Environmental Monitoring Report

Report #1
May 2016

Mongolia: Ulaanbaatar Urban Services and Ger Areas Development Investment Program (Tranche 1)

Prepared by the Municipality of Ulaanbaatar for the Asian Development Bank.

LIST OF ABBREVIATIONS

AP	Affected Person/People
ADB	Asian Development Bank
ADF	Asian Development Fund
CWWTP	Central Wastewater Treatment Plant
CSC	Citizen Service Center
CQS	Consultant Qualification Selection
C- EMP	Contractor's Environmental Management Plan
DE	Department Of Environment
DMF	Design And Monitoring Framework
DEIA	Detailed Environmental Impact Assessment
EGDA	Environment And Green Development Agency
ESMS	Environmental And Social Management System
EARF	Environmental Assessment And Review Framework
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
P1-EMP	Environmental Management Plan For Project 1
EMR	Environmental Monitoring Report
FAM	Facility Administration Manual
FFA	Framework Financing Agreement
GEIA	General Environmental Impact Assessment
GACAP	Governance And Anticorruption Action Plan
GoM	Government Of Mongolia
GRM	Grievance Redress Mechanism
GDP	Gross Domestic Product
IEC	Information, Education And Communication
IEE	Initial Environmental Examination
ICB	International Competitive Bidding
LAR	Land Acquisition And Resettlement
MEGD	Ministry Of Environment And Green Development
MNT	Mongolian Tugrik
MFF	Multi-tranche Financing Facility
MUB	Municipality Of Ulaanbaatar
NCB	National Competitive Bidding
NGOs	Nongovernment Organizations
PMO	Program Management Office
PSC	Program Steering Committee
PAI	Project Administration Instructions
PIU	Project Implementation Unit
PPTA	Project Preparatory Technical Assistance
QCBS	Quality- And Cost-Based Selection
REA	Rapid Environmental Assessment
RRP	Report And Recommendation Of The President To The Board
RPIC	Resettlement Planning Implementation Committee
SPS	Safeguard Policy Statement
SME	Small And Medium Enterprise
SAP	Social Action Plan
SES-WTPS	Socio-Economic Survey And Willingness To Pay For Services
SBD	Standard Bidding Documents
SOE	Statement Of Expenditure
SRA	Sub center Redevelopment Authority
SPRSS	Summary Poverty Reduction And Social Strategy
USIP	Ulaanbaatar Services Improvement Project
USUG	Ulaanbaatar Water Supply And Sewerage Authority
USD	United States Dollar
WHO	World Health Organization

WEIGHTS AND MEASURES

cm	centimeter
dB(A)	A-weighted sound pressure level in decibels
ha	hectare
kg	kilogram
km	kilometer
kWh	kilowatt hours
m	meter
mm	millimeter
m/s	meters per second
m^2	square meter
m^3	cubic meters
mg/l	milligrams per litre
mg/m^3	milligrams per cubic meter
mg/Nm^3	milligrams per standard cubic meter
Nm^3	standard cubic meter
^0C	degrees Celsius

CONTENTS

I. INTRODUCTION

A. Purpose of the Report

This report is the first environmental monitoring report for the Ulaanbaatar Urban Services and Ger Areas Development Investment Program, Project 1 (the Project). It covers the period until April 2016, and was prepared by Project Management Unit with the support of CS2 (Project Management Support Services) on behalf of the Municipality of Ulaanbaatar, the Executing Agency (EA) and Implementing Agency (IA) for the Program.

B. Background of the Project

Ulaanbaatar peri-urban area (ger areas) are characterized by unplanned settlement of low- and medium-income households with un-serviced plots, inadequate and mostly unpaved road networks, and a severe lack of social and economic facilities and basic infrastructure and services for water, sewerage, and heating. Poor sanitation—households almost exclusively rely on open pit latrines—and poor waste collection have created highly unsanitary living conditions. Air pollution is among the most severe in the world, particularly during winter because of inadequate household heating systems and unpaved roads.

The ger area population is estimated at 800,000, representing 60% of Ulaanbaatar or 30% of the country population. Despite their size, ger areas have until recently been considered temporary settlements. TA 7591-MON and PPTA 7970-MON significantly contributed to the official integration of ger areas in the 2013 city master plan by providing the vision and infrastructure programming strategy. This provided the necessary provision to plan the redevelopment of a formal peri-urban area.

The multi-tranche financing facility (MFF) program will support the Ulaanbaatar city master plan in upgrading priority service and economic hubs (Sub-centres) in ger areas. The program implementation time will be up to 9 years and will comprise three tranches. The program is geographically targeted with multi-sector interventions. It proposes an integrated solution to respond to the urgent demand for basic urban services and establish a network of well-developed urban Sub-centres providing economic opportunities, housing, and urban services as catalysts for growth in the ger areas.

The impact of the program is improved living conditions in Ulaanbaatar. Its outcome is a network of livable, competitive, and inclusive Sub-centres in Ulaanbaatar's ger areas providing economic opportunities and urban services, leading to a healthier urban environment.

The program is divided into three projects and has four outputs:

Output 1. Roads and urban services are expanded within the targeted Sub-centres and connectivity between Sub-centres is improved;

Output 2. Economic and public services in Sub-centres are improved;

Output 3. Service providers become more efficient;

Output 4. Institutions and capacity for urban development, program management, and service delivery are strengthened.

The first tranche of the MFF supports the city master plan in developing the Selbe and Bayankhoshuu Sub-centres. The main proposed components to be financed are:

1. construction of sewerage network extension of 6.1 kilometres (km) collector main, sewerage pumping station along with 2.09 km of sewer pipe extension;
2. within the Sub-centres, 15 km of priority roads, 18.6 km of water supply, 20 km of sewerage, 21 km of district heating network pipes, and 5 heating facilities;
3. social and economic facilities, including two kindergartens, green areas and small squares, and two business incubators associated with two vocational training centres;

4. multi-interventions in the Ulaanbaatar Water Supply and Sewerage Authority to improve its operations and service delivery efficiency; and
5. institutional strengthening and capacity development to prepare detailed design and construction supervision, support community participation and small and medium enterprise development, improve urban planning and Sub-center development, strengthen the capacity of the PMO, and support service providers' reforms.

The other tranches will (i) expand the coverage of similar investments in Tranche 1 Sub-centers, as well as in other Sub-centers located in the northern and eastern parts of the ger areas; and (ii) improve road connection between the targeted Sub-centers. Khaniin Material and Market Area Sub-centers are tentatively the two main targeted areas for Tranche 2, and Ulyastai and Amgalan Sub-centres for Tranche 3. Other Sub-centers may be considered.

Policy dialogue and capacity development

The policy dialogue and capacity development will focus (i) in communities, on community participation, awareness, and empowerment, including design and implementation of the social and gender action plan; and establishment of community development councils (CDCs) and small- and medium-sized enterprise (SME) development councils (SDCs); (ii) in Sub-centers, on Sub-center upgrading, including technical guidance for preparing and implementing local development plans, urban zoning regulation and construction standards, and a development framework with a transparent mechanism to regulate land redevelopment insuring current residents are integrated in the redevelopment plan; (iii) in the city, on the master plan through ongoing ADB technical assistance to strengthen urban planning capacity,[1] and (iv) in capacity development for water, wastewater, and heating utilities.

Investment and Financing Plans

The total cost of the program is $320 million. For the program, the government has requested an MFF of up to $163.70 million from a blend of ADB's Asian Development Fund (ADF), ordinary capital resources (OCR), ADB's trust funds, and other co-financing. It is expected that the Municipality of Ulaanbaatar (MUB) will finance $96 million, or 30% of the total cost, including taxes and duties, resettlement, and other miscellaneous costs. Co-financing which is estimated at $60.3 million equivalent may be provided as loans or grants. The European Investment Bank will provide a parallel co-financing up to €50 million for financing water supply and sanitation subprojects of the program.

The total cost of Tranche 1 is $104.52 million, inclusive of physical and price contingencies, interest, taxes and duties, and other charges. ADB financing is $53.70 million, consisting of about $22.5 million from ADF, $27.5 million from OCR, and $3.7 million as a grant from the Urban Environmental Infrastructure Fund. The total MUB financing is $22.44 million, and the European Investment Bank (EIB) is co-financing a total of $28.38 million.

Table 1. Investment Program ($ million)[2]

Item		Investment Program	Tranche 1
A.	**Base Cost[3]**		
	1. Expanded roads and urban services		
	1.1 Roads improvement	93.21	24.59
	1.2 Water supply system improvement	35.23	12.39
	1.3 Sewerage system improvement	42.91	13.31
	1.4 Heating services expansion	74.67	30.14
	Subtotal (1)	**246.02**	**80.43**
	2. More efficient service providers	11.48	3.70
	3. Increased economic and public services	15.36	5.00

[2] Source: Asian Development Bank estimates.
[3] In mid-2013 prices. Includes value-added tax and import duties estimated at $16.7 million for the investment program and $6.18 million for project 1. The government will finance these taxes and duties through tax exemptions.

Item		Investment Program	Tranche 1
	4. Institutional strengthening and capacity development		
	4.1 Program management implementation support	6.13	2.00
	4.2 Strengthening service providers	1.53	0.50
	4.3 Sub-center development and community engagement	4.59	1.50
	Subtotal (4)	**12.25**	**4.00**
	Subtotal (A)	**285.11**	**93.13**
B.	**Contingencies[4]**	**22.63**	**7.40**
C.	**Financing Charges During Implementation[5]**	**12.25**	**4.00**
	Total (A+B+C)	**320.00**	**104.52**

Note: Numbers may not sum precisely because of rounding.

The program will be implemented over a period of 9 years from December 2013 to December 2022. The implementation period for Tranche 1 started in December 2013 and will be completed by December 2017. Physical infrastructures for Tranche 1 are expected to be completed by 2017.

C. Project Management Arrangements

The MUB is the EA for the program. The Urban Development and Investment Office of the MUB are responsible for coordinating the program implementation. A program steering committee, chaired by the Mayor of Ulaanbaatar City, has been established to provide strategic and policy guidance.

	Management Roles and Responsibilities
Asian Development Bank (ADB)	▪ Oversees the implementation, including compliance by executing and implementing agencies of their obligations and responsibilities for project implementation in accordance with ADB's policies and procedures.
The Government	▪ The Borrower's representative ▪ Ensures that the MUB provides timely counterpart funding. ▪ Screens and approves withdrawal applications. ▪ Establish three imprest accounts (for loans and grant funds, respectively) in a Commercial bank acceptable to ADB. ▪ Ensures annual audit of the project accounts. ▪ Negotiates project and loan agreements.
Program Steering Committee	▪ Chaired by the Mayor of Ulaanbaatar ▪ Comprise representatives of the Ministry of Economic Development, Ministry of Finance, Ministry of Construction and Urban Development, Ministry of Labour, Ministry of Education, and other agencies concerned, as needed. ▪ Oversees progress on the Investment program. ▪ Provides strategic guidance on program implementation. ▪ Meet at least once every 6 months until program completion.
Executing Agency – Municipality of Ulaanbaatar (MUB)	▪ Responsible for program oversight and administration. ▪ Sets up multimodal coordination committee and follow up the action plan. ▪ Oversees implementation of investment program road maps. ▪ Submits progress reports to the steering committee for decision making.

[4] *Physical contingencies computed at 5% of civil works and consulting services. Price contingencies calculated at rates ranging from 3%–8.0% for local currency costs and 0.5%–2.2% for foreign exchange costs; includes provision for exchange rate fluctuations under a purchasing power parity exchange rate.*

[5] *Includes interest and commitment charges. Financing charges during implementation of the Asian Development Bank (ADB) loans are computed (i) at 2.0% per annum of the first tranche's loan from ADB's Special Funds resources; and (ii) at the 5-year dollar fixed swap rate plus an effective contractual spread of 0.4%, and a commitment charge of 0.15% on the undisbursed portion of the first tranche's loan from ADB's ordinary capital resources. Financing charges during implementation for the European Investment Bank loan were also calculated based on the 5-year dollar fixed swap rate.*

	▪ Prepares subsequent tranches. ▪ Be accountable and responsible for proper use of advances to the imprest accounts. ▪ Endorses withdrawal applications. ▪ Ensures compliance with project covenants. ▪ Hold quarterly meetings with the program management office.
Implementing Agency – Municipality of Ulaanbaatar (MUB)	▪ Responsible for implementation of the program, including finance and administration, technical and procurement matters, monitoring and evaluation, and safeguards compliance.
Program Management Office, and Procurement Committee	▪ Responsible for program implementation and management. ▪ Establishes and maintain program performance management system. ▪ Manages detailed surveys, investigations and engineering designs for all subcomponents. ▪ Prepares/update and submits final resettlement plans and updated EMP for ADB approval prior to award of contracts and implements all necessary documents related to land acquisition and resettlement, environmental, and other social safeguards. ▪ Secures technical and ecological expertise for all civil works prior to bidding. ▪ Assists the MUB in procurement and management of works, goods supply, and consulting services contracts (with support from relevant municipal bodies). ▪ Ensures monitoring and quality control of construction works with necessary safety measures. ▪ Coordinates with ADB on matters related to disbursements, including preparation of withdrawal/replenishment applications for endorsement by the MUB and the Ministry of Finance, and retaining of supporting documents. ▪ Submits progress reports and audit reports, to ADB and the MUB on time. ▪ Maintains the program imprest accounts. ▪ Submits the withdrawal application to ADB, collect and keep supporting documents, submit reporting requirements, including the annual report and financial statements.

SOURCE: FAM

D. Environmental overview of the Project Area

Project 1 focuses on the redevelopment of two Sub-centers: **Bayankhoshuu and Selbe;** which area located within the middle ger areas—expected to generate a development momentum not only within the Sub-center boundaries but also in their surrounding influence areas‘ (or hinterlands).

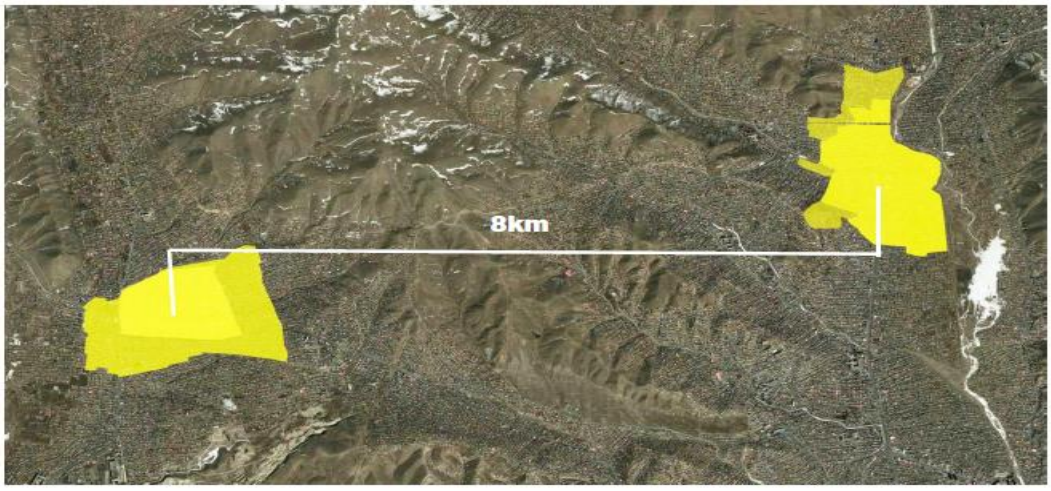


Figure 1: Perimeters of Two Sub Centres

The two Sub-centres are 8 km apart, and main asphalted N/S and E/W roads (Figure 1) cross both. Bayankhoshuu is located between several ravines and its primary drainage network lacks an appropriate outlet. However, its vibrancy is through its commercial activities located around an existing bus terminal. Selbe is bordered on the eastern side by the Selbe River, and is subject to flooding in its southern part.[6] Housing in both Sub-centres comprises mainly individual units, with the residential area covering about 96% of the urbanized area in Bayankhoshuu and 98% in Selbe. There is a poor coverage of public amenities reaching less than 5% of the population in Bayankhoshuu and 2% in Selbe—against a norm of at least 15%. The road network is haphazard, as result of the uncontrolled allocation of plots, with discontinuous routes, variable widths of largely gravel roads—often with less than a 6m right of way. Water and sewerage, are deficient and heating services are lacking.

Project 1 projects involve horizontal works (water supply, wastewater collection, heat distribution, roads, drainage/culvert, and embankment) and construction of point objects (HOBs, sewage pumping stations, and social and economic infrastructures).

The potentially affected environment from Project 1 implementation can be classified into:

(i) "main project areas of influence", covering component sites (footprints) and areas within 200 m from their edges7; considering the potential reach of noise, dust and socio-economic impacts; and

(ii) "extended areas of influence" to include borrow areas/quarry sites, waste disposal sites, access routes to and from component sites and the resources in close proximity to them, sources of water for construction use, workers campsites and their immediate surroundings, and sources of labour.

