Proposed Loan
People’s Republic of China: Gansu Jiuquan
Integrated Urban Environment Improvement Project
CURRENCY EQUIVALENTS
(as of 8 April 2013)

Currency unit – yuan (CNY)
CNY1.00 = $0.1613
$1.00 = CNY6.2015

ABBREVIATIONS

ADB – Asian Development Bank
EIRR – economic internal rate of return
EMP – environmental management plan
JMG – Jiuquan municipal government
JEDIC – Jiuquan Economic Development and Investment Company
O&M – operation and maintenance
PAM – project administration manual
PRC – People’s Republic of China
WWTP – wastewater treatment plant

WEIGHTS AND MEASURES

ha – hectare
m² – square meter
m³ – cubic meter
mu – 666.7 m²
km – kilometer

NOTE

In this report, "$" refers to US dollars.

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**PROJECT AT A GLANCE**

1. **Project Name:** Gansu Jiuquan Integrated Urban Environment Improvement Project
2. **Project Number:** 45506-002
3. **Country:** China, People's Republic of
4. **Department/Division:** East Asia Department/Urban and Social Sectors Division

5. **Sector Classification:**

<table>
<thead>
<tr>
<th>Sectors</th>
<th>Primary</th>
<th>Subsectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multisector</td>
<td>Water supply and sanitation</td>
<td></td>
</tr>
<tr>
<td>✓ Urban transport</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Forestry</td>
<td></td>
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</table>

6. **Thematic Classification:**

<table>
<thead>
<tr>
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<th>Subthemes</th>
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</thead>
<tbody>
<tr>
<td>Environmental sustainability</td>
<td>✓ Urban environmental improvement</td>
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<tr>
<td>Economic growth</td>
<td>Promoting economic efficiency and enabling business environment</td>
<td></td>
</tr>
<tr>
<td>Capacity development</td>
<td>Institutional development</td>
<td></td>
</tr>
</tbody>
</table>

6a. **Climate Change Impact**

- **Adaptation:** Low
- **Mitigation:** Low

6b. **Gender Mainstreaming**

- Effective gender mainstreaming (EGM) ✓
- Gender equity theme (GEN)
- No gender elements (NGE)
- Some gender elements (SGE)

7. **Targeting Classification:**

<table>
<thead>
<tr>
<th>General Intervention</th>
<th>Targeted Intervention</th>
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</thead>
<tbody>
<tr>
<td>Targeted Intervention</td>
<td>Geographic dimensions of inclusive growth ✓  MDG7</td>
</tr>
<tr>
<td></td>
<td>Millennium development goals</td>
</tr>
<tr>
<td></td>
<td>Income poverty at household level</td>
</tr>
</tbody>
</table>

8. **Location Impact:** Urban High

9. **Project Risk Categorization:** Complex

10. **Safeguards Categorization:**

<table>
<thead>
<tr>
<th>Environment</th>
<th>B</th>
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<tbody>
<tr>
<td>Involuntary resettlement</td>
<td>A</td>
</tr>
<tr>
<td>Indigenous peoples</td>
<td>C</td>
</tr>
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</table>

11. **ADB Financing:**

<table>
<thead>
<tr>
<th>Sovereign/Nonsovereign</th>
<th>Modality</th>
<th>Source</th>
<th>Amount ($ Million)</th>
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<tr>
<td>Sovereign</td>
<td>Project loan</td>
<td>Ordinary capital resources</td>
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<tr>
<td>Total</td>
<td></td>
<td></td>
<td>100.00</td>
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</tbody>
</table>

12. **Cofinancing:** None

13. **Counterpart Financing:**

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount ($ Million)</th>
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<tbody>
<tr>
<td>Jiuquan Municipal Government</td>
<td>54.23</td>
</tr>
<tr>
<td>China Construction Bank</td>
<td>62.20</td>
</tr>
<tr>
<td>Total</td>
<td>116.43</td>
</tr>
</tbody>
</table>

14. **Aid Effectiveness:**

| Parallel project implementation unit | No |
| Program-based approach              | No |
I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to the People’s Republic of China (PRC) for the Gansu Jiuquan Integrated Urban Environment Improvement Project.\(^1\)

2. The project aims to promote environmentally sustainable and socioeconomically inclusive urban development in Jiuquan, Gansu province, by upgrading urban infrastructure and services. The project will support wastewater management, urban transport and utility facilities, windbreak plantation, and related services.\(^2\)

II. THE PROJECT

A. Rationale

3. The PRC has made remarkable progress in economic development and poverty reduction since 1980, but such progress has not been balanced across different regions. Located in the country’s northwestern region, Gansu has lagged behind in the economic development and remains one of the poorest provinces in the PRC.\(^3\) In 2011, the poverty rates in Gansu province were 9.4% for urban and 20.4% for rural households, significantly higher than the national averages of 3.3% and 8.1%. Development barriers facing Gansu include a harsh natural environment, remote inland location, underdeveloped infrastructure, and lack of investment. Such wide regional disparities prompted the Government of the People’s Republic of China to launch the National Strategy for Development of the Western Region, with the aim to promote balanced economic growth and to raise the living standards in the region.\(^4\) The strategy focuses on developing infrastructure, protecting the environment, and strengthening economic cooperation and trade with neighboring provinces and countries.

