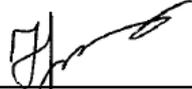


(4) ステアリングコミティミーティング (概略設計調査時)

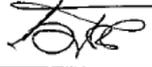
**MINUTES OF MEETING  
ON  
STEERING COMMITTEE MEETING  
OF  
THE PREPARATORY SURVEY (BASIC DESIGN)  
ON  
THE ULAANBAATAR WATER SUPPLY DEVELOPMENT PROJECT  
IN  
GACHUURT IN MONGOLIA**

ULAANBAATAR, October 14, 2009

  
\_\_\_\_\_  
**Mr. B. MUNKHBAATAR**  
Vice Mayor  
Municipality of Ulaanbaatar

for 石井昌樹 Masaki ISHII  
\_\_\_\_\_  
**Mr. Yoshiharu Matsumoto**  
Chief Engineer  
JICA Survey Team

  
\_\_\_\_\_  
**Mr. Ts. GANKHUU**  
UB City Chief Engineer and Director of  
Engineering Utilities Department

  
\_\_\_\_\_  
**Mr. B. PUREVJAV Msc**  
Director  
Water Supply and Sewerage Authority of  
Ulaanbaatar City

07. 17. 石井

## **I. General**

The meeting for the presentation of the field Survey for the Preparatory Survey (Basic Design) on the Ulaanbaatar Water Supply Development Project in Gachuurt in Mongolia (hereinafter referred to as "the Survey") was held on October 14, 2009 at the Conference Hall, 2<sup>nd</sup> Floor of Puma Imperial Hotel, Sukhbaatar District, Ulaanbaatar, Mongolia.

The list of attendance is shown in the Attachment.

## **II. Discussions**

First, Director of USUG Mr. B Purevjav Msc. Member of the Steering Committee, called the meeting to order.

Then, Mr. Yoshiharu Matsumoto, the Chief Engineer and Mr. Masaki Ishii, the Deputy Chief Engineer/Facility Designer1 of the Survey Team explained the contents of the presentation material on each expertise field for the Survey. The contents were accepted in principle by the Mongolian side.

In the meeting, the following confirmation and comments on the Survey were made:

### **1. Solid waste management**

The Mongolian side questioned whether the Survey will cover the contents about solid waste management.

The Survey Team answered that the contents about solid waste management are out of scope. The Mongolian side understood.

### **2. Water quality of water reserves**

The Mongolian side questioned whether the water quality of water reserves on current condition is safety for intake.

The Survey Team answered that the water reserves are designated as the water resource preservation area by Mongolian government, and the water quality is satisfactory.

The Mongolian side understood.

### **3. Water supply facility**

#### **1) Drawing of transmission main pipe and collection pipe**

The Mongolian side commented that the collection pipe and the transmission main pipe at the hillside slope in Gachuurt are seemed to be overlapped and hard to recognize the pipe lines.

The Survey Team answered that those pipes shall be expressed intelligibly on the

drawing.

The Mongolian side understood.

**2) Water sterilization system**

The Mongolian side questioned whether there was any comment from administration of land affairs regarding the method of sterilization for extracted raw ground water on the stakeholder meeting.

The Survey Team answered that there was a comment to discontinue the chlorination equipment for water treatment furthermore and they consider the requirement of higher sterilization system such as ozone treatment or ultra violet treatment system.

The Mongolian side understood.

**4. The amount of water supply and demand on this Survey**

The Mongolian side questioned whether the amount of estimated water demand and proposed water supply in this Survey cover the whole amount including power plant or others of Ulaanbaatar City.

The Survey Team answered that this Survey investigates about the amount of water supply and demand of the area supplied by USUG, and contains not only drinking water but also industrial factories, public institutions, etc. The Study Team also answered that the water amount by another supplier or organizations is not grasped and it is out of scope.

The Mongolian side understood.

**5. Others**

The Mongolian side commented that the customs duty of imported materials or machinery from Japan or other countries shall be exempted from taxation, but the circulating materials in Mongolia such as oil under construction shall not be exempted.

The Mongolian side also commented that the customs clearance shall be conducted in Ulaanbaatar, not Zamin-uud.

The Study Team understood.

**THE PREPARATORY SURVEY (BASIC DESIGN) ON THE ULAANBAATAR WATER  
SUPPLY DEVELOPMENT PROJECT IN GACHUURT IN MONGOLIA**

**Steering Committee Meeting  
Conference Hall, Puma Imperial Hotel, Sukhbaatar District, Ulaanbaatar, Mongolia  
October 14, 2009 (11:00 AM-13:00 PM)**

