Annex 4:

Technical Notes

Technical Notes
on
Quarterly Project Meeting (4th Quarter of 2014)
for
The Federal Capital Territory
Reduction of Non-Revenue Water Project

16th December 2014

At the beginning of the Quarterly Project Meeting, Mr. Hudu Bello, Project Manager, Chairperson of the meeting gave a remarks addressing importance of this regular meeting for continuous information sharing and discussions.

As a result of discussions, members confirmed the matters mentioned below:

1. **Location and Construction of Chamber for Ultrasonic Flow Meter at outlets of Water Treatment Plant (Phase 1&2)**

   Technical members of NRW Management Team and JICA Expert Team confirmed location and basic design of chambers, and also confirmed that JICA Expert Team will prepare detail design drawing, bill of quantities and basic specification by the end of February 2015.

2. **System Modification of Billing System**

   The billing system is getting expired, and its fundamental review is needed. It is also difficult to calculate total consumption by system modification only because a lot of flat-rate connections, uncaptured AMR meters, malfunctioning or bypassing of prepaid meters exists. Therefore, FCTWB and JICA Expert Team confirmed that both sides continue to discuss how to deal with it for the best solution.

3. **Creation of PMAs and Selection Criteria for Pilot Project**

   Technical members of NRW Management Team and JICA Expert Team confirmed created PMAs, selection criteria and selected PMAs for pilot project implementation.

4. **Capacity Assessment and Capacity Development Plan**

   JICA Expert Team will analyze results of capacity assessment, and prepare capacity development plan, then submit it to the management of FCTWB in March 2015.

5. **Equipment to be procured by JICA**

   The management of FCTWB and JICA Expert Team confirmed the updated list of equipment, which will be submitted to JICA.

Appendix: Documents distributed, List of Equipment and Attendance List

Mr. Hudu Bello
Project Manager,
Director, Federal Capital Territory Water Board,
Federal Republic of Nigeria

Mr. Akinori Miyoshi
Chief Advisor for
FCT Reduction of NRW Project
Japan International Cooperation Agency (JICA)

Federal Capital Territory Administration (FCTA)
Federal Capital Territory Water Board (FCTWB)
assisted by
Japan International Cooperation Agency (JICA)

THE FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER PROJECT

PROGRAMME/AGENDA FOR

1ST MONTHLY TECHNICAL MEETING AND 1ST QUARTERLY MEETING

Venue: Board Room, Headquarters of FCTWB, Area 3, Garki, Abuja
Date: Tuesday, 16th December 2014

11:00 - 11:10 Introduction
11:10 - 12:30 Project Progress, Plan and Issues
- Location and design of chambers for bulk flow meters at outlets of WTP (Phase-1&2)
- System modification of billing system
- Creation of PMAs and SMAs
- Capacity Assessment and Development Plan
- Quantity and specification of equipment to be procured
- Short-term schedule of the Project (Procurement, Construction)
- Procedures of tax exemption or refund
- Project office

12:30 – 12:40 Input from JICA Nigeria Office
12:40 - 13:00 Conclusions

Monthly Technical Meeting
Chairperson: Coordinator
NRW Management Team (excluding Technical Managers) and Area Managers
JICA Experts

Quarterly Meeting
Chairperson: Project Manager
Deputy Project Manager and Technical Managers
NRW Management Team and three Area Managers
JICA Experts
Representative of JICA Nigeria Office

Attendance List

20141216

No	Position in the Project	Name	Title in FCTA/FCTWB or other
1	Project Director	Mr. Ari, Isa Muhammad	Director of EPRS, FCTA
2	Project Manager	Mr. Hudu Bello	Director of FCTWB
3	Deputy PM	Mr. S.T Bello	Head of Administration and Supply Department, FCTWB
4		Hafsat Ahmed Lawi	Head of Finance and Accounts Department
5		Aliyu Usman	Head of Reservoir and Production Department
6		Bunmi Olowookere	Head of Planning, Research and Statistics Unit
7		Abbas A. Ahmed	Head of Public Relations Unit
8		Vincent Obeh	Head of Management Information System Unit
NRW Management Team			
9	Technical Manager	Engr. A. A. Nahuche	Head of Distribution Department, FCTWB
10	Technical Manager	Mr. Adis S. Muhammad	Head of Commerce Department, FCTWB
Distribution Department			
11	Coordinator	Abolade. R. Lawal	Head of Special Projects Unit
12		Moh. Kabir Rabiu	Head of Logistics Unit
13		Musa Dikko	Head of Pipeline Unit
14		Shehu Suleiman	Head of GIS Unit
15		Douglas E. Oloton	Head of Metering General
16		A.O. Akande	Head of Metering Unit (AMR Meter)
17		Yetunde Olaniyan	Head of Water Monitoring Unit
18		Abdullahi Masaud	Head of Metering Unit (Pre-paid Meter)
19		Abubakar Ubale Abubakar	Civil Engr. II, Logistics Unit,
20		Mohammed Dauda	Technical Officer, Pipeline Unit
21		Ezeh Hilary	Surveyor, GIS Unit
Commerce Department			
22		Isaac O. Owolabi	Head of Customer Care Unit
23		Danjuma Isah	Head of Monitoring and Detection Unit
24		Taiwo Adeyemi	Monitoring staff, Monitoring and Detection Unit
25		Aliyu Maradun	Head of Major Consumers Unit
26		Rose Akpan	Head of Billing Unit
Administration and Supply Department			
27		Francisca Samuel	Head of Training/ Welfare Unit
28		Akudike Ike D.	Head of Facility Management Unit
NRW Action Team			
Jabi Area Office			
29	Team Leader	Muhammed A. S. Ramat	Area Manager (Distribution)
30		Sadiq Salihu	Assistant Area Manager (Distribution)
31		Abawonse J. K	Assistant Area Manager (Commerce)
Gudu Area Office			
32	Team Leader	Abdurrahaman U. Sanda	Area Manager (Distribution)
33		Ogbu O. Williams	Assistant Area Manager (Commerce)
34		Abdul Ozumi	Assistant Area Manager (Distribution)
Garki I Area Office			
35	Team Leader	Adesoji Adenuga	Area Manager (Commerce)
36		Umar Ibrahim	Assistant Area Manager (Commerce)
37		Mohammed Gana	Assistant Area Manager (Distribution)

Schedule of Activities

16th December 2014

		Phase-1									Phase-2				
		2014	2015				2016				2017				2018
		4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st
Activities for Output-1: Level of NRW of the service area of FCTWB is monitored regularly.															
1-1	Install bulk meters to water treatment plants 1 and 2.														
1-2	Measure monthly water production of water treatment plants 1, 2, 3, and 4.														
1-3	Tally the above water production data monthly.														
1-4	Calculate the monthly water consumption based on the billing data.														
1-5	Calculate monthly NRW ratio of the service area of FCTWB using the data obtained from Activity 1-3 and 1-4.														
Activities for Output-2: Methods/operational procedures for effective NRW reduction are established through pilot projects at PMAs under pilot Area Offices.															
2-1	Review existing NRW reduction operations at each pilot Area Office.														
2-2	Conduct capacity assessment of the relevant staff of each pilot Area Office.														
2-3	Identify and select a Pilot Metering Area (PMA) for each pilot Area Office based on the selection criteria of PMA.														
2-4	Prepare/update distribution network drawings for each PMA.														
2-5	Install water flow meters to each PMA and measure in/outflows monthly.														
2-6	Zone each PMA into Sub Metering Areas (SMA).														
2-7	Isolate a SMA by installing valves.														
2-8	Update the distribution network drawings for each SMA.														
2-9	Measure an initial level of NRW of each SMA.														
2-10	Detect target NRW components (i.e. invisible leakage, customer meter malfunction, and illegal connection) of each SMA.														
2-11	Develop a NRW reduction operation plan of each SMA, including reduction target, for review by Head of Distribution Department.														
2-12	Review and approve NRW reduction operation plan of each SMA.														
2-13	Implement the NRW reduction operations at each SMA.														
2-14	Monitor the progress of the NRW reduction operations of each SMA.														
2-15	Measure level of NRW of each SMA at the end of the respective operations.														
2-16	Prepare a report on pilot projects, covering Activity 2-1 to 2-15.														
2-17	Develop manuals for NRW reduction for Area Office managers and field operators, including audio visual materials.														
Activities for Output-3: A medium-term strategic plan of FCTWB for NRW reduction is developed, utilizing the results of Output-1&2.															
3-1	Establish a Working Group for NRW planning.														
3-2	Review existing plans, implementation structure, on-the-job training mechanism, etc. related to NRW reduction at FCTWB.														
3-3	Conduct hydraulic and water pressure distribution analyses of the pipeline														
3-4	Develop outlines of the medium-term strategic plan and its annual NRW reduction														
3-5	Develop the first medium-term strategic plan (2018-2022) for approval by FCTA.														
3-6	Develop an annual NRW reduction plan based on the strategic plan as an integral part of an annual recurrent and capital plan of FCTWB for approval by FCTA.														
3-7	Develop a planning manual for NRW reduction.														

Annual Plan of Operation

16th December 2014

Project Title: The Federal Capital Territory Reduction of Non-Revenue Water Project

Activities

				2014 Oct. 1	Nov 2	Dec 3	Jan 4	Feb 5	2015 Mar 6	Apr 7	May 8	Jun 9	Jul 10	Aug 11	Sep 12
Output-1															
Level of NRW of the service area of FCTWB is monitored regularly	1-1	Install bulk meters to water treatment plants 1 and 2	W/P		Survey				Installation						
			Actual												
		Field survey and design													
		Contract and construction of chamber													
		Installation, commissioning and training													
	1-2	Measure monthly water production of water treatment plants 1, 2, 3, and 4	W/P												
			Actual												
		Development of record forms													
		Measurement													
	1-3	Tally the above water production data monthly	W/P												
			Actual												
		Development of tallying process													
		Tallying													
	1-4	Calculate the monthly water consumption based on the billing data	W/P		Review				System Modification						
			Actual												
		Review of existing system													
		Specification and System Modication													
		Calculation													
	1-5	Calculate monthly NRW ratio of the service area of FCTWB using the data obtained from Activity 1-3 and 1-4	W/P												
			Actual												
		Development of process													
		Calculation and Reporting													
Output-2															
Methods/operational procedures for effective NRW reduction are established through pilot projects at Pilot Metering Areas (PMAs) under pilot Area Offices	2-1	Review existing NRW reduction operations at each pilot Area Office	W/P												
			Actual												
		Operation for leakage													
		Operation for customer meter malfunction													
		Operations for illegal connection													
	2-2	Conduct capacity assessment of organization and the relevant staff	W/P		Baseline										
			Actual												
		Development of questionnaire/exam													
		Capacity assessment													
		Capacity devlopment planning													
	2-3	Identify and select a Pilot Metering Area (PMA) for each Pilot Area Office based on the selection criteria of PMA	W/P												
			Actual												
		Data collection													
		Analysis (simplified hydraulic analysis)													
		Identification and selection													
	2-4	Prepare/update distribution network drawings for each PMA	W/P												
			Actual												
		Data collection and visualization													
		Data input (including elevation)													
		Printing													
	2-5	Install water flow meters to each PMA and measure in/outflows monthly	W/P												
			Actual												
		Location identification													
		Construction of chamber													
		Installation and functioning check													
	2-6	Zone each PMA into Sub Metering Areas (SMA)	W/P												
			Actual												
		Data collection													
		Analysis													
		Zoning													
	2-7	Isolate a SMA by installing valves	W/P												
			Actual												
		Location identification													
		Construction of chamber													
		Installation and functioning check													
	2-8	Update the distribution network drawings for each SMA	W/P												
			Actual												
		Data collection													
		Data input													
		Printing													
	2-9	Measure an initial level of NRW of each SMA	W/P												
			Actual												
		Measure in/outflows													
		Survey water consumption													
		Calculate NRW ratio													
	2-10	Detect target NRW components (i.e. invisible leakage, customer meter malfunction, and illegal connection) of each SMA	W/P												
			Actual												
		Detect leakage													
		Detect customer meter malfunction													
		Detect illegal connection													
	2-11	Develop a NRW reduction operation plan of each SMA, including reduction target for review by Head of Distribution Department	W/P												
			Actual												
		Data compilation													
		Planning													

before Presidential Election on 14th February

Annual Plan of Operation

16th December 2014

Project Title: The Federal Capital Territory Reduction of Non-Revenue Water Project

