Report and Recommendation of the President to the Board of Directors

Project Number: 37697-025
November 2014

Proposed Loans and Technical Assistance Grant Mongolia: Darkhan Wastewater Management Project

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 14 November 2014)

Currency unit	–	togrog (MNT)
MNT1.00	=	$0.000534
$1.00	=	MNT1,872.00

ABBREVIATIONS

ADB	–	Asian Development Bank
ADF	–	Asian Development Fund
DAG	–	Darkhan-Uul *aimag* government
DUS	–	Darkhan Us Suvag
EIRR	–	economic internal rate of return
FIRR	–	financial internal rate of return
km	–	kilometer
LAR	–	land acquisition and resettlement
m^3/day	–	cubic meters per day
MRTCUD	–	Ministry of Roads, Transportation, Construction and Urban Development
O&M	–	operation and maintenance
OCR	–	ordinary capital resources
PAM	–	project administration manual
PIU	–	project implementation unit
PMU	–	project management unit
SAP	–	social action plan
TA	–	technical assistance
WWTP	–	wastewater treatment plant

GLOSSARY

aimag	–	province
ger	–	traditional tent
soum	–	district

NOTE

In this report, “$” refers to US dollars.

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PROJECT AT A GLANCE

1. Basic Data — **Project Number:** 37697-025

Project Name	Darkhan Wastewater Management Project	**Department /Division**	EARD/EASS
Country	Mongolia	**Executing Agency**	Ministry of Roads, Transportation, Construction and Urban Development
Borrower	Mongolia		

	2. Sector	**Subsector(s)**	**ADB Financing ($ million)**
✓	**Water and other urban infrastructure and services**	Urban policy, institutional and capacity development	1.64
		Urban sewerage	16.86
		Total	**18.50**

3. Strategic Agenda	**Subcomponents**	**Climate Change Information**	
Inclusive economic growth (IEG)	Pillar 2: Access to economic opportunities, including jobs, made more inclusive	Adaptation ($ million)	0.80
		Mitigation ($ million)	0.20
Environmentally sustainable growth (ESG)	Global and regional transboundary environmental concerns	CO_2 reduction (tons per annum)	100
	Urban environmental improvement	Climate Change impact on the Project	Medium

4. Drivers of Change	**Components**	**Gender Equity and Mainstreaming**	
Governance and capacity development (GCD)	Institutional development	Some gender elements (SGE)	✓
Partnerships (PAR)	Bilateral institutions (not client government)		
	Implementation		

5. Poverty Targeting		**Location Impact**	
Project directly targets poverty	No	Rural	Medium
		Urban	High

6. Risk Categorization: Low

7. Safeguard Categorization **Environment:** B **Involuntary Resettlement:** B **Indigenous Peoples:** C

8. Financing

Modality and Sources	**Amount ($ million)**
ADB	**18.50**
Sovereign Project loan: Asian Development Fund	9.05
Sovereign Project loan: Ordinary capital resources	9.45
Cofinancing	**0.40**
Urban Environmental Infrastructure Fund-UFPF Multi	0.40
Counterpart	**2.21**
Government	2.21
Total	**21.11**

9. Effective Development Cooperation

Use of country procurement systems	Yes
Use of country public financial management systems	Yes

Source: Asian Development Bank

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on the proposed loans to Mongolia for the Darkhan Wastewater Management Project. The report also describes proposed administration of technical assistance (TA) to be provided by the Urban Environmental Infrastructure Fund[1] under the Urban Financing Partnership Facility for the Darkhan Urban Utility Institutional Improvement Action Plan, and if the Board approves the proposed loans, I, acting under the authority delegated to me by the Board, approve the TA.[2]

2. The project will support environmentally sustainable urban development and better living standards in Darkhan *soum* (district), Mongolia. It will improve the city's wastewater management infrastructure and service delivery through (i) a modern wastewater treatment plant (WWTP), (ii) a more efficient sewer system and pumping stations, and (iii) institutional capacity development and policy dialogue. The project will promote poverty alleviation in a city with 27.0% poverty incidence and contribute to a more balanced national urban system and stronger urban–rural relationships by supporting urban and industrial development of a second-tier city in Mongolia. It will help improve cross-border water quality management and the water quality of the Kharaa River, which drains into Lake Baikal in the Russian Federation.[3]

