohai Sea is a part of China's coastal waters and is a marginal sea in the west part of the Pacific Ocean. The Bohai Sea is a semi-closed water system which connects with the Yellow Sea through the Bohai Strait. It consists of three bays, Liaodong Bay, Bohai Bay and Laizhou Bay. Yingkou and Yingkou EDZ are next to the Bohai Sea coastline, Panjin is 30 km from Liaodong Bay. Before the 1980s, more than 200 species of fish and shrimp were recorded in the Bohai Sea.More than 100 species could be caught through normal fishing activities. The annual fishing production was ranging from 500 to 700 thousand tons, which accounted for 30% of China's fishing production. Because of sand beach formations shellfishes were an important part of the production and marine culture developed rapidly. However, since the 1980s, increasing pollution of the Bohai Sea coastal area and over-fishing have resulted in a strong decline of the fisheries. China has drawn up a great marine environmental protection plan to control pollution in the Bohai Sea area and to restore the favorable ecological environment there. The Bohai Blue Sea Action Program should be put into practice in three stages: 2000-2005, 2006-2010 and 2011-2015. The program aims to halt discharge of industrial wastes, to monitor environmental pollution and to restore the damaged ecological system in the sea. LMC-2 is a major contribution to the achievement of this program.

Ethnic Minority Communities: Liaoning is a province with many ethnic minorities; about 51 ethnic minorities including Hans, such as Man Zu, Mongols, Hu Zu, Korean and Xibo Zu. There are 6.7 million minority group people accounting for 16% of the total population in Liaoning province. The ethnic minority counties, whose population accounts for over 40% of the local population, are Xingcheng, Suizhong, Yixian, Kaiyuan and Xifeng; the others are scattered. In the municipalities of Anshan, Fushun, Yingkou, Panjin and Huludao (Xingcheng), minorities are not living together so LMC-2 does not concern ethnic minority communities.

WATER SUPPLY: The total annual volume of water resources in LRB is estimated 23.511 billion m3. In normal years, the amount of water available for use is 10.567 billion m3. Utilization ratio of surface water is 81.2% and of groundwater is 43.1%. However the water is still in short supply: the annual amount of water supplied is 7.836 billion m3 while the annual water demand is 8.370 billion m3.

WASTEWATER: The surface water in Liaohe basin is heavily polluted; about 72% rivers within the province exceed the minimum permitted surface water quality of Category V (worst quality class). The total wastewater discharged within the province was 1.92 billion tons, of which 0.89 billion tons came from industry. The total COD load discharged was 546,000 tons of which 185,000 tons or 34 percent came from industry. Much of the industry fails to meet the standards for discharge water quality. The seriousness of the pollution within the Liao Basin has resulted in over 400 factories being closed down. The wastewater treatment ratio is only 40%; the remaining untreated wastewater is discharged directly to the nearest watercourse.

WASTE MANAGEMENT: The urban residents in Liaoning Province are generally provided with waste collection systems consisting of daily refuse collection and daily street sweeping. Treatment facilities in the Province are strongly under sized compared to requirements. Disposal of solid waste is mostly done in simple dumping sites, without any pollution control measure. Sites are not lined nor are leachate collected for treatment. Only few sanitary landfills have been developed in the Province in Dalian, Anshan and Liaoyang. Present production of solid waste in Fushun, Panjin and Yingkou represents a total of about 2,000 tons/day.

5. Environmental and Social Safeguards Specialists

Ms Chongwu Sun, Sr. Environment Specialist (EASCS)
Mr Aimin Hao, Social Development Specialist, (EASCS)

6. Safeguard Policies Triggered	Yes	No
Environmental Assessment (OP/BP 4.01)	X	
Natural Habitats (OP/BP 4.04)		X
Forests (OP/BP 4.36)		X
Pest Management (OP 4.09)		X
Physical Cultural Resources (OP/BP 4.11)		X
Indigenous Peoples (OP/BP 4.10)		X
Involuntary Resettlement (OP/BP 4.12)	X	
Safety of Dams (OP/BP 4.37)	X	
Projects on International Waterways (OP/BP 7.50)		X
Projects in Disputed Areas (OP/BP 7.60)		X

II. 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: The Project aims to improve the overall water environment, solid waste management and related health issues of Liaoning Province by: reducing pollution to the Liao River Basin and Bohai Sea through the construction of wastewater collection and treatment systems and the installation of leachate treatment systems as part of landfill development and closure; and by improving water supply distribution and wastewater and solid waste

collection and disposal. The sustainability of these benefits is likely to be enhanced through the technical assistance components which aim at improving financial performance of water, wastewater and solid waste companies.