	2-12	Review and approve NRW reduction operation plan of each SMA	W/P	
			Actual	
		Review		
		Approval		
	2-13	Implement NRW reduction operations at each SMA	W/P	
			Actual	
		Operation for leakage		
		Operation for customer meter malfunction		
		Operation for illegal connection		
	2-14	Monitor the progress of the NRW reduction operations of each SMA	W/P	
			Actual	
		Operation for leakage		
		Operation for customer meter malfunction		
		Operation for illegal connection		
	2-15	Measure level of NRW of each SMA at the end of the respective operations	W/P	
			Actual	
		Measure in/outflows		
		Survey water consumption		
		Calculate NRW ratio		
	2-16	Prepare a report on pilot projects, covering Activity 2-1~2-15	W/P	
			Actual	
		Development of contents and roles		
		Data compilation		
		Reporting		
	2-17	Develop manuals for NRW reduction for Area Office managers and field operators (i.e. technical officers and meter readers), including audio visual materials	W/P	
			Actual	
		Development of contents and roles		
		Drafting and compilation		
		Revision / finalization		
Output-3				
A medium-term strategic plan of FCTWB for NRW reduction is developed, utilizing the results of Output-1&2	3-1	Establish a Working Group for NRW reduction planning	W/P	
			Actual	
		Member listing/ re-listing		
		Approval / reconfirmation		
	3-2	Review existing plans, implementation structure, on-the-job training mechanism, etc. related to NRW reduction at FCTWB	W/P	
			Actual	
		Information collection		
		Review		
	3-3	Conduct hydraulic and water pressure distribution analyses of the pipeline networks	W/P	
			Actual	
		Data Collection and Input		
		Calibration and Analysis		
		Evaluation		
	3-4	Develop outlines of the medium-term strategic plan and its annual NRW reduction plan (approval by the Director)	W/P	
			Actual	
		Contents and roles		
		Outlines		
		Approval		
	3-5	Develop the first medium-term strategic plan (2018-2022) for approval by FCTA	W/P	
			Actual	
		Drafting and compilation		
		Revision / finalization		
	3-6	Develop an annual NRW reduction plan based on the strategic plan as an integral part of an annual recurrent and capital plan of FCTWB for approval by FCTA	W/P	
			Actual	
		Contents and roles		
		Drafting and compilation		
		Revision / finalization		
	3-7	Develop a planning manual for NRW reduction	W/P	
			Actual	
		Development of contents and roles		
		Drafting and compilation		
		Revision / finalization		

Annual Plan of Operation

16th December 2014

Project Title: The Federal Capital Territory Reduction of Non-Revenue Water Project

Inputs (the Japanese side)

			2014 Oct. 1	Nov 2	Dec 3	Jan 4	Feb 5	Mar 6	Apr 7	May 8	Jun 9	Jul 10	Aug 11	Sep 12
JICA Expert														
1	Akinori MIYOSHI	W/P												
	Chief Advisor / NRW Reduction Planning	Actual												
2	Taketoshi FUJIYAMA	W/P												
	Deputy Chief Advisor / NRW Reduction Planning	Actual												
3	Toru TOYODA	W/P												
	NRW Reduction Operations Management	Actual												
4	Kiyoshi KIYAMA	W/P												
	Leakage Detection Technology	Actual												
5	Takuji OKUBO	W/P												
	Commercial Loss	Actual												
6	Shinta SEGAWA	W/P												
	Hydraulic Analysis / GIS	Actual												
7	Kazuhiro ISHIURA	W/P												
	Procurement Management / Coordinator	Actual												
Equipment														
1	Leakage detection equipment	W/P				Tender & Delivery								
	*3PMAs in Japan (JICA)	Actual												
2	Bulk meters (ultrasonic flow meter)	W/P				Tender								
	*WTP in Japan (JICA Expert)	Actual												
3	Water meter, flow meter and valves	W/P					Tender & Delivery							
	*3PMAs in Nigeria (JICA Expert)	Actual												
4	Pipe repair equipment	W/P												
	*3PMAs in Nigeria (JICA)	Actual												
5	Vehicles (Pickup truck)	W/P												
	*Leakage Detection in Nigeria (JICA)	Actual												
6	GIS software, office equipment	W/P												
	*FCTWB HQs in Nigeria (JICA)	Actual												
Local Consultant														
1	Modification of billing and collection System	W/P												
		Actual												
2	GIS and database training	W/P												
		Actual												
Training in Japan		W/P												
		Actual												

Duration / Phasing

		W/P	Phase-1 (Oct 2014 - Dec 2016, 27 months)											
		Actual												

Monitoring Plan

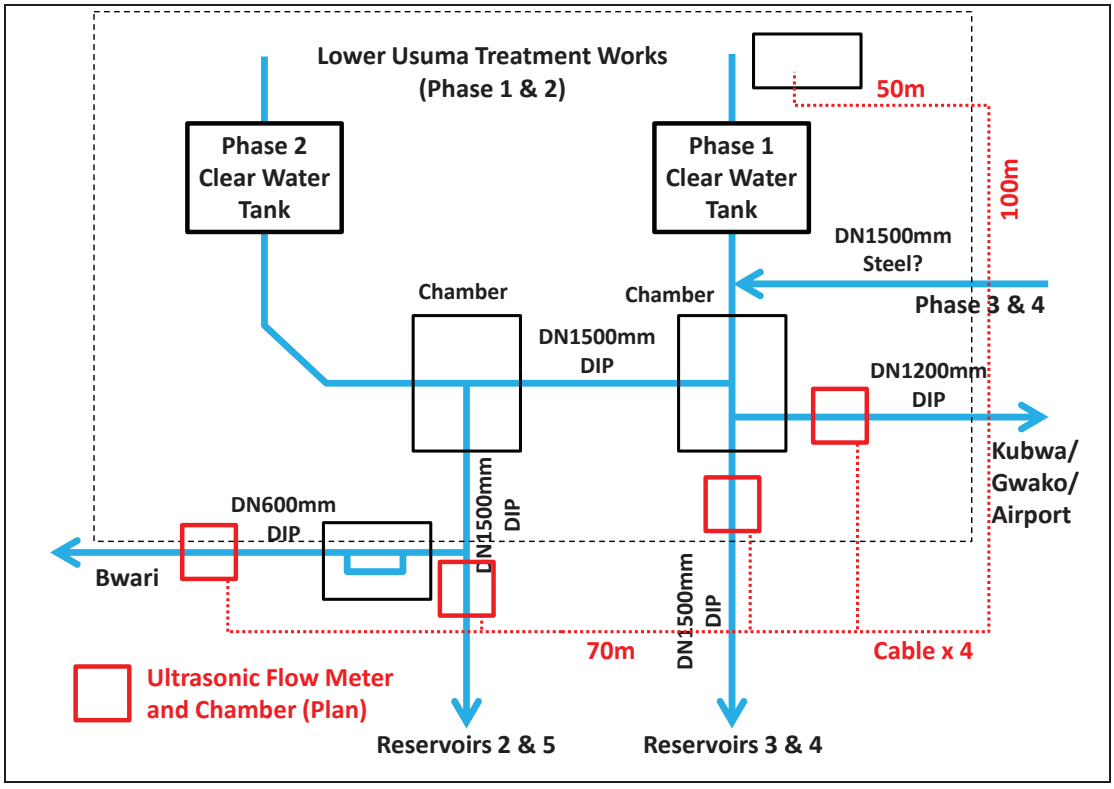
			2014 Oct. 1	Nov 2	Dec 3	Jan 4	Feb 5	Mar 6	Apr 7	May 8	Jun 9	Jul 10	Aug 11	Sep 12
Planning, Monitoring and Coordination														
1	Organize Joint Coordination Committee (JCC)	W/P			▲				▲					
		Actual												
2	Develop Detail Plan of Operations (DPO) for review and approval by JCC	W/P												
		Actual												
3	Develop Annual Plan of Operations (APO) for review and approval by JCC	W/P												
		Actual												
4	Organize monthly technical meetings	W/P			▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
		Actual												
5	Organize quarterly project meetings	W/P			▲				▲			▲		
		Actual												
6	Conduct Joint Monitoring semi-annually	W/P												
		Actual												
7	Submit Monitoring Sheet to JICA Nigeria Office semi-annually	W/P		▲					▲					
		Actual												
8	Monitoring Mission from JICA for Joint Review	W/P												
		Actual												
9	Organize information sharing seminars for FCTWB/FCTA, including Area Offices	W/P		Kick off	▲									
		Actual												
10	Collect and organize data for Indicators of PDM													
a	Develop criteria for capacity assessment for each level of the relevant staff (i.e. members of NRW Mgmt and Action Teams)	W/P												
		Actual												
b	Conduct joint capacity assessment of the relevant staff ※Prepare Capacity Development (CD) Plan	W/P		Baseline										
		Actual												
c	Set reduction target for each PMA by the first quarter of the second year	W/P												
		Actual												
d	Collect and organize for Indicators for semi-annual Joint Monitoring	W/P												
		Actual												
Reports / Documents														
11	Work Plan	W/P												
		Actual												
12	Project Progress Report	W/P												
		Actual												
13	Project Completion Report	W/P												
		Actual												
Public Relations														
14	Develop Project Website	W/P												
		Actual												
15	Prepration of public relations materials	W/P												
		Actual												
Monitoring and Evaluation in the Post-Project period														
16	Post Monitoring by JICA (not described here)													
17	Post Evaluation by JICA (not described here)													

One month before Presidential Election on 14th February

Location and Design of Chambers for Ultrasonic Flow Meter
at Outlets from Lower Usuma Water Treatment Plant (Phase-1&2)

1. Location

2. Schematic



3. Drawing of Chamber

See the next page.