4. The project is located in Jiuquan, Gansu province, about 730 kilometers (km) northwest of the provincial capital of Lanzhou.\(^5\) Jiuquan’s key industries are renewable energy equipment manufacturing and agricultural product processing. Tourism has increasingly contributed to the city’s economic output based on its rich historic and cultural resources and the launching site of the national space program. Historically an oasis on the ancient Silk Road along the Hexi Corridor, Jiuquan has the potential to serve as a vital artery for the relatively less-developed northwestern region of the PRC and play a strategic role in aiding the region’s socioeconomic development as envisaged under the National Strategy for Development of the Western Region.

5. Challenges. Jiuquan faces various environmental problems and urban development challenges due to its harsh natural environment and inadequate urban infrastructure. Situated between the southern limits of the Gobi desert and the Qilian Mountains, Jiuquan has a continental desert climate with constrained water resources and high evaporation.\(^6\) Sand and dust transported by frequent strong winds from the desert cause atmospheric pollution, a high

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\(^1\) The design and monitoring framework is in Appendix 1.


\(^3\) In 2011, per capita gross domestic product in Gansu was CNY19,595, compared with the national average of CNY35,181, third lowest among provinces, major municipalities, and autonomous regions in the PRC. The average annual per capita disposable incomes in Gansu were CNY14,989 for urban and CNY3,909 for rural households, substantially lower than the national averages of CNY21,810 and CNY6,977.


\(^5\) Jiuquan municipality comprises Suzhou district (Jiuquan city area), Dunhuang city, Yumen city, Akesei county, Guazhou county, Jinta county, and Subei county.

\(^6\) Average annual precipitation is 84 millimeters (mm) and average annual evaporation is 2,140 mm in Jiuquan.
incidence of respiratory illness, and productivity losses.\textsuperscript{7} The water quality in the Beida River is class II for the upstream reach of Jiuquan city, class III through the city area, and class IV downstream, resulting from discharges of untreated wastewater from the city.\textsuperscript{8} As a water-scarce city undergoing continuous growth, Jiuquan must stem the gradual contamination of its water resources, which endangers public health and safety and constrains its sustainable development. Jiuquan’s increasingly congested urban roads and inadequate infrastructure also limit the city’s ability to promote greater links along the Hexi Corridor and enable socioeconomic development in the northwestern region.

6. **Wastewater.** An estimated 66% of wastewater is treated in Jiuquan city at an existing wastewater treatment plant (WWTP). Excessive wastewater overflows and discharges into the Beida River. There is an urgent need to expand the wastewater collection and treatment system to serve broader coverage in the existing and expanded urban areas. The project will support the construction of a new WWTP and an associated wastewater collection network to expand the service area, targeting an 88% treatment rate by 2019 and mitigating pollution loads into the Beida River. The project will also provide institutional support for wastewater reuse and sludge treatment and disposal options appropriate to the local conditions.\textsuperscript{9}

7. **Urban transport.** According to the Jiuquan Urban Master Plan, 2011–2030,\textsuperscript{10} Jiuquan city will expand northward and westward, ultimately integrating economically with Jiayuguan city, 20 km to the northwest. The now incomplete and increasingly congested road network and ill-managed transport system are constraints to sustainable urban development. The project will support the construction and rehabilitation of an urban transport network, thereby relieving congestion in the existing road network, improving access to a main employment area, expanding farm-to-market routes for neighboring rural areas, and facilitating economic integration between Jiuquan and Jiayuguan. It will improve urban service delivery by expanding municipal utility services networks along the roads. It will also help improve traffic management and road safety, and introduce a public transport corridor for the main road connecting the planned high-speed railway station to the central urban area and to the expanded urban area to the north.

8. **Forestry.** Jiuquan suffers from frequent winds and sandstorms and is in a state of moderate desertification. The Jiuquan municipal government (JMG), recognizing the constrained physical environment and the importance of its prudent management to the city’s sustainable development, has made increasing investments in afforestation and resources reuse for ecological and environmental improvement. In support of these efforts, the project will establish an ecological corridor by planting windbreak tree screens along the banks of the Beida River. This will provide natural windbreaks for the city against sandstorms, enhance public amenities, and improve the living environment and public health of local residents, with additional benefits of carbon sequestration, sand fixation, securing agricultural production, soil conservation, and regulation of micro-climate.

\textsuperscript{7} According to the Jiuquan Environmental Protection Bureau, the annual average of daily sand and dust deposits from the atmosphere is 22.9 tons per square kilometer (km\textsuperscript{2}) per day. After the 5-day sandstorm in April 2011, it was reported that 31.1 km\textsuperscript{2} of farmland had been affected, resulting in direct economic losses of CNY15.7 million.

\textsuperscript{8} PRC water quality standards (GB 3838-2002) have five classes. Class I is pristine, class II is for high-value fish production areas and spawning habitats, class III is suitable for urban water supply, class IV is suitable for irrigation and recreation, and class V is polluted and not recommended for human consumption or agricultural use.

\textsuperscript{9} Effluent wastewater from the project-supported WWTP will be reused for industrial purposes subject to detailed technical and economic analyses on various reuse alternatives, including landscaping and agricultural uses. This will be supported by the capacity development component of the project. The project will also support sludge treatment and disposal option analysis.