Environmental Specialists, including International and National of the EGIS (PIS) team along with PMO Engineers made field visits during October 28 and November 5, 2015. Field visits covered proposed road alignment (Bayankhoshuu and Selbe sub center), water reservoir area, sewage collection points, proposed kindergarten, heating station etc. The present status of the proposed sub center development locations can be visualized from recent photographs (Appendix 3).

Salient features of project influence area in the social and environmental views are summarized in Appendix 5.

6 *The World Bank project "USIP3" plans the rehabilitation of some sections of roads and drainage channels. The PPTA takes these data into account.*

7 200 m takes into account the potential reach of noise, dust, and socioeconomic impacts

II. ENVIRONMENTAL MANAGEMENT

A. Compliance with environment related project covenants

Project 1 has been classified as a Category B undertaking by the ADB, requiring an ***initial environmental examination (IEE)***. This was carried out following the Safeguard Policy Statement (2009) of the ADB.

The IEE identified a range of positive impacts and benefits and adverse issues/ concerns/impacts from the investment. Benefits include convenient access to houses and properties, and safe/potable water supply, wastewater management services, heating, and social and economic infrastructure. These will lead to positive impacts, such as improved hygiene and sanitation, reduced health risks and incidence of diseases, reduced dust suspension, reduced soil and groundwater contamination, reduced greenhouse gas emission, reduced nasty odor especially during non-winter months, and an improved business and working environment.

In compliance with Mongolia's environmental safeguard policy, Project 1 was subject to ***General Environmental Impact Assessment (GEIA)*** or environmental screening by the Ministry of Environment and Green Development (MEGD) in March 2013. The GEIA concluded that a ***Detailed Environmental Impact Assessment (DEIA)*** for each Sub-center was required. DEIAs have been undertaken by a MEGD-registered consulting company, and were approved in October 2013. As indicated in the Mongolian environmental regulations and ADB requirements, DEIA and EMP are subject for consideration and compliance, while Subprojects construction and operation goes on.

The ***Environmental Management Plan (EMP)*** has been developed, and represents the framework for the environmental management of Project 1 components. It contains an ***Environmental Mitigation Plan*** and ***Environmental Monitoring Plan*** that addresses the potential impacts and risks arising from Project 1 implementation.

The EMP was designed to avoid, reduce, or at least minimize the adverse environmental impacts that could result from the activities during the implementation and operation of the project. Accordingly, the EMP considered all phases of the Project cycle, namely the detailed design, construction and operational phases of the Project. It consists of various mitigation measures needed to be undertaken in the course of the Project cycle.

All potential environmental impacts identified in the IEE Report for the project are listed in the EMP. The description of the respective proposed protection or mitigation measures, their attributes and the responsible entities for their implementation were also presented vis-à-vis the impacts. This EMP was presented in a matrix form in the IEE Report and is being used as the basis of the periodic monitoring activities during the construction period of the Project.

The ***Environmental Assessment and Review Framework (EARF)*** has been developed and agreed with MUB, where outlines the procedures that will be followed in the environmental assessment and review of subprojects that will be prepared after Program approval in order to comply with the environmental safeguard requirements of SPS (2009) of the Asian Development Bank (ADB) and the Law of Mongolia on Environmental Impact Assessment (2012). It is intended for use primarily by the following key players: (i) Municipality of Ulaanbaatar (MUB) as the executing agency and the implementing agency of the Program; (ii) Sub-center Redevelopment Authority (SRA); (iii) Ulaanbaatar Water and Sewerage Authority (USUG) as a sub-implementing agency; and (iv) the Program Management Office (PMO).

The EARF provisions shall guide MUB in the selection, screening and categorization, environmental assessment, and preparation and implementation of safeguard plans (such as an EMP) of components and subprojects under subsequent tranches of the Program. The preparation of environmental assessment documents shall follow the procedures outlined in the EARF. Since the environmental assessment reports and environmental management plans to be prepared for subsequent tranches are the Borrower's documents, these documents shall be officially endorsed by MUB and submitted to ADB for review, approval and disclosure.

The EARF: (i) describes the Program and its tranches; (ii) explains the general anticipated environmental impacts of the tranches to be financed under the proposed Program; (iii) specifies the requirements that will be followed related to screening and categorization of sub-sequent tranches, assessment, and planning, including meaningful consultation with affected people and other stakeholders and information disclosure requirements; (iv) specifies the environmental safeguard criteria that are to be used in selecting/rejecting subprojects and/or components under sub-sequent tranches; (v) assesses the adequacy of the borrower's capacity to implement national laws and ADB's requirements and identifies needs for capacity building; (vi) specifies EARF implementation procedures, including the budget, institutional arrangements, and capacity development requirements; (vii) specifies monitoring and reporting requirements, and (viii) describes the responsibilities of the EA and of ADB in relation to the

B. Environmental Responsibilities

The EARF and EMP specify the roles and responsibilities of institutions (including the Municipality of Ulaanbaatar (MUB), the program management office (PMO), project units, contractors, and environment consultants) in overall environmental management.

The MUB as executing agency has the overall responsibility for compliance with EARF, IEEs, and EMPs. The PMO handles day-to-day activities under the program. The PMO ensures compliance with assurances, including preparation, finalization, and implementation of the EMP for each tranche. It is staffed with one environmental safeguard staff (an environmental engineer/scientist).

The PMO environmental safeguard staff is responsible for the coordination and supervision of the implementation of the EARF and project 1 EMP, including (but not limited to)

i. updating IEE and EMP after detailed project design for project 1 and subsequent projects;
ii. overseeing incorporation of EMP recommendations into the bidding documents;
iii. ensuring the procurement of environmentally responsible contractors;
iv. ensuring that DEIA approval by MEGD has been secured prior to the awarding of civil works contract;
v. setting up baseline ambient air quality, noise and vibration levels, ground- and surface water quality and baseline in concerned *khoroos* for subsequent projects;
vi. setting up, coordinating, and reporting on the grievance redress mechanism (GRM, see below);
vii. monitoring contractors to ensure adherence to the project 1 EMP and the contractor EMPs;
viii. preparing monthly reports on project EMP implementation to the PMO;
ix. coordinating consultation with local stakeholders as required, informing them of imminent construction works, updating them on the latest project development activities, GRM, etc.;
x. supporting the environment consultants in conducting training, EMP compliance reviews, annual reporting, etc.; and
xi. coordinating the preparation of IEEs, including EMPs, for subsequent tranches.

Contractors are required to formulate contractor EMPs with complete management systems for adverse impacts, e.g., dust control, noise control, traffic management, addressing as minimum the requirements of the project 1 EMP. The contractor EMPs are reviewed and cleared by the PMO, and by the MEGD as necessary. To ensure that the contractors comply with the project 1 EMP provisions, the PMO prepares and provides the following specification clauses for incorporation into the bidding procedures: (i) a list of environmental management requirements

to be budgeted by the bidders in their proposals; (ii) environmental clauses for contractual terms and conditions; and (iii) the full project 1 EMP and DEIAs in Mongolian.

Figure 2: Implementing Organizational Structure for EMP[8]

In compliance with the agreed upon procurement plan, the PMO procured the services of environment consultants to provide support in (i) project preparation including updating the project 1 EMP; (ii) training; (iii) quarterly environmental quality monitoring (air, surface and ground water, and noise); (iv) annual project EMP implementation reporting; (v) identifying environment-related implementation issues and necessary corrective actions; and (vi) undertaking site visits as required.

[8] SOURCE: FAM

III. ENVIRONMENTAL MONITORING

Environmental monitoring and inspection consist of: (i) environmental impact monitoring; and (ii) EMP performance verification. Environmental impact monitoring covers ambient air quality, noise, groundwater quality, surface water quality and community health and safety prior to construction and during construction; and workers health and safety during construction. EMP performance verification monitors and verifies the performance of the Design Consultant, Contractor, Operator, SRA and PMO in complying with, or adhering to, the C-EMP/P1-EMP.

A. Responsibilities in monitoring of environmental safeguard

Municipality of Ulaanbaatar (MUB) as the executing agency and implementing agency of the Program, responsible for firming up the necessary collaboration with MEGD for environmental impact monitoring.

Project Steering Committee (PSC), responsible for ensuring the allocation and timely disbursement of adequate resources for the monitoring of EMP implementation and conduct of environmental monitoring activities required from the implementing agency in the Environmental Monitoring Plan.

Sub-center Redevelopment Authority (SRA). The SRA (i) facilitates obtaining the necessary inputs and/or assistance from the subproject khoroos, communities and concerned private sector to meet environmental safeguard obligations; and (iii) firms up collaboration with subproject khoroos in consultations and information disclosure, environmental monitoring, and implementation/observance of the grievance redress mechanism.

Ulaanbaatar Water and Sewerage Authority (USUG) as a sub-implementing agency, responsible for: (i) providing technical assistance and support to the PMO in EMP implementation; (ii) as operator for the completed water and sewerage structures, observing the program's GRM and implementing environmental mitigation and monitoring measures that will address as minimum the requirements of the project EMP.

Program Management Office (PMO)'s Environmental Safeguard Staff (ESS) coordinate and supervise the EMP implementation, including but not limited to: (a) update the P1-EMP after detail project design; (b) oversee incorporation of EMP recommendations into the design/bid documents; (c) ensure the procurement of environmentally responsible contractors; (d) ensure that an DEIA approval has been secured prior to the awarding of civil works contract; (e) set up baseline ambient air quality, noise & vibration levels, ground- & surface water quality & baseline statistics on incidence of diseases, road accidents and crimes occurring at night in the unlit roads in concerned khoroos; (f) set up and coordinate grievance redress mechanism (GRM); (g) review and clear C-EMPs of the selected Contractors; (h) monitor contractors to ensure adherence to the EMP; (i) prepare monthly reports on EMP implementation to the PMO; (j) conduct consultation meetings with local stakeholders as required, informing them of imminent construction works, updating them on the latest project development activities, GRM, etc.; and (k) support the PIS-ES in conducting training, EMP compliance reviews, annual reporting, etc.

Project Units (PUs) under the SRA, responsible for providing assistance to the SRA and PMO in environmental management at the Subcenter level, particularly in consultations and information disclosure, IEC campaign, environmental monitoring and implementation/observance of the grievance redress mechanism (GRM).

Contractors will develop, implement and (internally) monitor Contractor EMPs, fully responding to the P1-EMP. To ensure that the contractors comply with the P1-EMP provisions, the PMO with the help and technical support of PIS-ES, will prepare and provide the following specification clauses for incorporation into the bidding procedures: (a) a list of environmental management requirements to be budgeted by the bidders in their proposals; (b) environmental clauses for contractual terms and conditions; and (c) the full P1-EMP in Mongolian.

Concerned Khoroos (through their designated counterpart for the PMO's ESS) will actively participate in (a) public disclosure of Project 1 IEE, EMP & EMRs, and in the community

awareness program on health and safety impacts of Project 1 implementation; (b) the establishment of health and safety baseline data prior to construction; (c) review EMRs & results of environmental monitoring by Contractors, and ensure that necessary corrective actions are taken for reported exceed that will be confirmed as caused by Contractor's negligence;

Licensed institute. A licensed institute will be engaged to conduct baseline monitoring prior to construction, and quarterly environmental monitoring during project construction and operation, following the monitoring plan presented in the EMP. The licensed institute will comply with Mongolian Quality Assurance/Control procedures and regulations for sampling and monitoring of environmental media, and assess compliance with Mongolian environmental quality standards for ambient air, water and noise quality. The laboratory, to be contracted by the PMO, will submit quarterly environmental impact monitoring reports to the PMO.

Project Implementation Support (PIS) Team will provide support to the PMO, the PMO-ESS, and the SRA and USUG with (a) project preparation; (b) training, (c) yearly environmental progress and EMP compliance monitoring; (d) annual EMP monitoring and progress reporting; (e) identifying environment-related implementation issues and necessary corrective actions; and (f) undertaking site visits as required.

Asian Development Bank (ADB), responsible for undertaking reviews of relevant documents for clearance purposes and carry out periodic review missions to review (amongst others) the environmental aspects of Project 1.

B. Key Environmental Quality Standards Applicable to Project 1

Table 2. Ambient Air Quality Standards

Parameter	MNS 4585:2007		EHS Guidelines. World Health Organization (WHO). Air Quality Guidelines Global Update, 2005)	
SO_2	24-hour	20	24-hour	125 (Interim target-1)
				50 (Interim target-2)
				20 (guideline)
	10 minute	500	10 minute	500 (guideline)
NO_2	1-year	30	1-year	40 (guideline)
	24-hour	40	24-hour	-
	20-min	85	1-hour	200 (guideline)
PM_{10}	1-year	50	1-year	70 (Interim target-1)
				50 (Interim target-2)
				30 (Interim target-3)
				20 (guideline)
	24-hour	100	24-hour	150 (Interim target-1)
				100 (Interim target-2)
				75 (Interim target-3)
				50 (guideline)
$PM_{2.5}$	1-year	25	1-year	35 (Interim target-1)
				25 (Interim target-2)
				15 (Interim target-3)
				10 (guideline)
	24-hour	50	24-hour	75 (Interim target-1)
				50 (Interim target-2)
				37.5 (Interim target-3)
				25 (guideline)
CO	Average in 1 hour	30g/m3	No standard	

Interim targets are provided in recognition of the need for a staged approach to achieving the recommended guidelines.

Table 3. Noise Level Standards

Receptor	MNS 4585:2007		EHS Guidelines (Guidelines for Community Noise, World Health Organization (WHO), 1999)	
Residential, institutional, educational	07:00 - 23:00	60 dB(A)	07:00 - 22:00	55 dB(A)
	23:00 - 07:00	45 dB(A)	22:00 - 07:00	45 dB(A)

Table 4. Surface Water Quality Standards

Parameter	MNS 4586-98	
pH		6.5-8.5
DO	mgO/l	not less than 6&4 *
BOD	mgO/l	3
NH_4-N	mgN/l	0.5
NO_2-N	mgN/l	0.002
NO_3-N	mgN/l	9
PO_4-P	mgP/l	0.1
Cl	mg/l	300
F	mg/l	1.5
SO_4	mg/l	100
Mn	mg/l	0.1
Ni	mg/l	0.01
Cu	mg/l	0.01
Mo	mg/l	0.25
Cd	mg/l	0.005
Co	mg/l	0.01
Pb	mg/l	0.01
As	mg/l	0.01
Cr	mg/l	0.05
Cr^{6+}	mg/l	0.01
Zn	mg/l	0.01
Hg	mg/l	0.1
Oil	mg/l	0.05
Phenol	mg/l	0.001
Active and washing substances	mg/l	0.1
Benzapyren	Mkg/l	0.005

* DO >6 mgO/l for summer time and DO >4 mgO/l for winter time

Table 5. Groundwater Quality Standards

Parameter	MNS 900:2005		WHO Guidelines for Drinking Water Quality, Fourth Edition. 2011	
Na^+	mg/l	200		None established
K^+	mg/l	200		None established
Ca^{2+}	mg/l	100		-
Mg^{2+}	mg/l	30		-
$S0_4^{2}$	mg/l	500		None established
HCO_3	mg/l	-		-
CO_3^{2}	mg/l	-		-
Cl	mg/l	350	mg/l	5
P	mg/l	0.7-1.5		-
Br		-		None established
Test, by mark	mg/l	2		-
Color	degree	20°		None proposed
Odor	mark	2		-
pH		6.5-8.5		None established
Electric Conductivity Y S/st		-		-
General Minerals		1000		-
Hardness	mg-eqv/l	7		None established
Acidity potential	mB			-
Solid remains	g/l	1		-
NH_4	mg/l	1.5		None established
NO_3	mg/l	50	mg/l	50
NO_2	mg/l	1	mg/l	3
PO_4	mg/l	3.5		-
As	mg/l	0.01	mg/l	0.01
Fe	mg/l	0.3		None established
Pb	mg/l	0.03	mg/l	0.01
Ni	mg/l	0.02	mg/l	0.07
Cr	mg/l	0.05	mg/l	0.05
Cu	mg/l	0.1	mg/l	2
Zn	mg/l	5		None established
Mn	mg/l	0.1		None established
Cd	mg/l	0.003	mg/l	0.003
Hg	mg/l	0.0005	mg/l	0.006
B	mg/l	0.5	mg/l	2.4
Ba	mg/l	0.7	mg/l	0.7
Mo	mg/l	0.07		None estabished
Se	mg/l	0.01	mg/l	0.04
E.coli or thermotolerant coliform bacteria		-		Must not be detectable in any 100 ml sample.

MNS 900:2005, Drinking Water Hygienic Requirement and Qualtity Control is the stadard used for groundwater supply, which is the source for drinking water supply in Mongolia.