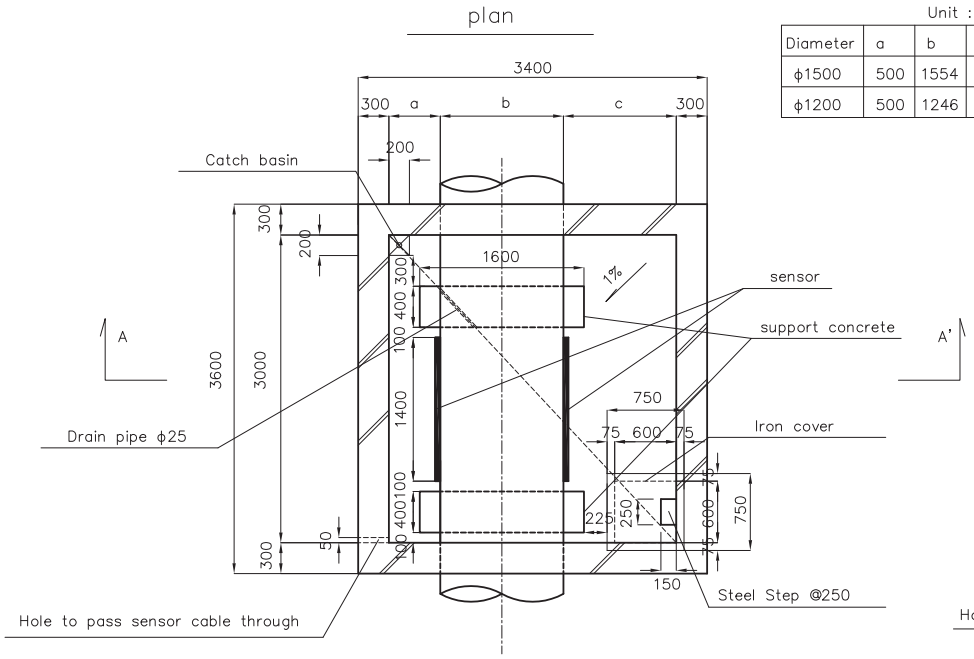
4. Issues

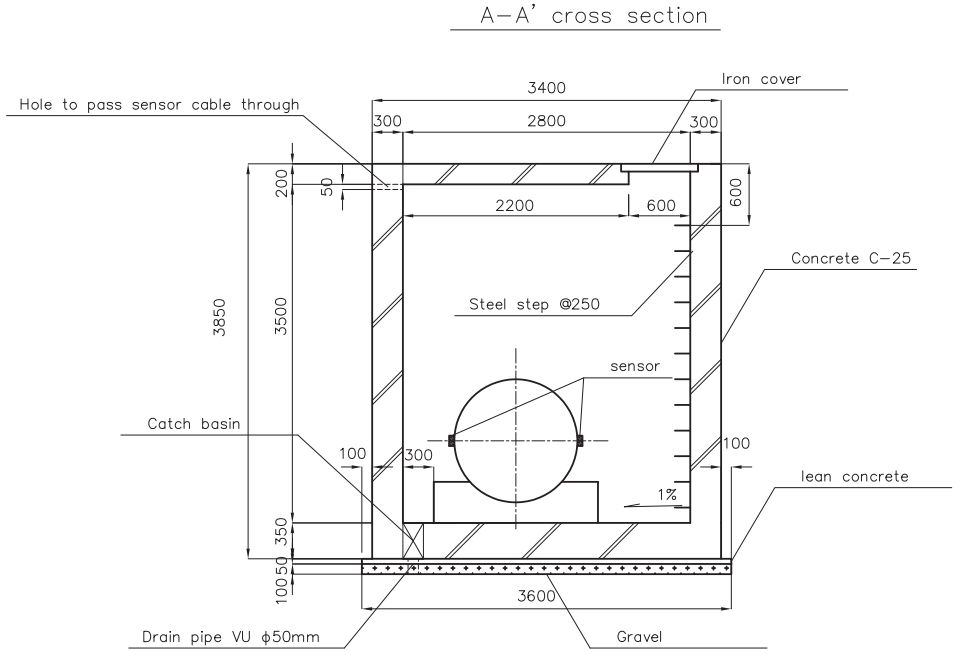
Schedule, detail design, specification, tender (if needed), materials, construction and installation

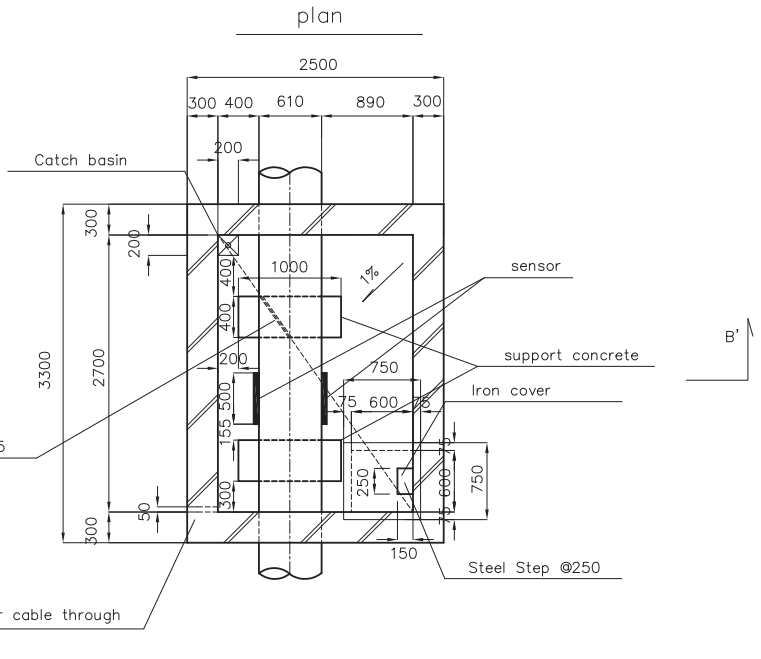
Bulk flow Meter chamber of ϕ1500, ϕ1200

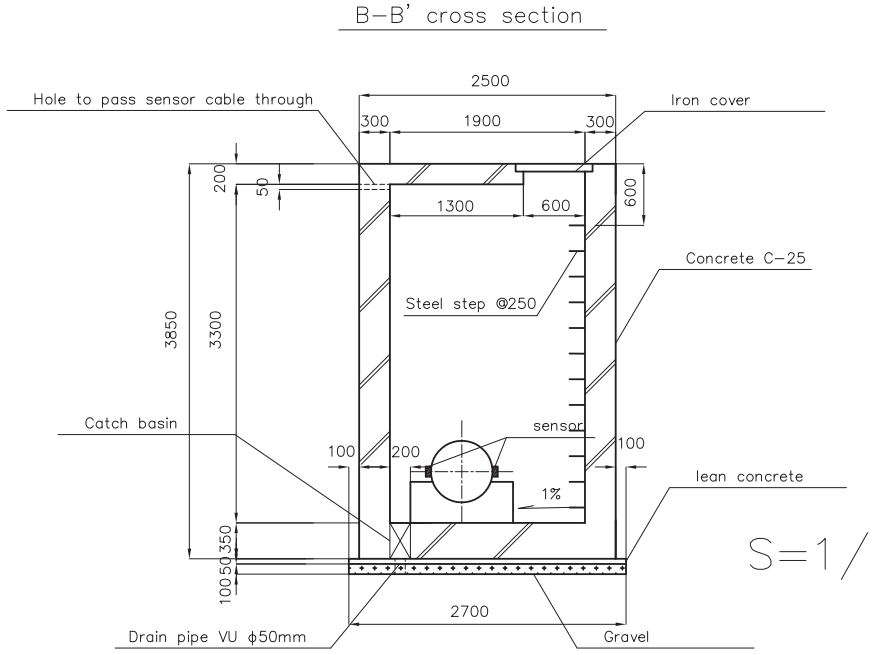
Unit : mm

Diameter	a	b	c
ϕ1500	500	1554	746
ϕ1200	500	1246	1054









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Annex4-9

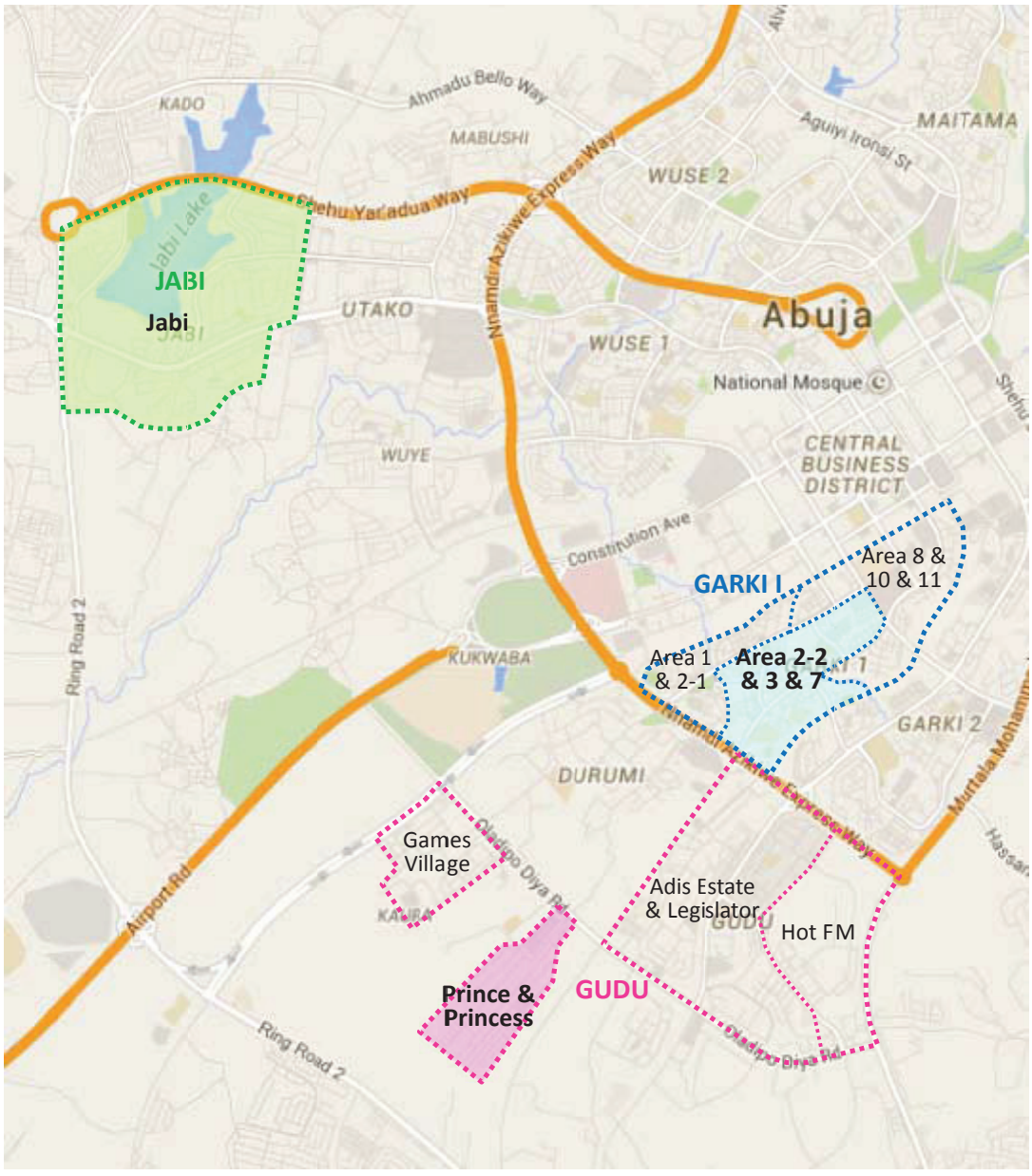
16th December 2014

Creation of Pilot Metering Areas (PMAs)