**ATTENDANCE LIST**

<b>Name</b>	<b>Position</b>	<b>Dept. / Section</b>
<b>A. Members of the Steering Committee and Invited Officials</b>		
Ts. Gankhuu	General Engineer of the Ulaanbaatar City and Director of Engineering Utilities Section	Ulaanbaatar City, Municipality
B. Purevjav Msc	Director of the Water Supply and Sewerage Authority	USUG, Water Supply and Sewerage Authority
B. Baatarkhuyag	Deputy Director of the Water Supply and Sewerage Authority, General Engineer	USUG, Water Supply and Sewerage Authority
P. Badamdorj	Head of department. Water Authority	The Water Authority
L. Dashdorj	Specialized Inception Agency of the Ulaanbaatar City	Specialized Inception Agency of the Ulaanbaatar City
Ts. Regzmaa	UB city, Municipality	Administration of the Ulaanbaatar city
Mr. Jargal	Engineer of the engineering structure	Administration of the Ulaanbaatar City
N. Bayaraa	Chief of the Water Supply office	USUG, Water Supply office
Sh. Ganzorig	Chief of the Industrial and Technology sector	USUG, Industrial and Technology sector
B. Bazargarid	Chief of the Monitoring and Appraisal sector	USUG, Monitoring and Appraisal sector
<b>B. JICA Mongolian Office</b>		
Ogura Toru	Project Formulation Adviser	JICA
E. Ankhtsetseg	Program Administrative Officer	JICA
<b>C. JICA Study Team</b>		
Yoshiharu Matsumoto	Chief Engineer	JICA Survey Team
Masaki Ishii	Deputy Chief Engineer/Facility Designer 1	JICA Survey Team
Teruo Tahara	Groundwater Development Engineer	JICA Survey Team
Manabu Atsuchi	Water Supply Planner/Mechanical and Electrical Engineer	JICA Survey Team
Hideki Konno	Facility Designer 2/ Coordinator	JICA Survey Team
Bat-Angalan	Translator	JICA Survey Team
Demuulen	Translator	JICA Survey Team

(5) ステアリングコミティミーティング (補足調査時)



**GOVERNOR'S OFFICE  
OF ULAANBAATAR MUNICIPALITY**

15160 Baga toiruu 15,  
Chingeltei duureg, Ulaanbaatar, MONGOLIA  
Tel: (976-11) 31-53-47, Fax: (976-11) 32-94-02,  
E-mail: UBGVRNR\_WR\_DV@mongolnet.mn

To: JICA Head  
Quarters in Tokyo

Date 11.01.2010  
Ref. 3/19

Subject: Mongolian Government Contribution to Ulaanbaatar Water Supply  
Development project

This is our great pleasure to be informed that project financing has been approved by Japanese government for improving water supply service of Ulaanbaatar city.

We, the Project Steering Committee, generally agree to your idea to implement part of construction work as our contribution, and after studying of your proposal, we are asking following changes for project contents:

1. Considering of cold climate of Ulaanbaatar and insufficient electricity supply, we prefer to construct bigger 'water' reservoir with capacity of 6000m<sup>3</sup> (instead of 1050m<sup>3</sup>) in order to avoid lack of water supply or freezing risk in the pipeline system.
2. All well field work including borehole construction will be done by Japanese financing part. Mongolian side will finance and construct water reservoir with capacity of 6000m<sup>3</sup> including valve chambers at the reservoir as a contribution of Mongolian part.
3. All expenses financed by Mongolian side shall not exceed 5% of total amount of the Exchange of Notes.

In addition, we would like to guarantee that during construction period of the project we would finance the work on time and complete work in the same time as scheduled by Japanese side.

We looking forward to considering our suggestions and proceeding to the project implementation.

Copy to: JICA representative office in Ulaanbaatar

Sincerely yours,

Ts.Gankhuu,

Head of Engineering Facilities department  
Municipality of Ulaanbaatar

(6) M/D (概略設計概要説明調査時)

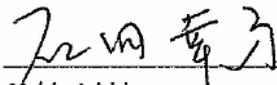
MINUTES OF DISCUSSIONS  
ON THE PREPARATORY SURVEY (BASIC DESIGN)  
ON THE ULAANBAATAR WATER SUPPLY DEVELOPMENT PROJECT IN GACHUURT  
IN MONGOLIA  
(EXPLANATION ON DRAFT BASIC DESIGN STUDY REPORT)

In August 2009, the Japan International Cooperation Agency (hereinafter referred to as “JICA”) dispatched the Preparatory Survey for the Basic Design on the Ulaanbaatar Water Supply Development Project in Gachuurt (hereinafter referred to as “the Project”) to Mongolia and through discussion, field survey and technical examination of the results in Japan, JICA prepared a draft basic design study report (hereinafter referred to as “the Draft Report”).

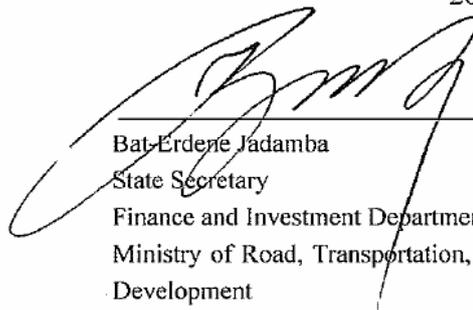
In order to explain and to consult with Mongolia on the components of the Draft Report, JICA sent the Draft Report Explanation Team (hereinafter referred to as “the Team”), which is headed by Yukio Ishida, Chief Representative, JICA Mongolia Office, from 22nd February to 26th February, 2010.

As a result of discussions, both sides confirmed the main items described on the attached sheets.

26<sup>th</sup> February, 2010



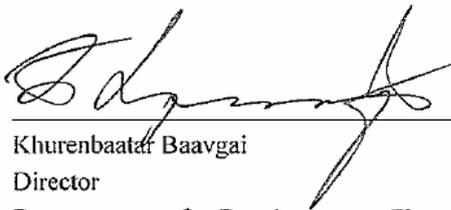
Yukio Ishida  
Leader  
Draft Report Explanation Team  
Japan International Cooperation Agency  
Japan



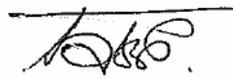
Bat-Erdene Jadamba  
State Secretary  
Finance and Investment Department  
Ministry of Road, Transportation, Construction and Urban  
Development  
Mongolia



Munkhbaatar Begzjav  
Vice Mayor  
Municipality of Ulaanbaatar  
Mongolia



Khurenbaatar Baavgai  
Director  
Department of Development Financing and  
Cooperation  
Ministry of Finance  
Mongolia  
(Witness)



Purevjav Bat-Ochir  
Director  
Water Supply and Sewerage Authority of Ulaanbaatar City  
(USUG) Co., Ltd.  
Mongolia

## ATTACHMENT

### 1. Components of the Draft Report

The Mongolian side agreed and accepted in principle the components of the Draft Report explained by the Team. The components of the Project are shown in **Annex-1**.