II. THE PROJECT

A. Rationale

3. Darkhan-Uul *aimag* (province) is Mongolia's third-largest province with a registered population of 92,000 and an urban population in Darkhan *soum* of 76,400,[4] of which an estimated 40.0% live in *ger* (traditional tent) areas.[5] Darkhan is located 220 kilometers (km) north of Ulaanbaatar and 130 km south of the border with the Russian Federation. Darkhan enjoys favorable conditions for farming and is rich in mineral deposits. It was founded as an industrial hub in 1961, and benefits from the Trans-Mongolian rail line and an Asian Development Bank (ADB)-supported road that connects Ulaanbaatar with Darkhan and the Lake Baikal region.[6] Few industrial investments were made in recent years. Darkhan-Uul's gross domestic product doubled between 2010 and 2013 and it is becoming an urban economy—the service sector grew from 29.4% to 41.9% of gross domestic product during that period. In 2012, to strengthen development of second-tier cities and to mitigate migration to Ulaanbaatar, where almost half the country's population resides, the government decided for Darkhan to become a national model city for urban sustainability and livability with a vision of becoming a "smart and green city" by 2028. An urban development master plan for Darkhan is under preparation. The government plan for Darkhan includes improvements of existing urban districts and *ger* areas, urban expansion in the form of new industrial and residential areas, strengthened academic institutions, expanded and new public parks, and environmental protection zones. By 2020, the registered population in Darkhan *soum* is estimated to grow to 83,000, with 75.0% of the population living in formalized and fully serviced residential districts. These industrial and

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1 Financing partner: the Government of Sweden.
2 The design and monitoring framework is in Appendix 1.
3 Funding of consultant services for project preparation in the amount of $200,000 under the Water Financing Partnership Facility was approved on 17 July 2013 (WFMFDC00100-MON), and administered by ADB.
4 An additional transient population accounts for approximately 8,000, which is being added for calculations.
5 Based on Darkhan Land Administration Office estimates.
6 ADB. 1995. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant to Mongolia for the Roads Development Project*. Manila (Loan 1364-MON supported road improvements of the Ulaanbaatar–Altanbulag road connecting key economic centers and the three largest cities of Mongolia—Ulaanbaatar, Erdenet, and Darkhan).

residential developments will increase demand for urban services, including water supply and wastewater treatment. Investment in infrastructure is needed to meet present and future demand from improved and expanded services, and to support clustering of new businesses and industries.

4. The city's WWTP, and the sanitary sewer system and pumping stations were built in 1965, and degraded despite partial expansion in 1987.[7] They are in urgent need of structural rehabilitation or replacement. The WWTP was significantly overdesigned with a capacity of 50,000 cubic meters per day (m^3/day) and never fully utilized. It operates at 8,000 m^3/day–10,000 m^3/day (summer and winter) with peak flows of 15,000 m^3/day. Many components are underutilized or unused and dilapidated. Even operating units are in need of serious repair. Of the total 223 km of sewer pipes, 65.0% were built in 1965, and since 2010 domestic funding has financed some sewer rehabilitation. Three sewer sections and two pumping stations are in serious need of replacement or repair and critical for system functionality. Sanitation in *ger* areas currently comes in the form of on-plot pit latrines, which cause soil and groundwater pollution. Wastewater is not currently collected in *ger* areas. Plans for incremental extension of the sewer network into *ger* areas have been prepared for government financing.[8] The WWTP treats domestic sewage along with nontoxic industrial wastewater. Industrial pretreatment plants remove toxic elements (e.g., from sheepskin processing). A slight temperature and precipitation increase is expected due to climate change. The frequency of droughts and floods, and the resulting variability of the Kharaa River's water flow, is projected to increase.[9] Breakdowns of the current domestic and industrial wastewater collection and treatment system cause untreated water to discharge into the groundwater and the Kharaa River. The existing WWTP will further deteriorate rapidly and soon fail—the remaining life of the facility has been estimated at just 2 years. Moreover, planned and anticipated urban and industrial growth cannot be served by the existing system.

5. The project will improve the wastewater collection and treatment system and ensure continuous treatment throughout implementation. The project will directly benefit more than 45,000 residents (around 60.0% of the urban population) currently connected to the sanitary sewer system and, indirectly, more than 76,400 residents. Once in operation, it is anticipated that planned developments and a further expanded sewer system will increase the beneficiary population to 62,000 residents (around 75.0% of the urban population) connected to the system by 2020. The project will support improvement of the city's wastewater management, its central WWTP, sewer system, and pumping stations. It will also support institutional development, training, project management, and policy dialogue.

6. The project was requested by the Government of Mongolia for ADB consideration.[10] It is included in ADB's country operations business plan, 2014–2016 for Mongolia and is aligned with the interim country partnership strategy, 2014–2016 for Mongolia.[11] With its objective to contribute to inclusive economic and environmentally sustainable growth, the project is aligned

[7] Darkhan has a sanitary sewer system that collects domestic and industrial wastewater. Runoff from precipitation is collected separately in drainage channels. The sewer pipes will be extended under newly planned and built roads.

[8] Studies to improve the water and wastewater management systems by a German Government funded technical assistance "MoMo" and by the Cities Development Initiative for Asia have been considered.