Environmental Assessment (OP/BP 4.01)

The Environmental Assessment (EA) and Environmental Management Plan (EMP) assessed the impacts associated with the different subprojects and suggested mitigation measures. These are summarized below:

Construction-related impacts: The major environmental impacts of project construction activities include those associated with construction site management (dust, erosion, noise, waste and spoil management, worker safety, disease) and rehabilitation of sewage and water pipelines (traffic disturbance, safety and chance finds of cultural property). Mitigation measures were developed and included in an environmental management plan that would be included in construction contracts. The mitigation measures included chance find procedures for cultural property in compliance with OPN 4.11.

Design and Operation of Water Supply Systems: The water supply subprojects will involve construction and upgrading of water treatment plants, network construction, rehabilitation and upgrading, installation of meters and raw water abstraction and distribution. The major issues identified by the EA were sludge disposal, chlorine leakage and wastewater production from the workers. Disposal procedures for the sludge would be the same as the wastewater treatment sludge and measures to reduce the risk of chlorine leakage and to treat wastewater from the workers were included in the EMP.

New water resources: Both Haicheng and Yingkou water supply projects will result in the abstraction of additional raw water. Haicheng will increase groundwater abstraction by 130,000 m3/d, and a comprehensive hydrogeological report has confirmed the availability and quality of the additional groundwater resources, Haicheng has received provincial permission for the increased abstraction. Yingkou will increase its water abstraction by 70,000 m3 by tapping into the Shimen reservoir which is currently used for irrigation and flood control purposes. A water balance study by the Yingkou Water Resources Bureau confirmed that sufficient water is additional water is available for the project, and the district government has entered into a raw water supply contract with Yingkou Water Supply Company.

Design and Operation of Wastewater Systems: The wastewater subprojects will involve the construction and upgrading of wastewater treatment plants; and the construction, rehabilitation and upgrading of the collection and drainage network. The main issues identified in the EA were sludge production, and odor and noise associated with WWTP operation. Odor control measures will include ventilation systems, a buffer zone (100 m) around the plant, deodorizing measures in air and in situ and efficient storage and transport of sludge. Noise mitigation measures include housing pumps and other loud equipment inside and a sufficient buffer zone (100 m) around the plant.

Design and Operation of Sanitary Landfills: The project will finance the construction of sanitary landfills in Panjin and Fushun and the closure of an open dump (Fushun). The new landfill constructed has been designed as modern sanitary landfills. Some of the key environmental issues highlighted in the EA and EMP are:

Landfill sites: The sites were chosen from several options based on a variety of considerations including environmental. The key characteristics of the sites are:

- Panjin: The site is located in an abandoned residential area for oil field workers. Currently there are no residents in the area or the vicinity. The nearby farm fields and ecologically important wetland are not impacted by the landfill construction and operation.

- Fushun: The new sanitary landfill will be an extension of the existing open dump and the project will integrate its site remediation and closure with the establishment of the new facility. The site is located within 500 m of two villages comprising 238 households. These villages will be resettled to avoid impacts of the solid waste facility. The site is adjacent to an area used for storage of coal shale overburden from local mining activities. The landfill operation is not anticipated to impact or be impacted by these activities.

Environmental controls during operation: The newly constructed landfills will contain (using clay or HDPE liners), collect, recirculate, and treat (onsite and municipal WWTP) the leachate. Monitoring of groundwater for contamination will also be undertaken. Passive venting of landfill gas will be done using vent stacks to prevent its accumulation in the landfill.

Open dump closure: The project will close the open dumps in Fushun.

In Fushun the open dump closure will be integrated with the development of the new landfill. Contouring and capping of the existing waste deposit area will be done using a clay liner and environmental control systems will be installed as described above for the new site. To avoid potential impacts on the nearby villages, they will be resettled to an area further away from the landfill and the monitoring of groundwater will be done in the area. Future land use will be limited to the new sanitary landfill operations until its final closure.