### 2. Japan's Grant Aid Scheme

The Mongolian side understood the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Mongolia as explained by the Team and described in **Annex-4**, **Annex-5** of the Minutes of Discussions signed by both sides on 7 August, 2009.

### 3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to the Government of Mongolia by April 2010.

### 4. Other Relevant Issues

The following issues were discussed and confirmed by both sides.

#### 4-1) Project Cost Estimation

The team explained to the Mongolian side the Project Cost Estimation as described in **ANNEX-2**. Both sides agreed that the Project Cost Estimation should never be duplicated or released to any outside parties until signing of all the contract(s) for the Project.

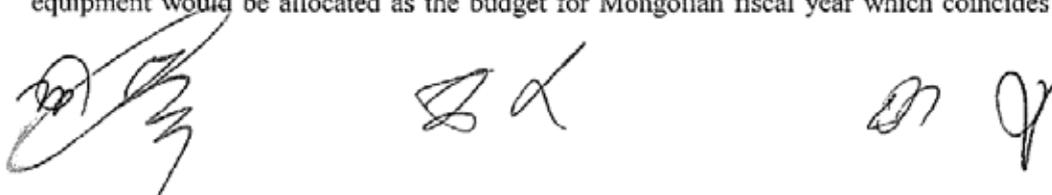
The Mongolian side understood that the Project Cost Estimation is not final and subject to be modified.

#### 4-2) Undertakings and Obligations of the Mongolian Side

In case that the Project would be approved by the government of Japan, the Mongolian side would execute the obligations in pace with the progress of the procurement of materials and equipment, in addition to the major undertakings described in **Annex-5** of the Minutes of discussions signed by both sides on August 7, 2009. The list of the obligations is described in **ANNEX-3**. The Mongolian side explained that there would be technical issues to build the bridge by the Mongolian side because they have not enough experiences for construction of similar scale bridges by themselves. The Mongolian side requested Japanese side for some advises on designing and cost estimation of the bridge.

##### 4-2-1) Budget Allocation Schedule

The budget for undertakings and obligations of the Mongolian side (hereinafter referred to as "the Undertakings and Obligations") would be approved and allocated in pace with the progress by Municipality of Ulaanbaatar. The budget for the fences and the electronic equipment would be allocated as the budget for Mongolian fiscal year which coincides with



the term 1 described in the implementation schedule in the Draft Report and the budget for the reservoir would be allocated as budget for Mongolian fiscal year which coincides with the term 2.

#### **4-2-2) Responsible Agencies**

The Responsible Agencies are the Ministry of Road, Transportation, Construction and Urban Development and the Municipality of Ulaanbaatar. In case that the Implementing Agency (USUG) could not fulfill the Undertakings and Obligations, both Responsible Agencies (Especially the Municipality of Ulaanbaatar) will fulfill them instead of USUG.

#### **4-2-3) Achievement of the project output**

The Mongolian side understood that fulfilling the Undertakings and Obligations by Mongolian side in proper occasion is necessary to achieve the project output. The Mongolian side confirmed to complete works and procedures of the Undertakings and Obligations in the same time as scheduled by Japanese side described in ANNEX-4

#### **4-3) Environmental Impact Assessment (EIA)**

EIA shall be approved by the Mongolian side before March 8, 2010.

#### **4-4) Monitoring for Environmental and Social Consideration**

Monitoring for Environmental and Social Considerations should be conducted by USUG in accordance with the Monitoring Plan. USUG would draft the Monitoring Plan by mid-March, 2010 based on contents of Monitoring Form (Draft) (ANNEX-5) made by Japanese side and contents of EIA report made by Mongolian side. The Monitoring Plan and the Monitoring Form would be finalized by agreement between JICA and USUG, by the end of March, 2010.

The results of the Monitoring for Environmental and Social Consideration will be provided to JICA by filling in the Monitoring Form, as part of progress reports during the construction phase and 2 years after completion of the Project.

#### **4-5) Environmental Checklist**

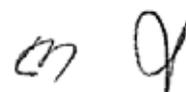
The environmental and social considerations including major impacts and mitigation measures for the Project are summarized in the Environmental Checklist, attached as ANNEX-6.

#### **4-6) Operation and maintenance of the Project's facilities**

JICA requested the Mongolian side for proper operation and maintenance of facilities which would be provided by the Project such as reservoir, pump houses, pipes, etc. JICA suggested that skillful staffs of the USUG who have enough experiences to work in other water supply facilities, should be relocated for the operation of the new facilities.

#### **4-7) Water distribution**

It is necessary to assure the water distribution from North East Reservoir to water users for achievement of the project target. In this connection, JICA recommended the Mongolian side to



conduct proper water distribution taking measures for water leakage and replacement of dilapidated pipes.

**4-8) Saving water in apart area**

In due consideration of water supply in Ulaanbaatar city, it is necessary to save the water usage in apartment area so that water shortage in ger area may be softened. In this connection, JICA recommended Mongolian side to take necessary actions such as installing meters for each user, establishing of adequate water charge system, etc.