9. **Strategic fit and lessons.** The project will contribute to balanced regional development in the PRC, thereby supporting the PRC’s Twelfth Five-Year Plan, 2011–2015. By promoting sustainable and environment-friendly urban development, the project aligns with ADB’s country partnership strategy for the PRC.\(^{11}\) It promotes economic growth that is environmentally sustainable and inclusive, in line with ADB’s Strategy 2020.\(^{12}\) It contributes to Millennium Development Goal 7 by improving sanitation. It conforms with ADB’s urban, water, and transport sector strategies, which encourage green, competitive, and inclusive urban development, efficient water use, expanded wastewater management, rehabilitation of degraded forestlands, and sustainable urban transport.\(^{13}\) It builds on ADB’s experience and lessons gained from previous projects in Gansu and other urban projects in the PRC,\(^{14}\) and from knowledge generated in policy-oriented studies on urban water security, sludge management, and dryland ecosystems, including the (i) need for well-programmed capacity building to accompany physical investments to enhance sustainability; (ii) importance of continued support and commitment to sector reforms such as cost recovery and resources conservation and reuse to improve sector performance and sustainability; and (iii) need for integrated, participatory, and well-coordinated management of the sensitive ecosystem in arid areas.

10. **Special features.** The project is designed to boost integrated environmental and social benefits and involve community participation in project design and implementation. It has the following special features:

   (i) To assist the government’s strategy for resources reuse, it will lend institutional support to wastewater reuse and sludge utilization in a manner befitting the local conditions.

   (ii) The design of the urban transport will take into account road safety, nonmotorized transport, and integration of the public transport system with a view to the planned high-speed railway. Road safety campaigns with schools, bus stations, drivers association, and communities will be supported to step up public safety awareness. To reinforce the social benefits of the road network, JMG gave assurances to allot adequate low-income housing in the expanded urban area.

   (iii) Windbreak plantation will adopt a multifunctional approach to reduce air pollution and land degradation, improve the city’s resilience to climate change impacts, and provide a landscaped area for public amenity. The results will be monitored through a quantitative evaluation system that the project will develop. The project will also support regular water balance analyses and establish an ecological education trail to inform the public on the city’s exposure to desertification and the benefits of afforestation.

**B. Impact and Outcome**

11. The project’s impact will be environmentally sustainable and socioeconomically inclusive urban development in Jiuquan. The project’s outcome will be improved urban infrastructure and services in Jiuquan.

**C. Outputs**

12. The project will have four outputs:


\(^{14}\) ADB supported urban projects in Baiyin, Dingxi, Lanzhou, Tianshui, and Zhangye in Gansu province. JMG established a rapport with these cities to learn from their lessons and practices.
(i) **Wastewater collection and treatment.** It will construct a WWTP with a capacity of about 60,000 cubic meters (m³) per day and about 39 km of wastewater collection network.

(ii) **Urban transport and utility facilities.** It will improve (a) the urban road network and related facilities in the expanded urban area by constructing and upgrading about 15.9 km of urban roads and two bridges, and constructing associated utility facilities such as road lighting, pipes for water supply, wastewater, heating, and gas, and conduits for electricity and telecommunication lines; and (b) traffic management and safety systems, and upgrade about 0.8 km of roads in the existing central urban area.

(iii) **Windbreak plantation.** It will plant about 60.5 hectares (ha) of windbreak tree screens along the northern and southern banks of the Beida River.

(iv) **Capacity development and institutional strengthening.** It will provide consulting services for (a) capacity development of JMG and Jiuquan Economic Development and Investment Company (JEDIC) for smooth and timely implementation of the project in line with ADB procedures and guidelines; (b) institutional strengthening of JMG and JEDIC for water conservation, wastewater reuse, sludge management, urban transport system, traffic management and safety, and desertification risk management; and (c) public awareness campaigns.

**D. Investment and Financing Plans**

13. The project is estimated to cost $216.43 million (Table 1).

| Table 1: Project Investment Plan  
| ($ million) |
|--------------------------|-----------------|
| **A. Base Cost**         |                 |
| 1. Wastewater collection and treatment | 33.06 |
| 2. Urban transport and utility facilities | 114.75 |
| 3. Windbreak plantation | 27.35 |
| 4. Capacity development and institutional strengthening | 2.21 |
| **Subtotal (A)**         | 177.36 |
| **B. Contingencies**    | 30.25 |
| **C. Financing Charges During Implementation** | 8.82 |
| **Total (A+B+C)**        | 216.43 |

Note: Numbers may not sum precisely because of rounding.

- a Includes taxes and duties of $8.6 million, of which $4.4 million is to be financed by the government and $4.2 million using ADB resources. The principles followed in determining the amount of taxes and duties to be financed by ADB are: (i) the amount is within reasonable country thresholds; (ii) the amount represents 4.8% of base cost, not an excessive share of the project investment plan; (iii) taxes and duties apply only to ADB-financed expenditures; and (iv) the financing of the taxes and duties is relevant to the success of the project.

- b In mid-2012 prices.

- c Physical contingencies are computed at 8%. Price contingencies are computed at 1.9% for 2013, 2.2% for 2014, 1.9% for 2015, and 1.8% thereafter on foreign exchange costs, and at 3.5% for 2013 and 3.0% thereafter on local currency costs. Contingencies include provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.

- d Includes interest and commitment charges. Interest during construction for the ADB loan has been computed at the 5-year US dollar fixed swap rate plus a spread of 0.4% and maturity premium of 0.2%. Commitment charges for an ADB loan are 0.15% per year to be charged on the undisbursed loan amount. Interest during construction for the domestic bank loan from the China Construction Bank is computed at 6.55% per year.

Source: Asian Development Bank estimates.