Pilot Metering Areas (PMAs)

Area	PMA-1	PMA-2	PMA-3	PMA-4
GARKI I	Area 1 & 2-1	**Area 2-2 & 3 & 7**	Area 8 & 10 & 11	-
GUDU	Hot FM	Adis Estate & Legislator	**Prince & Princess**	Games Village
JABI	**Jabi**	-	-	-

Location Map of Pilot Metering Areas (PMAs)



Source: Google Map

Selection Criteria of PMA

No.	PMAs	Security Condition			Leakage Condition			Condition of Network Drawing and Data			Number of Customers			Easily Measurement of Flow Rate			Types of Water Meter			Total Score
		A	-		B	-		C	-		-	D		-	E		-	F		
		Difficulty to take NRW Reduction Operations	Total Score	Weighting Factor (x 35%)	Leakages	Total Score	Weighting Factor (x 30%)	Existing Drawing	Total Score	Weighting Factor (x 15%)	Total Number of Customers *	Total Score	Weighting Factor (x 10%)	Number of Inlets and Outlets	Total Score	Weighting Factor (x 5%)	Number of Water Meters (Mechanical for Jabi AMR for Garki-I Pre-paid for Gudu)	Total Score	Weighting Factor (x 5%)	
Garki-I																				
1	Area 1 & 2-1	2	2	0.70	1	1	0.30	3	3	0.45	2,061	2	0.20	1	3	0.15	1,457	3	0.15	**1.95**
2	Area 2-2 & 3 & 7	3	3	1.05	2	2	0.60	3	3	0.45	1,376	3	0.30	2	2	0.10	741	2	0.10	**2.60**
3	Area 8 & 10 & 11	2	2	0.70	2	2	0.60	3	3	0.45	1,215	3	0.30	2	2	0.10	651	1	0.05	**2.20**
Gudu																				
1	Hot FM	3	3	1.05	1	1	0.30	1	1	0.15	593	1	0.10	1	3	0.15	450	1	0.05	**1.80**
2	Adis Estate & Legislator	2	2	0.70	1	1	0.30	2	2	0.30	1,092	3	0.30	2	2	0.10	450	1	0.05	**1.75**
3	Prince & Princess	3	3	1.05	3	3	0.90	2	2	0.30	1,102	3	0.30	1	3	0.15	750	3	0.15	**2.85**
4	Games Village	3	3	1.05	1	1	0.30	2	2	0.30	665	1	0.10	2	2	0.10	665	2	0.10	**1.95**
Jabi																				
1	Jabi	3	3	1.05	2	2	0.60	2	2	0.30	862	1	0.10	2	2	0.10	-	3	0.15	**2.3**

Note:
A: Not Serious: 3, Serious: 2, Very Serious: 1
B: Very Serious: 3, Serious: 2, Good: 1
C: Well-existing: 3, Partially Existing: 2, Non-existing: 1
D: 1,000 to 1,500 customers (Based on index mentioned in RD): 3, More than 1,500 customers: 2, Less than 1,000 customers: 1
E: One Place: 3, Two Places: 2, At Least Three Places: 1
F: Many: 3, Medium: 2, A Few: 1

* Commercial customers of Area 8 & 11 in Garki-I are not included in the total number of customers.

PMA with the highest score highlighted in color is selected for the Pilot Project in each Area.

List of Equipment for the Project

No.	Equipment	Specification	County to Purchase		Quantity	Remarks
			Japan	Nigeria		
For Activity 1-2						
1	Ultrasonic flow meter	fixed type, including cable (220m x 4 sets), Sensors: large-size x 4	●		4	including installation, commissioning and training
2	Data logger		●		4	
For Activity 2-4 and 2-8						
1	GIS software			●	2	Geomedia x 1 and ArcGIS x 1 have been proposed by FCTWB
2	Plotter (A0)	A0		●	1	
3	GPS terminal	Handset, tracking type, data transferable through USB cable		●	2	Built-in camera type preferable.
4	Personal computer	500HD, 4 GB Ram, Window 7or8, Microsoft Office installed, Mouse		●	2	
5	Anti-virus software			●	2	for No.4 PCs
6	UPS	1.2kVA		●	2	for No.4 PCs
For Activity 2-5						
1	Flow meter	Dia. 50, 80, 100, 150, 200, 250, 300mm including fittings (tentative)		●	-	The quantity will be decided after Activity 2-4
For Activity 2-7						
1	Sluice valve	Dia. 50, 80, 100, 150, 200, 250, 300mm including fittings (tentative)		●	-	The quantity will be decided after Activity 2-4
For Activity 2-10						
1	Ultrasonic flow meter	Portable type. Sensors: large-size x 3, medium-size x 6, small-size x 3	●		6	
2	Water pressure data logger	2ch	●		6	
3	Water leak detector	Leak noise correlator	●		2	
4	Water leak detector	Acoustic type	●		6	
5	Non-metal pipe locator	Electromagnetic induction type	●		3	
6	Metal locator		●		3	
7	Time integral water leakage detector		●		3	
8	Acoustic rod	1.5m	●		9	
9	Distance meter		●		3	
10	Hammer drill	Dia. 38mm	●		3	
11	Boring bar	1.0m	●		3	
12	Drill bit	Dia.19×800mm	●		9	
13	Residual chlorine analyzer	Portable type	●		3	
14	Metal pipe and cable locator		●		3	
15	Reference meter	Portable type, 13-25mm	●		3	for checking customer meters
16	Leakage Quantity Measurement Device		●		3	for checking quick effect by leakage repair
17	Personal computer	500HD, 2GB Ram, Window 7or8, Microsoft Office installed, Mouse		●	3	for checking collected data and reporting in pilot Area Offices
18	Anti-virus software			●	3	for No.17 PCs
19	UPS	1.2kVA		●	3	for No.17 PCs
20	Inkjet printer	A4, Color, All-in-one		●	3	
21	Digital camera			●	3	
For Activity 2-13						
1	Generator	200V, 3-Phase, 2.4kVA		●	3	
2	Asphalt cutter	3600RPM, 13kW		●	3	
3	Concrete breaker			●	3	
4	Small-sized dewatering pump	2"		●	3	
5	Small-sized tamper			●	3	
6	Electric drum	30-50m		●	3	
7	Customer meter	Dia. 2/3", 1" (tentative)		●	-	The quantity will be decided after Activity 2-4
For Output 2						
1	Pickup truck for pilot sites			●	2	
For Operation of the Project						
1	Laser printer	A4, B/W		●	1	
2	Inkjet printer	A3, Color		●	1	
3	Multifunction copier	A3, B/W		●	1	
4	Graphic/movie editing software			●	1	

Technical Notes
on
Technical Meeting
for
The Federal Capital Territory
Reduction of Non-Revenue Water Project

10 March 2015

At the beginning of the Technical Meeting, Engr. A. A. Nahuche, (Technical Manager), as the Chairperson of the meeting gave a remark on process of installation of flow meters and valves and their chamber construction.

Mr. Fujiyama, JICA Expert Team explained the necessity and tentative location of the bulk flow meters at outlets of Water Treatment Plant, PMA flow meters and valves required for isolation & step-test, and types of their draft chamber structure. In addition, he requested the technical members to appoint staff who would have site reconnaissance to identify location of the chambers and assist in Bill of Quantity (BQ) of the chambers.

Technical members and JICA Expert Team confirmed the following assignment:

1. **Location of the Bulk Flow Meters and Valves and their Chamber Structure**

   Technical members confirmed the tentative location of the bulk flow meters at outlets of Water Treatment Plant and PMA flow meters and valves and all the chamber structure.

2. **Identification of Chamber Location**

   In order to identify exact location of the chambers at the site, the Technical Manager appointed some staff among the technical members present to that effect.

3. **BQ of Chamber Structure**

   The Technical Manager also appointed Engr. Mumini A. Raifu to assist JICA Expert Team in preparation of BQ of chamber structure. He will start preparation of BQ after site reconnaissance.

Finally, technical members and JICA Expert Team agreed to hold the wrap-up meeting to report the identified location of the all the chambers in the third week of March.

Annex: Attendance List
Documents distributed: Location Plan View of Chambers, Chamber Drawings and List of Equipment

Eng. A.A. Nahuche
Technical Manager
Federal Capital Territory Water Board,
Federal Republic of Nigeria

Mr. Akinori Miyoshi
Chief Advisor for
FCT Reduction of NRW Project
Japan International Cooperation Agency (JICA)

FEDERAL CAPITAL TERRITORY REDUCTION OF NON- REVENUE WATER PROJECT

TECHNICAL MEETING

DATE: 10TH MARCH 2015 VENUE: FCTWB

ATTENDANCE LIST

S/N	NAME	TITLE	TELEPHONE	EMAIL
1	Engr. A. A Nahuche	H.O.D Distribution		
2	Engr. A. R. Lawal	Head of special project unit		
3	Rabiu Kabir	Head of logistics unit		
4	Hillary Ezeh	Surveyor GIS unit		
5	Abubakar U Abuba	Civil Engr I logistic unit		
6	Kenneth Azih	Head of operation		
7	Mumini Adekunle Raifu	Structure Engr		
8	Mohammed Dauda	Technical officer Pipeline unit		
9	Fujiyama Taketoshi	JICA expert team		

Technical Notes
on
Technical Meeting
for
The Federal Capital Territory
Reduction of Non-Revenue Water Project

19 March 2015

Following the technical meeting which was held on 10 March, technical members and JICA Expert Team held another technical meeting (wrap-up meeting) on 19 March to confirm the location of the chambers, equipment, and their quantities.

At the beginning of the Technical Meeting, Engr. A.A. Nahuche, (Technical Manager), as the Chairperson of the meeting briefly introduced activities of technical members and JICA Expert Team (Site Reconnaissance).

Afterward, Engr. A. R. Lawal reported the final location identified for chambers and their structure modification to the technical meeting members and explained the provisional total quantity of ultra-sonic flow meters, mechanical flow meters and valves, etc. (see Annex-1- Annex-7). Technical members agreed on the list of equipment in principle.

On the other hand, some of the technical members requested the following:

1) An inkjet printer (For No.20 in Activity 2-10) which is planned for each area office is replaced with a laser printer (Black/White) because of saving an ink cartridge.
2) A generator of at least 10kVA is provided to operate a concrete breaker (For No.3 in Activity 2-13) in electric type.
3) An additional pick-up truck (For Activity 2-10) should be provided in order to avoid sharing trucks for pilot project activities.

JICA Expert Team explained that their requests on 1) and 2) would be examined and considered in the light of the budget in future, and the request on 3) would be reported to JICA office.

Finally, Engr. A. R. Lawal also reminded the members of demarcation of the work on procurement of chamber and equipment between FCTWB and JICA Expert Team towards NRW reduction activities (see Annex-8). The members accepted location of the chambers, their structure modification and total quantity of equipment and confirmed their role as being relevant to the Project.

