

The Fourth Bangkok Water Supply Improvement Project (Phase 1)

Report Date: May 1999
Field Survey: March 1999

1 Project Summary and Japan's ODA Loan

This project aims to raise the water treatment capacity of the Bang Ken Water Treatment Plant, which draws water from the Chao Phraya River (from 2.8 million m³/day to 3.2 million m³/day) and expand the distributing pipe network in order to keep pace with increasing demand for water supply as the city grows, and to help limit ground subsidence in the Bangkok metropolitan area.

The ODA loan covers the entire foreign currency portion for this project.

2 Analysis and Evaluation

(1) Project Scope

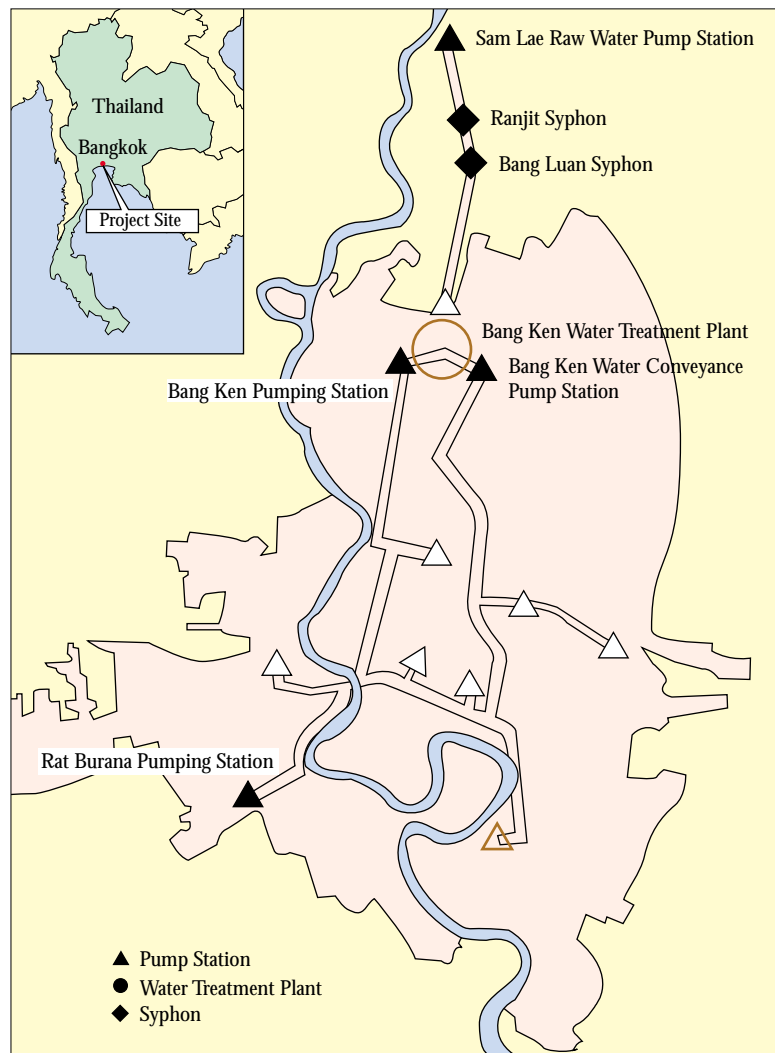
There were no major changes in project scope. The laying of distributing sub pipes was reduced slightly, but they were laid by MWA with its own funds. As a result, the project scope envisaged in the initial plan has been completed.

(2) Implementation Schedule

The improvement of the water distribution network was delayed by approximately 31 months. The delay was due to the time taken for acquisition of a permit for water distribution pipes laying from the Bangkok Metropolitan Authority, and the need to reroute some of the water distribution pipes laying when the permit was refused for some areas. In other implementation works, they were completed almost as scheduled and there were no major problems.

(3) Project Cost

The project cost was smaller than the initial plan in both the local and foreign currency portions. The main cause for the cost underrun was the appreciation of the Yen during 1992 and 1993, which coincided with the construction period. In addition, the



Borrower	Metropolitan Waterworks Authority (MWA) (Guarantor: Thai Government)
Executing Agency	Metropolitan Waterworks Authority (MWA)
Loan Amount	¥8,638 million
Loan Disbursed Amount	¥5,849 million (including charges)
Date of Exchange of Notes	September 1991
Date of Loan Agreement	September 1991
Final Disbursement Date	January 1998

MWA carried out some parts of the project using its own funds, as described above, which further reduced the project cost.