15 Detailed cost estimates are in the Project Administration Manual (accessible from the list of linked documents in Appendix 2).
14. The government has requested a loan of $100 million from ADB’s ordinary capital resources to help finance the project. The loan will have a 25-year term, including a grace period of 5 years, an annual interest rate determined in accordance with ADB’s London interbank offered rate-based lending facility,¹⁶ a commitment charge of 0.15% per year, and such other terms and conditions as set forth in the draft loan and project agreements. The loan will finance 46.2% of the project cost, including works, goods, and consulting services and training. The loan will also finance taxes and duties for eligible ADB-financed expenditures, and transportation and insurance costs. JMG will provide counterpart funding equivalent to $54.23 million, which will finance 25.1% of the project cost. It has also requested a loan of about $62.20 million from the China Construction Bank to cover 28.7% of the project cost. The domestic bank loan will have an 8-year term and an interest rate of 6.6% per year.

15. The financing plan is in Table 2. The PRC is the borrower of the loan and will make the loan available, through Gansu provincial government, to JMG on the terms and conditions satisfactory to ADB. As the end-borrower, JMG will pay the commitment charge and interest at the same rate as that of the loan and will assume the foreign exchange and interest rate variation risks. The PRC, Gansu provincial government, and JMG have assured ADB that counterpart funding and domestic bank loan proceeds will be provided in a timely manner, including any additional counterpart funding required for any shortfall of funds or cost overruns.

### Table 2: Financing Plan

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount ($ million)</th>
<th>Share of Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian Development Bank</td>
<td>100.00</td>
<td>46.2</td>
</tr>
<tr>
<td>China Construction Bank</td>
<td>62.20</td>
<td>28.7</td>
</tr>
<tr>
<td>Jiuquan municipal government</td>
<td>54.23</td>
<td>25.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>216.43</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Source: Asian Development Bank estimates.

E. Implementation Arrangements

16. The implementation arrangements are summarized in Table 3 and described in detail in the project administration manual (PAM, footnote 15).

### Table 3: Implementation Arrangements

<table>
<thead>
<tr>
<th>Aspects</th>
<th>Arrangements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation period</td>
<td>July 2013–June 2018</td>
</tr>
<tr>
<td>Estimated completion date</td>
<td>30 June 2018 (loan closing date: 31 December 2018)</td>
</tr>
<tr>
<td>Management</td>
<td>Project leading group (policy guidance)</td>
</tr>
<tr>
<td>(i) Oversight body</td>
<td>Vice Mayor of Jiuquan (chair)</td>
</tr>
<tr>
<td></td>
<td>Jiuquan Development and Reform Commission, Jiuquan Finance Bureau,</td>
</tr>
<tr>
<td></td>
<td>Jiuquan Planning Bureau, Jiuquan Urban and Rural Construction Commission,</td>
</tr>
<tr>
<td></td>
<td>Jiuquan Transport Bureau, Jiuquan Environmental Protection Bureau,</td>
</tr>
<tr>
<td></td>
<td>Jiuquan Land Resources Bureau, Jiuquan Housing Management Bureau,</td>
</tr>
<tr>
<td></td>
<td>Jiuquan Water Resources Bureau, Jiuquan Public Utilities Bureau,</td>
</tr>
<tr>
<td></td>
<td>Jiuquan Civil Affairs Bureau, Jiuquan Labor and Social Security Bureau,</td>
</tr>
<tr>
<td></td>
<td>Jiuquan Forestry Bureau, Jiuquan Statistics Bureau, Jiuquan Meteorological</td>
</tr>
<tr>
<td></td>
<td>Bureau, Suzhou District Government, and JEDIC (members)</td>
</tr>
<tr>
<td>(ii) Executing agency</td>
<td>JMG (overall project implementation, including finance, technical and</td>
</tr>
</tbody>
</table>

¹⁶ The interest includes a maturity premium of 20 basis points. This is based on the above loan terms and the government’s choice of repayment option and dates.
### Aspects | Arrangements
---|---
| (iii) Implementing agency  | JEDIC (day-to-day project implementation of all infrastructure components, to be supported by a tendering agent)
| (iv) Implementation unit  | Project management office in the JMG, with 15 proposed staff, to be supported by project implementation consultants

#### Procurement

<table>
<thead>
<tr>
<th>Method</th>
<th>Quantity</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>International competitive bidding</td>
<td>8 contracts</td>
<td>$101.8 million</td>
</tr>
<tr>
<td>National competitive bidding</td>
<td>8 contracts</td>
<td>$55.9 million</td>
</tr>
<tr>
<td>Shopping</td>
<td>4 contracts</td>
<td>$0.4 million</td>
</tr>
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</table>

#### Consulting services

<table>
<thead>
<tr>
<th>Method</th>
<th>Quantity</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality- and cost-based selection (80:20)</td>
<td>125 person-months</td>
<td>$2.0 million</td>
</tr>
<tr>
<td>Consultants’ qualifications selection</td>
<td>9.5 person-months</td>
<td>$0.1 million</td>
</tr>
<tr>
<td>Individual consultant selection</td>
<td>10 person-months</td>
<td>$0.1 million</td>
</tr>
</tbody>
</table>

#### Retroactive financing and advance contracting

4 works contracts for wastewater network and urban roads, bridges and associated utility facilities, and 4 consulting services contracts for capacity development will be procured through advance contracting. Retroactive financing will finance eligible expenditures up to $20 million (not exceeding 20% of the ADB loan) incurred before loan effectiveness, but not earlier than 12 months before the loan agreement is signed.

