Appendix 5

Technical Note

TECHNICAL NOTE

ON THE BASIC DESIGN STUDY
ON THE PROJECT FOR ZANZIBAR URBAN WATER SUPPLY DEVELOPMENT
IN THE UNITED REPUBLIC OF TANZANIA

AGREED UPON BETWEEN
MINISTRY OF WATER CONSTRUCTION ENERGY AND LANDS
AND
JICA STUDY TEAM

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After a series of discussions during the field survey in Zanzibar from 25th October 2004 through 23rd November 2004, the following points were agreed between the Department of Water Development (DWD), Ministry of Water Construction Energy and Lands, Zanzibar, The United Republic of TANZANIA and the JICA STUDY TEAM (Team). Based on the agreement, the Team will further analyze the results of field survey in consultation with JICA and concerned parties in Japan and will prepare a draft final report which includes the layout and design of facilities and/or equipment for the project.

1. Tariff Collection

Zanzibar side promised take necessity measures to approve and enforce the related acts in water sector.

2. Land Acquisition

Most of proposed site for boreholes, reservoirs/tanks and transmission/distribution pipeline are the national land. DWD promised that the necessary land will be acquired by them even if it is private land.

3. Basic Concept of the Water Supply Planning

(1) Target year:	2010
(2) Service area:	Zanzibar Urban and West
(3) Population:	Approx. 495,000 people in Zanzibar Urban/West in 2010
(4) Water demand criteria:	Based on FINNIDA report, 1991
(5) Water demand:	Approx. 54,000 m3/day (daily maximum) in 2010

4. Borehole Capacity and Location

The shortage of water resource is about 600 m3/hr. It will be managed by the ground water development. We found the proper capacity for each borehole shall be minimum 60 m3/hr against the 100 m3/hr in the request. Total number of new boreholes shall be 9 – 10 for full demand.
The proposed new borehole sites are presented in Appendix 1.

5. Reservoirs and Overhead Tanks

(1) Location

Although the reservoirs and overhead tanks are concentrated in Saateni station and Welezo station in the request, it will be better to relocate as Appendix 1.

(2) Disinfection

The contamination was found in tapped water as the result of water quality survey, proper and continuous disinfection is strongly recommended.

(3) Transmission pumps

The transmission pumps are aging and the performance is decreasing, the replacement of pumps and electric panels are recommended in the Saateni station.

6. Transmission/ Distribution pipe line

(1) Minimum earth cover

Minimum earth cover shall be 0.8 m in principle.

7. Equipment

(1) Pickup trucks

Four pickup trucks are strongly requested by DWD. The specification is as follows;

Double cabin, 4WD, 2500 cc grade 4 units

(2) Workshops and laboratory

Equipment for workshops and laboratory is requested but the priority is lower than boreholes, reservoirs/tanks and transmission/distribution pipeline.

8. House Connection

House connection has been implemented by DWD and more than 240,000 people can be connected at present. DWD has enough ability to conduct house connection and other piping works.

9. Soft Component

The necessity of following fields of soft component was recognized.

Organization development related with the technical assistance program

Operation and maintenance of Water supply facilities

10. Obligations of Zanzibar side

DWD will undertake the land acquisition, fencing, power supply, etc. according to the Minute of Discussions signed on 28 October 2004, Annex-V.

11. Standards

Japanese standards including JIS, JWWA can be adopted as an international standards as BS, ISO, DIN.

12. Scope of Work of the Japanese Grant Aid

The Team explained that all the scope of the Project may not be implemented by Japanese Grant Aid.

The priority of the component is as follows;

(1) Boreholes/ Transmission pipeline/ Reservoirs

(2) Distribution pipelines

(3) Equipment for workshop and laboratory

The priority of the area of reservoir is as follows;