[9] The Kharaa River basin has a dry winter continental climate with a current annual mean temperature of around 0°C and mean precipitation of 320 millimeters. Climate change information: C. Yeager and H. Zhou. 2014. Assessing Climate Change Risks in the People's Republic of China and Mongolia. *EAER Staff Guidance*. Manila: ADB.

[10] The Ministry of Economic Development submitted a request letter signed by Minister Batbayar on 28 June 2013.

[11] ADB. 2014. *Country Operations Business Plan: Mongolia, 2014–2016*. Manila; and ADB. 2014. *Interim Country Partnership Strategy: Mongolia, 2014–2016*. Manila.

with ADB's Midterm Review of Strategy 2020,[12] and follows ADB's urban and water operational plans. The project is aligned with the Government Action Plan, 2012–2016, including its objectives of improving centralized wastewater systems in *aimag* centers, enforcing the Law on Water Supply and Sewer Use, and supporting the expansion of industrial development in Darkhan *soum*. Lessons learned from previous urban and water sector projects in Mongolia include the selection of adequate wastewater treatment technology tested in cold climates, and management of contractor accountability by selecting the plant: design, supply, and install procurement modality for the WWTP to minimize risks of delay, mismatch of structure and equipment, and failure during operations. The project supports the sustainability of and complements previous ADB assistance to Darkhan.[13] To structurally rehabilitate and retrofit an existing WWTP will be a demonstration feature and serve as a model for other cities in the region with comparable conditions.

B. Impact and Outcome

7. The project impact will be better living conditions and an improved environment in Darkhan *soum* and the Kharaa River basin. The project outcome will be improved system of wastewater collection and treatment for domestic and industrial users in Darkhan *soum*.

C. Outputs

8. **Output 1: Improved wastewater treatment plant.** The project will establish a modern WWTP in Darkhan by renovating those components of the existing facility that are structurally sound, constructing on-site the required new components, and installing new equipment throughout the facility. A new, effective, and energy-efficient treatment process will be adopted, suitable for the cold climate and meeting national and international effluent standards. The base operating capacity will be 16,000 m^3/day with a peak capacity of 24,000 m^3/day.

9. **Output 2: Rehabilitated pumping stations and sewer pipes.** The project will improve the wastewater collection system by replacing 1,800 meters of dilapidated sewer pipes and complementing earlier investment programs of sewer network rehabilitation by the government. Two existing pumping stations will be structurally renovated and fully and newly equipped, ensuring delivery of the wastewater to the treatment plant at higher energy efficiency.

10. **Output 3: Project management support and capacity development.** The project will (i) provide expert support for project management, institutional enhancement, and capacity development in utility management, operation, and service provision; emergency preparedness and response; and detailed technical design and construction supervision; and (ii) strengthen

[12] ADB. 2014. *Midterm Review of Strategy 2020: Meeting the Challenges of a Transforming Asia and Pacific*. Manila.

[13] ADB assistance to Darkhan includes ADB. 2001. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to Mongolia for the Housing Finance (Sector) Project*. Manila (Loan 1847-MON, completed); ADB. 2006. *Proposed Grant Assistance to Mongolia for Improving the Living Environment of the Poor in Ger Areas of Mongolia's Cities Project*. Manila (Grant 9015-MON, completed); ADB. 2010. *Report and Recommendation of the President to the Board of Directors: Proposed Grant to Mongolia for the Southeast Gobi Urban and Border Town Development Project*. Manila (Grant 0204-MON, ongoing); and ADB. 2006. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to Mongolia for the Urban Development Sector Project*. Manila (Loan 2301-MON, ongoing). ADB assistance to Mongolia includes ADB. 1997. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant to Mongolia for the Provincial Towns Basic Urban Services Project*. Manila (Loan 1560-MON, completed), ADB. 2002. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to Mongolia for the Integrated Development of Basic Urban Services in Provincial Towns Project*. Manila (Loan 1907-MON, completed); and ADB. 2013. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility to Mongolia for the Ulaanbaatar Urban Services and Ger Areas Development Investment Program*. Manila (MFF 0078-MON, approved in December).

the capacities of the project management unit (PMU) and project implementation unit (PIU). Training and study tours will be provided during implementation. The project will include policy dialogue on water and wastewater tariff reform, sanitation improvements, and solid waste management. It will support public awareness campaigns on environmental management, sanitation, and solid waste management. The proposed loan will include a TA project to support institutional development of utility service provision, strategic planning, and operational improvements.[14]

D. Investment and Financing Plans

11. The project is estimated to cost $20.68 million (Table 1). The ADB loan will finance, exclusive of taxes and duties, the WTTP as plant: design, supply, and install contract package estimated at 73% of total cost; civil works for sewer pipes and equipment for pump stations estimated at 3% and 5%, respectively of total cost; consulting services and project management support estimated at 7% of total cost; and interest and commitment charges during construction estimated at 3% of total cost. The government will finance taxes and duties, and land acquisition and resettlement (LAR) costs, and provide counterpart staff time, office accommodation, logistics support, and other in-kind contributions.