Table 6. Soil Quality Standards

Parameter	MNS 5850 :2008			
	Soil Mechanical Composition			Maximum Acceptable Amount
	Clay	Loamy	Sandy	
Pb	100	70	50	100
Cd	3	1.5	1	3
Hg	2	1	0.5	2
As	6	4	2	6
Cr	150	100	60	150
Cr^{6+}	4	3	2	4
Sn	50	40	30	50
Sr	800	700	600	800
V	150	130	100	150
Cu	100	80	60	100
Ni	150	100	60	150
Co	50	40	30	50
Zn	300	150	100	300
Mo	5	3	2	5
Se	10	8	6	10
B	25	20	15	25
F	200	150	100	200
CN	25	15	10	25

Table 7. Boiler Emission Guidelines

Guideline	Parameter (in mg/Nm3)			
	MNS 6298:2011		EHS Guidelines *	
SO_2	mg/m^3	400 urban 600 remote areas	mg/Nm^3	2000
NO_x	mg/m^3	450-1,100 based on volatile coal	mg/Nm^3	650
PM	mg/m^3	50-200	mg/Nm^3	50-150
Dry Gas Excess O_2 content	-	-	%	6

* Small Combustible facilities Emission Guidelines (3MWth-50MWth) - for Boilers using solid fuel

MWth - Megawatt thermal

Nm^3 is at one atmospheric pressure, 0°C.

C. Selected Climate Data

Table 8. Climate data

Period	Month												Year
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Average Air Temperature, oC (Ulaanbaatar Sta.)													
1978-2008	-21.7	-16.7	-7.6	1.8	10.0	15.8	18.2	16.0	9.3	0.6	-11.0	-19.0	-0.36
1978-1990	-21.5	-17.6	-8.5	0.9	9.8	14.7	16.9	14.8	8.4	0.5	-11.3	-18.7	-0.97
1991-2008	-21.8	-16.0	-6.9	2.4	10.2	16.5	19.1	16.8	9.9	0.6	-10.8	-19.3	-0.06
Average change	0.3	1.6	1.6	1.5	0.5	1.8	2.3	2.0	1.5	0.1	0.5	0.6	0.91
Rainfall, mm * Mean rainfall, mm 1961-1990 **	1.1	1.7	2.7	8.3	13.4	41.7	57.6	51.6	26.2	6.4	3.2	2.5	216.4
Relative humidity % ^													
average morning	83	81	74	66	64	73	78	80	76	75	79	83	76
average evening	71	65	50	40	37	43	50	49	46	48	60	72	53
Sunshine hours, mean daily 1961-1990 **	5.7	7.3	8.6	8.8	9.7	9.0	8.0	8.3	8.2	7.3	5.9	5.0	7.7
Wind speed, 2005 m/sec ^^	1.6	21.	2.9	3.9	4.4	3.5	3.1	2.6	2.9	2.6	2.0	1.6	2.8

* National Statistical Yearbooks 2003, 2007, 2010. National Statistics Office of Mongolia.

** Hong Kong Observatory www.hko.GOM.hk/wxinfo/climat/world/eng/asia/china/ulaanbaatar_e.htm# (Location of weather station, 47.9 N, 106.9 E, altitude: 1306 m.

^ www.weatherbase.com

^^ 2007-Environmental Outlook of the Ulaanbaatar City. Asia-Pacific Global Environmental Outlook, Data Portal Project. 2006-2010, UNEP. October 2009.

Table 9. Climate Data (2008-2012) - Ulaanbaatar Meteorological Station

Average air temperature (°C)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	-23.6	-17.7	-2.4	5.2	8.2	17.4	20.3	17.8	10.9	1.5	-7.1	-19.1
2009	-20.5	-17.3	-7.5	7.2	12.3	16.8	19.3	16.8	10.1	1.2	-13.5	-20.9
2010	-23.6	-20.8	-11.5	-2.2	12.1	19.4	21.7	15.6	12.2	1.6	-8.9	-19.2
2011	-23.8	-15.6	-9.6	4.2	8.2	17.3	17.4	18.4	8.0	3.7	-10.4	-22.1
2012	-25.5	-20.2	-8.0	2.7	11.5	15.2	18.0	15.9	11.6	0.2	-12.3	-22.4

Extreme maximum air temperature (°C)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	-11.8	1.9	11.0	26.7	28.6	34.0	34.8	33.6	24.7	15.8	7.4	-6.7
2009	-6.8	0.0	6.9	24.1	29.8	30.0	33.3	32.5	28.7	17.9	9.5	-5.0
2010	-6.6	-4.6	7.8	22.3	29.5	38.3	37.4	29.9	31.5	21.6	8.1	-3.0
2011	-10.5	0.8	12.6	23.5	27.2	32.1	29.7	31.8	23.9	22.0	9.3	-11.3
2012	-11.6	-6.4	14.0	21.7	29.5	32.7	29.4	30.9	27.4	17.8	8.1	-9.5

Extreme minimum air temperature (°C)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	-33.8	-31.6	-18.1	-10.2	-5.3	1.8	9.2	2.2	-3.6	-14.0	-20.0	-31.8
2009	-32.9	-33.3	-25.7	-8.1	-4.0	1.8	10.2	4.2	-4.4	-12.7	-25.5	-33.6
2010	-35.7	-33.1	-29.1	-17.0	-1.5	3.3	7.3	3.2	-5.3	-9.8	-23.9	-33.2
2011	-32.5	-27.5	-27.1	-10.2	-5.4	5.9	6.1	5.7	-6.9	-7.7	-24.6	-31.3
2012	-37.0	-34.4	-23.9	-9.7	-2.0	4.0	7.3	0.0	-1.9	-14.1	-28.4	-32.9

Total precipitation (mm)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	2.2	0.9	2.3	1.4	12.4	67.2	69.1	41.3	14	10.8	0.7	6.2
2009	0.9	2.8	3.8	2	39	31.1	118	47.3	13.8	8.1	1.8	5.5
2010	2.3	4.4	7.2	1.1	25.7	23.3	79.6	65.8	8.9	12.6	7.6	1.2
2011	1.4	8.2	0.4	11	27.4	77.3	58.3	43.9	7.6	10.5	11.7	2.1
2012	0.7	1.4	0.9	6.5	9	70.1	106.8	56.7	17.5	3.8	7.8	6.2

Maximum precipitation (mm/day)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	1.2	0.5	1.2	0.9	3.0	28.6	25.7	30.6	5.0	7.2	0.5	1.1
2009	0.9	1.9	2.9	2.0	33.1	14.7	44.8	13.8	5.9	6.0	1.4	2.0
2010	0.5	3.4	2.2	0.9	21.8	7.9	25.1	34.3	5.9	5.9	2.1	0.8
2011	0.6	2.4	0.4	9.4	8.0	30.9	21.3	11.5	5.9	5.5	5.8	1.1
2012	0.3	0.8	0.5	3.8	2.8	20.7	21.9	16.5	10.1	1.7	3.5	1.8

Average relative humidity (%)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	82	74	47	35	36	49	52	49	51	60	62	68
2009	68	60	51	34	36	44	57	59	50	59	69	69
2010	65	65	61	45	35	45	50	57	49	56	69	68
2011	69	70	59	37	48	49	61	55	49	57	65	77
2012	76	73	57	39	33	50	60	58	46	53	61	64

Minimum relative humidity (%)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	60	31	15	6	7	10	17	11	12	11	22	41
2009	40	31	12	6	8	7	14	16	11	17	23	47
2010	29	29	29	11	8	6	13	16	14	14	32	39
2011	42	43	11	7	9	8	18	12	12	13	18	59
2012	60	44	13	12	12	14	24	17	13	18	14	45

Maximum relative humidity (%)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008				94	98	94	92	97	95	99	90	92
2009	85	85	91	94	98	95	95	96	97	97	89	88
2010	79	85	94	86	95	96	97	98	93	97	96	92
2011	79	90	85	96	96	97	96	98	88	85	84	84
2012	82	81	84	87	83	84	84	87	80	88	82	78

Total sunshine duration (hours)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	160.4	231.1	240.5	268.4	285.3	209.0	307.4	304.1	254.3	216.9	214.5	164.3
2009	198.4	223.3	269.9	265.2	304.1	277.6	231.7	275.1	251.5	212.4	196.2	151.2
2010	171.0	200.6	229.4	280.7	316.0	253.5	265.1	266.6	281.6	214.8	168.0	152.4
2011	191.1	203.8	284.4	295.4	282.4	259.3	285.8	252.0	278.5	236.4	187.1	159.7
2012	183.4	241.4	285.7	270.1	311.8	257.7	223.2	244.6	245.0	200.8	153.8	94.4

Average wind speed (m/sec)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	0.9	1.1	2.0	3.2	3.3	3.1	2.9	2.8	2.8	2.5	1.9	1.6
2009	1.4	2.3	2.6	3.0	3.5	3.5	3.1	2.9	3.0	2.4	1.8	1.8
2010	1.9	2.1	2.8	2.9	3.6	3.3	3.1	2.8	2.7	2.1	1.9	1.7
2011	1.3	1.8	2.3	3.1	3.2	3.0	2.8	2.7	2.6	2.2	2.0	1.2
2012	1.2	1.8	2.4	3.2	3.4	2.7	2.3	2.8	2.5	2.2	2.1	1.7

Maximum wind speed (m/sec)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	7	8	14	21	20	30	21	24	16	16	14	17
2009	14	19	18	20	19	21	20	17	20	16	15	18
2010	13	22	19	19	22	25	17	22	14	14	20	13
2011	10	11	20	19	23	20	18	18	19	16	13	9
2012	10	13	17	20	19	20	17	20	20	14	13	13

Prevailing wind direction

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	E	E	N	N	N	E	E	N	WN	E	W	WN
2009	ES	ES	E	N	W	WN	E	E	WN	W	E	ES
2010	W	ES	E	N	WN	E	E	WN	E	WN	ES	WN
2011	W	ES	WN	WN	WN	E	WN	E	N	E	ES	ES
2012	W	W	W	W	WN	WN	EN	WN	E	WN	E	E

D. Environmental Quality Data

Table 10. Air Quality in Songino Khairkhan, Sukhbaatar district and at the City Center, 2011 & 2012

Songino Khairkhan District, 16 khoroo

2011	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	MNS 4585:2007	WHO
SO_2	90	77	46	25	5	4	2	2	4	12	37	-	20	20
NO_2	No data												40	40

2012	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	MNS 4585:2007	WHO
SO_2	111	79	33	13	12	5	1	2	3	17	44	99	20	20
NO_2	68	60	39	20	19	20	24	20	22	26	29	38	40	40

Sukhbaatar District, 10 khoroo

2011	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	MNS 4585:2007	WHO
SO_2	133	110	66	41	25	18	9	7	11	29	96	245	20	20
NO_2	72	71	49	32	26	23	18	22	28	40	59	87	40	40
PM10	1,020	623	255	247	175	114	missing	215	215	254	679	1,549	100	50
CO	4,787	4,368	2,476	1,211	617	397	310	408	711	752	3,205	5,876	10,000	10,000
O_3	7	19	23	30	36	39	43	51	37	23	14	8	100	100

2012	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	MNS 4585:2007	WHO
SO_2	208	140	56	26	11	8	5	3	4	16	50	100	20	20
NO_2	73	44	32	26	21	32	37	30	27	41	53	73	40	40
PM10	1,435	756	364	425	573	125	107	147	132	67	519	1,286	100	50
CO	5,501	3,851	2,062	1,319	593	397	331	144	578	771	missing	missing	10,000	10,000
O_3	2	5	18	33	38	38	21	21	23	41	8	5	100	100

Sukhbaatar District, 16 khoroo

2012	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	MNS 4585:2007	WHO
SO_2	87	61	29	8	3	1	1	-	1	9	27	106	20	20
NO_2	52	47	23	17	18	16	13	13	15	21	26	44	40	40

West Crossroad, Bayangol District (UB Center)

2011	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	MNS 4585:2007	WHO
SO_2	57	51	44	26	16	11	-	10	13	22	39	60	20	20
NO_2	127	148	126	115		55	50	58	58	65	94	139	40	40
CO	3,259	2,832	2,148	1,087	955	907	no data	981	960	1,853	2,271	3,266	10,000	10,000
PM10	430	235	190	190	150	92	109	117	128	158	158	374	100	50
PM2.5	459	273	120	53	43	43	51	30	33	109	122	271	50	25

2012	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	MNS 4585:2007	WHO
SO_2	70	60	43	14	9	12	6	4	5	13	22	36	20	20
NO_2	no data	no data	no data	49	50	120	133	137	127	153	197	229	40	40
CO	2,894	2,514	1,832	1,245	1,105	1,083	1,038	396	509	575	1,229	1,656	10,000	10,000
PM10	307	334	162	177	153	104	115	143	144	209	174	312	100	50
PM2.5	no data	no data	no data	no data	no data	33	36	39	42	178	131	227	50	25

Exceeded international standard
Exceeded both national and international standards

Table 11. Water Quality of Tuul River and Selbe River, 2011 & 2012

Tuul River - Bayanzurkh Bridge

Date	pH	EC	Weig	DO	BOD_5	COD	SO_4	NH_4	NO_2	NO_3	Pmineral	F	Fe	Cr /VI
5/4/2011	7.47	70.80	0.40	10.90	5.60	5.20		0.15	0.00	0.25	0.03	0.17	0.03	-
6/8/2011	6.53	56.90	-	8.22	1.90	4.40		0.09	0.01	0.08	0.05	0.24	0.03	
7/20/2011	7.13	72.70	26.40	7.11	1.30	5.00	1.00	0.15	0.00	0.39	0.01	0.46	0.02	
8/17/2011	6.54	70.50	1.80	7.47	1.11	2.50		0.10	0.00	0.08	0.01	0.17	0.01	
9/21/2011	7.64	78.00	2.00	9.26	3.90	2.00	3.20	0.08	0.00	0.10	0.01	0.18	0.01	
10/19/2011	7.22	84.70	0.80	9.11	2.80	1.40		0.04	0.00	0.25	0.00	0.58	0.03	
11/16/2011	7.33	88.70	-	8.64	2.60	1.20	16.00	0.49	0.01	0.01	0.02			
12/6/2011	7.27	87.30	2.60	8.01	0.80	0.80	6.90	0.02	0.00	0.40	0.00	0.26	0.04	
4/4/2012	7.51	139.10	3.60	4.71	1.26	3.80	19.80	0.37	0.02	0.64	0.01	0.04	0.07	
5/2/2012	8.04	76.40	21.80	9.95	2.70	4.30	6.60	0.10	0.00	0.20	-	0.14	0.04	0.01
6/6/2012	7.18	106.00	4.20	8.24	1.25	4.80	4.30	0.12	0.01	0.07	0.00	0.04	0.03	0.00
7/4/2012	6.17	62.00	5.80	6.88	2.90	3.30	1.60	0.14	0.00	0.32	0.03	0.03	-	
8/22/2012	7.25	61.90	5.20	9.20	3.44	5.40	2.40	0.20	0.01	0.33	0.00	0.05	0.09	
9/19/2012	7.48	77.90	2.40	7.90	1.11	4.30	2.70	0.11	-	0.17	0.00	0.10	-	
10/17/2012	7.11	106.60	-	8.53	5.84	2.50	2.40	0.12	0.00	0.34	0.00	0.05	-	-
11/14/2012	7.65	88.80	-	9.24	2.92	2.70	8.20	0.06	0.00	0.36	0.01	0.14	-	-
MNS 4586:1998	6.5-8.5	-	-	Not less than 6&4	3	10	100	0.5	0.02	9	0.1	1.5	-	0.01

Bayanzurkh Bridge is located upper part from Zaisan post. It is east of confluence of Selbe River with Dund Gol River.

Tuul River - Zaisan

Date	pH	EC	WB	DO	BOD_5	COD	Hardness	SO_4	NH_4	NO_2	NO_3	Pmineral	F	Fe
5/4/2011	7.84	60.70	-	11.22	5.90	5.20	0.53	2.50	0.13	0.00	0.16	0.01	0.14	0.04
6/8/2011	6.67	55.40	3.40	7.90	1.10	4.00		2.80	0.09	0.01	0.13	0.01	0.07	0.02
7/20/2011	8.09	68.30	8.00	8.06	2.60	3.80	0.70	1.60	0.14	0.00	0.55	0.00	0.37	0.02
8/17/2011	7.07	71.40	2.40	7.63	0.60	2.20		1.40	0.04	0.00	0.07	0.00	0.18	0.01
9/21/2011	8.27	77.30	4.00	8.64	1.90	2.00	0.78	2.60	0.04	0.00	0.04	0.01	0.18	0.03
10/19/2011	7.50	75.80	4.00	8.64	2.30	2.00			0.04	0.00	0.43	0.03		0.04
11/16/2011	7.26	85.10	0.40	11.15	2.60	1.20		15.40	0.02	0.00	-	0.04		
5/2/2012	8.70	81.40	26.60	7.58	0.60	3.50		5.90	0.11	0.01	0.32	0.01	0.16	0.02
6/6/2012	7.46	59.80	10.60	6.28	1.34	2.80	0.51	17.10	0.11	0.00	0.08	0.00	0.11	0.07
7/4/2012	8.15	64.00	1.60	7.66	3.53	4.40	0.57	7.50	0.28	0.00	0.44	0.01	0.03	-
8/22/2012	7.15	63.60	6.20	7.20	0.72	4.80	0.53	1.00	0.24	0.01	0.39	0.00	0.10	-
9/19/2012	8.13	78.90	0.20	7.27	0.79	4.30	0.55	3.20	0.09	0.01	0.20	0.00	0.08	-
10/17/2012	7.30	94.70	4.80	12.01	5.69	8.70		1.20	0.09	0.00	0.79	0.00	0.14	-
11/14/2012	7.50	100.40	-	6.32	2.84	2.40	0.87	5.60	0.05	0.00	0.59	0.01	0.21	-
MNS 4586:1998	6.5-8.5	-	-	Not less than 6&4	3	10	-	100	0.5	0.02	9	0.1	1.5	-

Zaisan is i nthe area of confluence of Selbe River with Dund Gol River.