Annex: Attendance List and Documents distributed

Eng. A.A. Nahuche
Technical Manager
Federal Capital Territory Water Board,
Federal Republic of Nigeria

Mr. Akinori Miyoshi
Chief Advisor for
FCT Reduction of NRW Project
Japan International Cooperation Agency (JICA)

Federal Capital Territory Water Board,
Federal Republic of Nigeria

FCT Reduction of NRW Project
Japan International Cooperation Agency (JICA)

Documents distributed:

Annex-1: List of Equipment for the Project

Annex-2: Location and Design of Chambers for Ultrasonic Flow Meter at Outlets from Lower Usuma Water Treatment Plant (Phase-1&2)

Annex-3: Overview of Location of Flow Meters and Valves

Annex-4: List of Chambers of Bulk Flow Meters at Usma Water Treatment, and PMA Flow Meters and Valves for Isolation and Step-test at each Area

Annex-5: List of Casings and Covers of Isolation Valves in PMA

Annex- 6: Conceptual Drawing of Installation of Ultra-sonic Flow Meter

Annex-7: Structure Drawings of Chambers

Annex-8: Demarcation of Work on Installation of Flow Meters and Valves

FEDERAL CAPITAL TERRITORY REDUCTION OF NON- REVENUE WATER PROJECT

TECHNICAL MEETING

DATE: Thursday 19TH MARCH 2015 VENUE: FCTWB

ATTENDANCE LIST

S/N	NAME	TITLE	TELEPHONE	EMAIL
1	S.T Bello	H.O.D Admin and supply		
2	Engr. A.A Nahuche	H.O.D Distribution		
3	Engr. A. R. Lawal	Head of special project unit		
4	Kabir Rabiu	Head of logistics unit		
5	Musa Dikko	Head of pipeline unit		
6	Abubakar U. Abuba	Civil Engr I Logistics unit		
7	Mohammed Dauda	Technical officer pipeline unit		
8	Ezeh Hillary	Surveyor GIS unit		
9	Ifechukwu I. Justin	SNR land resource office (G.I.S)		
10	Kenneth Azih	Head of operations		
11	Mohammed Gana	AAM garki I		
12	Engr mohammed Abdul Ozumi	AAM (D) gudu		
13	Salihu O. Sadiq	AAM(Dist) Jabi		
14	Taketoshi Fujiyama	JICA Expert Team		

Federal Capital Territory Administration (FCTA)

Federal Capital Territory Water Board (FCTWB)

Assisted by

Japan International Cooperation Agency (JICA)

THE FEDERAL CAPITAL TERRITORY

REDUCTION OF NON-REVENUE WATER PROJECT

PROGRAMME /AGENDA FOR TECHNICAL MEETING

Venue: Federal capital territory water board

Date: Thursday 19th march 2015

Time: 11am

1. Opening
2. Presentation

    - List of Equipment for the Project
    - Location and Design of Chambers for Ultrasonic Flow Meter at outlets from lower Usuma water treatment plant (phase 1&2)
    - Overview of Location of Flow Meters and Valves
    - List of Chambers of Bulk Flow Meter at Usuma Water Treatment, and PMA Flow Meters and Valves for isolation and Step-test at each area
    - List of Casing and Covers of Isolation Valves in PMA
    - Conceptual Drawing of Installation of Ultra-sonic Flow Meter
    - Structure Drawings of Chambers
    - Demarcation of work on Installation of Flow Meters and Valves

3. Comment / Observation

4. Closing

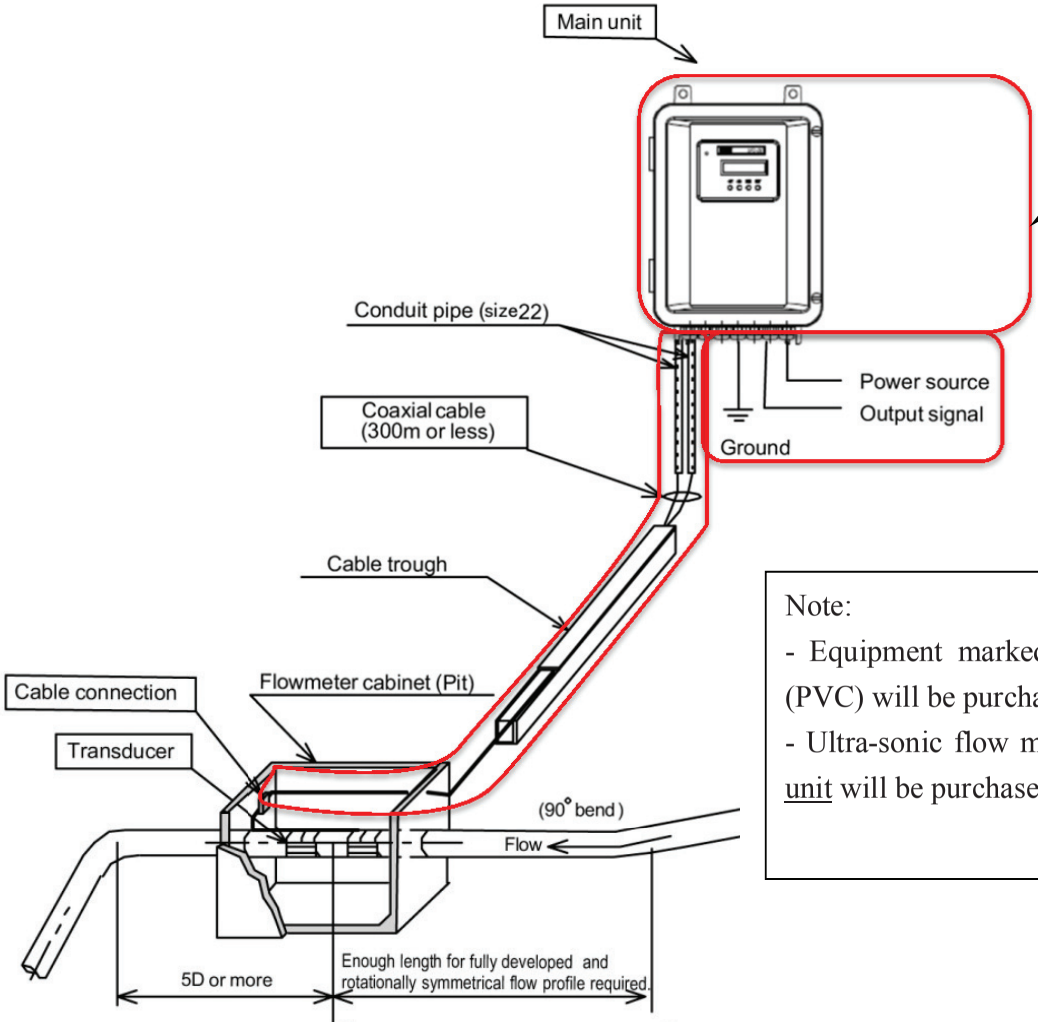
Annex-8

Demarcation of Work on Installation of Flow Meters and Valves

Work	Responsibility		
	FCTWB	Person in Charge	JICA Expert Team
1. Installation of Ultra-sonic Flow Meters at the Pipe Outlet of Usuma Water Treatment Plant			
1.1 Equipment			
● Measure coordinates of ultra-sonic flow meters and plot on Google Maps/Earth	X	Shehu S./ Ezeh Hilary	
● Purchase ultra-sonic flow meters and their accessories such as coaxial cables (220m x 2sets and 300m x 2sets)			X
● Purchase a cabinet box for a main unit and data logger and install it	X	Kabir Rabiu/ Musa Dikko	
● Purchase cable through (PVC) to protect coaxial cables	X	Kabir Rabiu/ Musa Dikko	
● Install ultra-sonic flow meters and data logger			X
● Connect coaxial cables (220mx 2sets and 300mx 2sets) from the main unit to the transducer of ultra-sonic flow meter and their data logger	X	D.E. Oloton/ Baba Yamda (Electro -mechanical Unit)	
● Connect power source to main unit of ultra-sonic flow meters and loggers	X	D.E. Oloton/ Baba Yamda (Electro -mechanical Unit)	
● Supervise above-mentioned work	X	A.R. Lawal assisted by Yetunda Olaniyan	X
1.2 Chambers			
● Prepare chamber drawings and structure analysis			X
● Prepare Bill of Engineering, Measurement and Evaluation (BEME)	X	M. A. Raifu	X
● Prepare tender documents and tender	X	A.O. Akande	
● Construct chambers and their fences including temporary works	X	Kabir Rabiu/ M. A. Raifu	
● Supervise above-mentioned work	X	A.R. Lawal assisted by Yetunda Olaniyan	X
2. Installation of Ultra-sonic Flow Meter, Mechanical Flow Meters and Valves at each PMA			
2.1 Equipment			
● Measure coordinates of flow meters and valves and plot on Google Maps/Earth	X	Shehu S./ Ezeh Hilary	
● Purchase ultra-sonic flow meter for Garki-I, mechanical flow meters, valves and their accessories such as coaxial cables (20m x 1set), pipe fittings			X
● Purchase a cabinet box for a main unit and data logger for 450mm-ultra-sonic flow meter of Garki-I	X	Kabir Rabiu/ Musa Dikko	
● Install ultra-sonic flow meters and data logger for Garki-I			X
● Install mechanical flow meters and valves	X	D.E. Oloton/ M. Dauda/ Gana	
● Connect coaxial cables (20m x 1set) from the main unit to the transducer of ultra-sonic flow meter for Garki-I (The main unit and data logger will be installed in the chamber in principle.)	X	D.E. Oloton/ Baba Yamda (Electro -mechanical Unit)	
● Connect power source to the main unit of ultra-sonic flow meters and the logger for Garki-I	X	D.E. Oloton/ Baba Yamda (Electro -mechanical Unit)	
● Supervise above-mentioned work	X	A.R. Lawal assisted by Yetunda Olaniyan	X

Work	Responsibility		
	FCTWB	Person in Charge	JICA Expert Team
2.2 Chambers			
● Prepare chamber drawings and structure analysis			X
● Prepare Bill of Engineering, Measurement and Evaluation (BEME)	X	M. A. Raifu	X
● Prepare tender documents and tender	X	A.O. Akande	
● Construct chambers including demolish of the existing chambers and temporary works	X	Kabir Rabiu/ M. A. Raifu	
● Supervise above-mentioned work	X	A.R. Lawal assisted by Yetunda Olaniyan	X
2.3 Casings and Covers for Valve Control			
● Quantity of casings and iron covers	X	M. A. Raifu	X
● Purchase casings and iron covers	X	Kabir Rabiu/ Musa Dikko	
● Install casing and iron covers at the valve location where the chambers are not constructed	X	M. Dauda/ M. A. Raifu	
● Supervise above-mentioned work	X	A.R. Lawal assisted by Yetunda Olaniyan	X
3. Installation of Ultra-sonic Flow Meter, Mechanical Flow Meters and Valves at each PMA			
● Overall Supervision	X	A.A. Nahuche	X

Annex-6 Conceptual Drawing of Installation of Ultra-sonic Flow Meter



Note:

- Equipment marked in red lines will be installed and cable through (PVC) will be purchased by FCTWB
- Ultra-sonic flow meter including a transducer, coaxial cable and main unit will be purchased by JICA Expert Team.