Table 1: Project Investment Plan
($ million)

Item			Amount[a]
A.	**Base Cost**[b]		
	1.	Improved wastewater treatment plant	15.00
	2.	Rehabilitated pumping stations and sewer pipes	1.67
	3.	Project management support and capacity development	1.80
		Subtotal (A)	**18.47**
B.	**Contingencies**[c]		**1.51**
C.	**Financing Charges During Implementation**[d]		**0.70**
		Total (A+B+C)	**20.68**

[a] Includes taxes and duties of $2.18 million to be financed from government resources.
[b] In mid-2013 prices.
[c] Physical contingencies computed at 5% for civil works and consulting services. Price contingencies computed at 0.5%–2.2% for foreign exchange costs and 3.0%–8.0% on local currency costs; includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.
[d] Includes interest and commitment charges.
Source: Asian Development Bank estimates.

12. The government has requested a loan of $9.45 million from ADB's ordinary capital resources (OCR loan) and a loan in various currencies equivalent to SDR6.159 million from ADB's Special Funds resources (Asian Development Fund [ADF] loan) to help finance the project. Both loans will have a 25-year term, including a grace period of 5 years. The OCR loan will have an annual interest rate determined in accordance with ADB's London Interbank offered rate (LIBOR)-based lending facility,[15] a commitment charge of 0.15% per year (the interest and other charges during construction to be capitalized in the loan), and such other terms and conditions as set forth in the draft loan and project agreements. The ADF loan will have an interest rate of 2.0% per annum during the grace period and thereafter, and such other terms and conditions as set forth in the draft loan and project agreements. The government will provide the proceeds of the two loans to Darkhan-Uul *aimag* government (DAG) under one or

[14] Attached Technical Assistance: Darkhan Urban Utility Institutional Improvement Action Plan (accessible from the list of linked documents in Appendix 2).
[15] A straight-line principal repayment method is applicable to the OCR loan.

more subsidiary agreements on the terms and conditions satisfactory to ADB and in accordance with the loan agreements and project agreement.

13. The financing plan is in Table 2.

Table 2: Financing Plan

Source	**Amount** ($ million)	**Share of Total** (%)
Asian Development Bank		
Ordinary capital resources (loan)	9.45	45.70
Special Funds resources (loan)	9.05	43.76
Government	2.18	10.54
Total	**20.68**	**100.00**

Source: Asian Development Bank estimates.

E. Implementation Arrangements

14. The Ministry of Roads, Transportation, Construction and Urban Development (MRTCUD)[16] will be the executing agency and DAG will be the implementing agency for the project.[17] A project steering committee in the ministry has been established under ADB's Urban Development Sector Project and will be supervising this project. Building on the experience of two PMUs currently administering ADB loan and grant projects under the ministry, a new PMU will be established under the MRTCUD and adequately trained after ADB Board approval, and will be responsible for the project's day-to-day management and for arranging safeguard monitoring, auditing, and reporting. A PIU will be established under DAG after ADB Board approval in the Darkhan Us Suvag (DUS), the public utility service organization, and will be responsible for managing and supervising the implementation of the project. All procurement of goods and civil works will follow ADB's Procurement Guidelines (2013, as amended from time to time). All consultants will be recruited according to ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). The loan proceeds will be disbursed in accordance with ADB's *Loan Disbursement Handbook* (2012, as amended from time to time).

15. The implementation arrangements are summarized in Table 3 and described in detail in the project administration manual (PAM).[18]

Table 3: Implementation Arrangements

Aspects	**Arrangements**		
Implementation period	March 2015–December 2018		
Estimated completion date	31 December 2018 (estimated loan closing date: 30 June 2019)		
Management			
(i) Oversight body	Project steering committee under the MRTCUD		
(ii) Executing agency	MRTCUD with a PMU of five specialists partly supported by the project		
(iii) Key implementing agency	Darkhan-Uul *aimag* government with a local project steering committee		
(iv) Implementation unit	Darkhan Us Suvag, 200 staff with a PIU of eight specialists partly supported by the project		
Procurement[a]	International competitive bidding	1 contract	$15.00 million[b]
	National competitive bidding	2 contracts	$1.68 million[b]
Consulting services	Quality- and cost-based selection	1 contract for 137 person-months	$1.32 million[b]

[16] On 7 October 2014, the Parliament of Mongolia adopted a consolidation of ministries. The Ministry of Economic Development was discontinued and functions were assigned to the Ministry of Finance and Ministry of Foreign Affairs. The Ministry of Construction and Urban Development and the Ministry of Roads and Transportation were consolidated into the MRTCUD.

[17] DAG is a financially separate entity subject to audit.

[18] Project Administration Manual (accessible from the list of linked documents in Appendix 2).