**4-9) Influence of dam project**

Regarding to the future water resources development plan by dam construction, the Mongolian side informed that there exist some preliminary study results, but no clear schedule for the implementation of the further study. JICA requested the Mongolian side to implement groundwater survey carefully when such dam projects would be implemented in the future, since construction of dam may seriously affect to the existing water supply system by groundwater.

ANNEX-1	Components of the Project
ANNEX-2	Project Cost Estimation (CONFIDENTIAL)
ANNEX-3	Obligations of the Mongolian side
ANNEX-4	Implementation deadlines of Obligations of the Mongolian side
ANNEX-5	Monitoring Form (Draft)
ANNEX-6	Environmental Checklist



**ANNEX-1 Components of the Project**

**Requested Items and Survey Results**

	Requested Items	Survey Results	
		Japan Side	Mongolia Side
Development Volume	25,200m <sup>3</sup> /day	25,200m <sup>3</sup> /day	
Production well	21 wells	21 wells	—
Conveyance pipe	Length: 4.8km SP Φ Ave.320mm	Length: 4.3km DCI Φ 150 to 500mm	
Collection pipe	—	Length: 2.8km DCI Φ 150mm	—
Distribution reservoir	Capacity: 8,000m <sup>3</sup>	—	Capacity: 6,000m <sup>3</sup>
Chlorination unit	1 unit (Cl <sub>2</sub> )	1 unit (CaCl <sub>2</sub> O)	—
Transmission main pipe	Length: 19.5km SP Φ 600mm	Length: 18.8km FRPM Φ 700mm	—
Others	—	—	Fence installation Electric power drawing Bridge for operation and maintenance

Note) SP: Steel pipe, DCI: Ductile Cast Iron, FRPM: Fiberglass Reinforced Plastic Mortar

ANNEX-2 Project Cost Estimation (CONFIDENTIAL)

CONFIDENTIAL

**Project Cost Estimation borne by Japan side**

Work Item		Estimated Cost (million yen)
Facilities	Transmission main (L=18.8km)	Pipes
		Valve chambers
		Siphons
		Thrust blocks
	Conveyance and collection pipes (Conveyance pipe: L=4.3km) (Collection pipes: L=2.8km)	Pipes
		Valve chambers
		Siphons
		Thrust blocks
	Well pumping stations (21 units)	Wells
		Pumps
		Pump house and substructures
		Electric equipment
	Chlorination & operation house	Building
		Sanitation equipment
		Telemetry system
Chlorination system		
Electric equipment		
Others	Transportation & packing cost, temporary construction cost, etc.	
Detailed design/construction supervision		

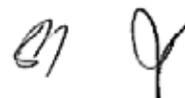
**Project Cost Estimation borne by Mongolian side**

Work Item		Estimated Cost (million yen)
Facilities	Reservoir (V=6,000m <sup>3</sup> )	Reservoir
		Valve room
		Overflow pipe
	Others	Electric power supply
		Fences and gates
		Bridge for operation and maintenance

### ANNEX-3 Obligations of the Mongolian side

The undertakings to the Government of Mongolia for the Project are as follows.

- 1) Take necessary measures to ensure prompt unloading and customs clearance upon entry into Mongolia and transportation inside Mongolia, for the goods purchased for the implementation of the Project.
- 2) Take necessary measures to exempt the contractor and the consultant from the customs duty, internal taxes and other fiscal levies imposed in Mongolia for their supply of goods, services, and equipment.
- 3) Open an account in a designated bank in Japan for the Banking Arrangement (B/A), and issue the Authorization to Pay (A/P). Bear the advising commission of the A/P and payment commissions to the bank.
- 4) Execute restriction of development activities and necessary negotiations with the landlords for the use of the necessary lands for the construction work.
- 5) Apply for the construction approval from the authorities concerned for the construction work.
- 6) Carry out necessary procedures for the Detailed Environmental Impact Assessment (DEIA).
- 7) Construct the distribution reservoir (6,000m<sup>3</sup> in volume), which Mongolia side is responsible for in construction work excluding the installation of the valves, flow meters, level gauges and piping around the reservoir, in compliance with the overall implementation schedule of the Project.
- 8) Extend the electric power lines with the necessary capacity to the required locations such as the well pumping stations, distribution reservoir and relevant temporary stock yards. Increase the electric capacity to the required power if the capacity is insufficient.
- 9) Apply for the permission of the use of frequency band for the telemetry system.
- 10) Conduct a study along the transmission main pipe route to monitor the ger houses affected by the construction work. Take due process, concurrence and proper compensation for the affected households when temporal relocations and removal of those houses and their properties are necessary.
- 11) Provide lands for the temporary stock yards for setting-up of the site offices and storage of the construction materials and equipment during the construction work.
- 12) Install fences and gates in the premises of the distribution reservoir and the well pumping stations.
- 13) Provide a bridge over Tuul River for the access, operation and maintenance of the Gachuurt water source after the completion of the construction work.
- 14) Allocate proper security guards for the security of construction work.
- 15) Conduct environmental and social impact monitoring based on the monitoring plan instructed by the DEIA
- 16) The transmission main pipe will be connected to the existing inlet pipes (φ500) of the Northeast reservoir. Therefore, repair the reservoir and the existing peripheral pipes in the event of any trouble caused by the discharge, under normal use, to the reservoir.
- 17) Procure the disinfectant (calcium hypochlorite CaCl<sub>2</sub>O) for the operation of the chlorination facility.
- 18) Plan out observation tours for citizens for the advertisement of the Project. In addition, carry out promotion activities by creating project brochures and through the media.