Selbe River at Ulaanbaatar

Date	pH	EC	WB	DO	BOD_5	COD	Hardness	SO_4	NH_4	NO_2	NO_3	Pmineral	F	Fe	Cr /VI
4/6/2011	7.58	284.00	10.60	10.27	6.00	10.40	2.21	7.00	1.30	0.06	0.97	0.07	0.10	0.12	0.02
5/4/2011	7.65	286.00	257.00	8.06	6.80	11.60	2.54	33.60	0.54	0.03	1.02	0.03	-	0.74	0.01
6/8/2011	8.12	297.00	4.40	5.21	0.63	4.70	0.78	12.40	0.21	0.02	1.21	0.01	0.18	0.05	
7/20/2011	8.01	374.00	32.40	7.27	3.00	6.50	2.95	68.30	0.18	0.03	1.76	0.00	0.65	0.04	
8/17/2011	6.86	250.00	12.00	8.35	1.59	3.60	2.17	49.30	0.05	0.13	1.80	0.03	0.31	-	
9/21/2011	8.65	708.00	1.00	8.79	2.50	3.00	5.00	11.30	0.04	0.02	0.32	0.01	0.22	-	
10/19/2011	7.35	412.00	7.40	8.32	2.20	2.50	3.81	42.90	0.17	0.02	7.05	0.01	1.56	0.07	
5/2/2012	8.98	331.00	21.80	9.32	5.70	2.90	2.77	2.70	0.10	0.01	0.32	-	0.11	0.05	0.01
6/6/2012	7.29	191.50	15.60	5.65	1.33	4.60	1.70	7.00	0.52	0.04	0.40	0.01	0.12	0.15	0.01
7/4/2012	8.09	140.00	1,010.80	5.51	4.90	26.00	1.31	40.60	0.25	0.26	5.45	0.17	0.30		
8/22/2012	7.61	239.00	77.40	7.52	2.72	12.40	1.68	7.70	0.39	0.09	0.65	0.02	0.28	0.02	
9/19/2012	8.46	428.00	11.00	8.06	2.37	5.80	3.15	33.10	0.10	0.00	0.12	0.00	0.31	-	
10/17/2012	7.60	600.00	3.20	12.48	6.79	11.80	4.06	86.80	0.14	0.03	9.00	0.01	0.32	0.01	0.01
MNS 4586:1998	6.5-8.5	-	-	Not less than 6&4	3	10	-	100	0.5	0.02	9	0.1	1.5	-	0.01

Source: NAMHEM

Exceeded national standards

Table 12. Frequency of Daily Average Concentration Exceeding the National Standard Limits[9]

Period	Monitoring Station	Parameter			
		SO2	NO2	PM10	PM2.5
05/2011	Around Misheel Expo Centre, Khan-Uul District	-	-	-	-
	Around the west crossroad, Bayangol District	6 times	13 times	22 times	6 times
	Around 1st khorooloi, Songino Khairkhan District	-	-	-	-
	Around the 13th khorooloi, Bayanzurkh District	1 time	3 times	2 times	2 times
	32nd Toirog	17 times	-	26 times	-
	Kharkhorin Market	9 times	1 time	21 times	-
	Offitseruudiin ordon	-	1 time	-	-
12/2012 (prelim)	Around Misheel Expo Centre, Khan-Uul District	-	-	-	-
	Around the west crossroad, Bayangol District	23 times	28 times	26 times	27 times
	Around 1st khorooloi, Songino Khairkhan District	28 times	12 times	-	-
	Around the 13th khorooloi, Bayanzurkh District	30 times	26 times	27 times	-
	32nd Toirog	31 times	29 times	28 times	-
	Kharkhorin Market	25 times	29 times	28 times	-
	Offitseruudiin ordon	31 times	12 times	-	-
01/2013	Around Misheel Expo Centre, Khan-Uul District	-	-	-	-
	Around the west crossroad, Bayangol District	30 times	31 times	30 times	25 times
	Around 1st khorooloi, Songino Khairkhan District	20 times	15 times	-	-
	Around the 13th khorooloi, Bayanzurkh District	30 times	30 times	-	-
	32nd Toirog	31 times	26 times	30 times	-
	Kharkhorin Market	29 times	28 times	29 times	-
	Offitseruudiin ordon	25 times	22 times	-	-

Table 13. Air quality monitoring results in Khoroos (winter - Nov 2011 and January 2012)[10]

District / Khoroo No.	November 2011				January 2012			
	CO	NO2	SO2	PM10	CO	NO2	SO2	PM10
Songino-Khairkhan 9	29.9	125	300	885	50.5	57.5	225	890
	11/16/2011. 18:40-19:10				1/20/2012. 20:20-20:50			
Chingeltei 18	25.69	140	275	494	30.7	207.5	475	1040
	11/21/2011. 21:20-21:50				1/23/2012. 19:55-20:25			
Sukhbaatar	63.36	225	860	1770	101.4	240	780	2780

[9] Source: Economic Sector Indicators. Social and Economic Situation of Mongolia. Statistical News. National Statistics Office of Mongolia. www.nso.mn

[10] Source: UB Air Quality Agency. Winter Measurement Results by Moving Station, AQMS-9000

14	11/23/2011. 20:15-20:45	1/25/2012. 19:00-19:30

Table 14. Air Quality Index

Index estimation	Level of air quality	Color	Impact on health
0-50	Good, no impact.	**green**	Within standard
51-100	Minor	**yellow**	Within standard, might impact some persons (mainly with ozone-sensitivity).
101-150	Negative impact on vulnerable people	**orange**	Negative impact on health of vulnerable persons as (with lung or heart diseases)
151-200	Negative impact	**red**	Health is changed, vulnerable persons more impacted than others.
201-300	Highly negative impact	**pink**	All are affected from negative impact
301-500	Hazardous impact	**brown**	Harmful conditions and all are at risks.

E. Environment Monitoring

Introduction

During the reporting period the project developed list of licensed environmental monitoring institutes accredited by the Standardisation and Measuring Agency of the Government of Mongolia, eligible to apply for the project environmental monitoring.

As of May 2016, the Design Consultant has not yet finalized the detail design of all subproject components. After finalization of the Detail Design, Project Management Support Service Consultant will update the EMP and submit it to ADB for review and clearance.

For components of Project 1 that did not require detailed environmental impact assessment the Contractor-EMP (CEMP) will be required. Accordingly, the guideline on developing the CEMP is developed and will be a part of the bidding document.

As of today, no environmental monitoring was conducted as no construction was carried out (see following Tables).

Table 15. Monitoring activities conducted during reporting period

Conducted measures during reporting period	Date	Budget	Responsible entity	Methods used	Locations
A. Air quality					
B. Soil quality					
C. Water quality					
D. Biodiversity					
E. Human health issue					

F. Waste management					
G. Noise reduction					
H. Socio-economic & cultural environment					

Table 16. Site visits conducted by PMOs and/or the Consultants during the reporting period

No.	Date	Contract	PMO Staff Visiting Site	Consultants Visiting Site
1				
2				
3				
4				
5				
6				
7				
8				

Emission Discharge (Source) Monitoring Results

Results

No results yet. Table will be added once monitoring results are available. Discharge levels will be compared to the relevant discharge standards and/or performance indicators noted in the EMP. Any non-compliance will be highlighted for attention and follow-up.

Assessment

Discharge levels will be compared to baseline conditions (if baseline data is available) and described in qualitative terms. Additional explanatory comments will be provided as necessary. Possible reasons for non-compliance will be identified.

Ambient Monitoring Program (if relevant)

Results

No results yet. Table will be added once monitoring results are available. Ambient environmental conditions will be compared to the relevant ambient standards and/or performance indicators noted in the EMP. Any non-compliance will be highlighted for attention and follow-up.

Assessment

Ambient environmental conditions will be compared to the baseline conditions (if baseline data is available) and described in qualitative terms. Additional explanatory comments will be provided as necessary. Possible reasons for non-compliance will be identified.

IV. ISSUES, CORRECTIVE ACTIONS

A. Key Issues Identified

After reviewing the documents and based on performance review of the project and compliance in terms of environmental safeguard issues, the following gaps were identified:

1. The DEIAs have to be closely related to the project technical specifications, which should enable proper estimation of the project impacts, ensuring evidence based management of those adverse impacts in the future. But since the current DEIA reports were prepared before finalization of the project detailed design, the assessments are not very accurate and too generic.
2. Environmental quality monitoring related to pre-construction stage (baseline condition) was not performed during this reporting period due to delay of detail design as well as bidding process. After finalization of detail design, PMO will bid and award the the civil works contracts. The estimated budget for conducting baseline monitoring (preconstruction stage) will be incorporated in the bidding documents to ensure the contractors comply with such activities.
3. The CS1 Consultants did not yet finalize the detailed layout plan for Project 1 (Bayankhoshuu and Selbe Sub-centers). Updating EMP will be commenced after receiving all updated layout maps, design parameters for various components of Program 1.

B. Action Taken

The Mongolian DEIAs or EMPs need updating due to changes of alignment and project specification, as per Mongolian guidelines. However, updating the whole DEIA is inconvenient in terms of timing and budget constraints. Therefore following options were suggested by the CS1 environmental specialist.

Table 17. Options to overcome safeguard compliance issues

#	Option	Advantage	Disadvantage	Budget	Description
1.	Updating DEIA based on current detailed design on two sub-centres	Actual legislative and compliance gaps can be filled out	Conducting update of the DEIA will require minimum 5 months	No budget	Needs to develop ToR covering project in detail according to procurement plan
2.	After final approval of the detailed design, set DEIA as requirement for bidding entities.	Every construction work can have environmental impact assessment and EMP	Some specifications of the project can be common. Therefore action could be 1. An additional pressure for bidders 2. Collection of numerous EIA reports 3. Monitoring of each procurement would be difficult	Under the responsibility of the bidding company	
3.	CS1 who is responsible for developing detailed design (DOHWA) will responsible for the project's EIA	Revealing adverse impacts of the project in designing stage is the best way to overcome future environmental risks	In Tranche 1 the CS1 haven't environmental specialist. Environmental impact assessment of the project after DD is difficult. Also will take time	Detailed design company	
5.	Update only EMP reflecting updated detailed design specifications and approve by the	Less time and budget	n/a	PMO-But didn't allocated any budget since 2013.	

	MEGDT				

Accordingly the ToR and budget estimation for conducting EMP update has been developed with the support of CS1 environmental specialist (*Appendix 2*). Updating EMP will be incorporated all data which was received from the CS1 and the EMP required by the ADB. Procedures set in the Minister's order #A-05 *(dated in 6 January 2014)* will need to be followed in developing, supervising, approving and reporting of environmental protection and management plan.

C. Planned targets and activities for the next reporting period

Find out all possible Government Clearances required for implementation of Ger Areas Development Investment Program-1 (Use attached Format)

Updating the design parameters of water supply, sewerage, road, heating system for Bayankhoshuu and Selbe Sub-centers as per detailed layout plan

Organize and Conduct Training Session on 'Baseline and Public Consultation'; 'Impact Identification and Mitigation Measures;

In the meantime if detailed design has been finalized by CS1 consulting group; then updating of EMP will be commenced;

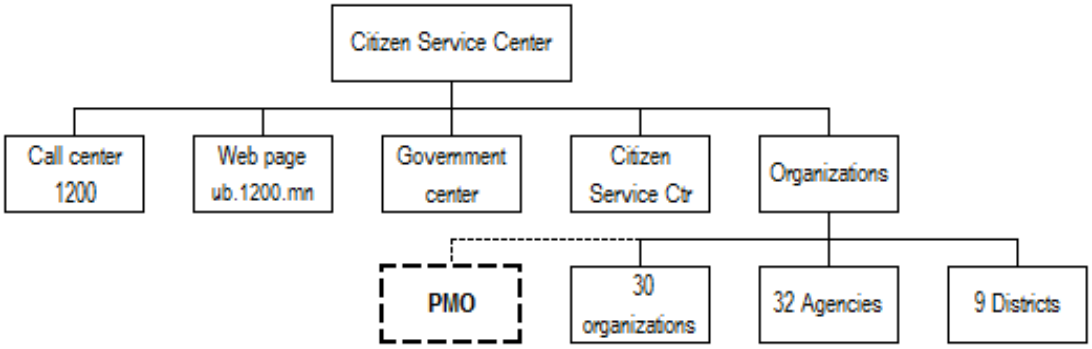
Ensure all outputs of the design team including bidding documents meet all Government and ADB environmental requirement;

The Contractor shall be responsible for implementation of environmental provisions outlined in the EMP. All works undertaken towards protection of environmental resources as part of the EMP and as part of good engineering practices while adhering to relevant specifications will be deemed to be incidental to works being carried out. Environmental specifications will be included in the technical specifications of bid document. It will commence after finalization of detailed design.

V. PUBLIC CONSULTATION, GRIEVANCE REDRESS MECHANISM

In consultation with the Citizen Service Center (CSC), the grievance redress mechanism (GRM) for Project 1 is linked to the existing system and the PMO will network as one of the participating organizations in the system.

Figure 3. Proposed Integration of PMO into the Citizen Service Center



The PMO's environmental safeguard staff oversees the implementation/ observance of the GRM. Local grievance staffs will be designated by subproject khoroos to: (i) serve as the counterparts of the PMO's environmental safeguard staff at the khoroo level; (ii) serve as a form of the khoroos' participation in the environmental management of the subproject affecting them; and (iii) bring the GRM closer, comfortably and conveniently accessible, to all segments of society in the affected khoroos. Contractors and operators will be required to designate their respective counterpart grievance staff.

The GRM will accommodate both formally and informally lodged, but eligible, grievances. Formally lodged grievances are those received at the PMO and at Khoroo Offices. Informally lodged grievances are those received by the Contractor during construction or Operator during operation. All grievances will have to be registered/recorded at the PMO and evaluated for eligibility by the PMO. The PMO will inform ADB, and will report on the observance/implementation of the GRM in the Project 1 monthly reports and in the periodic Environmental Monitoring Report submitted to ADB. The PMO will periodically provide the CSC with necessary information and records of valid grievances.

Sufficient support system, i.e., communication facilities, recording, and reporting system, funds, posters declaring contact details at strategic locations, among others, will be set up to sustain the effective implementation of the GRM.

Any person who has environmental concerns/issues pertaining to Project 1 subprojects during detailed design, construction and operation phases will have access to the GRM free of charge. The PMO will ensure that:

- potentially affected people in the main areas of influence of the subprojects[11], are aware of their rights to access, and will have access to, the GRM free of administrative and legal charges; and
- the GRM is fully disclosed prior to construction: (a) in public consultations and IECs or social/community preparations, (b) through posters placed in the offices of the subproject khoroos and USUG, in strategic places within the immediate area of influence of Project 1, on the web page, www.ub1200.mn (posters to include names and contact details of the head and environmental safeguard staff of the PMO and of counterparts in the subproject khoroos and USUG).

[11] Main areas of influence to include project sites and areas within 200 m from the edge of project sites.

A. Types of Grievance Expected and Eligibility Assessment

The expected grievances are those relating, but not limited, to the following:

- during detailed design or prior to construction - environmental concerns of affected residents and environment-oriented groups;
- during construction - damages to properties, injuries caused by project activities/equipment/workers, access blocking, disruptions of utility services, constricted access to water kiosks and public bath houses, dust, odor, noise, vibration, health and safety hazards, and other inconveniences.
- during operation - local water logging/impeded surface drainage caused by road, unsustainable effectiveness of services due to poor maintenance and repair of completed works, and other inconveniences.

Once a grievance is received, its eligibility will be assessed:

- Does the grievance relate to a Project 1 subproject/component?
- Is the grievance within the scope of the mechanism? (The mechanism will cover only environmental issues/concerns on and environmental impacts of Project 1 subprojects.)

Ineligible grievances are those that:

- do not relate to a Project 1 subproject/component; or
- are outside the scope of the mechanism, such as land acquisition, involuntary resettlement, issues of fraud/ abnormalities in the procurement process under Project 1.