Aspects	Arrangements		
	Individual consultant selection for PMU and PIU	13 contracts for 220 person-months	$0.48 million[b]
Advance contracting	Consulting services for both quality- and cost-based selection and individual consultant selection will be processed prior to loan effectiveness.		
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.		

ADB = Asian Development Bank; MRTCUD = Ministry of Roads, Transportation, Construction and Urban Development; PIU = project implementation unit; PMU = project management unit.

[a] The land acquisition and resettlement plan shall be updated after detailed measurement surveys prior to awarding contracts.

[b] Includes taxes and duties.

Source: Asian Development Bank.

III. TECHNICAL ASSISTANCE

16. The attached capacity development TA is designed to enhance the sustainability of the ADB-financed investment by strengthening the institutional, managerial, and operational capacity of Darkhan's water and wastewater services (footnote 12). The objective of the TA is to improve effectiveness, efficiency, and customer orientation toward a corporatized utility service management. The TA will produce three outputs: (i) institutional, financial, managerial, and operational performance assessment; (ii) Darkhan urban utility institutional improvement action plan; and (iii) capacity building, training, and action plan implementation support. The TA will be implemented over 24 months. An international consulting firm will be engaged using the quality- and cost-based selection method in line with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). The TA will require 33 person-months of consulting services, of which 12 person-months are international and 21 person-months are national inputs. The TA is estimated to cost $430,000, of which $400,000 will be financed on a grant basis by the Urban Environmental Infrastructure Fund[19] under the Urban Financing Partnership Facility and administered by ADB.[20]The government will provide counterpart support in the form of counterpart staff, office accommodation, office supplies, secretarial assistance, domestic transportation, and other in-kind contributions.

IV. DUE DILIGENCE

A. Technical

17. The project is technically feasible based on detailed technical assessment and evaluation of wastewater management systems in extremely cold climate conditions around the world and in Mongolia with temperature drops to –40^{o}C, as well as on detailed analysis of the local conditions and existing facilities and structures. The proposed wastewater treatment technology has been subjected to intensive scrutiny and analysis, resulting in a short list of technology choices most appropriate for operation in Darkhan. A three-stage process was adopted to evaluate alternative wastewater treatment solutions and select the best and lowest-possible cost solution. The evaluation concluded that the structural rehabilitation of the existing treatment plant, retrofitted with a new treatment process (a modified activated sludge process using new equipment and technology), is the lowest-possible cost option and will provide treatment quality that will be at least as good as the other considered options. The selected technology is called integrated fixed-film activated sludge. Measures to mitigate possible

[19] Financing partner: the Government of Sweden.

[20] Funding of the capacity development TA for the Darkhan Urban Utility Institutional Improvement Action Plan was approved by the Urban Financing Partnership Facility Steering Committee on 25 August 2014.

operational and lifetime risks will be implemented, including (i) ensuring that the WWTP can be operated throughout the entire reconstruction process while meeting treatment standards; and (ii) managing possible cost increases, because the level of rehabilitation of existing structures cannot be fully evaluated until the facility is empty. A thorough phasing plan to ensure continuous treatment and two independent studies by structural engineering units were carried out to manage these issues.

B. Economic and Financial

18. **Economic analysis.** The economic analysis examined the economic viability of the project. The project is expected to generate economic benefits from (i) better urban quality of life through reduced health risks from waterborne diseases, (ii) improved water quality and aquatic biodiversity of the Kharaa River, and (iii) preparedness for wastewater management infrastructure expansion into the growing urban and industrial areas. The without-project scenario will be loss of wastewater treatment within 2 years. Evaluation of various technology options and layouts confirmed that the selected project is the least-cost option. The economic internal rate of return (EIRR) for the base case is 13.7%; tests for sensitivity to capital investment, and operation and maintenance (O&M) cost overruns confirm economic viability with EIRRs of 12.0% and 12.4%, respectively. However, a decrease in benefits and a delay in implementation by 1 year result in EIRRs of 10.5% and 10.3%, slightly below the economic opportunity cost of capital. Project economic benefits are quantified based on willingness to pay for improved wastewater management service using the contingent valuation method. The benefit streams from incremental and nonincremental wastewater treated by the proposed WWTP are compared with cost streams that include capital investment and O&M costs to determine the discounted net cash flows and the resulting EIRR. Additional benefits such as public health, environmental improvement, and attractiveness for investments are not quantified.

19. **Financial analysis.** The financial analysis confirmed that the project is financially viable based on assumptions of a slight increase in water and wastewater tariffs, improved technical and managerial efficiencies, improved billing, and incremental growth and expansion of the client base. The financial internal rate of return (FIRR) is 3.1% for the base case against the weighted average cost of capital calculated at 1.4%. Sensitivity tests evaluated the effects of adverse financial conditions on project financial viability. Increases in capital and O&M costs result in FIRRs of 2.3% (both), a reduction in revenue results in a FIRR of 1.5%, and a 1-year delay incurs a FIRR of 1.9%, all above the weighted average cost of capital. Subsidies may be needed in certain years and are guaranteed by DAG, should any financial shortfall occur during the O&M phase. The affordability analysis confirms that the proposed tariffs are within willingness to pay and affordability limits, including for the poor.