Annex-5

List of Casings and Covers of Isolation Valves in PMA

Pilot Area	No.	ID. No.	Diameter (mm)	Covering Depth (m) 1)	Height of Valve H (mm) 2)	Outer Diameter of Valve (mm) 3)	Height of Valve H' (mm) 4) = 2)- 3)/2	Length of Casing (m) 5) =1)-[4)/1000 x 1/2]	Number of Casing Iron Cover (set)
Garki-I	1	3	200	2.0	770	256	642	**1.7**	**1**
	2	4	200	2.0	770	256	642	**1.7**	**1**
	3	5	150	2.0	660	204	558	**1.8**	**1**
	4	6	50	2.0	340	100	290	**1.9**	**1**
	5	7	200	2.5	770	256	642	**2.2**	**1**
	6	8	150	2.5	660	204	558	**2.3**	**1**
	7	11	200	1.8	770	256	642	**1.5**	**1**
	8	14	50	2.0	340	100	290	**1.9**	**1**
Gudu	1	2	150	1.3	660	204	558	**1.1**	**1**
	2	3	100	1.3	530	152	454	**1.1**	**1**
	3	4	100	1.3	530	152	454	**1.1**	**1**
	4	5	100	1.3	530	152	454	**1.1**	**1**
	5	6	100	1.3	530	152	454	**1.1**	**1**
	6	7	100	1.3	530	152	454	**1.1**	**1**
	7	8	150	1.3	660	204	558	**1.1**	**1**
	8	9	100	1.3	530	152	454	**1.1**	**1**
	9	10	100	1.3	530	152	454	**1.1**	**1**
	10	11	100	1.3	530	152	454	**1.1**	**1**
Jabi	1	2	250	2.3	880	308	726	**2.0**	**1**
	2	4	150	2.0	660	204	558	**1.8**	**1**
	3	5	150	2.0	660	204	558	**1.8**	**1**
	4	6	100	2.5	530	152	454	**2.3**	**1**
	5	10	150	2.5	660	204	558	**2.3**	**1**
	6	12	150	2.0	660	204	558	**1.8**	**1**

Note
- Casing Diameter: At least 150mm for valve key control
- Casing Material: uPVC

List of Chambers of Bulk Flow Meters at Usma Water Treatment, and PMA Flow Meters and Valves for Isolation and Step-test at each Area

Area	No.	ID.	Flow Meter (Ultra-sonic type)			Flow Meter (Mechanical type)			Sluice for Isolation			Sluice Valve for Step-test		
			Only **ultra-sonic flow meter** is installed in a chamber.			**A valve** for maintenance of a mechanical flow meter is installed in a chamber as well as the **flow meter.**			Only **valve** is installed in a chamber for isolation.			**A valve** is permanently installed in a chamber for the purpose of step-test but size of chamber must be secured for **mobile ultra-sonic flow meter** to be equipped with the chamber.		
			Drawing No.	Diameter (mm)	Covering Depth (m)	Drawing No.	Diameter (mm)	Covering Depth (m)	Drawing No.	Diameter (mm)	Covering Depth (m)	Drawing No.	Diameter (mm)	Covering Depth (m)
Usuma WTP	1	**1**	Bulk	600	1.4									
	2	**2**	Bulk	1500	0.7									
	3	**3**	Bulk	1500	0.7									
	4	**4**	Bulk	1200	1.0									
Garki-I	1	**1**	①	450	2.0									
	2	**2**										⑥	300	2.0
	3	**9**										⑥	300	2.5
	4	**10**										⑥	300	2.0
	5	**12**				③	300	1.8						
	6	**13**							②	300	2.0			
Gudu	1	**1**										⑩	200	1.3
	2	**12**										⑩	200	1.0
	3	**13**				③	200	1.5						
Jabi	1	**1**										⑨	250	2.3
	2	**3**										⑧	200	2.0
	3	**7**							②	300	2.5			
	4	**8**										⑦	300	3.0
	5	**9**										⑨	150	3.1
	6	**11**							②	300	2.0			
	7	**13**				④	300	2.3						
	8	**14**				⑤	300	2.5						

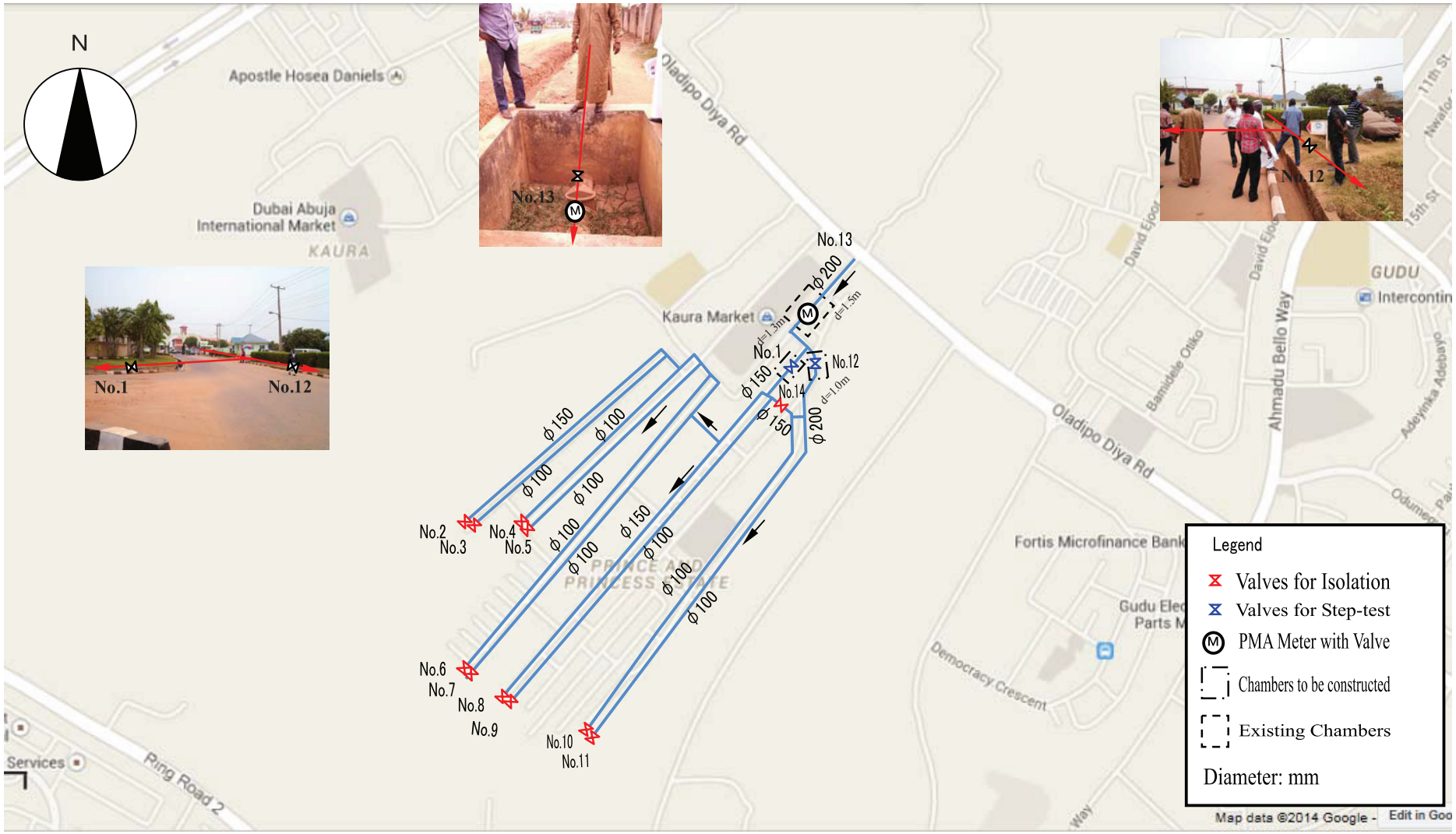
Note:
- Covering depth highlighted in white bule was revised from 6.5m to 2.3m as result of site reconnaissance.
- There is the existing chamber which is highlighted in yellow but no the cover of the chamber. FCTWB will install the cover for it.

Annex-3 Overview of Location of Flow Meters and Valves

Layout of Distribution Network in Garki-1

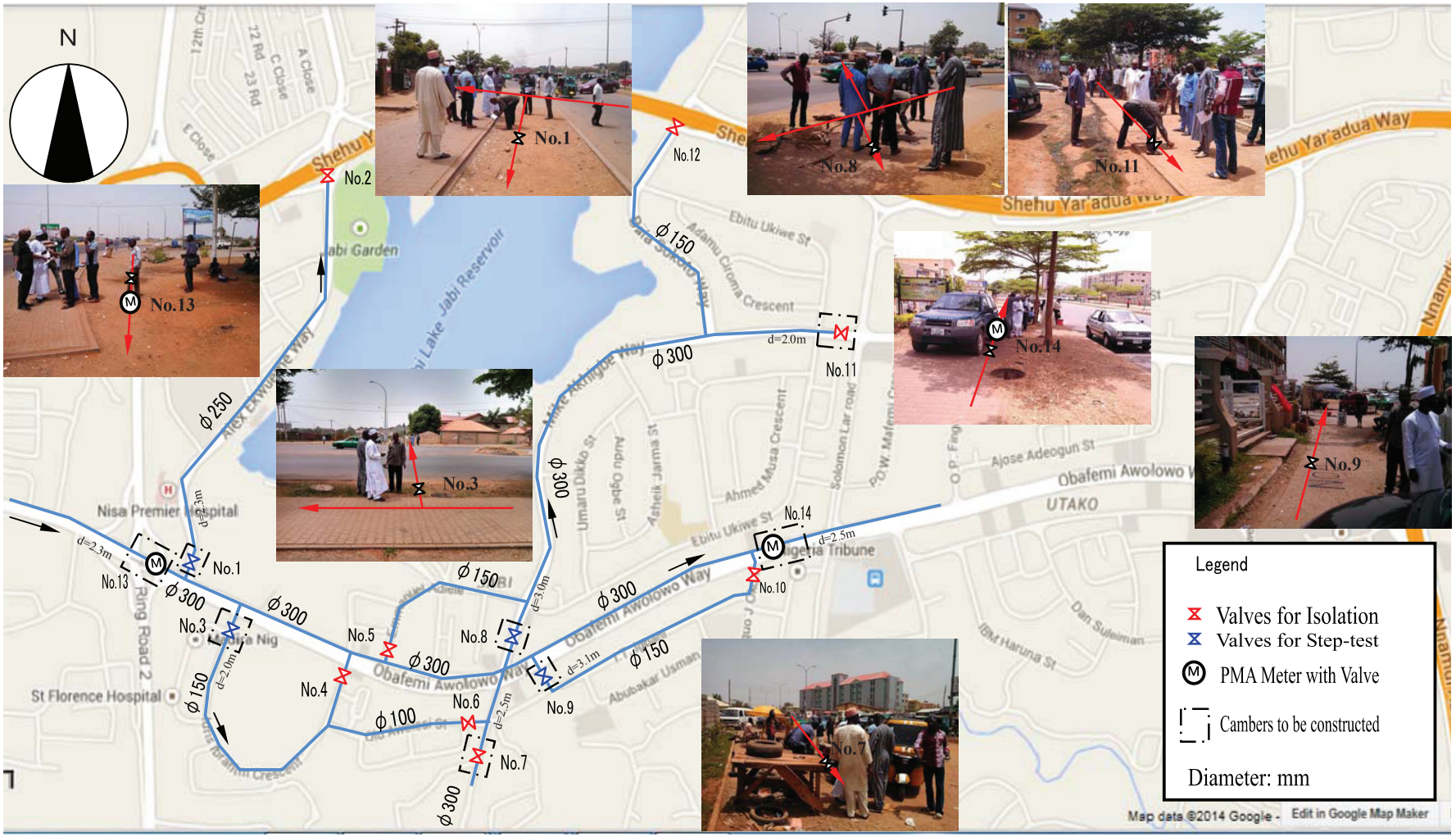
Annex-3 Overview of Location of Flow Meters and Valves