To minimize a high incidence of non-valid grievances, it is critical that the scope of the mechanism is well-explained to, and is understood by, the public especially the residents of the immediate areas of influence of Project 1.

B. GRM Steps and Timeframe

Grievances raised on environmental impacts are critical to the health, wellness and safety of affected persons (APs). Hence, the proposed mechanism attempts to be most easily accessible and most responsive to APs' complaints (**Error! Reference source not found.**).

Stage 1 (informal): First, APs can lodge complaints directly to the Contractor during construction or Operator during operation. Contractor/Operator shall assess the complaint immediately and act on the complaint within three days from receipt of complaint.

Stage 2 (formal): If assessment reveals the issue as not associated with the Subproject's environmental performance, the Contractor/Operator shall direct AP to the City's Citizen Service Center (CSC). If it is associated with the subproject's environmental performance but is not acted on within three days from receipt of complaint, or if AP is not satisfied with the resolution undertaken by the Contractor/Operator, he/she can access the stage 2, as follows:

Step 1 (Day 1)

AP lodges complaint at the access points of the PMO or Khoroo Office.

Step 2 (Day 1)

PMO/Khoroo Office documents/registers lodged complaint, makes sure these are duly referenced and provides AP with a copy of referenced complaint. If lodged at the khoroo level, local grievance staff contacts the PMO immediately to inform about the lodged complaint. AP shall immediately be informed if the grievance is within, or outside, the purview of the mechanism.

Step 3 (Day 3/Day 4)

If the grievance is outside the purview of the mechanism, AP shall be informed accordingly, and directed to the CSC, as relevant.

If complaint is covered by the mechanism, the AP shall be informed of the expected action timelines as set out in the established mechanism. If both of the AP and Contractor/Operator are available, the complaint shall be immediately reviewed, investigated and discussed. If not, both parties should agree to undertake the review, investigation and discussion within 5 days. The discussion will center on the cause and action/measure to implement based on the review and investigation. Agreement on actions and measures and time involved shall be made with the AP. Agreement shall be properly documented and filed; PMO, concerned Khoroo Office and AP shall have copies.

Step 4 - Implement the agreed on action/resolution.

(Day 5/Day 6) If complaint is minor, i.e., not requiring further investigation and would be easy to resolve, the Contractor/Operator shall immediately implement agreed on action/resolution.

(Day 5/Day 6 to Day 9/Day 10) If further investigation and/or procurement of supplies/parts would be necessary, the Contractor/Operator shall: (i) immediately provide the most suitable interim measure to reduce the magnitude of the impact; and (ii) start work on the final measure not later than 6 days from the day discussion meeting is held.

Step 5 (2 weeks after completion of action/measure taken)

If, according to the AP, the impact has been resolved satisfactorily, PMO shall obtain a written confirmation of satisfaction from the AP. This confirmation will signify closure of grievance and will form part of the grievance documentation. Concerned Khoroo Office and AP shall retain their copies of the confirmation. The PMO will inform ADB about the complaint and its resolution.

Step 6 (after closure of grievance)

The PMO shall monitor the effectiveness of the resolution for at least a week after closure of grievance (that is, when action implemented has been satisfactorily confirmed in writing by the complainant). Monitoring and evaluation shall be properly documented and included in the Environmental Monitoring Report. The PMO will inform ADB about the complaint and its resolution.

Step 7 (Appeal level for dissatisfied AP)

When dissatisfied (or, in the event the issue/impact persists despite actions undertaken), AP can contact the Citizen Service Center. The PMO shall ensure that ADB is immediately informed.

Informally and formally lodged grievances, discussions and agreements made, associated actions or responses taken, satisfaction/dissatisfaction of APs, grievances directed/referred to the CSC, cases appealed and found eligible/ineligible, and important lessons learned shall be documented for record, monitoring and evaluation, and mechanism-enhancement purposes. Records, findings and experiences shall be included in the progress and environmental monitoring reports of the Contractor, Operator and PMO. The PMO will periodically provide the CSC with necessary information and records of valid grievances.

The GRM is presented in **Appendix 8.**

VI. INSTITUTIONAL STRENGTHENING AND TRAINING

In accordance with the environmental safeguard and environment related covenants stakeholder training module were developed. Training topic has been finalized by PMO and conducted Training workshops on Legal Framework for EIA systems.

A. Objectives of Training under Environment and Social Safeguard

The general objective of the training on **Environmental and Social Safeguard Requirements** are to enhance the capacity of the MUB/SRA/USUG/PMO Personnel to ensure that the Municipality at the city, district and Khoroo levels will have better perception and understanding of environmental and social issues related to implementation of Ulaanbaatar Urban services and Ger Areas Development Investment Program emphasis to Project 1 (Bayankhoshuu and Selbe Sub-centers) and will be capable of implementing mitigation measures and subsequent monitoring. It is also important that the officials and staff of these agencies who will be involved in the Project have a good understanding of relevant MON and ADB environmental and social assessment procedures and requirements. This training manual has been devised to assist and help the project implementing agencies (MUB) to ensure that Ger Area Development plan interventions are environmentally and socially sound and sustainable.

B. Objectives of the Training under Resettlement Requirements

Resettlement is not just physically transferring people from one place to another. It is a continues process which all the parties including the Project Management Office(PMO), other relevant Government Agencies(GAs), Non-Governmental Organizations(NGOs) and the Project Affected People(PAP) are involved in. Therefore almost all the parties who are involving in the process of land acquisition and resettlement should be well aware and understand the roles and responsibilities of each organization in implementation of the Resettlement Plan.

The common objective of the Involuntary Resettlement Policy of the Asian Development Bank(ADB) is to ensure that people displaced by the Project, otherwise known as Project Affected Persons (PAPs) should generally be at least as well off, if not better off, than they would have been without the project.

The Resettlement Plans (RAP) for both Bayankhoshuu and Selbe sub canters are developed in accordance with the ADB's policy on involuntary resettlement with states that involuntary resettlement should be avoided wherever possible and minimized wherever unavoidable. When people are subject to resettlement, they should, at minimum, be assisted in the re-establishment, if not improvement of their former living standards, income earning capacity and livelihood production levels.

In this regard, positive steps should be taken to ensure that the implementing agency, stakeholder agencies, NGOs and the people affected are well equipped with the knowledge of ADB's policies and principles in involuntary resettlement. However, it should be further ensured that these agencies are much aware of the land acquisition process and procedures, legal framework and entitle metrics, social and resettlement safeguard policies and sustainable income restoration approaches. The table below presents basic training topics identified for those who are involved in implementation of the resettlement plans of the project.

Table 18. Proposed Topics for Capacity Building/Training under CS2[12]

Topic	Objectives	Subtopic	Target Participants	Remarks
Environment Safeguards				
Legal Framework	Know a list of applicable national (Mongolian) and Donor (ADB) environmental assessment requirements Acquainted with pertinent regulation and standards governing the environmental quality, health and safety, protection of sensitive areas and any other relevant regulation governing the proposed Ger Areas development investment program interventions	Relevant GoM laws, regulations & standards on environmental assessment & management ADB Safeguard Policy Statement-2009(Environment) Environmental Assessment Procedure under the Program-Harmonizing the GoM & ADB Safeguard Requirements Environmental Quality and Health and Safety Standards	MUB-DE, USUG, PMO, Concerned Environmental Department of three districts of Project 1 (Songino Khairkhan District for Bayankhoshuu Sub-center, Sukhbaatar District and Chingeltei District for Selbe Sub-center); Concerned Representatives of Khoroos Government Unit (Khoroos 7, 8, 9, 10, 28 in Songino Khairkhan District, Khoroo 14 in Sukhbaatar District and Khoroos 14, 18 in Chingeltei District	
Baseline and Public Consultation	Understand the objective of baseline and its importance in the EIA/SIA and type of information needed for baseline Know various methodology adopted for baseline data collection Identify the principles and requirements for consultation with stakeholders and the tools and techniques that can be used for this purpose.	Baseline Data Collection Meaningful Consultation and Information Disclosure Grievance Redress Mechanism	Concerned personnel of MUB, PMO, CS1, UN Habitat	Topic 2 and Topic 3 will organize together both in Social and Resettlement aspects
Impact Assessment and Mitigation Measures	Provide an overview of the tools and methods used to identify, predict and evaluate different types of impacts Understand the role of mitigation in EIA/SIA/RAP process and its importance for impact management	Identification and Assessment of Impacts Possible Environmental and Social Impacts –Project 1 Mitigation Measures	Concerned personnel of MUB, PMO, CS1, UN Habitat	
Environmental Management and Monitoring Plan (EMMP)	Identify the principles, elements, and contents that are used for preparing Environmental Management and Monitoring Plan Find out major institutional arrangements for EMP implementation	Guiding Principles of EMP EMP Implementation arrangements Institutional responsibilities Environmental monitoring and reporting Performance Indicators Occupational and Community health and safety	Concerned Engineers of PMO (Executing as well as implementing level), Engineers of CS1, Personnel of CS4, Civil Works Contractors	
Environmental Sound Construction Management	Able to knowledge about Environmental Specification in contract documents and their implications Guide on Good construction practice	Construction/Engineering Practice Environmental Specification for Bid Documents Incorporating EMP into Bid Documents Environmental Code of Practice	Concerned Engineers of PMO (Executing as well as implementing level), Engineers of CS1, Personnel of CS4, Civil Works	Contractor training will be conducted prior construction and

[12] ***Abbreviations-*** *MUB- Municipality of Ulaanbaatar, DE- Department of Environment, USUG- Ulaanbaatar Water and Sewerage Authority, PMO- Project Management office, CS1- Consultant Services 1, CS4- Consultant Services 4, AP- Affected Person, PC- Public Consultation, GRC- Grievance Redress Committee*

		Environmentally responsible procurement	Contractors	during construction
Social and Resettlement Safeguards				
Legal Framework of Mongolia for Land acquisition and Resettlement	Make the participant fully aware of Mongolian Policy on Land Acquisition and Resettlement, ADB policy requirement and policy gaps in implementation of the project	1.1 Mongolian Law on Land Acquisition and Resettlement 1.2 ADB Involuntary Resettlement Policy requirements 1.3 Policy Gaps	To be identified by the PMO	
Resettlement Objectives/outputs/results and Impacts	All participant are well aware of the objectives/results/impacts/outputs/of the project	2.1 Impacts on Lands 2.2 Impacts on people 2.3 Impact on Women and other Vulnerable Groups 2.4 Impact on social and cultural setting etc.	To be identified by the PMO	This will organize together in Environmental Module 3
Eligibility and Entitlement Metrics	The participant are fully understand the type of losses due to resettlement, and the entitlements for losses		To be identified by the PMO	
4.Income Restoration and Rehabilitation	Both the PMO officers, relevant agencies and the families affected are fully understand and aware of sustainable income restoration strategies	4.1 The common issues facing the executing agency in implementation of the IRPs in resettlement 4.2. Issues in developing Income Restoration Programmes s for APs 4.3. Income restoration strategies		
5. Grievance Redress Mechanism in Resettlement	Both the Affected People and the implementing agency are well understood the use and the functions of the GRC.	5.1 Objective of the GRC 5.2. Composition 5.3. Activities and Responsibility 5.4. Powers of GRC 5.5. Grievance Redress Process	Staff from the PMO, APs and other relevant members from the stakeholder agencies	This will organize together in Environmental Module 2
Public consultation and Participation	All participants well aware of the importance of setting up an efficient and effective community information center under the project.	6.1. The process of PC and Participation 6.2.Public consultation process and procedures 6.3 Conventional and innovative in public consultation and participation	Officers from PMO, APs. and other relevant members from the stakeholder agencies.	This will organize together in Environmental Module 2

Following trainings were conducted during reporting period (August 2015 – February 2016):

a) Capacity building workshop ***on ADB and Mongolian Government's Safeguard Policies and Principles concerning Environmental and Social Safeguards*** (5th November, 2015).

b) Workshop training on Capacity Development Training on ***Involuntary Resettlement*** for the Stakeholder Agencies of Ulaanbaatar Urban Services and Ger Area Development and Investment Program (15th Nov, 2015).

c) Workshop training on Capacity Development Training on ***Grievance Redress Mechanisms*** for the Stakeholder Agencies of Ulaanbaatar Urban Services and Ger Area Development and Investment Program (19th Nov, 2015).

VII. CONCLUSION

A. Overall Progress of Implementation of Environmental Management Measures

During the reporting period, construction works did not yet begin due to delay of detailed design approval and bidding process. However, based on consultancy service agreement, in October 2015, the PIS team mobilized international and national environmental consultants to provide support for compliance with ADB Safeguard Policy Statement and Mongolia safeguard requirements.

The PIS team along with PMO Engineers made field visits during October 28 and November 5, 2015. Field visits covered proposed road alignment (Bayankhoshuu and Selbe sub centre), water reservoir area, sewage collection points, proposed kindergarten, heating station etc.

The major tasks performed during reporting period were as follows:

1. Coordination meetings/workshops with the ADB, PMO, consulting parties (CS1, CS2, CS3), government officials;
2. Reviewed following documents:
    a) Environmental Assessment and Review Framework (EARF) for the Project, July 2013;
    b) Initial Environmental Examination for Project 1, October 2013;
    c) Facility Administration Manual- FAM , November 2013;
    d) Environmental Management Plan for Project 1, October 2013;
    e) Inception Report prepared By DOHWA (CS-1);
    f) Feasibility Report for Project 1, November 2013;
    g) Detailed Environmental Impact Assessment, October 2013;
3. Reconnaissance field visit to Bayankhoshuu and Selbe Sub-centre;
4. Developed Training module of Legal Framework on EIA Systems;
5. Organized Training/Workshops;
6. Collected preliminary environmental data end created online based map;
7. Finding all possible Government Clearances required for implementation of Ger Areas Development Investment Program-1;
8. Finding all possible licensed laboratories who will conduct Environmental Monitoring (air, water, noise, soil quality) with methodology and quotation for determination of those parameters;
9. Developed recommendation on Environmental Safeguards on Heating Station;
10. Developed Environmental Specifications, which is incorporated in the bidding documents.

B. Problems Identified and Actions Recommended

1. Environmental quality monitoring related to preconstruction stage (Baseline condition) did not performed during this reporting period due to delay of detail design as well as bidding process. After finalization of detail design, PMO will float bidding and awarding the contractor. The estimated budget for conducting baseline monitoring (preconstruction stage) will be incorporated in the bidding documents to ensure the contractors comply with such activities.
2. The CS1 Consultants did not yet finalize the detailed layout plan for Project 1 (Bayankhoshuu and Selbe Sub-center). Updating EMP will be commenced after

receiving all updated layout maps, design parameters for various components of Project 1.