**ANNEX-4 Implementation deadlines of Obligations of the Mongolian side**

Large item	Small item	Quantity	Implementation deadline (Months after E/N for DD)
EIA procedure	-	Implementation of DEIA and permission for the Project	March 2010
Application for construction permission	-	Application to the City of Ulaanbaatar and permission	12 months
Land acquisition	Base camp and temporary yard	4 sites	16 months
	Transmission main	18.8km	22 months
	Conveyance pipe	4.3km	22 months
	Collection pipes	2.8km	22 months
	Reservoir and chlorination & operation house	1 site	22 months
	Well pumps	21 sites	22 months
Distribution power line installation	Reservoir and chlorination & operation house	1 site	39 months
	Well pumps	21 sites	39 months
Frequency band	Telemetry system	1 set	36 months
Construction	Reservoir	1 site	Budget acquisition : 12 months Construction : 39 months
	Fence at well pumps	21 sites	51 months
	Access bridge	1 site	On the timing not to hamper operation and maintenance works
Compensation	Temporary removal and restoration of fence on transmission main route	Review before construction commencement	Until construction completion after 23 months
Inspection	Discharging in Gachuurt Reservoir	1 site	47 months
	Discharging in North-East Reservoir	1 site	52 months

Source: JICA Survey Team

②

ANNEX-5 Monitoring Form (Draft)

MONITORING FORM IN CONSTRUCTION PHASE

Monitoring elements	Suggestion for avoidance and mitigation measures
Temporal relocation of the ger houses and restoration for the temporal removal	<p>* Prior to the commencement of the construction work, USUG and Ulaanbaatar City shall conduct a study along the transmission main pipe route to monitor the ger houses that are to be affected by the construction work. When relocations of those houses are necessary, USUG and Ulaanbaatar City shall follow proper procedure and request the residents to relocate the houses to other areas within the housing lots during the construction work.</p> <p>* During the period of the construction work, USUG and Ulaanbaatar City shall take due process and proper compensation shall be materialized with the affected households for the temporal removal and restoration of private property.</p>
Records of performance	
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### MONITORING FORM IN CONSTRUCTION PHASE

Monitoring elements	Suggestion for avoidance and mitigation measures
Traffic control	* USUG and Ulaanbaatar City shall inform local residents and businesses of the schedule of construction work and the traffic control plan in due timing. * USUG and Ulaanbaatar City shall set a contact address and locate necessary personnel to receive complaints from affected parties.
Records of performance	

① 

-2-   

### MONITORING FORM IN CONSTRUCTION PHASE

Monitoring elements	Suggestion for avoidance and mitigation measures
Coordination for Tsaiz area and the military bases	<ul style="list-style-type: none"><li>* Before the commencement of the construction work, USUG and Ulaanbaatar City shall organize an informational meeting at Tsaiz area with local businesses, bus operators, and other related parties to discuss whether it is necessary to move bus stations or to do night work.</li><li>* As for the military facilities, USUG and Ulaanbaatar City shall provide sufficient information about the work plan and equipment to be used, and operate construction work according to necessary precautions directed by the military institutions.</li></ul>

Records of performance

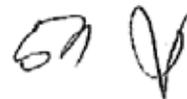


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### MONITORING FORM IN CONSTRUCTION PHASE

Monitoring elements	Suggestion for avoidance and mitigation measures
<p>Coordination for Gachuurt area</p>	<ul style="list-style-type: none"> <li>* USUG and Ulaanbaatar City shall organize informational meetings at Gachuurt area before the commencement of the construction work and in due timing as necessary about the work item, schedule and request to the residents.</li> <li>* During the period of the temporal channel closure required for the due construction work, USUG and Ulaanbaatar City shall designate locations to draw water for the affected households.</li> <li>* USUG and Ulaanbaatar City shall consult with the Hotel Mongolia and any other local businesses to be affected during the period of construction and take their requests into considerations in conformity with due regulations.</li> </ul>
<p>Records of performance</p>	
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### Groundwater Level of Observation Wells in Construction Phase

Location: \_\_\_\_\_

Month: \_\_\_\_\_

Year: \_\_\_\_\_

Day	Week	Static groundwater level from zero gauge in meters	Time	Weather	Observer
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
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24					
25					
26					
27					
28					
29					
30					
31					
		Mean			
		Max.			
		Min.			




**MONITORING FORM IN OPERATION PHASE**

Monitoring elements	Suggestion for avoidance and mitigation measures
Restriction of the entry to the facilities	* The bridge and the distribution reservoir at Gachuurt area shall be guarded 24 hours by the military and the entry to the constructed facilities shall be limited to those permitted. * USUG is requested to report the monthly record of the activity, to JICA Mongolia office, every month during first 1 year after the commencement of the operation of the pumps, and submit to the said office the annual results of the activity at the end of the second year.

Records of performance

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**MONITORING FORM IN OPERATION PHASE**

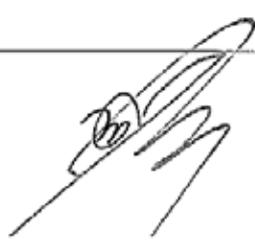
Monitoring elements	Suggestion for avoidance and mitigation measures
Prevention of accident in the chlorination	<ul style="list-style-type: none"> <li>* USUG shall properly store and manage the disinfectant for the chlorination work to avoid accidents such as theft and leak to outside.</li> <li>* USUG shall provide the chlorination personnel with proper training and due equipment to prevent any physical damage to their health.</li> <li>* USUG shall properly dispose of the empty containers of the disinfectant.</li> <li>* USUG is requested to report the monthly record of the work on the chlorination, to JICA Mongolia office, every month during first 1 year after the commencement of the operation of the pumps, and submit to the said office the annual results of the work at the end of the second year.</li> </ul>
Records of performance	
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**MONITORING FORM IN OPERATION PHASE**