The Yingkou EDZ solid waste component will be cancelled from the project.

Panjin Solid Waste Subproject: The Panjin solid waste subproject was added to the project at a relatively late date. Although the landfill site and basic approach for the project is confirmed, the Feasibility Study and subproject EA cannot be finalized before overall project appraisal was completed. Bank acceptance of the Feasibility Study, EIA, and RAP was specified in the legal agreements as conditions precedent for starting construction of the project.

During project implementation, the above mentioned landfill in Panjin was built by counterpart fund financing. As a consequence, it was agreed that the Bank loan would be reallocated to finance construction of two solid waste transfer stations and procurement of solid waste transportation vehicles in Panjin, as a new component financed by the Bank loan. An EIA/EMP was prepared to assess possible impacts at the sites of the transfer stations and along transport routes, mainly noise, odor and safety issues. As part of the assessment, related mitigation measures have been proposed to tackle the environmental issues. In addition, environmental monitoring has been carried out on the landfill site, according to the EIA/EMP prepared for the landfill. The Bank task team reviewed the monitoring report and found it complies with national regulation and requirement.

Shortly after project appraisal in May 2006 Gaizhou added a small package (GWW/1.4) for the rehabilitation of Xiangshui River and three interconnected sections of the Old City Moat embankments. The scope of this package is to improve 4.246 km of riverbanks consisting of 1.504 km of Xiangshui River and a total of 2.742 km for the northern, and southern sections of the Old City Moat. Subsequently, and EIA and RAP were produced for this package and both were reviewed by the Bank and disclosed in the Bank's InfoShop.

Involuntary Resettlement (OP/BP 4.12)

Individual RAPs for each of the subprojects involving land acquisition and resettlement were prepared in Chinese by the respective design institutes, assisted by the respective PMO, house demolition offices, land resources bureaus, affected villages and communities, and potential displaced persons. The RAPs were prepared in compliance with OP 4.12 Involuntary Resettlement and describe in detail the impacts, affected populations, consultation process, rehabilitation measures, budget, and implementation and monitoring arrangements. There are no resettlement impacts identified for the remaining four subprojects based on their designs and a brief note was prepared for each of them to explain why there are no resettlement impacts.

Efforts have been made to minimize the resettlement impacts during project planning and design. The resettlement impacts have been significantly reduced through optimizing the project design and implementation arrangements. These are described in the analysis of alternatives in the environmental assessment section. In the process of project design, the project owners and design institutes assessed possible linkages with ongoing or previous activities and found no linkage. On the basis of individual RAPs, a Summary Resettlement Report was produced in both Chinese and English.

Resettlement Impacts: The original project affected 5,853 persons, with resettlement impacts are scattered in 23 villages of 8 districts or counties and 5 municipalities. The impacts in each village are minor, except in Fushun. The physical resettlement impacts include: (a) 1,689 mu (112 ha) of permanent land; (b) 14,347 m2 of housing demolishing, and (c) 1.091 mu (73 ha) of temporary use of collective land. In addition to the foregoing numbers, Gaizhou's package GWW/1.4 which was not included in the original RAPs

affects 57 households with 171 people in three communities (Minhe, Shengli and Luxi). In addition 618.25 m2 storage huts and 164.62 m2 of toilets will be demolished. In addition 436 trees, 24 poles and 8 public toilets will be affected.

The following basic principles were adopted for resettlement planning:

- Acquisition of land and other assets, and relocation of people, will be minimized as much as possible.
- All project affected people residing, working, doing business or cultivating land required for the project as of the date of the baseline surveys are entitled to rehabilitation measures sufficient to assist them to improve or at least maintain their pre-project living standards, income-earning capacity and production levels. Lack of legal rights to the assets lost will not bar them from entitlement to such rehabilitation measures.
- The rehabilitation measures due to land acquisition are: (i) agricultural land for land of equal productive capacity; (ii) compensation for land acquisition and resettlement subsidy for the farmers affected by land acquisition; and, (iii) other forms of assistance.
- Replacement of agricultural land will be, as much as is possible, similar to the land that was lost.
- Plans for acquisition of land and other assets and provision of rehabilitation measures will be carried out in consultation with the affected people.
- Financial and physical resources for resettlement and rehabilitation will be made available as and when required.
- Institutional arrangements will ensure effective and timely design, planning, consultation and implementation of the Resettlement Plan.
- Effective and timely supervision, monitoring and evaluation of the implementation will be carried out.