Layout of Distribution Network in Gudu



Annex-3 Overview of Location of Flow Meters and Valves

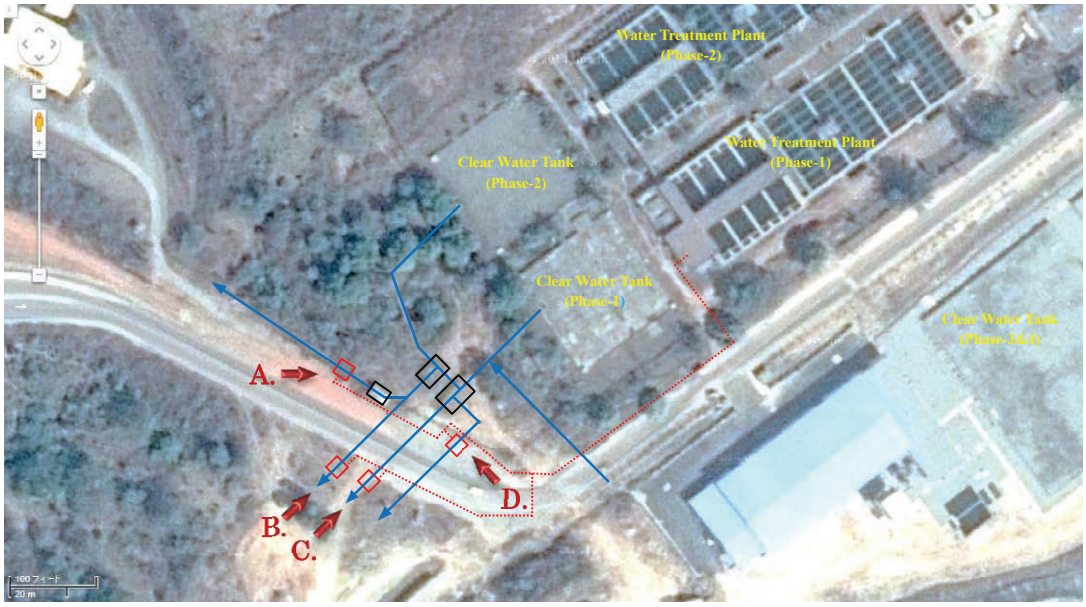
Layout of Distribution Network in Jabi



Annex-2

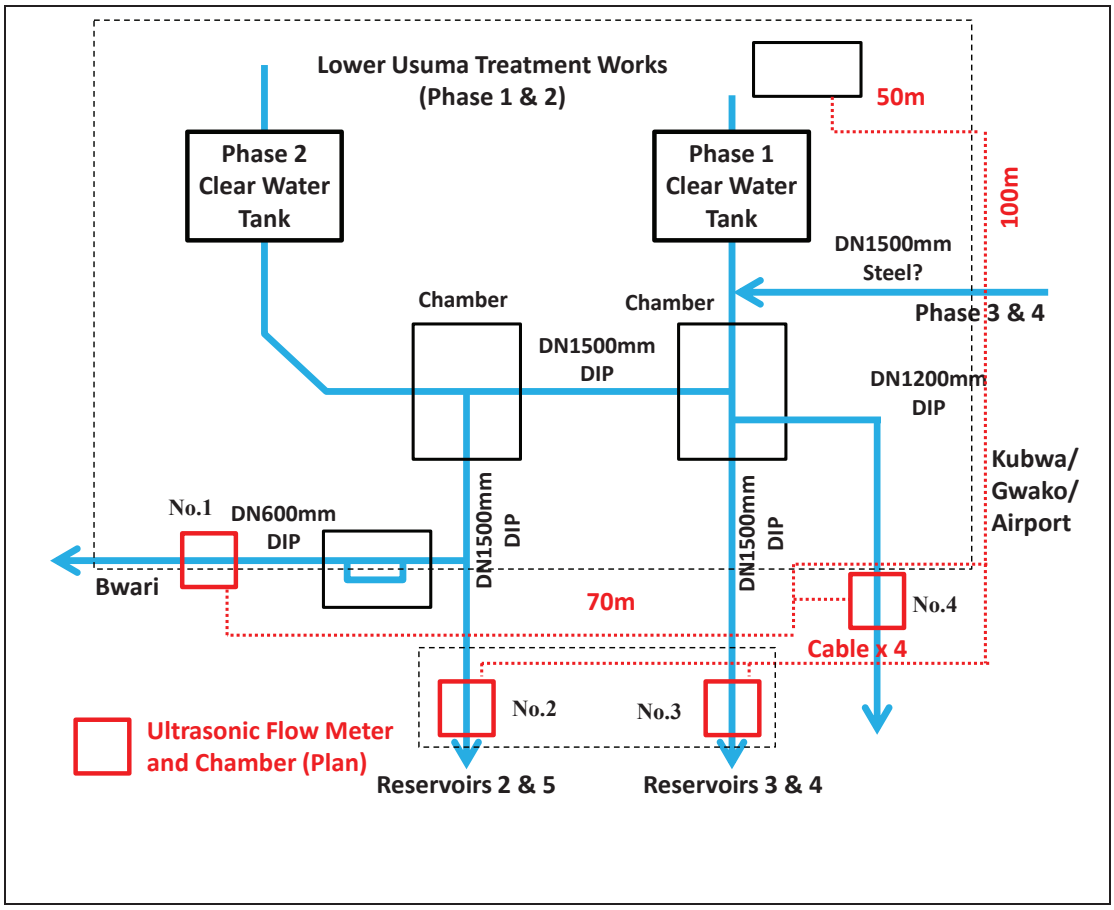
Location and Design of Chambers for Ultrasonic Flow Meter
at Outlets from Lower Usuma Water Treatment Plant (Phase-1&2)

1. Location



Note: A. to D. is Picture symbol.

2. Schematic



A. Chamber for 600mm to Bwari

B. Chamber for 1500mm to Res. 2&5

C. Chamber for 1500mm to Res. 3&4

D. Chamber for 1200mm to Kbuwa, Gwako & Airport

Annex-1

Updated on 17/02/2015

List of Equipment for the Project

No.	Equipment	Specification	County to Purchase		Quantity	Remarks
			Japan	Nigeria		
For Activity 1-2						
1	Ultrasonic flow meter (stationary, 220m)	Ultrasonic pulse transmit time difference method, sensor for 600-1,500mm, 220m cable	●		2	including installation, commissioning and training
2	Ultrasonic flow meter (stationary, 300m)	Ultrasonic pulse transmit time difference method, sensor for 600-1,500mm, 300m cable	●		2	including installation, commissioning and training
3	Data logger (stationary)	Paperless, 6 points, 1s-1h record cycle, 4-20mA, trend, bar graph and histrical trend displays	●		1	for the above No.1&2 ultrasonic flow meters
For Activity 2-4 and 2-8						
1	GIS software	Intergraph Geomedia Essential		●	1	Software has been adopted by AGIS. V13.1
2	GIS software	ESRI ArcGIS Basic Version 10.3		●	1	Mainly for data input
3	Plotter (A0)	A0		●	1	
4	GPS terminal	High sensitvity, 2,000 points, 200 routes, IPX7, bulit-in camera (5 mega-pixel), USB, nickel hydride battery pack		●	2	Garmin or Trimble
5	Personal computer	500HD, 4 GB Ram, Windows 7or8, Microsoft Office installed, Mouse		●	2	
6	Anti-virus software			●	2	for the above PCs (No.5)
7	UPS	1.2kVA		●	2	
For Activity 2-5						
1	Ultrasonic flow meter (stationary)	Ultrasonic pulse transmit time difference method, sensor for 450mm, 20m cable	●		1	
2	Data logger (portable)	2ch (flow and pressure), 1s - 24h record cycle, 4-20mA, 5 years battery life	●		1	for the above No.1 ultrasonic flow meter
6	Flow meter	Dia. 150mm with fittings		●		Provisional, but to be determined through Activity 2-4.
7	Flow meter	Dia. 200mm with fittings		●	1	Provisional, but to be determined through Activity 2-4.
8	Flow meter	Dia. 250mm with fittings		●		Provisional, but to be determined through Activity 2-4.
9	Flow meter	Dia. 300mm with fittings		●	3	Provisional, but to be determined through Activity 2-4.
For Activity 2-7						
1	Sluice valve	Dia. 50mm with fittings		●	2	Provisional, but to be determined through Activity 2-4.
2	Sluice valve	Dia. 80mm with fittings		●	0	Provisional, but to be determined through Activity 2-4.
3	Sluice valve	Dia. 100mm with fittings		●	9	Provisional, but to be determined through Activity 2-4.
4	Sluice valve	Dia. 150mm with fittings		●	12	Provisional, but to be determined through Activity 2-4.
5	Sluice valve	Dia. 200mm with fittings		●	6	Provisional, but to be determined through Activity 2-4.
6	Sluice valve	Dia. 250mm with fittings		●	2	Provisional, but to be determined through Activity 2-4.
7	Sluice valve	Dia. 300mm with fittings		●	10	Provisional, but to be determined through Activity 2-4.
For Activity 2-10						
1	Ultrasonic flow meter (portable)	Ultrasonic pulse transmit time difference method, sensors (small x 3, medium x 6, large x 3)	●		6	
2	Data logger (portable)	2ch (flow and pressure), 1s - 24h record cycle, 4-20mA, 5 years battery life	●		6	
3	Leak noise correlator	Main unit, preamplifier and piezoelectric sensor	●		2	
4	Water leak detector	Acoustic type, piezoelectric sensor	●		6	
5	Non-metal pipe locator	Electromagnetic induction type for plastic pipe (PVC, PE)	●		3	
6	Metal locator	Optical and acoustical output signal, 50cm depth	●		3	
7	Time integral water leak detector	Automatic leak noise determination method	●		3	
8	Acoustic rod	1.5m length	●		9	
9	Distance meter	Max. 10km, 10cm scale	●		3	
10	Hammer drill	Dia. 38mm, 270rpm, 3,000 stroke/min	●		3	
11	Boring bar	Dia. 16mm, 1.0m length	●		3	
12	Drill bit	Dia.19×800mm	●		9	
13	Portable residual chlorine analyzer	DPD, absorptiometry, 0.02-2.00mg/L	●		3	
14	Metal pipe and cable locator	5m depth	●		3	
15	Reference meter	Portable built-in case type, 13-25mm	●		3	
16	Leakage quantity measurement device	13-25mm	●		3	
17	Personal computer	500HD, 2GB Ram, Windows 7or8, Microsoft Office installed, Mouse		●	3	
18	Anti-virus software			●	3	for the above PCs (No.17)
19	UPS	1.2kVA		●	3	

No.	Equipment	Specification	County to Purchase		Quantity	Remarks
			Japan	Nigeria		
20	Inkjet printer	A4, Color, All-in-one		●	3	
21	Digital camera	Compact type, Optical zoom, 10 mega-pixel (min), LCD		●	3	
For Activity 2-13						
1	Generator	200V, 3-Phase, 2.4kVA		●	3	
2	Asphalt cutter	3600RPM, 13kW		●	3	
3	Concrete breaker			●	3	
4	Small-sized dewatering pump	2"		●	3	
5	Small-sized tamper			●	3	
6	Electric drum	30-50m		●	3	
7	Customer meter	Dia. 2/3" with fittings, conventional type		●	388	Provisional, but to be determined through customer survey.
8	Customer meter	Dia. 1" with fittings, conventional type		●	259	Provisional, but to be determined through customer survey.
9	Customer meter	Dia. 50mm with fittings, conventional type		●	89	Provisional, but to be determined through customer survey.
10	Customer meter	Dia. 80mm with fittings, conventional type		●	23	Provisional, but to be determined through customer survey.
11	Customer meter	Dia. 100mm with fittings, conventional type		●	7	Provisional, but to be determined through customer survey.
For Output 2						
1	Pickup truck for pilot sites			●	2	
For Operation of the Project						
1	Laser printer	A4, B/W		●	1	
2	Inkjet printer	A3, Color		●	1	
3	Multifunction copier	A3, B/W		●	1	
4	Graphic/movie editing software	Windows Movie Maker, Microsoft Powerpoint		●	1	Free or preinstalled softwares to be utilized.