Monitoring elements	Suggestion for avoidance and mitigation measures
Groundwater level	<ul style="list-style-type: none"> <li>* USUG shall monitor, around 9AM everyday, 2 test wells drilled for the basic design survey and 1 well used by the local water service provider at Gachuurt village in static groundwater level.</li> <li>* USUG shall monitor, everyday, 21 wells constructed by the project in dynamic groundwater level.</li> <li>* USUG is requested to operate the 21 pumps so that the dynamic water levels in the wells can not lower over 2m each from the static water level before the pump operation.</li> <li>* USUG is requested to report the result of the monitoring to JICA Mongolia office every month during first 1 year after the commencement of the operation of the pumps, and submit to the said office the annual monitoring results at the end of the second year.</li> <li>* Recording format is as per attached below.</li> </ul>
Records of performance	
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-9-



### Groundwater Level of Observation Wells in Operation Phase

Location: \_\_\_\_\_

Month: \_\_\_\_\_

Year: \_\_\_\_\_

Day	Week	Static groundwater level from zero gauge in meters	Time	Weather	Observer
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
		Mean			
		Max.			
		Min.			



- 10 - *Ed*



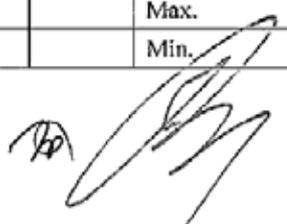
### Groundwater Level of Wells in Operation Phase

Location: Well No. \_\_\_\_\_

Month: \_\_\_\_\_

Year: \_\_\_\_\_

Day	Week	Groundwater level from zero gauge in meters		Weather	Observer
		Static before operation	Max. dynamic		
1					
2					
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18					
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21					
22					
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25					
26					
27					
28					
29					
30					
31					
		Mean	Mean		
		Max.	Max.		
		Min.	Min.		


- 11 -
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**MONITORING FORM IN OPERATION PHASE**

Monitoring elements	Suggestion for avoidance and mitigation measures
Drinking water quality of the wells	<ul style="list-style-type: none"> <li>* USUG shall monitor the drinking water quality of the Gachuurt Reservoir and the North East Reservoir, and the raw groundwater quality of the 21 Wells in conformity with the USUG's regulations.</li> <li>* USUG is requested to report the result of the monitoring to JICA Mongolia office every ____ month during first 1 year after the commencement of the operation of the pumps, and submit to the said office the annual monitoring results at the end of the second year.</li> <li>* Recording format is as per attached below.</li> </ul>
Records of performance	





### Raw Groundwater Quality of Wells in Operation Phase

Location: Well No. \_\_\_\_\_

Month: \_\_\_\_\_

Year: \_\_\_\_\_

No.	Parameters	Units	Allowable figures in Mongolia	Measured values	Sampling date	Testing methods	Testing laboratories
1							
2							
3							
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8							
9							
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11							
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35							





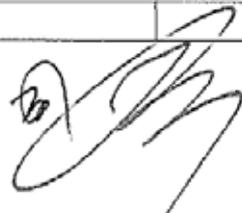
### Drinking Water Quality of Reservoirs in Operation Phase

Location: Gachuurt Reservoir, North East Reservoir

Month: \_\_\_\_\_

Year: \_\_\_\_\_

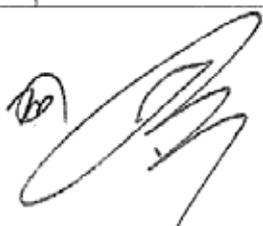
No.	Parameters	Units	Allowable values in Mongolia	Measured values	Sampling date	Testing methods	Testing laboratories
1							
2							
3							
4							
5							
6							
7							
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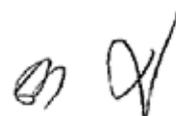


### Drinking Water Standards in Mongolia

No.	Parameters	Units	Allowable values in Mongolia	Testing frequency	
				Chlorinated water	Raw water
1	Color	TCU	20	Everyday	2/year
2	Odor	-	2.0	Everyday	2/year
3	Taste	-	2.0	Everyday	2/year
4	Turbidity	NTU	5	Everyday	2/year
5	Conductivity	Ms/sm	-	Everyday	2/year
6	pH	-	6.5-8.5	Everyday	2/year
7	Total coliforms	No.100mL	Not detected	Everyday	2/year
8	General bacteria	No./mL	20	Everyday	2/year
9	Chloride	mg/L	350	1/month	2/year
10	Sulphate	mg/L	500	1/month	2/year
11	Calcium	mg/L	100	1/month	2/year
12	Magnesium	mg/L	30	1/month	2/year
13	Total hardness	mg-eqv/L	7	1/month	2/year
14	Dry residuals	mg/L	1000	1/month	2/year
15	Nitrates	mg/L	50	1/month	2/year
16	Iron	mg/L	0.3	1/month	2/year
17	Fluoride	mg/L	0.7-1.5	1/month	2/year
18	Nitrite	mg/L	1.0	1/month	2/year
19	Ammonium	mg/L	1.5	1/month	2/year
20	Sodium	mg/L	200	1/month	2/year
21	Phosphate	mg/L	3.5	1/month	2/year
22	Residual chlorine (free)	mg/L	0.3	1/month	2/year
23	Aluminum	mg/L	0.5	1/3 months	2/year
24	Manganese	mg/L	0.1	1/3 months	2/year
25	Copper	mg/L	1	1/3 months	2/year
26	Zinc	mg/L	5	1/3 months	2/year
27	Silver	mg/L	0.05	1/3 months	2/year
28	Arsenic	mg/L	0.05	1/3 months	2/year
29	Cadmium	mg/L	0.01	1/3 months	2/year
30	Cyanides	mg/L	0.01	1/3 months	2/year
31	Chromium	mg/L	0.05	1/3 months	2/year
32	Molybdenum	mg/L	0.25	1/3 months	2/year
33	Lead	mg/L	0.03	1/3 months	2/year