### Disbursement

The loan proceeds will be disbursed in accordance with ADB’s Loan Disbursement Handbook (2012, as amended from time to time) and detailed arrangements agreed upon between the government and ADB.

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a All procurement of goods and works will be undertaken in accordance with ADB’s Procurement Guidelines (2010, as amended from time to time), and all consulting services will be engaged in accordance with ADB’s Guidelines on the Use of Consultants (2010, as amended from time to time).

b Approval of advance contracting and retroactive financing does not commit ADB to finance the project.


### III. DUE DILIGENCE

17. The project will directly benefit about 450,000 residents of Jiuquan, by improving environmental and living conditions through (i) expanded wastewater services, reduced pollution, and better public health; (ii) greater mobility, accessibility, and safety in urban transport; and (iii) a healthier urban environment.

#### A. Technical

18. The project design accommodates local conditions and accords with PRC design guidelines and local regulations. The design for wastewater treatment adopts a proven technology in the PRC, suits the natural environment, and is adequate to attract market competition. Holistic road design considerations have been incorporated into the transport component, including junction design, nonmotorized and pedestrian lanes, stronger traffic safety management, and a cross-section design amenable to the public transport system. Windbreak plantation is well integrated and sequenced with other project components. A detailed engineering design will comply with latest urban design standards and specifications. A capacity-building program for related urban services is included to ensure sustainable operation and maintenance (O&M) of project facilities. A detailed description of components is in the PAM.

#### B. Economic and Financial

19. **Economic.** The economic analysis evaluated technical options and confirmed that the project components use least-cost options to support Jiuquan’s long-term urban development plans. The cost–benefit analysis reveals the project’s overall economic internal rate of return...
(EIRR) at 14.5% and the overall economic net present value at CNY108.5 million. The EIRR for each component is computed at 12.4% for wastewater, 15.2% for urban transport, and 14.0% for windbreak plantation, each exceeding the economic opportunity cost of capital of 12.0%. Sensitivity analysis indicates that the EIRR for wastewater is sensitive to changes in either costs or benefits, the EIRR for urban transport is robust to adverse changes, and the EIRR for windbreak plantation is generally robust but sensitive to simultaneous increase in costs and decrease in benefits. However, all EIRRs are considered underestimated, as all project components have significant benefits not easily quantified. Sensitivity of the project depends on adequate O&M of the project facilities throughout their expected economic life. Economic costs include capital costs for four components, physical contingencies, and O&M costs. Economic benefits for wastewater are based on estimates of willingness to pay as derived from the contingent valuation survey conducted during project preparation; for urban transport, they are based on (i) savings in vehicle operating costs, (ii) time savings, (iii) accident cost reductions, and (iv) road maintenance cost savings; and for windbreak, on (i) more income due to employment generated by the component, (ii) benefits from carbon sequestration, and (iii) avoided damages on agricultural crops and properties due to occurrence of sandstorms.

20. **Financial.** The analysis of the financial viability of the revenue-generating component—wastewater—finds a financial internal rate of return at 2.3%, which compares favorably with the 1.4% weighted average cost of capital. Wastewater tariff increases are proposed to achieve full cost recovery by 2027, as assured by JMG. The analysis of existing tariffs and cost-recovery arrangements shows full cost recovery to be unrealistic in the short term without government subsidy. However, the project will promote progressive tariff increases through the capacity development component, following the PRC process for public participation in water tariff reform. The wastewater tariff will equal 0.4% of an average household’s income and 0.7% of a poor household’s income, considered affordable. The proposed tariff increase is within the amount that beneficiaries are willing to pay. The tariff subsidy to the poor will be maintained. Sensitivity analysis indicates that the financial internal rate of return is sensitive to a revenue decrease and O&M cost increase. Hence, realizing a tariff increase and controlling costs will be crucial in ensuring the financial viability of the wastewater component. Financial sustainability analysis indicates that JMG presents acceptable fiscal risk in its ability to provide counterpart funds for capital investment, finance O&M costs, and service project debts. Its contributions to the project will be less than 0.5% of its fiscal revenue over the project implementation period, and debt service and O&M costs will not exceed 0.7% of fiscal revenue during the operation period. The nonrevenue-generating components—urban transport and utility facilities and windbreak plantation—are therefore considered both financially sustainable and affordable.

C. **Governance**

21. **ADB’s Anticorruption Policy** (1998, as amended to date) was explained to and discussed with the Gansu provincial government, JMG, and JEDIC. Specific policy requirements and supplementary measures are described in the PAM, e.g., providing support and training on ADB policies and procedures, engaging a tendering agent and project implementation consultants to

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17 Not readily quantifiable benefits such as health benefits were not included in the economic analysis. Better water quality and urban environment are probably not fully reflected in the willingness-to-pay survey because of their intangibility.
18 Tariff analysis is described in the Financial Analysis (accessible from the list of linked documents in Appendix 2), and tariff increases and associated capacity development support are assured in the draft Project Agreement and PAM (accessible from the list of linked documents in Appendix 2).
19 Poor households receiving minimum living standard security are eligible for a 50% discount in wastewater tariff up to 6 m³ per month.
strengthen procurement, and involving the Jiuquan Discipline Investigation Bureau in procurement. The financial management assessment concludes that, although the project management office and JEDIC have general financial management capacity and project management experience, they lack sufficient experience in managing ADB projects and require a component that builds their capacity to implement the project in line with ADB policies and procedures.