C. Governance

20. The MRTCUD and DAG have extensive experience in cooperation and management of projects financed by multilateral and bilateral institutions such as ADB, German development cooperation through GIZ, the Japan International Cooperation Agency, the United States Agency for International Development, and the World Bank. The lessons from implementing and managing ADB-financed projects will be passed on to the PMU under the MRTCUD and the PIU under DAG. Special emphasis will be given to the procurement capacity by engaging qualified specialists for the PMU and PIU, and the provision of training at the onset of project implementation by the loan implementation consultants engaged under output 3. Project financial management will be carried out by the PMU and PIU for implementation-related funds flow management with final approval by the Ministry of Finance. The DAG as end borrower and

DUS as operating unit have reasonable financial management capacity and the weaknesses identified in the financial management assessment will be overcome by engaging financial specialists for the PMU and PIU, and through training and financial management support provided by the loan implementation consultants. These arrangements are deemed adequate.

21. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government and agencies concerned during project preparation, including the Ministry of Economic Development, Ministry of Finance, MRTCUD, DAG, and DUS. The specific policy requirements and supplementary measures are described in the PAM (footnote 16).

D. Poverty and Social

22. Poverty incidence in Darkhan is significant at 27% citywide and 44% in *ger* areas. It reflects a high unemployment rate of 14.3% (compared with a national average of 8.2%), immigration of rural poor, and expansion of unserviced *ger* areas. Lack of wastewater treatment results in unsanitary living conditions and limited interest to invest in Darkhan due to underdeveloped conditions. The project will directly benefit 12,153 households in the apartment areas, and 1,699 public and private entities currently connected to the sewer system in Darkhan. Indirect beneficiaries of the project are all residents of Darkhan *soum* (more than 76,400 persons) who will benefit from the project through (i) an increase in business activities and job creation in Darkhan *soum*, (ii) better sanitary and health conditions, and (iii) a healthier urban and river environment. The project will improve treatment and management of domestic and industrial wastewater in Darkhan *soum*, and will create direct short-term employment in construction and indirect long-term income-generating opportunities, including industrial development in Darkhan. It will benefit the poor and vulnerable households in the apartment area by improving their health conditions and reducing their health-care expenditure, which now accrues from illness caused by poor water quality and unsanitary environment conditions. Under the project, the population, especially the poor and women, will participate in the improvement process for the city's public services. It is estimated that 70 jobs (40 skilled, 30 unskilled) will be created, and that most unskilled jobs will be provided to local people, including the poor, and at least 30.0% will be for women. The implementing agency will ensure that Mongolian labor laws and the core labor standards are followed. Specific measures to ensure the poverty and social benefits are in the social action plan (SAP) within the PAM (footnote 16).

23. A SAP was prepared to ensure continued consultation and participation of the local community during project implementation. Actions include (i) public awareness program on sanitation and public health issues; (ii) public hearing on wastewater tariff increases; and (iii) targets for employment of local men, women, and the poor during construction and operation. Implementation will be monitored through the project performance management system, project progress reports, and ADB missions.

24. **Gender.** The project is classified as some gender elements, so no gender action plan has been developed. The SAP includes activities that are targeted at both men and women. As for women, the project will (i) ensure their participation in the public awareness campaign on the importance of the project and training on maintaining sanitation facilities properly (40.0% of participants), (ii) ensure their participation in tariff increase consultations (40.0% of participants), and (iii) provide employment opportunities for them during construction.

E. Safeguards

25. **Environment.** The project is classified as category B for environment since it is not

expected to have unprecedented or irreversible impacts on the environment. A draft initial environmental examination, including an environmental management plan, has been prepared in line with ADB's Safeguard Policy Statement (2009) and the Government of Mongolia's regulatory framework. Short-term impacts are anticipated during construction, including dust and noise generated during sewer-line replacement work, and inappropriate solid and liquid waste management at construction sites, which could pollute the Kharaa River. Mitigation measures have been defined in the environmental management plan to reduce these impacts to acceptable levels. During construction, continuous wastewater treatment will be maintained at current levels. During operation, no significant environmental impact is anticipated. O&M training and monitoring of treatment performance will minimize operational impacts and risks. The project will have substantial environmental and socioeconomic benefits. By strengthening Darkhan's municipal wastewater collection and treatment capacity it will provide protection of and improvement to Kharaa River's water environment. [21] The project's climate risk is medium. The projected increase in average and peak precipitation, and the related risk of more urban stormwater runoff, will be adequately managed with separate wastewater and stormwater collection systems.

