Chapter 3.
Project Evaluation and Recommendations

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3-1 Project Effect

Through the implementation of this project, the capacity of water supply system in Ulaanbaatar City will be augmented from 222,000 m3/day to 240,000 m3/day to cope with the water demand growth due to the rapid population increase. The direct project effects are shown in the Table 3-1.

Table 3-1 Anticipated Effects and Improvement through Project Implementation

Present Status and Problems	Project Countermeasures	Effects and Improvement
Serious water shortage is anticipated attributes to the large water demand increase due to: ➢ Population transition from rural areas to Ulaanbaatar City. ➢ Upgrading in living environment by urbanization.	・16 wells will be constructed in Upper Water Source Area to produce groundwater of 18,000 m^3/day.	・ Adding the proposed groundwater development amount to the existing water source of 222,000 m^3/day, the total water source of 240,000 m^3/day can deal with the projected water demand in 2010.
As the existing distribution pumps installed in Upper Water Source Area and some of the pumps in Middle Water Source Area, the largest water source, have been deteriorated, they cannot pump the design pumping amount and have been consuming excessive electricity because of their inferior operational efficiencies.	・The existing pumps in Upper Water Source Area will be replaced. ・The existing pumps in Middle Water Source Area will be replaced.	・ Accounting the proposed groundwater development amount, total water amount of 90,000 m^3/day can be properly supplied to the City Area. Electricity will also be drastically reduced by replacement of deteriorated pumps. The saved electricity will be equivalent to 18,000,000 Yen/year. ・ Water delivery capacity of 4,000 m^3/Hr（96,000 m^3/day）will be secured by the replaced pumps and large part of electricity will be saved. It will be equivalent to 7,000,000 Yen/year.
The existing water transmission pipelines have been endangered by water hammer.	・Surge Vessel will be installed in Upper Water Source Area.	・ In-pipe negative pressure caused by sudden pump operation suspension due to power failure will be drastically reduced and therefore, breakage of pipelines can be avoided.

After the project completion, residents can easily use larger volume of water by public faucets installed in Water Supply Improvement Project Areas in Ger Districts. Thus, the following items are expected as indirect project effects:

- Improvement in sanitary condition
- Reduction in outbreak of water-borne disease

Further, since full-time water supply will be available aside from water supply vehicles, the following effect can also be expected:

- Reduction in water fetching time and burden assigned to women and children

While, reliable water supply will cover the increased population and it will attribute to the sound city development as well.

Summary of Indirect Project Effects

1) Improvement in sanitary condition, reduction in outbreak of water-borne disease

2) Reduction of water fetching time assigned to women and children (Less wasted time)

3) Sound development of Ulaanbaatar City

3-2 Recommendations

For further effective display and sustain of project effects, the USAG, the acting agency, shall undertake the following items to improve the water supply system:

(1) Items supported by Soft Component

1) Managerial Strengthening

In recent years, the balance of profit and loss has been in red. USAG shall introduce effective accounting method based on the various managerial indices for efficient management.

2) O&M of Water Supply Facilities

For the Upper Water Source Area, necessary measures shall be undertaken to cope with the increase in transmission water volume and the number of wells. Appropriate pump operation considering water level fluctuations in Zavsariin reservoir is also needed.

Though the water quality is excellent, water transmission cost is high in this Area. Therefore, proper and mutual exploitation of the existing four Water Source Areas is strongly recommended.

3) Advancement in Water Leakage Detection and Countermeasures

Water leakage from pipelines wastes valuable water and reduces efficiency in system management by increase in non-revenue water. Furthermore, this may cause damage such as road depression. Water leakage survey and countermeasures, which have been conducted by USAG, shall be updated and a systematic survey and countermeasures must be performed.

4) Enforcement in Water Quality Monitoring

Surface water and groundwater is endangered by the contamination attributed to sewage generated in Ger area which have been expanding rapidly in the fringe areas of the city. Water quality monitoring activities must be enforced for preservation of water sources and sanitary environment.

5) Enlightenment Campaign for Consumers

As a fixed rate system has been adopted during ex-USSR period, consumer awareness on “water-saving” is still low. Considering that the water volume that will be produced from the water source is expected to be low, water-saving and water source preservation are important. Therefore, consumer’s consciousness

toward abovementioned items shall be promoted through a public information and awareness campaign.

(2) Others

6) Schematic Distribution Pipeline Expansion

Along with the rapid population increase, expansion of city area and growth in city area population is progressing accordingly. Water distribution pipeline serving said expansion areas shall be constructed to secure the stable water supply.

7) Self-supporting Management

Through the implementation of this Grant-in Aid Program, the following effects are expected:

- Water demand in 2010 can be covered
- Safe and stable water supply by rehabilitation of deteriorated facilities
- Cheaper water supply cost in compare with before.

From now on, USAG must make their full efforts to undertake the rehabilitation work on their existing facilities and system expansion works by themselves based on efficient management and cost saving.