D. Poverty and Social

22. Poverty and social. Poverty and social analysis was undertaken through a household survey, community and focus group discussions, and key informant interviews. The project will directly benefit over 450,000 urban residents, of whom about 8.6% are poor, by improving living conditions, urban services, public health, urban environment, and ecology. The project will create about 8,000 jobs during construction of the wastewater and urban transport components, and about 145 jobs during operation. It is also estimated that about 3,000 person-days of labor will be generated for windbreak plantation. Employment targets for vulnerable groups and women are included in the design and monitoring framework and loan assurances. Better urban environment and transport services through expanded wastewater management, windbreak protection, and a road network with stronger public and nonmotorized transport and road safety will improve public health and safety. A social development action plan has been prepared and will be implemented by the project management office in collaboration with other stakeholders during project implementation. The project will not only improve the urban environment but also raise public awareness on water conservation, wastewater tariffs, road safety, and anti-desertification and thereby help sustain socioeconomic development in Jiuquan.

23. Gender. The project is classified as effective gender mainstreaming and a gender action plan has been prepared with agreed activities and indicators. The analysis of the survey and focus group discussion data reveals that women are affected by poor mobility and access, generally burdened with family and household responsibilities, and employed in low-paying jobs. Improving sanitary conditions through expanded wastewater services will benefit women by reducing illness and associated time and cost burdens. Improvements to urban transport and attention to the needs of women in the planning of public transport, pedestrian, nonmotorized transport access, and road safety programs will benefit women by increasing access, mobility, and safety, reducing time and cost burdens, and improving productivity. The healthier ecological environment and green space will provide recreational areas for women and children. Women’s participation in windbreak plantation, education trail design, various public awareness activities, and public hearings on the wastewater tariff will strengthen the effectiveness of project activities and bolster project sustainability. The gender action plan includes specific targets for women in employment, participation, and capacity-building opportunities, and is supported by a loan assurance and consultant support for implementation and monitoring.

E. Safeguards

24. Environment. The project is environment category B. An initial environment examination—prepared in compliance with ADB’s Safeguard Policy Statement (2009) and posted on the ADB website—concludes that the project will have substantial environmental benefits and that its potential adverse environmental impacts can be mitigated through the environmental management plan (EMP). Construction and operation of the project components have potential impacts on the environment, but these are site-specific, reversible, and not unprecedented. Dust and noise generated by construction activities could be a nuisance to nearby residents unless mitigated. Discharge of wastewater from construction sites could
potentially pollute nearby water bodies. Traffic on the project roads could generate air and noise pollution that may affect nearby sensitive receptors. Operation of the WWTP could generate odor and noise impacts. Environmental management measures defined in the EMP, such as sound construction site management and regular monitoring of the project’s environmental performance during construction and operation, will reduce these impacts to acceptable levels. JMG will be responsible for the overall implementation and compliance with the EMP, including inspection, monitoring, reporting, and corrective actions or measures. Contractors as well as JEDIC during construction, and facility operators during operation, will implement the EMP measures. Environmental management is supported by capacity development and institutional strengthening activities under the project and loan covenants. JMG disclosed relevant environment information to potentially affected people, and the results and findings of the consultation process were used to modify the initial environmental examination and finalize the project design. Consultations and public participation will continue throughout project implementation. Environmental complaints will be handled in accordance with the environment grievance redress mechanism developed for the project. The EMP is in Annex 1 of the PAM.

25. **Resettlement.** The project is resettlement category A. A total of 897 mu of land will be permanently acquired, including 609 mu of collective land and 288 mu of state-owned land. A further 351 mu of state-owned land will be temporarily occupied during project implementation. Land acquisition will affect 138 households with 547 persons. A total of 5,624 square meters (m²) of rural residences and 21,580 m² of nonresidential structures will be demolished, affecting 22 households with 88 persons, and 21 enterprises with 162 employees. A resettlement plan was prepared in line with ADB’s Safeguard Policy Statement (2009), endorsed by JMG, disclosed to affected people in the local language, and posted on the ADB website. The resettlement plan will be finalized in line with the detailed engineering design and detailed measurement survey, disclosed to affected people in the local language, and submitted to ADB for approval before awarding civil works contracts. Compensation for lost assets and resettlement allowances will be paid to affected people, and livelihood rehabilitation will be arranged in accordance with the resettlement plan before starting the related civil works. The project management office and JEDIC will assume responsibility for planning, implementing, financing, and reporting on land acquisition and resettlement. A grievance redress mechanism was established.

26. **Indigenous peoples.** The project is indigenous peoples category C. In Jiuquan city, ethnic minorities make up about 1.6% of the population. They are socially and economically well integrated and will benefit from the project activities as much as the mainstream population. The project will not have any impact on the dignity, human rights, traditional lands, or culture of ethnic minorities. No buildings with cultural or religious significance to ethnic minorities are in the project area. The project will not have any direct impact on their livelihoods.

**F. Risks and Mitigating Measures**

27. **Major risks and mitigating measures** are summarized in Table 4 and described in detail in the risk assessment and risk management plan. The project has no unusual technical risks. The project’s integrated benefits and impacts are expected to outweigh costs and risks.