26. **Involuntary resettlement.** The project is classified as category B for involuntary resettlement because it will not have significant LAR impacts. No residential land or structures will be affected by the project. A resettlement plan was prepared in line with ADB's Safeguard Policy Statement and endorsed by DAG and the MRTCUD, disclosed to the affected persons, and uploaded on ADB's website on 12 August 2014. Eight entities will be affected, i.e., two small enterprises, three commercial entities, and three state budget institutions. Five affected entities will lose a total of 2,711.1 square meters of land. All losses are partial. State institutions and private companies own the land. Fences and gates of three entities with a total length of 112 meters will be affected. Other affected structures include entrance stairs to two shops, a speed bump, and a billboard. Two businesses will experience a temporary impact. Compensation for lost assets and resettlement allowances will be paid to affected persons. The PMU under the MRTCUD is responsible for all management, communication, and coordination work during project preparation and implementation. The PIU under DAG has overall responsibility for LAR. This includes preparation, implementation, financing, and interagency coordination of all related tasks. The MRTCUD is experienced in implementing ADB-funded and LAR activities. The loan implementation resettlement consultant will provide training and support to the PMU and PIU to ensure smooth implementation. A grievance redress mechanism will be established, and the PIU will conduct semiannual monitoring and evaluation of resettlement plan implementation, assisted by the loan implementation resettlement consultant. DAG confirmed that all funds for involuntary resettlement compensation will be available on time.

27. **Indigenous peoples.** The project is classified as category C for indigenous people. No specific communities of ethnic minorities or groups are living in concentrated areas and no adverse impacts are expected.

F. Risks and Mitigating Measures

28. The overall benefits and impacts are expected to outweigh the costs and risks involved. Major risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.[22]

[21] The WWTP will remove significant amounts of pollutants that would otherwise be discharged into the Kharaa River, including chemical oxygen demand (3,000 tons per year), biological oxygen demand (1,700 tons per year), nitrogen (330 tons per year), and phosphorous (42 tons per year).

[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

Risks	Mitigating Measures
Public financial management issues, weak fund-flow management, and little capacity to manage foreign exchange risks	DAG's financial reporting systems will be upgraded with support from the PIU and loan implementation consultants to enable DAG to track project proceeds from sources and payments to final beneficiaries. Consulting services during implementation will assist with public financial management, fund-flow support, and audit reporting.
Inefficient procurement and corruption risk	Procurement specialists will be recruited for the PMU and PIU, and consultants will provide training before procurement starts and bridge gaps that may impede project effectiveness. Relevant provisions of ADB's Anticorruption Policy (1998, as amended to date) are included in the loan documents and will be part of the bidding documents. The MRTCUD will annually disclose the status of the use of project proceeds.
DAG project implementation capacity is limited and may cause delays	Consultants will (i) provide training and support, including financial management, project and contract management, and performance monitoring and reporting; and (ii) review and guide optimization of design, equipment specification, and operation.
Unforeseen flow rates and composition of wastewater compromise treatment	DAG and DUS capacity to enforce national discharge standards for industries discharging effluent into public sewers will be strengthened. Emergency monitoring, early warning, and response systems will be developed. The WWTP is designed with capacity to balance shock pollution loads with one reserve reactor.

ADB = Asian Development Bank; DAG = Darkhan-Uul *aimag* government; DUS = Darkhan Us Suvag; MRTCUD = Ministry of Roads, Transportation, Construction and Urban Development; PIU = project implementation unit; PMU = project management unit; WWTP = wastewater treatment plant.
Source: Asian Development Bank.

V. ASSURANCES

29. The government has 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.

30. The government has agreed with ADB on certain covenants for the project, which are set forth in the loan agreements and project agreement.

VI. RECOMMENDATION

31. I am satisfied that the proposed loans would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve

(i) the loan of $9,450,000 to Mongolia for the Darkhan Wastewater Management 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; and

(ii) the loan in various currencies equivalent to SDR6,159,000 to Mongolia for the Darkhan Wastewater Management Project, from ADB's Special Funds resources, with an interest charge at the rate of 2.0% per annum during the grace period and thereafter; 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.