Compensation Standards

The compensation for land acquisition includes land compensation, resettlement subsidy, and young crop compensation. The land acquisition compensation is calculated based on annual production value according to the Law of Land Administration. The compensation rates of structures are determined based on their replacement cost. The detailed compensation rates are included in the RAPs.

Rehabilitation Measures

Persons affected by housing demolishing: 238 households in two villages will be relocated within the same village due to expansion of the landfill in Fushun. Consultation with affected households indicated they would all like to construct their own housing. To meet their requirements, housing plot and 700yuan/m2 cash compensation will be provided to affected persons.

Persons affected by permanent land acquisition: Loss of collective land will not severely impact local residents as they derive less than 10 percent of their income from

agriculture. Land compensation for collective land will be paid to the village committees for public use. The resettlement subsidy will be paid to the affected households.

Persons affected by temporary land use: The persons affected by temporary land use will receive young crop compensation according to annual production value of the land. The compensation rates are higher than the production value of the land in all cases. The construction contractors will be responsible for land recovery for cultivation.

Affected public infrastructure: Compensation based on replacement value will be paid to the relevant government agencies or local governments to restore the affected infrastructure and services.

As mentioned above, during project implementation, landfill in Panjin Solid Waste subproject was completed by counterpart financing, and the loan will be reallocated to finance building two solid waste transfer stations and purchase a fleet of solid waste transportation vehicles. Based on TT approval of these restructured activities, the client was requested to finalize the RAP for the newly constructed solid waste transfer stations, and conduct due diligence review for the completed landfill in Panjin. As a condition no work will be allowed to commence until the Bank has reviewed the RAP and due diligence review for the completed landfill.

It is important to pay close attention during the next 12 months to the progress of land acquisition and construction of the two solid waste transfer stations, as this newly proposed activity was raised in relatively late stage of the project, and the client has about one year to complete the task.

Safety of Dams (OP/BP 4.37)

The Shimen Reservoir will be used as the water supply for Yingkou subproject, and is located at the upper reach of Daqinghe River in Gaizhou County. The dam and was built in 1971 with a height of 46.7m and a reservoir capacity 101 MCM. The design flood criteria was 1 in 50 (1/50) years, and check flood criteria was 1/200 years. The main structural features include a main dam of clay-core embankment type, a spillway and a bottom outlet, and a small hydro only operational in irrigation season. The upstream dam slope failed due to an earthquake in 1975, and repair works were carried out in the same year. In 1986, following instructions from the Ministry of Water Resources, the design and check floods for the dam were raised to 1/200 and 1/10,000 floods, respectively by adding a second spillway and riprap was placed on the upstream slope. However, some problems remained after the 1986 rehabilitation including dam slope stability, bottom outlet leakage, and cracks on the guide-walls of the 1st spillway.

Dam Structural Integrity. As a result of a dam safety enhancement campaign initiated by the Liaoning Provincial Government in 1999, Shimen Reservoir Management Bureau requested the Provincial Design Institute to conduct a strengthening design which laid out the following measures: (i) maintain the 1/200 year flood as design flood and lower the check flood to 1/3000 year flood (1/10,000 year flood was considered too high for this

dam); (ii) upstream dam slope strengthening and shot-crete treatment of left abutment; (iii) bottom outlet leakage treatment; (iv) heighten and extend the guide walls of the 1st and 2nd spillways respectively, plus building the tailrace channel for second spillway; (v) upgrade leakage monitoring instruments; (vi) rehabilitate the access road to the dam site; (vii) upgrade the gates and hoists for the bottom outlets; (viii) relocate the sub-station and rehabilitate the transmission lines. Construction work started in 2000, and as of 2006 some works have been completed, and with final completion acceptance expected in 2008. A World Bank team visited the dam site, and a Bank dam safety expert has discussed the issues with the Gaizhou City Water Resources Bureau. The LMC-2 legal agreement includes a covenant that requires Liaoning to contract an independent dam safety expert to review and comment on the overall dam safety upgrading program and complete the works to the satisfaction of the Bank and the responsible dam safety regulatory agency in Liaoning by June 1, 2009.