VIII. APPENDICES

Appendix 1. Environmental Management Plan during Construction Stage

A.3 Procurement & Prior to Mobilization

Potential Environmental Concerns/Impacts	Recommended Mitigation Measures	Location	Estimated cost* (USD)	Institutional responsibilities	
				Implement	Review & Evaluate
8. Engagement of environmentally irresponsible contractor for civil works	8.1. An ADB-cleared Project 1 EMP (P1 EMP}, as part of bidding documents. 8.2. P1-EMP to be appended to the Contract for basis of preparation of Contractor's EMP (C-EMP) that will address as minimum the requirements of the ADB-cleared P1-EMP and for compliance. 8.3. Contract to require Contractor's submission of monthly environmental monitoring report, outline appended in Contract 8.4. Contract to also stipulate some tie up of progress payment and collection of performance bond with the performance in C-EMP/P1-EMP implementation. 8.5. PMO to clear C - EMP before start of any work on site or establishment of project construction related facilities.	Not applicable		PMO	PIS Envi Sp/ ADB*

B. Construction phase

Potential Environmental Concerns/Impacts	Recommended Mitigation Measures	Location	Estimated cost* (USD)	Institutional responsibilities	
				Implement	Review & Evaluate
PHYSICAL / CHEMICAL ENVIRONMENT 9. Dust/suspended particles from: - earthworks - stockpile of dry soil, sand, cement - transport of aggregates, cement, residual soil for disposal, & wastes - loading/unloading of fine aggregates cement and other materials - movements of construction vehicles	9.1. Segmentation of works, as appropriate, to minimize having more loose surfaces/stockpiles than necessary.	All sites	-	Contractor	PMO & PIS EnviSp/ ADB*
	9.2. Appropriately watering dry exposed surfaces, stockpiles of sand and, if applicable, excavated materials, at least twice daily	All applicable sites	c/o Construction running cost		
	9.3. Tarpaulin or similar cover on trucks carrying aggregates, cement residual soils, & wastes. Maintain min 2 feet freeboard	Entire hauling route	c/o Supplier's cost	Suppliers & Contractor	
	9.4. Minimize drop heights when loading/unloading soil onto trucks/ground. Spray water on soil being loaded/unloaded.	All sites	-		
	9.5. Clean up work surfaces at the end of each day's work. 9.6. Speed limit for construction vehicles to max of 30 kph in sites	All sites	-	Contractor	
	9.7. For works within 30 m from houses set up a temporary wall between receptor & work area. Wall to be at least 2.5 m high & at least 10 m beyond each end of the work area	All sites	c/o Construction safety cost (preliminaries)	Contractor	
10. Gas emissions from; - exhaust of operating construction equipment/vehicles, including generator sets - burning of solid/hazardous wastes - overall power/energy use in construction - use of high VOC emitting specialty applications	10.1. Reduced vehicular movements through: - coordinated transport of materials, spoils & waste - worker's accomodations at walking distances, or providing mass transport for workers - bigger capacity trucks for hauling of waste/spoils, where access roads allow 10.2. Turn off equipment/vehicle when not in use. Limit engine idling to a max. of 5 minutes. 10.3. Use clean-fuelled generators 10.4. No burning of wastes. No indiscriminate dumping of waste, especially organic wastes, left to decompose. 10.5. Use low VOC-emitting asphalt processing & other materials, e.g., adhesives, sealants, paints, etc 10.6. Use only well maintained construction vehicles/equipment, with emission test certificate.	All sites		Contractor	PMO & PIS EnviSp/ ADB*
11. Odor from:	11.1. Application of gas emission mitigation measures. (No. 10 above) 11.2. Properly store, promptly dispose of, organic & hazardous wastes.	All sites		Contractor	PMO &

Potential Environmental Concerns/Impacts	Recommended Mitigation Measures	Location	Estimated cost* (USD)	Institutional responsibilities	
				Implement	Review & Evaluate
- gas emission sources - use of high VOC emitting specialty applications - poorly managed solid & hazardous wastes - poor sanitation practices of workers	11.3. Require enclosed trucks for, or effective cover when, hauling wastes to the landfill & chemicals to construction sites. 11.4. Schedule as much activities that generate odor as possible to specific times of the day (non-peak hours of pubic presence) and consider weather conditions (wind & temperature) 11.5. When there is high odor release from activities, slow down/adjust or suspend, some odor releasing activities. 11.6.Where applicable, install barriers around potential odor generators, located against				PIS EnviSp/ ADB*
	11.7. prevailing wind directions 11.8.Provide adequate sanitation facilities, adequate water supply. Strictly enforce observance of sanitation practices	All sites	c/o Construction mobilization cost (preliminaries)		
12. Noise from: - Operating equipment/vehicles (especially those diesel-fed & without efficient mufflers), - processes such as drilling/pavement breaking, excavation, concrete mixing, earthmoving, demolition of existing structures - unloading of aggregates	12.1. Set up noise barriers, for example: - temporary fence around active work area, 2.5 m high - sound absorbing enclosure around generator sets	Applicable sites	c/o Construction mobilization cost (preliminaries)	Contractor	PMO & PIS EnviSp/ ADB*
	12.2. Restrict use of noisy equipment from 8 AM-5 PM. Overtime work should not go past 10 PM, observe reduced noise level, not use noisy equipment be coordinated with W/CPC; Inform affected communities at least 3 days in advance. 12.3. Use only equipment that emit least noise, eg. electrically powered equipment, hydraulic tools, those with efficient mufflers. Allow only well-maintained equipment/vehicles, with certificates of compliance to noise standards, to be used in construction. 12.4. Locate noise generators at max distance from nearest receptors. 12.5. Turn off equipment/vehices when not in use 12.6. Spread out schedule of material, spoil & waste transport, in the day (off-peak traffic hours), or early evening.	All sites			
13. Vibration generated from: - operation of equipment/vehicles & movement of trucks to & from sites - construction activities, e.g., drilling, excavation	13.1. Restrict use of equipment emitting vibrations, 8 AM-5 PM	All sites			
	13.2. Prior to start, identify vibration-sensitive areas & structures in the construction influence area to plan for the appropriate technology, equipment/tools & procedure level to apply or use. 13.3. Schedule separately ground impacting activities as necessary to reduce the intensity of impact. 13.4. Limit engine idling to a max. of 5 minutes.				
	13.5. Limit spoed to max 40 kph en route to sites, 30 kph in acccs road and cites.	En route to and in, Subproject sites			
	13.6. Use available equipment A tools that emit least vibrations per manufacturer's specifications, or equipped with shock absorber, A has a handbook for user's safety A specifies requirements on	All sites	c/o Construction mobilization cost (preliminaries)		
14. Impacts from extracting (quarrying/borrowing) materials to meet construction needs	14.1. Implement Contractor's Aggregates Management Plan (CAMP)	All sites		PMO	PIS EnviSp/ ADB*
	14.2. Source aggregate only from quarry/borrow areas with environmental clearance & license to operate, & that still have high ratio of extraction capacity over loss of natural state				

Potential Environmental Concerns/Impacts	Recommended Mitigation Measures	Location	Estimated cost* (USD)	Institutional responsibilities	
				Implement	Review & Evaluate
- dust, noise, vibration during quarrying/ borrowing, during transport, during loading/unloading, from wind-blown stockpiles in quarry - slitation/sedimentation or water body in surface drainage path, in quarry/ borrow areas & while stored in sites - visual Impact on the landscape in quarry/borrow areas - traffic & smoke generated during transport - potential accidents, especially during transport of aggregates, cement, construction and deconstruction waste etc	14.3. If Contractor /Sub-contractor shall operate its own quarry/borrow operations: - Contractor to obtain environmental certificate & license to operate prior to extraction & implement site restoration after. - Verity Contractor's license to. environmental clearance tor quarry. - Ensure site restoration plan is implemented by contractor after completion of borrowing for Project 1 subproject.	Contractors quarry/borrow area	c/o Contractor's Project Cost		
	14.4. Aggregate trucks to. - Observe max. speed limit of 40 kph en route to sub-component sites; 30 kph in access loads to. & in. sub-component sites - maintain min. of 2 feet freeboard & provide tight cover - visibly display in their bodies the required speed limit, Subproject info & contact details - minimize drop heights during loading/unloading; spray water on aggregates being loaded/unloaded - be well-maintained, with up-to-date emission test certificate 14.5. Manage aggregate stockpiles in quarry sites, e.g. stockpiling only enough, providing wind barrier, regularly wetting stockpiles. 14.6. Sub-contract for aggregates supply to stipulate the obligation to comply to all of the above and all applicable mitigation measures stipulated in C-EMP/P1-EMP.	Contractors quarry/borrow area to sites		Contractor	PMO & PIS EnviSp/ ADB*
15. Depletion of water resources in Sub-center due to workers getting water from kiosks for their potable water supply.	15.1. Meet construction water demand using water from permitted sources outside Subcenter, delivered to sites by water trucks & stored on site in tanks. Ensure potable water is stored clean & safe	All sites	c/o Construction running cost (preliminaries)	Contractor	PMO & PIS EnviSp/ ADB*
16. Deterioration of surface & ground water resources (crossing & adjacent water bodies & existing wells) from inadequate management of the following in workers camp & subproject sites: - sewage/wastewater - solid & hazardous wastes - sediments, silts - hazardous construction materials - construction and demolition waste	16.1. Provide adequate sanitation facilities, adequate water supply. Strictly enforce observance of sanitation practices. 16.2. Implement an eco-friendly waste management that: - practices waste minimization, reuse and segregation - has adequate covered storage bins/containers, color-coded clearly marked to avoid mixing, especially hazardous wastes - has separate enclosed storage areas for solid & hazardous wastes, that can contain spills, clearly marked/labelled - recovery & recycling to reduce wastes brought to landfills - Implements prompt disposal at the city landfill - coordinate with authority for the disposal of hazardous wastes - workers & hazardous waste contractors to observe safety measures/system when handling hazardous wastes - requires waste contractors to promptly submit a manifest from City landfill for every disposal, from recycler/junkshops for every delivery of re-usable construction spoils/refuse.	All construction sites &/or field offices & workers accommodations	**c/o** Construction mobilization & running costs (preliminaries)	Contractor	PMO A PIS Envi Sp/ ADB*

Potential Environmental Concerns/Impacts	Recommended Mitigation Measures	Location	Estimated cost* (USD)	Institutional responsibilities	
				Implement	Review & Evaluate
	16.3. Implement measures to mitigate sedimentation/siltation. - Use any combination of silt fences, sandbags barrier nets, speed stilling humps, diversion of offsite runoff around site appropriately. - Stockpile on flat grounds & away from, not obstructing, main surface drainage routes, limit to max height of 2 m, dispose of unsuitable & excess soils as soon as possible program stockpiling on site. 16.4. Implement measures to mitigate potential adverse impact from use and storage of hazardous substances - have safe storage, with visible caution signage, secure from unauthorized entry or use & can contain spillage - safe storage • if using stationary ground storage, it should be at least 30 m from water bodies or nearest groundwater resource, at least 1 foot above highest flood level: or • use mobile storage tor easy transfer during potential flooding, as appropriate • should always be in good condition, color-coded, with clear labels - have equipment clearly leaking oil repaired at once, but off site. - no vehicle maintenance & refueling in Component sites. - use less hazardous substances - store no more hazardous substances on site than needed - spill clean up materials for all types of hazardous substances present in the sites to be readily available in the sites 16.5. Limit engine idling to a max of 5 minutes	All sites All sites All sites All sites			
	16.6.Limit speed to max. 40 kph en route to sites, 30 kph in access road and sites	En route to and in Subproject sites			
	16.7.Use available equipment & tools that emit least vibrations per manufacturer's specifications, or equipped with shock absorber & has a handbook for user's safety & specifies requirements on vibration Maintain equipment/tools to specifications.	All sites	c/o Construction mobiliz'n cost (preliminaries)		
SOCIO-ECONOMIC & CULTURAL ENVIRONMENT 17. Traffic and load blocking due to: - movements of construction vehicles/ equipment in narrow access roads - roadside parking of construction vehicles and equipment - stockpiling of aggregates excavated soils, spoils within access road ROW	17.1. Prepare traffic management scheme, & coordinate implementation with the local traffic authorities & affected communities	Concerned local traffic authorities, khoroos	-	PMO with local traffic authorities & khoroos	PIS Envi Sp/ ADB*
	17.2. Post billboards on road/lane closure, traffic re-routing plan at strategic places, min. 1 week prior to effectivity.	All affected sites	c/o Construction safety cost (preliminaries)		
	17.3. Post traffic (flag) persons during entire working hours. 17.4. Provide safe pedestrian access	Access roads			
	17.5. Spread out schedule for materials delivery in non-peak hours. 17.6. Coordinate with khoroos for parking of construction trucks 17.7. Manage arrivals/departures of trucks 17.8. Store excavated materials without obstructing traffic flow & safe access by affected communities.	All sites	-		

Potential Environmental Concerns/Impacts	Recommended Mitigation Measures	Location	Estimated cost* (USD)	Institutional responsibilities	
				Implement	Review & Evaluate
18. Blocking of access to properties	18.1. During IEC, prior to mobilization, inform communities regarding work phasing & schedules, anticipated access blocking, provisions for safe access for blocked properties & temporary parking for blocked garages/driveways	Affected khoroos	co PMO's counter, part obligations	PMO with khoroos	PIS Envi Sp/ADB*
	18.2. At least one week prior to access blocking notify the affected properties. Work together and agree with property owners and khoroo authorities for the alternative access and parking areas.	Affected properties	-	Contractor	PMO & PIS Envi Sp/ADB*
	18.3. Provide safe access to blocked properties e g , steel planks of adequate grade, width and length, &, if needed, with guide rail.	Affected properties	c/o Construction safety cost (preliminaries)		
19. Accidental damage to utility & service infrastructures, & adjacent structures	19.1. During mobilization coordinate with relevant utility companies. Verify exact locations of underground utility lines, & set contact arrangements in case of damage.	Not applicable			
	19.2. Prepare a schedule of crossing of all existing utility lines and ensure that a copy is available on site for reference by workers 19.3. In case of accidental damage, advise concerned utility company and/or PMO at once	All sites			
	19.4. Give at least 1 week prior notice on planned service interruption due to relocation of existing utilities, power supply poles,water lines, &/or for interconnection/streamlining.	All khoroos concerned			
20. Disruption of socio-economic activities due to interruption of infrastructure services, access and road blocking	20.1. Provide safe alternative access for blocked properties. 20.2. Issue prior notice on scheduled service interruption, 1 week before effectivity. interruption should not go beyond 2 hours. 20.3. Immediately advise utility companies on any accidental damages to existing utility for quick restoration of service.	All sites	c/o Construction safety cost		
21. Community health/safety hazard from, among others: - dust, noise, gas emissions, odor, vibration - water resource depletion & deterioration - inadequate waste/wastewater management - spillage of hazardous substances - haphazard movement & parking of construction - increased traffic - open excavations - unsafe alternative access provided - rise of communicable/transmittable diseases with entry of workers - Deconstruction and demolition waste	21.1. Implement a C-EMP that addresses the measures in the P1-EMP as minimum requirements to mitigate dust, gas emissions, noise, odor, vibration, water depletion and deterioralion, traffic, road & access blocking. In addition, to ensure that such safety measures as the following are implemented/ in place - Adequate appropriate lighting, reflectorized barrier (or temporary fences, where applicable) around active work sites - Safe access for pedestrians/residents. - Emergency response preparedness(procedures, trained staff, equipment, tools & supplies), including for fire-fighting. - Posting of billboards about the Subcomponents, informing on the dates of start & finish, names & contact details of contractor, supervising person on site. PMO. route of trucks, layout of subproject, etc.	All sites	c/o Construction mobilization & running costs (preliminaries) &/or Project cost	CONTRACTOR	SRA, PMO & PIS Envi Sp/ADB*
	- Coordination with authorities of nearby schools & hospitals for safety measures.	All sites			
	- Adequate social preparation regarding construction activities & associated health & safety risks, grievance redress mechanism, to be conducted at least one month prior to award of Contract	All khoroos within construction area of influence	c/o PMO counterpart fund	PMO	PIS EnviSp/ ADB*
22 Workers' health/safety hazard from, among others: - dust, noise, gas emissions, odor.	22.1. Orient workers, prior to mobilization, on occupational health & safety hazard and strict observance of safety measures.	All sites	c/o Construction mobilization & running costs (preliminaries)	Contractor	SRA, PMO & PIS Envi Sp./ADB*
	22.2. Strictly enforce use of protective wears, e.g. eye masks, nose masks, ear mufflers, helmets, gloves, appropriate footwear.	Not applicable			

Potential Environmental Concerns/Impacts	Recommended Mitigation Measures	Location	Estimated cost* (USD)	Institutional responsibilities	
				Implement	Review & Evaluate
- inadequate waste/wastewater management - poor sanitation practices - exposure to hazardous substances - operating equipment/handling of tools - haphazard movement of construction vehicles/equipment - increased traffic - open excavations - rise of communicable/transmittable diseases in Subproject communities	22.3. Implement recommended measures to mitigate dust, gas emission, odor, noise, vibration, traffic.				
	22.4. Install adequate lighting, safe accesses to & from work areas 22.5. Provide safe accommodations with reliable supply of potable water, adequate sanitation facilities. 22.6. Provide adequate water for washing & safe drinking, and adequate sanitation facilities, in construction sites. - Ensuring that workers' daily exposure limit value (ELV) is kept within standard limit as specified by manufacturer: Break up of continuous use of equipment by individual worker, introduce 3 shifts/day in use of the equipment - Pre-construction orientation & training on safe operation/ handling of hazardous equipment/tools - Strict enforcement of wearing protective clothing/gear prescribed when using vibrating equipment.	All sites			
	22.7. Require workers to submit health certificates for employment & for workers health baseline data. 22.8. Arrange with nearest primary & tertiary health institutions for health & emergency care of workers.	Not applicable			
	22.9. Set up emergency response team equipped with **adequate** staff, equipment, tools & supplies, including for fire-fighting.	All sites	c/o Construction safety cost		
23. Damage to temples (or parts of), during religious rites & ceremonies	23.1. Prior consultations & adequate coordination with temple authorities 23.2.Apply protection measures as agreed 23.3.Contractor to compensate damage (actual value) if damage is due to lack of inadequate protection measures	Bayankhoshuu Subcenter	c/o Construction safety cost		
SUSTAINABILITY CONTRIBUTION 24. Damages during seismic or extreme weather event	24.1. After every seismic or extreme weather event, conduct engineering investigation of built structures & implement corrective measures without delay	All sites	c/o Construction insurance cost	Contractor	PMO & PIS Envi Sp/ADB*

Appendix 2. TOR for updating the EMP

Terms of Reference

Objective: To develop the Environmental Protection and Management Plan (EPMP) approved by the MNET for the project for two sub-centres

Term: 3 months

Starting date: 1 July 2016

Ending date: 30 September 2016

Legal framework/justification

The ToR for developing EPMP is conducted according to following legislation and regulations:

- The Law of Mongolia on Environmental Protection
- The Law of Mongolia on Environmental Impact assessments
- The Law of Mongolia on Air
- The Law of Mongolia on Water
- The Law of Mongolia on Soil protection and prevention from desertification
- Procedures declared by the Minister's order #A-05 dated in 6 January 2014 to be followed in developing, supervising, approving and reporting of environmental protection and management plan
- Procedures declared by the Minister's order #A-04 dated in in 6 January 2014 to be followed for environmental protection and controlling of transactions of special accounts set as guarantee for environmental restoration

According to the Law of Mongolia on Environmental Impact Assessment, Article 9. Environmental Management Plan:

> 9.1. The entity that has performed a detailed environmental impact assessment shall develop an environmental management plan in order to protect and ensure sustainable use and restoration of the nature and environment in which the proposed project is to be implemented, ensure the realization of recommendations outlined in the strategic assessment, mitigate, eliminate and prevent adverse impacts that are identified by the detailed impact assessment and monitor and identify potential negative consequences that may arise in the proposed project environment.
>
> 9.8. The entity that has performed the general environmental impact assessment shall receive the project implementer's report on the implementation of the environmental management plan within December of each year as well as approving the next year's plan and associated budget.
>
> 9.9. The project implementer other than those stated in 9.10. shall deposit, as a guarantee, a sum in the amount of no less than 50 percent of the total budget of the annual environmental protection management plan in the designated account opened by the local soum or district governor's office for centralizing local environmental protection and restoration funds and shall annually report on the implementation of the plan.