Takehiko Nakao
President

25 November 2014

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
Impact Better living conditions and an improved environment in Darkhan *soum* (district) and the Kharaa River basin	**By 2025 (2013 baseline)** Kharaa River quality meets Mongolian ambient surface water quality standard	Government statistics and records Government survey ADB project performance evaluation report	**Assumptions** Mongolia's economic development remains strong. The government's commitment to improving wastewater operation and management remains strong. **Risk** Population growth and industrial development fall significantly behind forecasts, reducing demand.
Outcome Improved system of wastewater collection and treatment for domestic and industrial in Darkhan *soum*	**By 2018 (2013 baseline)** Population served by the improved wastewater collection and treatment system increased from 45,000 to 55,000	DUS operational record Local environmental monitoring station reports ADB PCR	**Assumption** MRTCUD and DAG remain committed to implementing the project and improving wastewater operation and management. **Risk** The government fails to enforce industrial wastewater effluent standards for new industrial users.
Outputs 1. Improved WWTP	**By 2018 (2013 baseline)** WWTP process improved and actual capacity increased from 12,000 m^3/day to 16,000 m^3/day Wastewater effluent meets national standards (i.e., biological oxygen demand, chemical oxygen demand, and nutrients)	Project implementation and monitoring reports ADB review missions ADB PCR	**Assumption** Structural renovation, construction, and installation of new equipment are sequenced properly to ensure continuous wastewater treatment throughout construction. **Risk** Unknown structural and environmental conditions of the existing WWTP result in cost escalations during renovation.
2. Rehabilitated pumping stations and sewer pipes	Two pumping stations operating efficiently, avoiding overflow, and at 10.0% reduction in	Project implementation and monitoring reports ADB review missions	

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
	operating cost (2013 baseline)	ADB PCR	
3. Project management support and capacity development	New operational and financial management systems launched at DUS (baseline: single entry system) 10 training sessions on financial management, project management, procurement, and O&M of WWTP for at least 20 implementing agency staff, of which at least 8 are women Five events to raise public awareness on public health, environmental management, sanitation, and solid waste management are attended by 100 residents, of which at least 40 are women Tariff increase reviewed, proposed, and considered; affordability analysis conducted; and subsidy mechanism proposed	Project implementation and monitoring reports ADB review missions ADB PCR DAG and DUS customer records DAG and DUS financial records	

Activities with Milestones	Inputs
1. Improved wastewater treatment plant 1.1 Finalize employer's requirements with assistance from consultants, and procure and award design–supply–install contracts for WWTP (2014–2015). 1.2 Update and implement land acquisition and resettlement plan prior to civil works. 1.3 Design, obtain approval, structurally renovate, construct, and install new equipment; provide operation assistance; and start operation and monitoring of WWTP with capacity of 16,000 m^3/day (peak capacity of 24,000 m^3/day) (2015–2016). **2. Rehabilitated pumping stations and sewer pipes** 2.1 Finalize detailed design, obtain permits, and procure contract packages for pumping stations and sewers (2015). 2.2 Structurally renovate and install new equipment, and start O&M of two pumping stations (2015–2016). 2.3 Replace 1,800 meters of sewer pipes and start operation (2015–2016).	**Loans** **ADB: $18.5 million** **Government: $2.2 million** **Technical Assistance Grant** **Urban Environmental Infrastructure Fund under the Urban Financing Partnership Facility: $400,000**

Activities with Milestones	
3. Project management support and capacity development	
3.1 Establish project management unit, project implementation unit, and project steering committees and all working arrangements, procedures, and responsibilities (2014).	
3.2 Recruit consultants to support procurement, project management, capacity development, and policy dialogue (2014–2015).	
3.3 Provide project management implementation and monitoring support (2015–2018).	
3.4 Assess institutional weaknesses, and prepare and start implementing institutional development plan (2015–2018).	
3.5 Provide staff training for executing and implementing agencies, and project implementation unit; and conduct public awareness campaigns (2015–2018).	
3.6 Policy dialogue on further institutional improvements, tariff reforms, nonrevenue water reduction, sanitation, solid waste management, and urban and industrial cluster planning (2015–2018).	
3.7 Develop and implement WWTP operational plans, emergency preparedness and response mechanism, and operational procedures to manage possible accidents from discharging toxic industrial wastewater (2015–2018).	
3.8 Implement, monitor, and report on environmental management plan, land acquisition and resettlement plan, and social action plan (2015–2018).	

ADB = Asian Development Bank; DAG = Darkhan-Uul *aimag* government; DUS = Darkhan Us Suvag; m^3/day = cubic meters per day; MRTCUD = Ministry of Roads, Transportation, Construction and Urban Development; O&M = operation and maintenance; PCR = project completion report; WWTP = wastewater treatment plant.
Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=37697-025-3

1. Loan Agreement (Special Operations)
2. Loan Agreement (Ordinary Operations)
3. Project Agreement
4. Sector Assessment (Summary): Water and Other Urban Infrastructure and Services
5. Project Administration Manual
6. Contribution to the ADB Results Framework
7. Development Coordination
8. Attached Technical Assistance: Darkhan Urban Utility Institutional Improvement Action Plan
9. Financial Analysis
10. Economic Analysis
11. Country Economic Indicators
12. Summary Poverty Reduction and Social Strategy
13. Initial Environmental Examination
14. Land Acquisition and Resettlement Plan
15. Risk Assessment and Risk Management Plan