- 15 -

ANNEX-6 Environmental Checklist: 18. Water Supply (1)

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
1 Permits and Explanation	(1) EIA and Environmental Permits	<ol style="list-style-type: none"> <li>Have EIA reports been officially completed?</li> <li>Have EIA reports been approved by authorities of the host country's government?</li> <li>Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied?</li> <li>In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?</li> </ol>	<ol style="list-style-type: none"> <li>Detailed EIA was submitted by Feb. 5, 2010, and was forwarded to the local authority (City of Uthmaniyah) for review and comment, prior to the official submission to the Ministry of Nature, Environment and Tourism. The EIA procedure is still on-going.</li> <li>The report is expected to be approved by MNET by 4th March 2010.</li> <li>No special condition.</li> <li>No other environmental requirements.</li> </ol>
	(2) Explanation to the Public	<ol style="list-style-type: none"> <li>Are contents of the project and the potential impacts adequately explained to the public based on appropriate procedures, including information disclosure? Is understanding obtained from the public?</li> <li>Are proper responses made to comments from the public and regulatory authorities?</li> </ol>	<ol style="list-style-type: none"> <li>USUG has organized public consultation meeting twice and stakeholder meeting once to introduce the project outline and collect public and authorities complaints.</li> <li>Suggested complaints and comments will be considered into DEHA report for authorities discussion.</li> </ol>
2 Mitigation Measures	(1) Air Quality	<ol style="list-style-type: none"> <li>Is there a possibility that chlorine from chlorine storage facilities and chlorine injection facilities will cause air pollution? Do chlorine concentrations within the working environments comply with the country's occupational health and safety standards?</li> </ol>	<ol style="list-style-type: none"> <li>Calcium hypochlorite Ca(ClO)<sub>2</sub> will be used to disinfect the raw water in the planned reservoir site. The same material is already used at existing Zavsartin reservoir and no chemical accidents are reported since opening of the facility. USUG has the chemical handling manual for the staff and the staff are trained using this manual. In this project, the same training, management, and operation is expected and the possibility of chemical accident is low.</li> <li>As USUG described, septic tank will be installed underground and it will be emptied with waste truck when it filled up. Then there is guideline for using waste water storage tank and its padding approved by MNET and MH, MNS 4543:2000 is standard for effluent water from waste water treatment facility.</li> </ol>
	(2) Water Quality	<ol style="list-style-type: none"> <li>Do pollutants, such as SS, BOD, COD contained in effluents discharged by the facility operations comply with the country's effluent standards?</li> </ol>	<ol style="list-style-type: none"> <li>For sludge, see above. Chemical containers shall be stored and disposed to disposal site or washed for reuse.</li> </ol>
	(3) Wastes	<ol style="list-style-type: none"> <li>Are wastes, such as sludge generated by the facility operations properly treated and disposed of in accordance with the country's standards?</li> </ol>	<ol style="list-style-type: none"> <li>Proposed facilities will not generate significant noise and vibration.</li> </ol>
	(4) Noise and Vibration	<ol style="list-style-type: none"> <li>Do noise and vibrations generated from the facilities, such as pumping stations comply with the country's standards?</li> </ol>	-
	(5) Subsidence	<ol style="list-style-type: none"> <li>In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of groundwater will cause subsidence?</li> </ol>	<ol style="list-style-type: none"> <li>According to the geological survey results, there is no clay layer in the water source area. Subsidence will be unlikely.</li> </ol>
3 Natural Environment	(1) Protected Areas	<ol style="list-style-type: none"> <li>Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?</li> </ol>	<ol style="list-style-type: none"> <li>According to guideline for Sanitary areas by MNET and MH (March 2009), it is allowed to construct or build drinking water supply facilities for public use in the special protected and sanitary zone of water reverses and resources. The project will not affect the purpose of the protected area.</li> </ol>
	(2) Ecosystem	<ol style="list-style-type: none"> <li>Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)?</li> <li>Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions?</li> <li>If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?</li> <li>Is there a possibility that the amount of water (e.g., surface water, groundwater) used by the project will adversely affect aquatic environments, such as rivers? Are adequate measures taken to reduce the impacts on aquatic environments, such as aquatic organisms?</li> </ol>	<ol style="list-style-type: none"> <li>The water source area is 45 ha and located in the Sanitary Zone protected for water resources. Out of the 45 ha, 27 ha is grassland area and 18 ha is forest area dominated by poplar and willow.</li> <li>No.</li> <li>No significant ecological impacts are anticipated.</li> <li>No. Tull River that runs through existing water source area has good amount of water flow. Drawing ground water will not affect surface flow.</li> </ol>

ANNEX-6 Environmental Checklist: 18. Water Supply (2)