Procedures to be followed in developing, supervising, approving and reporting of environmental protection and management plan

The yearly environmental protection and management plan shall be developed by the project implementer, and reviewed and approved by the legal entity, aimag and municipality level environmental agency that has performed the general environmental impact assessment.

The yearly environmental protection of the environmental management plan shall include activities related to prevention from environmental degradation, mitigation and elimination of adverse impacts, environmental offset, restoration, resettlement, compensation and protection of historical and cultural heritages with required budget estimation, legal framework, methods and standards during use of natural resources.

The Environmental Monitoring Program of the Environmental Protection and Management Plan shall address the monitoring and analysis of changes made to the state of environment as a result of the project activity, clarifying results of prevention, elimination and reduction activities against adverse impacts and shall clarify reporting requirements and the ways to implement the plan as well as providing the timeline and estimated budget.

Scope of work

According to the order A-05 declared by the Ministry of Environment, Green Development and Tourism the environmental protection and management plan will have following Table of Contents.

1. Project introduction
2. Main and potential adverse impacts of the project
3. Main objectives of the EPMP
4. Measures to reduce adverse impacts
5. Measures to restore environment
6. Measures to offset the environment
7. Measures for resettlement and compensation
8. Measures to protect historic and cultural heritage
9. Chemical risk management plan
10. Waste management plan
11. Organizational management plan to implement environmental management plan
12. The environmental monitoring program
13. Schedule to present implementation of environmental management plan for stakeholders and affected people
14. Expected output

Environmental protection and management plan for each sub-center approved by the general expert of the environment and natural resource department of the MEGDT in Mongolian and English.

4. Raw Budget /thousand. Tug/

№	To develop EPMP for Selbe and Bayankhoshuu sub-centres		Unit	Months	Unit cost	Total cost
1	Salary cost for specialists	Project manager	Person/month	4.0	1,500.0	6,000.0
		Specialist on Air	Person/month	2.5	1,600.0	4,000.0

		Specialist on soil	Person/month	3.5	1,600.0	5,600.0
		Botanist	Person/month	2.5	1,600.0	4,000.0
		Hydrogeologist	Person/month	3.0	1,600.0	4,800.0
		Hydrologist	Person/month	3.0	1,600.0	4,800.0
		Environmental sanitation specialist	Person/month	2.5	1,600.0	4,000.0
		Occupational safety specialist	Person/month	2.5	1,600.0	4,000.0
		GIS specialist	Person/month	2.0	1,200.0	2,400.0
	Total salary cost					**39,600.0**
2	Information, data cost /baseline data and formulation, processing/		Batch	2.0	1,000.0	2,000.0
3	Compiling and approving process of the EPMP		Batch	2.0	2,000.0	4,000.0
4	Stationary and translation cost /2 sub-centres/		Batch	400.0	45.0	18,000.0
5	Individual Income Tax (10%)					3,560.0
	Total cost					**67,160.0**

Appendix 3. Project area

Bayankhoshuu Sub Center Project Area

Upper water reservoir, proposed to supply Bayankhoshuu project area.

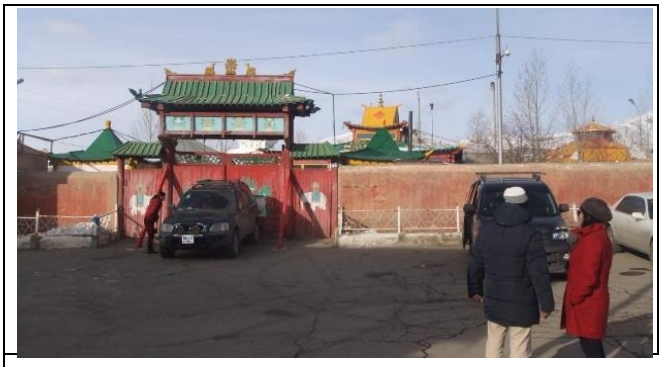
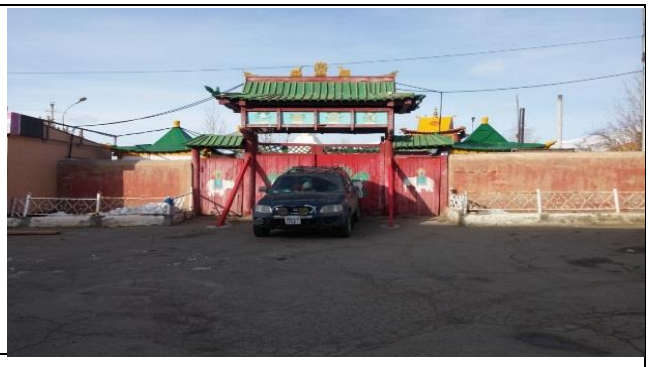
Examples of street widths in the Bayankhoshuu ger area

50 household apartment under construction for resettlement people; Sub-power station is located in the area of construction

Site for proposed kindergarten and new cross cut road to the main street

Starting point of the proposing sewage system from the Bayankhoshuu ger area to the Central system

End connection of the Bayankhoshuu sewage system to the Central system

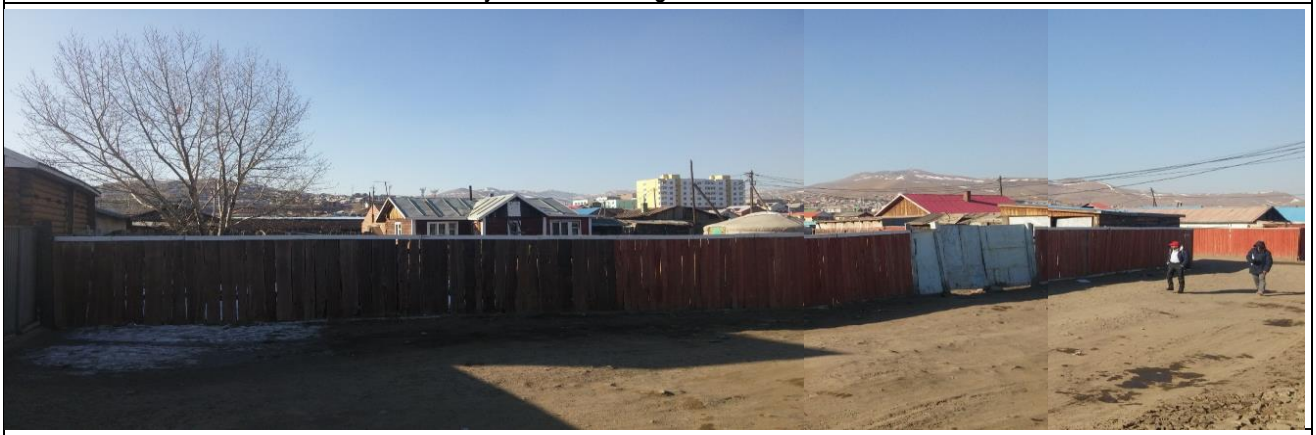



Buddhist temple which may be affected during road construction

Selbe Sub Center Project Area


Sewage collector and pipeline near the building, goes to the central sewage system through the streets


Newly installed sewage line with manholes



Area proposed for kindergarten and business incubation center

Appendix 4. Actual Observations of Monitoring Plan developed during IEE Report

Monitoring Parameter	Method of Monitoring	Location	Frequency	Responsibility		Remarks
				Implement	Compliance Monitoring	
Prior to Construction Phase; During procurement prior to awarding of contract for civil works						
Ambient air quality: SO2, NO2, CO, PM10, PM2.5	Analytical Methods outlined in MNS 0017-2-3-16:1998	7 nos. in Bayankhoshuu 8 nos. in Selbe	Once Results as baseline data before mobilization	Licensed Laboratory for PMO	PIS Env. Sp/ADB	CS2 has already listed licensed laboratory for monitoring, Awarded contractor will conduct baseline prior to construction works
Ambient Noise level	Analytical Methods outlined in MNS 0IMLR 102:2001	7 nos. in Bayankhoshuu 8 nos. in Selbe				
Ground Water Quality: pH, DO, EC, BOD, Hardness, NH4, NO2, NO3, PO4, , Fe, SO4, F, Cr, E coli, Coliform	Analytical Methods outlined in MNS (ISO) 5667-11:2000	3 nos. in Bayankhoshuu 3 nos. in Selbe				
Surface Water quality: pH, DO, EC, BOD, Hardness, NH4, NO2, NO3, PO4, , Fe, SO4, F, Cr, E coli, Coliform	Analytical Methods outlined in MNS (4047:1988	2 nos. in Bayankhoshuu Creek 2 no. in Chingeltei Creek 2 nos. in Selbe river 2 nos. in Khailast Creek (appropriate, if there have waters)				
Community Health and safety conditions: Incidence of disease associated with respiratory, nervous circulatory & digestive system, skin, cancer, communicable/transmittable diseases; Incidence of accidents (Vehicular, fire etc.) & crime	Information from & close coordination with khoroo government	Concerned Khoroos				

Appendix 5. Summary of important features of the Project Sub-center area

Sl.	Parameter	Description
Environmental Setting		
1	Climate	The climate in Bayankhoshuu area is referred to as a local steppe climate. There is not much rainfall in Bayankhoshuu all year long. This climate is considered to be BSk according to the Köppen-Geiger climate classification. The average temperature in Bayankhoshuu is -1.4 °C. Precipitation here averages 248 mm. In Selbe area, the climate is cold and temperate. Selbe area has a significant amount of rainfall during the year. This is true even for the driest month. Köppen and Geiger classify this location as Dfc. The average temperature in Selbe area is -1.9 °C. The average annual rainfall is 263 mm.
2	Ecologically Critical Area	No ecologically Critical areas found in the periphery of the Bayankhoshuu Sub-centers area
	Reserve/Protected Forests	Chingeltei Natural Reserve part 1 (1814.33ha) and part 2 (2571.22 ha) are located in 12-13 km to North from the sub project area. In Selbe Sub-centers area, No Reserve/Protected Forests found in the periphery of the subproject area
3	Predominant Geological Formations	Gullying and erosion is visible on steep slopes in the ger areas to the north, including in Bayankhoshuu and Selbe Sub-centers.
	Topography	**Bayankhoshuu-**The general location of the area is the plain (1450-1380m) between low-level mountains (highest elevation is 1800m) and topography is almost plain, slowly descending from NE to SW. **Selbe**- Western part of the Selbe project area refer to hillside of the mountain, while eastern side climb down to the Selbe river bed
	Major Soil Type	Major soil type of UB is mountain meadow steppe, mountain forest, mountain steppe, alluvial soils. However due to urbanization the project areas' natural soil completely changed and degraded.
4	Principal crops	No cropping area,
5	Major Water Bodies	The following surface waters are in the area of influence of Project 1 components: (i) Selbe River which forms the eastern boundary of the Selbe Sub-center; (ii) Tuul River, to which Selbe River flows and which receives effluent from the CWWTP; and (iii) the Bayankhoshuu, Chingeltei and Khailast Creeks
6	Flooding	Project 1 Sub-centers to have flood prone areas, appears to be the areas along the gullies
7	Seismicity	The Bayankhoshuu and Selbe sub centres are exposed to seismic events.
8	Environmental Hotspots	**Bayankhoshuu** - Secondary Schools – 2, kindergartens – 4 **Selbe-** Kindergarten – 3, secondary school -1
9	Major Settlement	**Bayankhoshuu** - The area shares area of 5 khoroos of Songinokhairkhan district – 7,8,9,10 and 28 **Selbe-** The area shares area of 3 khoroos of Chingeltei district – 14,18,19 and 2
10	Major Industries/ Business Entrepreneurs	There is no major industry exists in the Scheme area. By the numbers, shops and supermarkets are leading in the area. Other small and medium businesses are vehicle repairing, construction material production, secondary raw material collection points.
11	Attractive Site	There is no attractive site available within the scheme area

Socioeconomic Profile			
1	Population	112,734 nos.	
2	Household	24,600	
3	Average Household Size	4.58	
4	Density	47 persons per hector	
5	Sex Ratio (male/Female) – **State Statistics**	at birth: 1.05 male(s)/female 0-14 years: 1.04 male(s)/female 15-24 years: 1.02 male(s)/female 25-54 years: 0.94 male(s)/female 55-64 years: 0.85 male(s)/female 65 years and over: 0.69 male(s)/female Total population: 0.96 male(s)/female (2015 est.)	
6	Literacy Rate – State Statistics	98%	
7	Land use Pattern–	Of 162-ha of land covered by the Bayankhoshuu Sub-center, about 154 ha (95%) is residential (including roads and open areas); 7.5 ha (5%) is devoted to public amenities; and 0.5 ha is occupied by the bus station	
8	Major Occupation Pattern among HH Members	53% of the households in the two Project 1 Sub-centers depend on wage and salary, 19% on pension, and 15% on household business, for income. The remaining 13% are supported by allowances or remittances from children, parents and/or other relatives.	
9	Household Monthly Income	MNT 250,941 per person per month.	

Source: Initial Environmental Examination, Mongolia: Ulaanbaatar Urban Services and Ger Areas Development Investment Program (MFF, Project 1)

Appendix 6. Environmental Monitoring plan according to Mongolian legislation

Monitoring mechanism includes methodology, duration, sampling location, sampling characteristics of the survey on impacts on water, soil, air, term of compiling and reporting survey results, and mitigation and prevention actions.

Air pollution monitoring

Justification of the survey and survey aspects: Air pollution due to getting dusty, evaporation of combustible materials, fuel during the construction work, and objectionable smell/stink due to copulation of waste could be the main reason for conducting surveys. The survey will cover dust, CO, CO2, NO2, SO2, smell, noise levels.

Type of survey: Air sampling

Timing of monitoring: June and November of each year

Methodology:

MNS 17.2.3.16-88

MNS 3384-82

MNS 12.100-91

MNS 12.013-91

MNS 12.054-91

MNS 12.055-91

Air quality characteristics: MNS 4585-98

Equipment: Equipment of professional organization

Recording of results, Table of contents: Conduct survey by professional organization and follow its forms and formats

Professional organizations: Botanical laboratory: phone 451014, Bayanzurkh district -13, Mongolian Academy of Sciences; Central Environmental Laboratory- phone 341816, Khan Uul district, Chingis avenue

Soil pollution and erosion monitoring

Justification for conducting survey: Due to project implementation and waste management; the survey will cover mechanical composition, salinity, dust level, soil agrochemical characteristics; Level of oil and Pb will serve as Indicators of soil pollution

Survey type and fashion: Collect soil sampling from project implementing area and comparing by agrochemical characteristics

Location: Vicinity of waste disposal pipeline, waste collection area, parking area

Timing: In spring April, October in autumn

Methodology:

MNS 3297-91

MNS 3298-91

MNS 2305-94

MNS 3310-91

MNS 3985-87

Equipment: Kjeldahl apparatus, pH meter, photometer, atomnospectrophotometer, calcium meter and other laboratory equipment, bottles, flask

Result recording: Recordings and registration of monitoring and survey results shall follow formats developed by official authorization organization

Data collection, compiling and reporting: Submit all data and reports to the Environmental agency within 15th of May and November of each year.

Water pollution and use monitoring

Justification for conducting survey: Due to project implementation, the ground and underground water may be polluted. Therefore, following data shall be collected:

- Physical characteristics – color, smell, taste, transparency level, turbidity, floating substances, temperature
- Oxygen characteristics – dissolved oxygen, level of maximum oxygen, biochemical need of oxygen, acidity
- Mineral's composition – Ca, Mg, total solidity, constant solidity, chlorine, sulphate, carbonate, hydro carbonate, total mineralization

Frequency: Every spring

Methodology:

MNS 4047-88

MNS 3534-83

MNS 3534-83

MNS 4586-98

MNS 4047-88

Water basic data registration treatment

Water data reporting treatment

Water use agreement

Equipment: Equipment of professional organization

Result recording: Recordings and registration of monitoring and survey results shall follow formats developed by official authorization organization

Data collection, compiling and reporting: Submit all data and reports to the Environmental agency in May of each year.