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20 A *mu* is a Chinese unit of measurement (1 *mu* = 666.67 m²).
21 Of these, 78 households with 297 persons will be seriously affected, losing more than 10% of their productive land.
22 Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).
Table 4: Summary of Risks and Mitigating Measures

<table>
<thead>
<tr>
<th>Risks</th>
<th>Mitigating Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation delays due to the limited experience of the PMO and JEDIC in projects financed by multilateral agencies</td>
<td>JMG has hired a qualified tendering agent with ADB procurement experience. The project will provide consulting services for technical support and on-the-job trainings in procurement, disbursement, and financial management. JMG has established rapport with the implementing agencies of previous ADB urban sector projects in Gansu to learn about ADB guidelines and procedures.</td>
</tr>
<tr>
<td>Delay in land acquisition and resettlement</td>
<td>JMG will make available for and timely release of funds for compensation under its fiscal budget as per loan covenant. The project will support (i) initial project implementation by engaging a resettlement expert to assist in detailed measurement surveys and resettlement plan finalization, and (ii) independent resettlement monitoring to ensure compliance.</td>
</tr>
<tr>
<td>Unsustainable operation and maintenance of infrastructure components due to lack of capacity or budget</td>
<td>JMG will ensure adequate staff resources and annual operation and maintenance budget as per loan covenants. The project will provide (i) infrastructural support for management improvement such as wastewater system monitoring, road maintenance, and traffic management; and (ii) institutional support for prudent operational practices and trainings.</td>
</tr>
<tr>
<td>Delay in tariff increase</td>
<td>JMG will implement a phased tariff increase to achieve full cost recovery by 2027 as per loan covenant. The project will provide institutional support for annual tariff reviews and public awareness program.</td>
</tr>
</tbody>
</table>


IV. ASSURANCES

28. The government, Gansu provincial government, and JMG have assured ADB that implementation of the project shall conform to all applicable ADB policies including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the PAM and loan documents. The government, Gansu provincial government, and JMG have also agreed with ADB on certain covenants for the project, which are set forth in the loan and project agreements.

V. RECOMMENDATION

29. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and, acting in the absence of the President, under the provisions of Article 35.1 of the Articles of Agreement of ADB, I recommend that the Board approve the loan of $100,000,000 to the People’s Republic of China for the Gansu Jiuquan Integrated Urban Environment Improvement Project, from ADB’s ordinary capital resources, with interest to be determined in accordance with ADB’s London interbank offered rate (LIBOR)-based lending facility; for a term of 25 years, including a grace period of 5 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan and project agreements presented to the Board.

Bindu N. Lohani
Ranking Vice-President

23 May 2013
## DESIGN AND MONITORING FRAMEWORK

<table>
<thead>
<tr>
<th>Design Summary</th>
<th>Performance Targets and Indicators with Baselines</th>
<th>Data Sources and Reporting Mechanisms</th>
<th>Assumptions and Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impact</strong></td>
<td><strong>By 2021</strong> (baseline 2011)</td>
<td>Annual statistics from the Jiuquan Statistics Bureau</td>
<td>Assumption</td>
</tr>
<tr>
<td></td>
<td>Environmentally sustainable and socioeconomically inclusive urban development in Jiuquan</td>
<td>Annual statistics from the Jiuquan Labor and Social Security Bureau</td>
<td>Positive socioeconomic development continues in Jiuquan during and beyond Twelfth Five-Year Plan.</td>
</tr>
<tr>
<td></td>
<td>Average annual per capita disposable income of urban households increased from CNY17,265 to CNY41,900</td>
<td>Annual reports of Jiuquan Environmental Protection Bureau</td>
<td>Risk</td>
</tr>
<tr>
<td></td>
<td>Annual increase in new employment by 10,000</td>
<td></td>
<td>Development pressures outpace planned infrastructure development.</td>
</tr>
<tr>
<td></td>
<td>Public satisfaction with the urban environment and ecology improved from 84% and maintained at no less than 85%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Outcome</strong></td>
<td><strong>By 2019</strong> (baseline 2011)</td>
<td>Annual urban construction reports by Jiuquan Urban-Rural Construction Bureau</td>
<td>Assumption</td>
</tr>
<tr>
<td></td>
<td>Improved urban infrastructure and services in Jiuquan.</td>
<td>Quarterly effluent monitoring records of Jiuquan Environmental Protection Bureau</td>
<td>Government commitment and support for infrastructure development continues.</td>
</tr>
<tr>
<td></td>
<td>Percentage of urban population provided with piped wastewater collection and treatment system increased from 66% to 88%</td>
<td>PCC issued by PMO</td>
<td>Risk</td>
</tr>
<tr>
<td></td>
<td>Average annual discharge of COD reduced from 6,961 tons to 535 tons, and discharge of NH₄⁺-N reduced from 562 tons to 134 tons</td>
<td>Annual accident statistics from Jiuquan Traffic Police</td>
<td>Lack of agency coordination in monitoring environmental protection and management.</td>
</tr>
<tr>
<td></td>
<td>Peak-hour traveling time between high-speed railway station and Western Suburbs Industrial Zone reduced from 45 minutes to 25 minutes</td>
<td></td>
<td>Project facilities are not sustainably operated and maintained.</td>
</tr>
<tr>
<td></td>
<td>Traffic fatality rate per 10,000 vehicles decreased from 4.5 to 2.5 with average annual decrease of 8%</td>
<td></td>
<td>Actual economic growth and population increases are far from the estimates.</td>
</tr>
<tr>
<td></td>
<td>Biomass measured at windbreak plantations increased to 7,000 tons</td>
<td>Biomass monitoring by Suzhou District Gardening Bureau</td>
<td></td>
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<tr>
<td></td>
<td>8,000 jobs during project implementation and 145 jobs during operation created, with 30% targeted for women and 30% for the poor; 3,000 person-days of tree planting work, with 50% targeted for women and 30% for the poor</td>
<td>Contractors’ employment data (to be disaggregated by sex, income status, age, and ethnicity), and annual reports by Jiuquan Labor and Social Security Bureau</td>
<td></td>
</tr>
<tr>
<td>Design Summary</td>
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</tbody>
</table>
| Outputs 1. Wastewater collection and treatment system is operating | **By 2018** (baseline 2011)  
A new wastewater treatment plant with a capacity of 60,000 m³/d and 39 km of collection network is operating  
At least 40% of participants in public hearings on wastewater tariff increases are women, and 50% of beneficiaries in water conservation advocacy campaigns are women | PCC issued by PMO  
Semiannual progress reports | **Assumption**  
Ongoing water supply system expansion is implemented as planned.  
**Risk**  
Land acquisition and resettlement approvals and implementation are delayed. |
| 2. Urban transport and utility facilities are operating | Improved urban road network and related facilities are operating in the expanded urban area, including 15.9 km of new and upgraded urban roads, 2 new and upgraded bridges opened to traffic, and associated utility facilities are operating  
Improved traffic management and safety systems and 0.8 km of upgraded roads are operating in the existing central urban area  
At least 50% of beneficiaries in road safety awareness activities are women | PCC issued by PMO  
PCC issued by PMO  
Semiannual progress reports | **Assumption**  
Jiuquan’s urban expansion and economic integration with Jiayugan continues in line with the urban master plan.  
**Risks**  
Land acquisition and resettlement approvals and implementation are delayed.  
Relevant agencies lack coordination in implementation. |
| 3. Windbreak tree screens planted | 60.5 ha of windbreak tree plantations opened to the public | PCC issued by PMO | **Risk**  
Exceptional weather conditions affect project implementation. |
| 4. Capacity developed and institutions strengthened | A 4-year training plan developed and implemented from 2013 to 2018, with a target of 30% women beneficiaries  
Water conservation and wastewater reuse plan, sludge utilization plan, public transport system, traffic management and safety improvement plan, windbreak plantation education trail, desertification risk management plan are developed | PCC issued by PMO  
Semiannual progress reports | **Assumptions**  
Relevant authorities provide strong support for capacity development.  
Loan implementation consultants are recruited in a timely manner. |
**Activities with Milestones**