Comparison of Original Plan and Actual

Item	Plan	Actual
1. Project Scope		
i) Expansion of syphon	2.5m x 3.0m: 5 units	As planned
ii) Expansion of Bang Ken Water Treatment Plant	400,000 m ³ /day	As planned
iii) Strengthening of pumping station	4 pumps, reservoir	As planned
iv) Improvement of water distribution network		
Distributing main pipe	42.7km	44.0km
Distributing sub pipe	400km	323.8km
Distributing sub pipe (rehabilitation)	107km	109.2km
v) Consulting services	239M/M	313M/M
		(In addition, 329M/M as assistant staff except engineers)
2. Implementation Schedule		
i) Civil works (commencement to completion)		
Except water distribution network	February 1993 to August 1995	March 1993 to January 1996
Water distribution network	February 1993 to August 1995	September 1992 to October 1997
ii) Consulting Services (commencement to completion)	April 1992 to August 1995	May 1992 to June 1996
3. Project Cost		
Foreign currency	¥8,638 million	¥5,843 million
Local currency	¥8,505 million	¥5,517 million
Total	¥17,143 million	¥11,360 million
Exchange Rate	1 Baht = ¥5.3 (in 1991)	1 Baht = ¥4.2 (average at the time of loan disbursement)

(4) Project Implementation Scheme

As noted above, the implementation period was prolonged slightly, but the delay was largely due to an external factor, namely lengthy procedures to acquire approval from another agency. There was no major problem with the project implementation capability of MWA, the contractors or the consultants.

(5) Operations and Maintenance

In March 1999, MWA was an organization of 6,441 employees, of whom approximately 400 were working on the operation and maintenance of the Bang Ken Water Treatment Plant and its water distribution network. MWA is working to raise the quality of its staff by making the use of Water Supply Technical Training Center, which was set up with technical cooperation with Japan.

(6) Operational Performance

The facilities built under this project are operated steadily with no major problems. However, the non-charged ratio is an extremely high as about 40% in the Bangkok capital area. Of the non-charged ratio, around 80% is due to water loss, and the most pressing task now is to improve the non-charged ratio by stepping up investment for rehabilitation to the water distribution network.

(7) Management Performance of MWA

Changes in the Thai currency system have caused cumulative exchange losses on the MWA long-term foreign currency-based borrowing which have a serious impact on the MWA's ordinary profits.

(8) Project Effects and Impacts

The volume of water supplied from the expanded Bang Ken Water Treatment Plant has been growing steadily since October 1995, and the aim of this project to meet demand in 1996 was achieved. (Table 1).

Table 1 Monthly Results of Water Supply for Bang Ken Water Treatment Plant (Unit: 1,000 m³/day)

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.
1994	79.7	81.7	86.4	81.3	78.5	88.7	90.1	92.2	92.2	94.4	94.6	90.9
1995	91.2	88.5	93.3	93.5	87.6	94.7	95.3	97.6	95.8	98.3	99.3	95.6
1996	98.9	95.5	95.9	95	87.6	96.7	92.9	97.3	92.4	96.3	95.9	94.3
1997	98.2	94.5	94.4	91.2	82.1	94.9	93.4	98.4	95.6	98.2	98.4	94.8

Source: MWA

The amount of groundwater pumped up has been declining since 1997. Thus another aim of this project to reduce ground subsidence have been achieved. (Table 2).

Table 2 Movements in Groundwater Pumping in Bangkok Metropolitan Area (Unit: 1,000 m³/day)

FY	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Central System	170.4	127.7	40.8	46.3	61.4	86	146.3	187.4	196.4	165.8	74.8
Separate Sysutem	25.8	30.4	32.6	41.9	44.7	34.2	45.5	51	55.3	48.5	34.5
Total	196.2	158.1	73.4	88.2	106	120.3	191.8	238.4	251.8	214.3	109.3

Note: Central system: Supplying a majority of the Bangkok metropolitan area.
 Separate system: Supplying towns¹ on the periphery of Bangkok.

¹ Refers to seven towns: Minburi, Bang Yai, Sai Noi, Bang Phlee, Bang Bo, Nong Chok, Bang Bua Thong
 Work is now proceeding on pipelines to link the central and separate systems which are expected to be completed by FY 2001.



Bang Ken Water Treatment Plant expanded by this Project



Chemical Injectors



Large-sized Pump installed by this Project