Dam Operations: The Gaizhou Water Resources Bureau has provided the Bank team with the existing O&M manual and the Emergency Preparation Plan (EPP). The LMC-2 legal agreement includes a covenant requiring the Bureau to update these documents after the completion of the dam safety remedial works, and submit to the Bank for review and comment. In particular, the documents should include the following:

- O&M Manual: Improve and make available to operating staff, the rules/ procedures and technical/safety requirements for operation, maintenance and surveillance (monitoring and inspection) of the dam in accordance with the relevant Chinese Government's technical criteria for large embankment dams/reservoirs. Contingency plan: Improve the annual Contingency Plan for Flood Control Dispatch of each dam by adding inundation maps corresponding to different flows up to design flood for various failure modes, and emergency communication with the local flood control commanding offices and communities in the threatened areas.

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

The project will, combined with other initiatives in the province, contribute to the long term environmental improvement of the Liao River Basin and Bohai Sea. The program is consistent with the marine environmental protection plan to control pollution in the Bohai Sea. In particular, the Bohai Blue Sea Action Program aims to halt discharge of industrial wastes, to monitor environmental pollution and to restore the damaged ecological system in the sea.

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

Alternatives considered in project design: The project was designed as part of a comprehensive approach to environmental management in Liaoning Province. The basic project design and components were chosen to improve the waste, wastewater and water

supply sectors and as a result considered the environmental and social benefits of these interventions in their conceptualization. The social and environmental impacts of different alternatives were considered during subproject and weighed with other economic, financial and technical factors. Below is a summary of the major alternatives considered, the important environmental and social issues associated with those alternatives.

- No project alternative: No project alternative would result in continued pollution from wastewater and solid waste leachate; environmentally unsound collection and disposal of solid waste; poor water supply systems; and inefficient use of water resources.
- Water supply pipeline alignments: The project considered the impact of different water supply pipeline alternatives on traffic, roads and land acquisition. In most cases the relative environmental and social impact of different alternatives was negligible and therefore cost and technical considerations were major factors in subproject design.
- Water treatment plants: Alternatives for water treatment plant sites and processes were considered in light of their ability to meet drinking water standards and the impact on land occupation along with other factors including cost, and water and energy usage. The small land acquisition and ability to meet drinking water standards were important criteria in the choice of rapid sand filtration over slow sand filtration as a treatment process under the project. Land occupation was also a major consideration in the siting and layout for the Haicheng and Yingkou water treatment plants.
- Wastewater collection system alignments: Alternatives for sewerage pipeline alignments considered the impact on traffic, land acquisition and resettlement along with other factors such as cost, and ease of construction and operation. In Fushun and Panjin reduced resettlement impacts was a key factor in choosing the final alignments.
- Wastewater treatment plant siting: Alternatives for siting of the WWTP were limited due to land availability and cost. Selection was based in part on the following criteria: located in the downstream part of town, has low wind frequency in summer, adequate geological conditions and land availability, has minimal farmland removal and available land for buffer zone, and convenience in terms of transportation, water, power supply and waste disposal. Consideration of alternatives in Panjin resulted in a site that was further away from the residential areas and in Yingkou the site that was chosen involved less resettlement.
- Wastewater treatment processes: The major environmental consideration in evaluating alternatives for wastewater treatment processes was the design effluent standard. Two options were considered for these subprojects: i) Class 1-A standard (10 mg/l BOD and SS; 0.5 mg/l Total-P; and 15 mg/l Total N) which is the highest effluent standard; and ii) Class 1-B which is slightly lower (20 mg/l BOD and SS; 1.0 mg/l Total-P; and 20 mg/l Total-N). The Provincial EPB has received direction from SEPA that all new wastewater treatment plants in critical water resource areas (such as the Liao River Basin) should adopt Class 1A standards to minimize nutrient pollution. A World Bank analysis showed that use