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
		<p>1. Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?</p> <p>2. Is adequate explanation on relocation and compensation given to affected persons prior to resettlement?</p> <p>3. Is the resettlement plan, including proper compensation, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?</p> <p>4. Does the resettlement plan pay particular attention to vulnerable groups or persons, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?</p> <p>5. Are agreements with the affected persons obtained prior to resettlement?</p> <p>6. Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?</p> <p>7. Is a plan developed to monitor the impacts of resettlement?</p>	<p>Confirmation of Environmental Considerations</p> <p>1. During the construction work of the transmission main pipe, there is no involuntary resettlement. Only temporal removal of fences shall be required at about 20 households along the pipe route. USUG and other related institutions should keep proposed areas from illegal settlement.</p> <p>2. USUG organized some meetings with Khoroov governors and land department of Bayanzurkh district. And explained them if the dwellers are affected by the project implementation, they will receive some compensation.</p> <p>3. Municipality intends to create a relocation plan for those 20 households asked for temporary removal from their plots with proper compensation and restoration.</p> <p>4. The resettlement plan will pay attention to vulnerable people on the base of socioeconomic study to be done by MUB.</p> <p>5. If there is need, agreements will be made between affected dwellers and MUB prior to the resettlement.</p> <p>6. On the base of cost estimation of the properties, MUB will secure budget for the resettlement.</p> <p>7. MUB intends to develop a plan to monitor the impacts of the resettlements.</p>
4 Social Environment	(1) Resettlement	<p>1. Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?</p> <p>2. Is there a possibility that the amount of water used (e.g., surface water, groundwater) by the project will adversely affect the existing water uses and water area uses?</p>	<p>1. There may occur some impacts, but it will not be significant. To avoid or minimize the impact, USUG shall inform local residents and businesses about the schedule of construction work and traffic control plan during the construction. USUG shall also conduct sufficient traffic control measures on site. USUG shall plan and coordinate the construction work efficiently to minimize the length of road closure. USUG shall set a contact address and locate necessary personnel to receive complaints from affected parties.</p> <p>2. No. According to the Water Authority, it is custom in Mongolia to limit the water level change within 2 m during well operation. If the regulation is followed, the project will not affect groundwater level in the surrounding area. USUG shall monitor the groundwater levels at the 2 observation wells drilled by the Project and the existing 1 private kiosk.</p>
	(3) Heritage	<p>1. Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage sites? Are adequate measures considered to protect these sites in accordance with the country's laws?</p>	<p>1. None of cultural heritage and archaeological findings recorded and found in the proposed project area.</p>
	(4) Landscape	<p>1. Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?</p>	<p>1. It is expected that there will be little or no impact on landscape of the project areas as water supply pipelines will be installed underground and the water collection facility and pumping wells will not have significant impact on project area landscape. Restoration plan will be developed and implemented when construction completed.</p>
4 Social Environment	(5) Ethnic Minorities and Indigenous Peoples	<p>1. Does the project comply with the country's laws for rights of ethnic minorities and indigenous peoples?</p> <p>2. Are considerations given to reduce the impacts on culture and lifestyle of ethnic minorities and indigenous peoples?</p>	<p>1. There is no ethnic minorities and indigenous peoples in the project area.</p> <p>2. Not applicable.</p>

ANNEX-6 Environmental Checklists: 18. Water Supply (3)

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
		<ol style="list-style-type: none"> <li>1. Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?</li> <li>2. If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?</li> <li>3. If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?</li> <li>4. If necessary, is health and safety education (e.g., traffic safety, public health) provided for project personnel, including workers?</li> </ol>	<ol style="list-style-type: none"> <li>1. USUG and contractor shall properly maintain construction vehicles and construction machineries to minimize noise and vibration.</li> <li>To minimize production of turbid water, water channels will be closed by the earth dams during the construction of crossing structures such as distribution pipe.</li> <li>Materials for the earth dam must be chosen carefully among the material available on-site so that minimum amount of clayish soil shall go into the river water. To minimize wastes, dug materials will be used to refill the pipe ditch and construct earth bars over the pipes.</li> <li>2. If it is necessary to cut trees during the construction work, Populous laurifolia, Salix ledebouriana, Salix pentandra shall be cut above ground level, and their root system shall be dug out, about 6 m diameter maximum. That root system shall be immediately re-planted to nearby grassland for regrowth. Such activity will minimize reduction of tree number.</li> <li>4. Education related to chemical handling will be provided to the staff at the reservoir by USUG. During construction work, drivers and operators will be instructed by USUG to avoid traffic accidents and other accidents at the construction sites.</li> </ol>
5 Others	(1) Impacts during Construction	<ol style="list-style-type: none"> <li>1. Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts?</li> <li>2. Are the items, methods and frequencies included in the monitoring program judged to be appropriate?</li> <li>3. Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)?</li> <li>4. Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?</li> </ol>	<ol style="list-style-type: none"> <li>1. DEIA report should contain Environmental Monitoring Plan and Environmental Protection Plan with respect to Law of DEIA. Project operator is obligated to implement approved EMP and EPP during project operation and have to report EPP and EMP implementation to authorities.</li> <li>2. Appointed Environmental officer by MNET will judge and review entire DEIA report.</li> <li>3. Project operator at USUG should implement approved EMP by MNET and project operator can update or enhance EMP under the standard and regulation.</li> <li>4. Implemented measures and result should be reported end of the each year to MNET.</li> </ol>
6 Note	Note on Using Environmental Checklist	<ol style="list-style-type: none"> <li>1. If necessary, the impacts to transboundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).</li> </ol>	<ol style="list-style-type: none"> <li>1. In Mongolia, as some researchers expect and conclude, global warming will impact and continue in nearest and future. In past 20 years, the impact from global climate change has very clear in Mongolia.</li> </ol>

1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are made, if necessary.

In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).

2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which it is located.

Ministry of Natural Environment and Tourism  
Ministry of Health