Noise monitoring

Justification for conducting survey: Level of noise during construction will exceed normal level and will have negative impact for the health of construction workers and vicinity dwellers.

Frequency: Every season

Methodology:

MNS 4990.2000

MNS 4996-2000

MNS 5003-2000

MNS 5010-2000

Data collection, compiling and reporting: Submit all data and reports to the Environmental agency in May of each year.

Human health monitoring

Justification for conducting survey: Due to implementation of the project may raise exceed of noise, air pollution during the construction, which will have negative impact to the health of construction workers and vicinity area dwellers.

Frequency: All workers have to have medical survey every year; Conduct community survey

Methodology: Conduct comprehensive medical check and surveys.

Organization responsible for conducting surveys: Contracted health organization of the executing organization

Result recording: Recordings and registration of monitoring and survey results shall follow formats developed by official authorization organization

Other aspects

- Timely response requirements of the government organizations at district level
- Close cooperation with related environmental professional organizations to abide and follow up environmental legislations
- In case of change of the project content, part of it the executing organization at first have to address to the MNE to update and make necessary amendments on the ECMP for final approval.

Appendix 7. Environment protection plan /EPP/

EMP consists of environmental protection plan and environmental control and monitoring program /ECMP/. EPP is the basis in defining proper actions against main and probable negative impact and its cost estimate. Below table shows relationship and responsibility of stakeholders to implement EMP and ECMP.

Stakeholders in implementing EMP

#	Organization	Associated relationship in implementing EMP	Duty
	MEGDT	Central government organization responsible for Environment	- Conducts general EIA - Controls and monitors Detailed EIA and ECMP - Bring up for discussion and approves detailed EIA - Approves ECMP on yearly basis
	Ulaanbaatar city governor's office	Central organization responsible for Ger area development and financial support project	- Management of related organizations in project implementation, launch and activate PMO - Administration and guidance in implementing ECMP - Control ECMP implementation
	State specialized agency	Government central organization controlling implementation of environmental legislation	- Controlling of implementation of environmental legislation - Controlling of implementation of ECMP through municipality, Songinokhairkhan district specialized agency on yearly and quarterly basis - Support by data and report to the Ministry of Environment on ECMP implementation
	Municipality governor's implementation agency Ger area development agency	Local project implementation unit	- Manage project implementation unit activity - Ensure coordination of consultants and ECMP implementation stakeholders - Review monthly, quarterly and yearly reports on ECMP implementation and approve next year ECMP - Submit ECMP to the MNE for reviewing
	Project implementation unit	Implementing agency of the ECMP on daily basis	- Support and control project executor in implementing ECMP - Ensure coordination of project consultants, contractors and sub-contractors - Support in implementing ECMP, daily control/verification - Develop ECMP report - Develop yearly ECMP

The development of the EPP considered environment protection, management and mitigation activities mentioned in the detailed EIA report with its term, budget.

Air pollution mitigation

During the project implementation, the amount of air pollutants will be increased due to noise, dust, smoke of heavy tracks, equipment and evaporation of materials used in pawing roads. Therefore, prevention actions would be necessary. In this case, following standards have to be followed.

Source of funding

Every year the executive agency should include budget for mitigation activities in their financial planning and conduct required activities.

Activity	Term	Responsible person	Executing organization	Frequency	Breakdown of budget				Total budget
Conduct air pollution sampling by special organization/laboratory	From the beginning of the project	Project coordinator, environmental specialist	Special organization with permission to conduct survey	2 times per year, in June and November	Worker salary	Trip cost	Sampling cost	Laboratory cost	730.0/1460
					400.0	100.0	150.0	80.0	
During the construction organize activities to prevent air pollution	From the beginning of the project	Environmental specialist nominated by the Contractor	Contractor's equipment, technology and workers	During the dry season of the year once per month, 6 times per year	Managing officer	Salary for 2 workers	Trip and carrying cost	Amount of water /25000l * 6 times * 1.5tug	1437.5/8626.0
					500.0	800.0	100.0	37.5/225.0	
Do not pollute environment with hard waste	From the beginning of the project	Administrator of executing organization	Contractor's equipment, technology and workers	Hard waste should be collected in one place/point and carried Once a month /12 times per year/	Waste carrying and disposal cost during the project implementation			Salary	850.0/10200
					400.0			450.0	
Do not allow evaporation of oil and fuel materials	From the beginning of the project	Person responsible for equipment and machines of the Contractor	Mechanics and drivers of the Contractor	Regular control and monitoring of equipment and machine repairing and maintenance. And timely replacement of any mistakes	Environmental manager should control			Monthly salary	600.0
					Over year			50.0	
Total cost									**20885.0**

During implementation of mitigation activities against air pollution following issues should be considered:

- Special organization conducting air sample should use best and modest methods and in winter and summer time.
- In order to avoid dust in the air eroded land and roads should be irrigated except in winter, totally 6 times using special irrigation track.
- In order to avoid from objectionable smell/stink protecting fence, bunkers have to be constructed, and have to be disposed every month to the UB official waste disposal point.
- To avoid any evaporation of combustible materials safety of workers and safe condition of machine and equipment should be controlled and monitored. In case of loss of combustible materials, the treatment on mitigation, cleaning, disposal of waste should be developed and implemented.

Avoiding soil erosion and pollution

In case of break of requirement, arrangement of waste disposal and due to heavy tracks and equipment the project area is under the risk of soil pollution and erosion. Moreover, excess of combustible materials, fuel and oil could pollute soil with heavy metals due to maintenance of tracks in improper location.

Allowed maximum content of hazards in the soil

#	Chemicals	Tolerance
	Benzol	0.3
	H2S	0.4
	Pb^{+2}	6.0

Source of funding

Every year the executive agency should include budget for mitigation activities in their financial planning and conduct required activities. The budget for soil pollution mitigation shown on following table.

Activity	**Term**	**Responsible person**	**Executing organization**	**Frequency**	**Breakdown of budget**					**Total budget**
Define soil pollution by special organization	From the beginning of the project	Project manager/Project environmental specialist	Special organization with permission to conduct survey	2 times per year, in April and October	Worker salary	Trip cost	940/1880.0	Laboratory cost		940/1880.0
					400.0	100.0	40.0	400.0		
Affected road, areas during construction have to be cleaned, flattened and restored	From the beginning of the project	Administration of Contractor	Professional organization	Every year	Managing officer	Salary for workers 20person/5 days/	Trip and carrying cost	Fuel cost	Additional cost	
					500.0	5000.0	1000.0	2000.0	1000.0	7700.0
Construct drain pipes in roads, areas that have a risk of flooding	From the beginning of the project	Administration of Contractor	Professional organization	Every year	Managing officer	Salary for workers /5 days/	Trip and carrying cost	Materials	Additional cost	
					500.0	5000.0	6000.0	50000.0	3000.0	15000.0
Construct temporary parking area for the tracks and technics during the construction of infrastructure	From the beginning of the project	Administration of Contractor	Contractor's own capacity and equipment, technics	Every year	Professional worker's cost	Worker's salary /5 days/	Trip and carrying cost	Materials	Additional cost	4400.0
					400.0	1000.0	2000.0	3000.0	700.0	
Signing and sticking boards against soil erosion and pollution in Infrastructure development areas	From the beginning of the project	Administration of Contractor	Contractor's own capacity and equipment, technics	Every year	Professional work's cost			Material		750.0
					50.0			700.0		
Total cost										29730.0

Prevention of water pollution

Ground and underground water

- Disposal of waste open could lead to penetration into soil and underground water due to rain and flooding.
- Due to absence of drain system the condition of construction process could be worsen and affected by flood
- Due to leak of combustible materials and fuel, the underground water could be polluted.

Possible affected objects

- Underground water
- Ground level water
- Workers

Standard limits

- MNS 3342-82
- Regulation to protect water resource from pollution /Joint treatment of ministers from MNE and Ministry of Health dated in 1997, #143/A352
- Drinking water standard MNS 900-2005
- MNS 4586-98
- Protection zone of drinking water sources /Joint treatment of ministers of MNE, Ministry of health developed in 1995 - #167/335/A171/
- MNE minister's order 167/335/A171 – Registration of water resource pollution, shortage, restoration
- Water usage rate – Government's order #7 released in 2005

Funding sources

Every year the executive agency should include budget for mitigation activities in their financial planning and conduct required activities. The budget for water pollution mitigation shown on following table.

Activity	Term	Responsible person	Executing organization	Frequency	Breakdown of budget				Total budget
Conduct water pollution sampling by professional organization/laboratory	From the beginning of the project	Project coordinator, environmental specialist	Prof.organization with permission to conduct survey	Every spring	Worker salary	Trip cost	Sampling cost	Laboratory cost	1000.0
					500.0	100.0	200.0	200.0	
Mapping, designing, implementation of drinking, waste water, drainage collection system	From the beginning of the project	Contractor's administration	Negotiation and implementation with related organization	Every year	Materials	Salary			6000.0
					5000.0	1000.0			
Regular monitoring of water quality based on selected areas in 3 points for ground and underground water		Environmental specialist		Every year	Cost for specialist	Trip cost	Sampling cost	Laboratory cost	1200.0

					400.0	100.0	300.0	400.0	
Conduct related activities to protect water pollution based on monitoring	From the beginning of the project	Environmental specialist	Under the capacity of Contractor/executive agency	Every quarter	Cost for specialist	Salary	Equipment, track cost	Fuel cost	2400.0/9600.0
					400.0	1000.0	500.0	300.0	
Total cost									**17800.0**

Impacts on Vegetation

Following impacts may rise during developing infrastructure:

- Due to not considering advisement of professional, the healthy soil layer may be mixed and polluted by the construction, which will lead to soil erosion impossible for plant growth.
- Natural and exaggerated vegetation cover, garden, trees planted by dwellers may be affected
- Many road crossing may harm soil and vegetation
- During construction work vicinity area's soil may be eroded, polluted by fuel oil and waste
- Blow down of household ashes by wind during construction work
- Due to land degradation biodiversity of the soil, insects and microorganisms may be reduced, which will lead to increase density of soil and lack of oxygen
- Due to crash of water and waste pipes newly grown vegetation may be destroyed again.
-

Control and Monitoring

- Conduct monitoring survey after the construction and control and monitor restoration through its initial planning, 3 times per year, which means in spring, summer and autumn
- Monitor plant growth suggested in this report 3 times per year, which means in spring, summer and autumn
- Take yield sample from newly gardened areas 3 times per year, which means in spring, summer and autumn
- Check out possible negative factors (dry and liquid waste, degradation by man and technics) that may impact restored areas
- Fencing of restored and greened areas

Activity	**Term**	**Responsible person**	**Executing organization**	**Frequency**	**Breakdown of budget**			**Total budget**
Seasonal monitoring cost	During the end of the project	Project manager, environmental manager	Prof.organization with permission to conduct survey	2 times per year, May, September	Worker salary	Trip cost	Yield sampling	700.0/1400.0
					400.0	100.0	200.0	
Experiment new species of plant if previous plant did not growth	During the end of the project	Project manager, environmental manager	Restoration organization, project env.specialist	1 month after plantation	Worker salary	Trip cost	Material cost	900.0
					700.0	200.0	500.0	
Restoration	During the	Project	Restoration	Once per	Worker	Trip	Material	6300.0

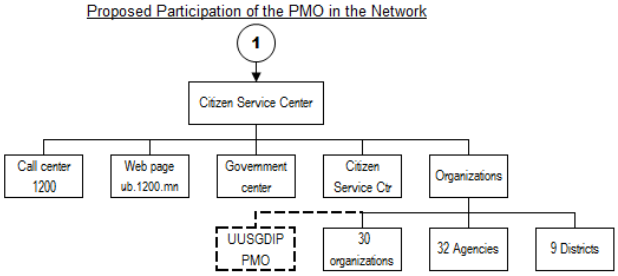
cost	end of the project	manager, environmental manager	organization, project env.specialist	year/in spring time	salary	cost	cost	
					700.0	600.0	5000.0	
Irrigation	During restoration	Project manager, environmental manager, person responsible for restoration	Restoration organization, project env.specialist	2 times per week/8 times per month	Worker salary	Trip cost	Fuel cost	980.0/5880.0
					400.0	400.0	1800*100l	
Total cost								14480.0

Total cost for environmental protection estimated as 82895.0 thousand tug per year.

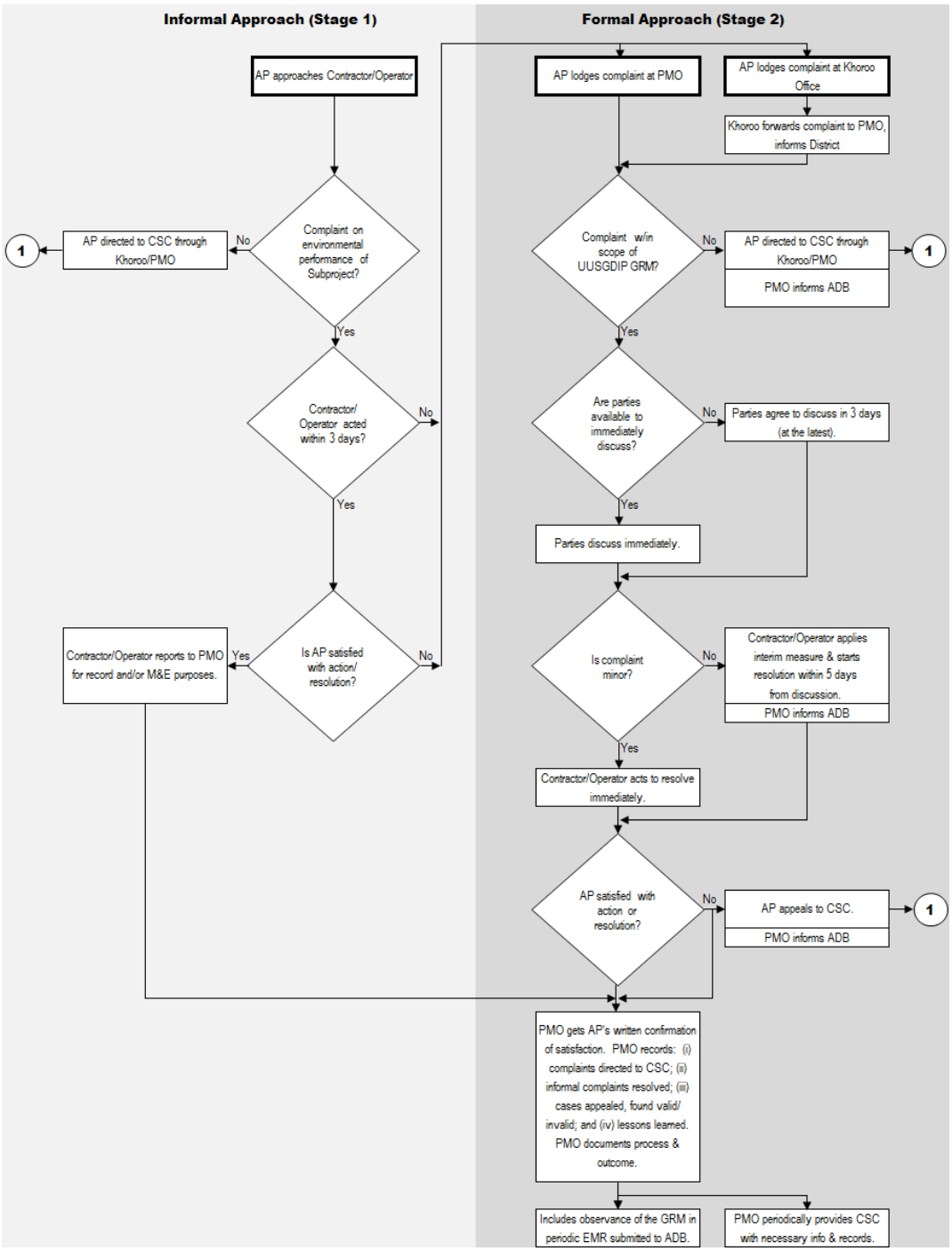
Appendix 8. Grievance Redress Mechanism defined for Project 1

MUB's Centralized Network of Receivers for Complaints/Grievances

Proposed Participation of the PMO in the Network



Proposed Tranche 1's Environmental Grievance Redress Mechanism



Abbreviations: AP – Affected Person; CSC – Citizen Service Center; GRM – Grievance Redress Mechanism; M&E – Monitoring & Evaluation PMO – Program Management Office; UUSGDIP – Ulaanbaatar Urban Services and Ger Areas Development Investment Program