(1) Welezo station

(2) Dole station

(3) Kinuni station

(4) Saateni station

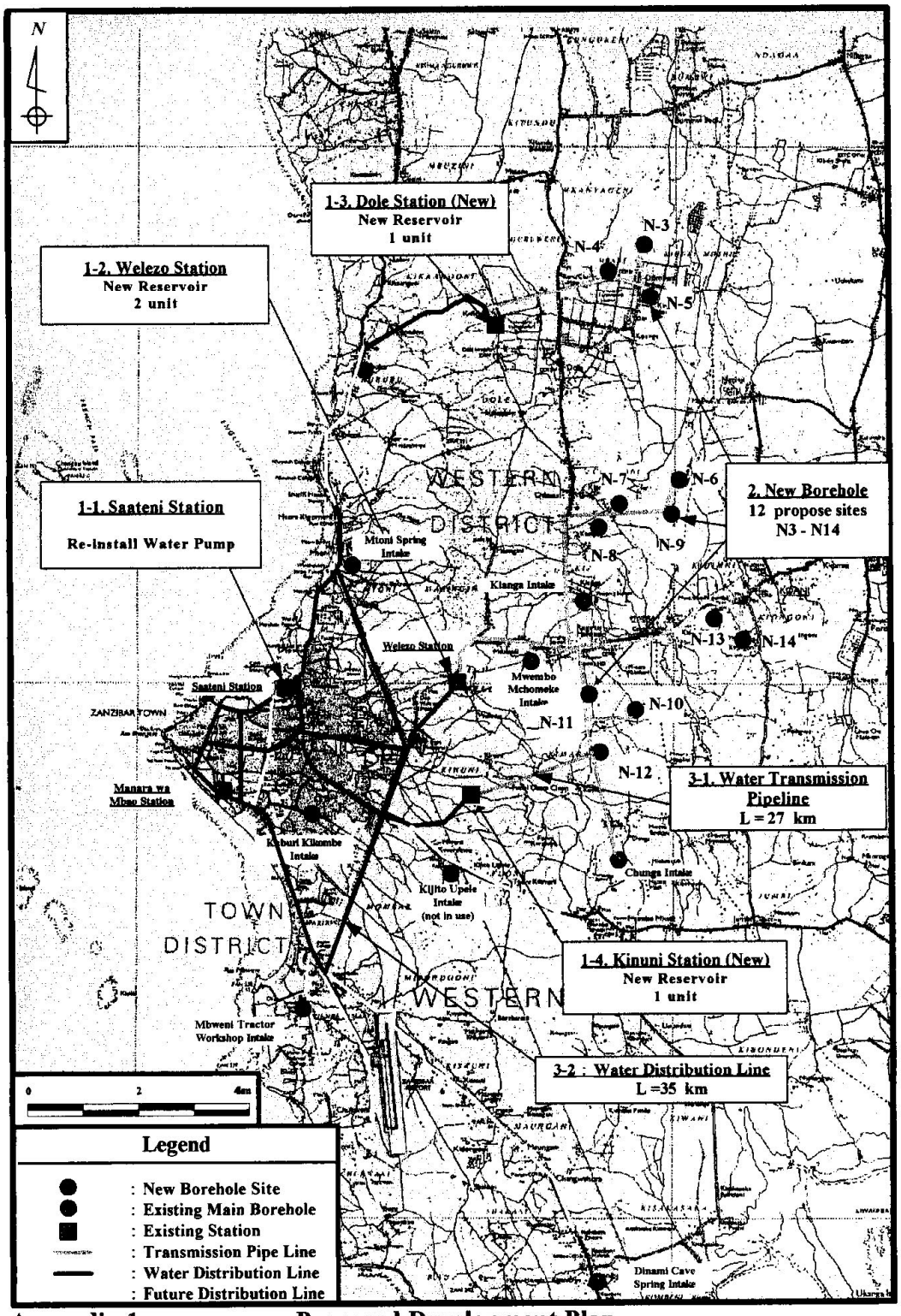
The component is summarized in Appendix 2

13. EIA

The Team confirmed to DWD that EIA for this project can be conducted by Zanzibar side, Department of Environment.

Appendix-2

Number	Item	Request	Study Result	Remarks
A	Facilities			
A 1	Reservoir Construction			
A 1-1	Saateni Station			
(1)	Construction of Underground Reservoir	4,000 $m^3 \times 1$	—	Modification of Distribution system
(2)	Re-Construction of Overhead Water Tank	450 $m^3 \times 2$	—	DWD is repairing
(3)	Construction of Overhead Water Tank	450 $m^3 \times 2$	—	Modification of Distribution system
(4)	Re-installation of Centrifugal Water Pump Set	540 $m^3/hr \times 2$ 250 $m^3/hr \times 2$	Approx. 400 $m^3/hr \times 2$ 200 $m^3/hr \times 2$	(1 stand-by for each capacity included)
(5)	Construction of Chlorination System	1 set	1 set	
A 1-2	Welezo Station			
(1)	Construction of Reservoir	4,000 $m^3 \times 1$ 3,000 $m^3 \times 2$	Approx. 4,000 $m^3 \times 2$	Modification of Distribution system
(2)	Construction of Chlorination System	1 set	1 set	
A 1-3	Dole Station	—		Modification of Distribution system
(1)	Construction of Reservoir		Approx. 1,200 $m^3 \times 1$	
(2)	Construction of Chlorination System		1 set	
A 1-4	Kinuni Station	—		Modification of Distribution system
(1)	Construction of Reservoir		Approx. 2,700 $m^3 \times 1$	
(2)	Construction of Chlorination System		1 set	
A 2	Borehole Construction	100 $m^3/hr \times 6$ sets	60 $m^3/hr \times 10$ sets +stand-by1 set	12 candidate sites were surveyed
A 3	Network Construction			
A 3-1	Transmission Pipeline	Length approx. 20km	Length approx. 27km	D=150 ~ 600
A 3-2	Distribution Pipeline	Length approx. 35km	Length approx. 35km	D=200 ~ 600
B	Equipment			
B1	Water Laboratory Equipment	1 set	—	
B2	Workshop Equipment	1set	Pickup Trucks 4 units	- Pump maintenance - Laboratory & Chlorine - Pipe repair - Monitoring



Appendix-1 Proposed Development Plan

Zanzibar Urban Water Supply Depelopment

List of Land Owner

Facility	Place	Land Owner
(Boreholes)		
N-3	Kinu Moshi	Government
N-4	Kizinbani	Government
N-5	Kizinbani	Government
N-6	Chemani	Government
N-7	Chemani	Government
N-8	Kianga	Government
N-9	Kianga	Government
N-10	Chunga	Government
N-11	Chunga	Government
N-12	Chunga	Government
N-13	Koani	Government
N-14	Koani	Government
(Distribution Reservoirs)		
Welezo New Reservoir No.1	Welezo (beside hospital)	Government
Welezo New Reservoir No.2	Welezo (beside existing reservoir)	Government
Dole New Reservoir	Dole	Government (Zanzibar Vocational School)
Kinuni New Reservoir	Kinuni	Government (Military security area)
(Elevated Tanks)		
Sateeni New Tank	Sateeni Waterworks	Government
Mazizini New tank	Mazizini	Government (Islamic Academy)
(Transmission Pipeline)		
N-3 to road		Government
N-4 to road		Government
N-5 to road		Government
N-6 to road		Government
N-7 to road		Government
N-8 to road		Government
N-9 to road		Government
N-10 to road		Government
N-11 to road		Government
N-12 to Kinuni Reservoir		Government
N-13 to road		Government
N-14 to road		Government
(Distribution Pipeline)		
Urban area		Government
Urban extension area		Government
Peri-urban area		Government