1. **Wastewater collection and treatment**
   - 1.1 Undertake detailed design and engineering by Q3 2013
   - 1.2 Acquire land and implement resettlement by Q2 2014
   - 1.3 Procure works and goods by Q2 2014
   - 1.4 Construct and commission the project facilities by Q4 2016

2. **Urban transport and utility facilities**
   - 2.1 Undertake detailed design and engineering by Q3 2013
   - 2.2 Acquire land and implement resettlement by Q2 2014
   - 2.3 Procure works and goods by Q1 2014
   - 2.4 Construct and commission project facilities by Q4 2016

3. **Windbreak plantation**
   - 3.1 Undertake detailed design and engineering by Q3 2014
   - 3.2 Procure works and goods by Q1 2015
   - 3.3 Construct and commission the project facilities by Q1 2018

4. **Capacity development and institutional strengthening**
   - 4.1 Complete organizational arrangements for executing and implementing agencies and the PMO by Q1 2013
   - 4.2 Recruit and mobilize implementation support consultants by Q1 2014
   - 4.3 Refine the project performance management system and establish targets and procedures by Q1 2014
   - 4.4 Develop a 4-year training plan by Q2 2014
   - 4.5 Develop water conservation and wastewater reuse plan, sludge utilization plan, public transport system, traffic management and safety improvement plan, windbreak plantation education trail, and desertification risk management plan by Q4 2015
   - 4.6 Undertake training on ADB procedures and capacity development programs until Q2 2018
   - 4.7 Implement environmental monitoring plan, resettlement plan, and social and gender action plans, and conduct safeguards monitoring until Q2 2018
   - 4.8 Conduct public awareness campaign on water conservation, resources reuse, public transport, road safety, and combating desertification until Q4 2017
   - 4.9 Conduct project-specific surveys to measure results for the midterm review in 2016 and project completion in 2018

**Inputs**

<table>
<thead>
<tr>
<th>ADB: $100 million</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Item</strong></td>
</tr>
<tr>
<td>Investment cost</td>
</tr>
<tr>
<td>Contingencies</td>
</tr>
<tr>
<td>Financing charges during implementation</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Jiuquan Municipal Government: $54.23 million</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Item</strong></td>
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<tr>
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<td>Total</td>
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</tbody>
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<table>
<thead>
<tr>
<th>China Construction Bank: $62.20 million</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Item</strong></td>
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<tr>
<td>Total</td>
</tr>
</tbody>
</table>

ADB = Asian Development Bank, CNY = yuan, COD = chemical oxygen demand, ha = hectare, km = kilometer, m = meter, m$^3$/d = cubic meter per day, NH$_4^+$-N = ammoniacal nitrogen, PCC = project completion certificate, PMO = project management office, Q = quarter.

LIST OF LINKED DOCUMENTS
http://www.adb.org/Documents/RRPs/?id=45506-002-3

1. Loan Agreement
2. Project Agreement
4. Project Administration Manual
5. Contribution to the ADB Results Framework
6. Development Coordination
7. Financial Analysis
8. Economic Analysis
9. Country Economic Indicators
10. Summary Poverty Reduction and Social Strategy
11. Gender Action Plan
12. Initial Environmental Examination
13. Resettlement Plan
14. Risk Assessment and Risk Management Plan