of Class 1A standard results in around 15% increase in cost, with a decrease in 2% in COD and 12% decrease in phosphorus and nitrogen. It was agreed that LMC-2 project would finance plants designed to meet Class 1B standards, and the cities would overtime upgrade to Class 1A as required. The reasons for selecting Class 1B standard in the interim period are: i) cost savings could be used to fund expansion of the collection systems which results in greater pollution reduction; ii) the wastewater utilities are financially weak and increasing operational costs may impact their operational sustainability; and iii) programs to reduce nutrients in the Bohai Sea should focus on both municipal wastewater treatment plants as well as agricultural run-off, and not focuses exclusively on high municipal discharge standards. In terms of the treatment process chosen to meet Class 1B standard, SBR and A2/O processes were compared and there were only minor differences in land occupation and therefore other factors such as cost and operational familiarity and ease were more important considerations in the choice.

- Wastewater sludge disposal options: The options for disposal of wastewater treatment sludge that were considered included composting and landfilling. The major consideration was the quality of sludge, as much of the wastewater in the project cities comes from industrial sources that may include toxic metals and other pollutants. Although initial tests indicate the sludge will be adequate for agricultural use, the project took the precautionary approach of landfilling the sludge and only allowing composting if proper monitoring is undertaken to ensure standards for use are met. Panjin and Fushun will have new modern sanitary landfills financed under the LMC-2 which can accommodate the sludge. Gaizhou and Yingkou will dispose of its sludge in a new (non-Bank financed) sanitary landfill which is under implementation.
- Solid waste disposal: Three options were considered in choosing solid waste disposal technologies: open dumping, landfilling, and incineration. All of the subprojects chose sanitary landfilling over incineration and open dumping as the technology can meet environmental requirements at relatively low cost and ease of operation.
- Siting of sanitary landfills: Alternatives were considered in the selection of sites for the sanitary landfills. In Fushun initial plans to site the landfill near the coal tip site next to the existing landfill were abandoned as that site is now reserved for oil refinery development. Three additional sites were considered including a site connected directly to the existing landfill and two other sites located in farming areas. The site next to the current landfill was chosen largely due to its limited land acquisition and low capital cost and the feasibility study's assessment that with some resettlement and good engineering the site would be environmentally safe. In Panjin, three options were considered and the final site was chosen largely due to the limited relocation and displacement of economic activities and confirmation by the feasibility study report that the relatively shallow groundwater can be safely accommodated through good technical design.

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.

LUCPRO will have overall responsibility for coordination with and reporting to the World Bank on safeguards issues of the LMC-2 project. They will also provide training, coordination and advice to the Environmental and Resettlement Management Divisions of the subproject PMOs. LUCPRO has extensive experience with the implementation of World Bank projects and ensuring safeguard compliance. LUCPRO has administered over five World Bank-financed projects in the urban environment and transportation fields since the early 1990s. LUCPRO has experienced environmental and resettlement specialists who oversee safeguard implementation at the subproject level. All of the prefecture level cities (Fushun, Anshan, Yingkou, and Panjin) have in the past implemented Bank projects and have PMO with resettlement and environmental specialists. The county-level cities under the project (Yingkou ETZ, Haicheng, and Xingcheng) will need additional training on safeguard issues. An independent resettlement monitor will be contracted under the project, and LUCPRO will prepare semi-annual environmental management reports for the Bank supervision teams.

5. Identify the key stakeholders and describe the mechanisms for consultation and disclosure on safeguard policies, with an emphasis on potentially affected people.

Two rounds of public consultation were conducted during the course of environmental impact assessment. The first round was carried out in all 6 cities in September 2005, and the second round in December 2005. The primary objective of the first round was to gather information on public concerns about the Project, while that for the second round was to communicate the EIA findings and proposed mitigation measures and confirm public acceptance and satisfaction. Both rounds of public consultation focused on the project-affected people and beneficiaries of different age groups, genders, educational backgrounds and occupations as well as other stakeholders. In addition, there have been many rounds of consultation with government agencies, local governments, non-government organizations and other stakeholders of the project to discuss Project locations, scope, environmental and socio-economic concerns and environmental management and mitigation plans. The consultation exercise covered three forms: bulletins in the press, public opinion questionnaires and surveys of the public. Throughout the process of public consultation, a telephone hotline has been set up and maintained in each PMO to address EA-related issues of concern for the stakeholders.

Public consultation and participation also has played a key role in formulating the RAPs. The affected residents, business people and district governments participated in the census, inventory and formulation of the livelihood rehabilitation strategy, measures and relocation sites, and their feedback has been incorporated. Each RAP contains a list of major consultations. Public consultation and participation will continue during the RAP implementation. Project information will be provided to the affected people through TV, radio broadcast, newspapers, bulletins and posters. The RAP will be summarized into a resettlement information booklet (RIB) and distributed to every affected household.

B. Disclosure Requirements Date

Environmental Assessment/Audit/Management Plan/Other at Appraisal:	
Date of receipt by the Bank	01/25/2006
Date of "in-country" disclosure	01/25/2006
Date of submission to InfoShop	01/25/2006
For category A projects, date of distributing the Executive Summary of the EA to the Executive Directors	12/19/2006
For new components after Appraisal:	
Date of submission of EIA for Panjin's SW Transfer Station	12/19/2013
Date of "in-country" disclosure for Panjin's SW Transfer Station	12/2013
Date of submission to InfoShop	12/20/2013
Date of submission of EIA for Gaizhou's GWW/1.4	01/03/2014
Date of "in-country" disclosure for Gaizhou's GWW/1.4	01/2014
Date of submission to InfoShop	01/10/2014
Resettlement Action Plan/Framework/Policy Process at Appraisal:	
Date of receipt by the Bank	07/03/2006
Date of "in-country" disclosure	07/03/2006
Date of submission to InfoShop	07/03/2007
For new components after Appraisal:	
Date of submission of RAP for Panjin's SW Transfer Station	12/19/2013
Date of "in-country" disclosure for Panjin's SW Transfer Station	12/2013
Date of submission to InfoShop	12/20/2013
Date of submission of RAP for the Gaizhou's GWW/1.4	02/17/2014
Date of "in-country" disclosure for Gaizhou's GWW/1.4	02/26/2014
Date of submission to InfoShop	02/24/2014
*** If the project triggers the Pest Management and/or Physical Cultural Resources, 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 (to be filled in when the ISDS is finalized by the project decision meeting)

OP/BP/GP 4.01 - Environment Assessment	
Does the project require a stand-alone EA (including EMP) report?	Yes
If yes, then did the Regional Environment Unit or Sector Manager (SM) review and approve the EA report?	Yes
Are the cost and the accountabilities for the EMP incorporated in the credit/loan?	Yes
OP/BP 4.12 - Involuntary Resettlement	
Has a resettlement plan/abbreviated plan/policy framework/process	Yes

framework (as appropriate) been prepared?	
If yes, then did the Regional unit responsible for safeguards or Sector Manager review the plan?	Yes
OP/BP 4.37 - Safety of Dams	
Have dam safety plans been prepared?	Yes
Have the TORs as well as composition for the independent Panel of Experts (POE) been reviewed and approved by the Bank?	N/A
Has an Emergency Preparedness Plan (EPP) been prepared and arrangements been made for public awareness and training?	Yes
The World Bank Policy on Disclosure of Information	
Have relevant safeguard policies documents been sent to the World Bank's Infoshop?	Yes
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
All Safeguard Policies	
Have satisfactory calendar, budget and clear institutional responsibilities been prepared for the implementation of measures related to safeguard policies?	Yes
Have costs related to safeguard policy measures been included in the project cost?	Yes
Does the Monitoring and Evaluation system of the project include the monitoring of safeguard impacts and measures related to safeguard policies?	Yes
Have satisfactory implementation arrangements been agreed with the borrower and the same been adequately reflected in the project legal documents?	Yes

D. Approvals

Signed and submitted by:	***Name***	***Date***
Task Team Leader:	Mr. Suhail J. S. Jme'an	03/03/2014
Environmental Specialist:	Ms. Chongwu Sun	03/03/2014
Social Development Specialist	Mr. Aimin Hao	03/03/2014
Additional Environmental and/or Social Development Specialist(s):		
Approved by:		
Regional Safeguards Coordinator:	Mr. Peter Leonard	08/20/2014
Comments:		
Sector Manager:	f/Mr. Chas Feinstein	03/20/2014
Comments:		