The Federal Capital Territory Reduction of Non-Revenue Water Project

Technical Notes
on
Monthly Technical Meeting

8th May 2015

At the beginning of the Monthly Technical Meeting, Engr. A. A. Nahuche (Technical Manager) gave a remark addressing the reactivation of the Project after Presidential Election turned out successful and in peace. And then, Engr. Lawal, Chairperson facilitated the meeting.

Mr. Akinori Miyoshi, Chief Advisor of JICA Expert Team explained the reason for absence of JICA experts in the last months, and then welcomed technical members.

As a result of discussions, members confirmed the matters mentioned below:

1. **Project Schedule and Procurement in Japan**

   Technical members and JICA Expert Team confirmed updated schedule of the Project including procurement of equipment from Japan, and also importance of preparation for smooth customs clearance. NRW Management Team requested provision of equipment information for procedures.

2. **Bill of Quantity of Chambers for Flow Meter and Valve**

   Based on chamber drawings prepared by JICA Expert Team, Technical members have worked on bill of quantities as its responsibility. Both parties confirmed that it will be completed and shared soon.

3. **System Modification of Billing System**

   To focus on fact-findings and discussions, sub-committee is created and its members are appointed from different units. The sub-committee members should be involved in system modification of billing system. The members appointed are: Mr. Shehu Suleiman (Chairman), Mr. Danjuma Isah, Mr. Aliyu Maradun, Mrs. Rose Akpan, Mrs. Elizabeth Adewumi and Mr. Vincent Obeh.

4. **GIS Training**

   Five members are nominated as trainees for GIS Training, namely Engr. Kabir Raibu, Mr. Shehu Suleiman, Mr. Abubakar Ubale, Mr. Mohammed Dauda and Mr. Ezeh Hilary.

5. **Capacity Assessment and Capacity Development Plan**

   FCTWB accepted the result of Capacity Assessment and Capacity Development Plan. JICA Expert Team will feed back to each member.

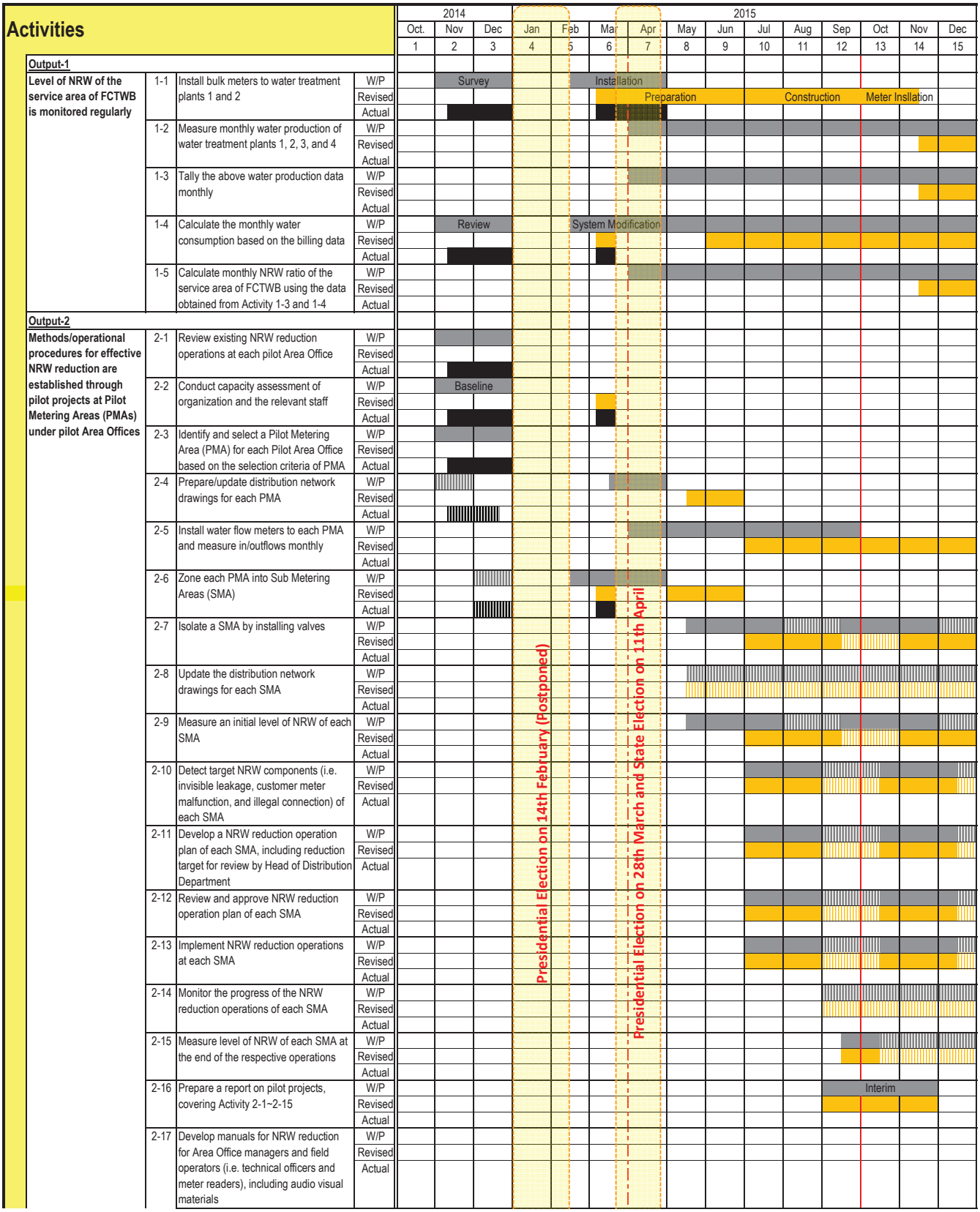
Appendix: Attendance List, Updated Project Schedule

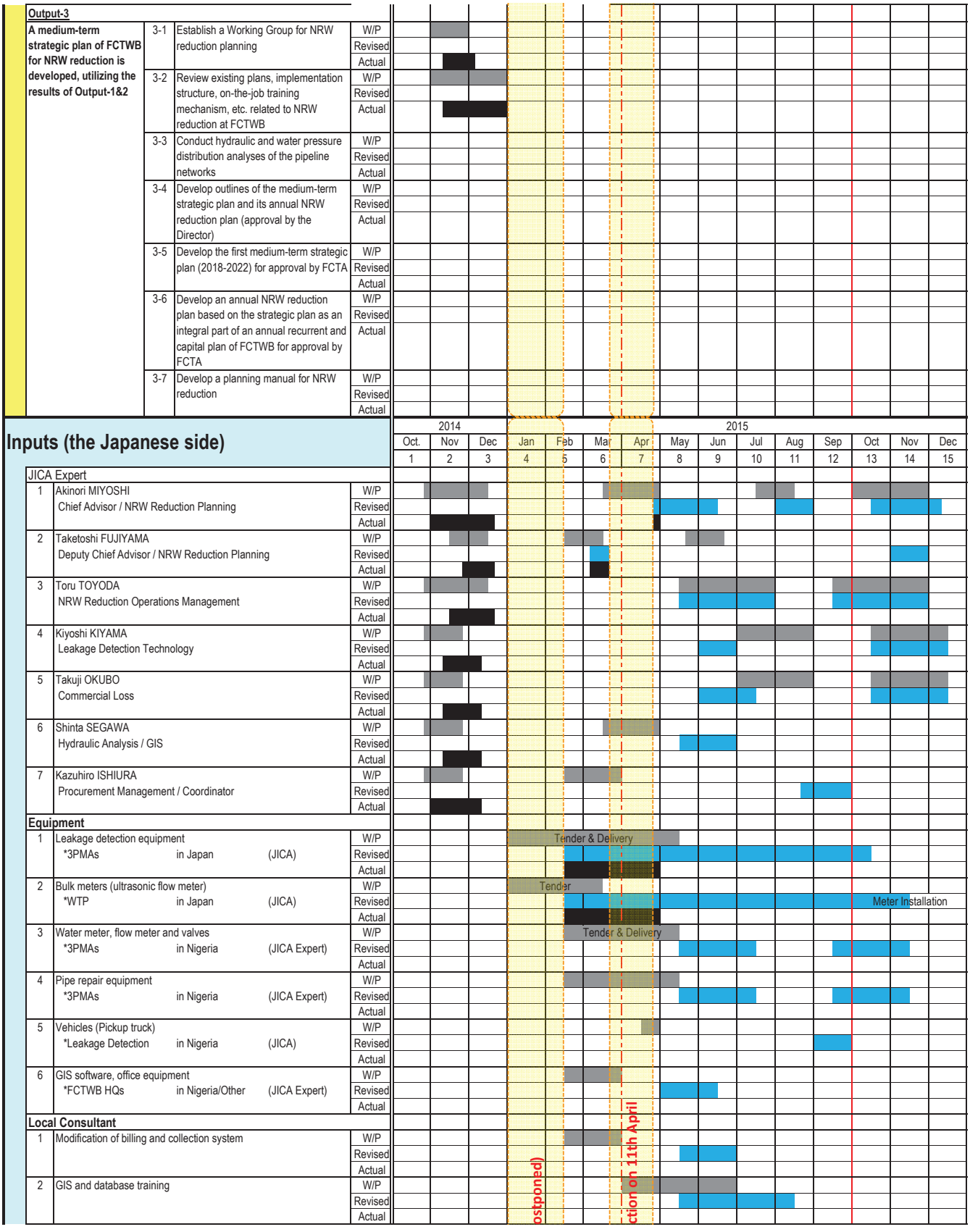
Engr. A. A. Nahuche Technical Manager, HOD Distribution Federal Capital Territory Water Board	Mr. Akinori Miyoshi Chief Advisor for FCT Reduction of NRW Project Japan International Cooperation Agency (JICA)

Attendance List

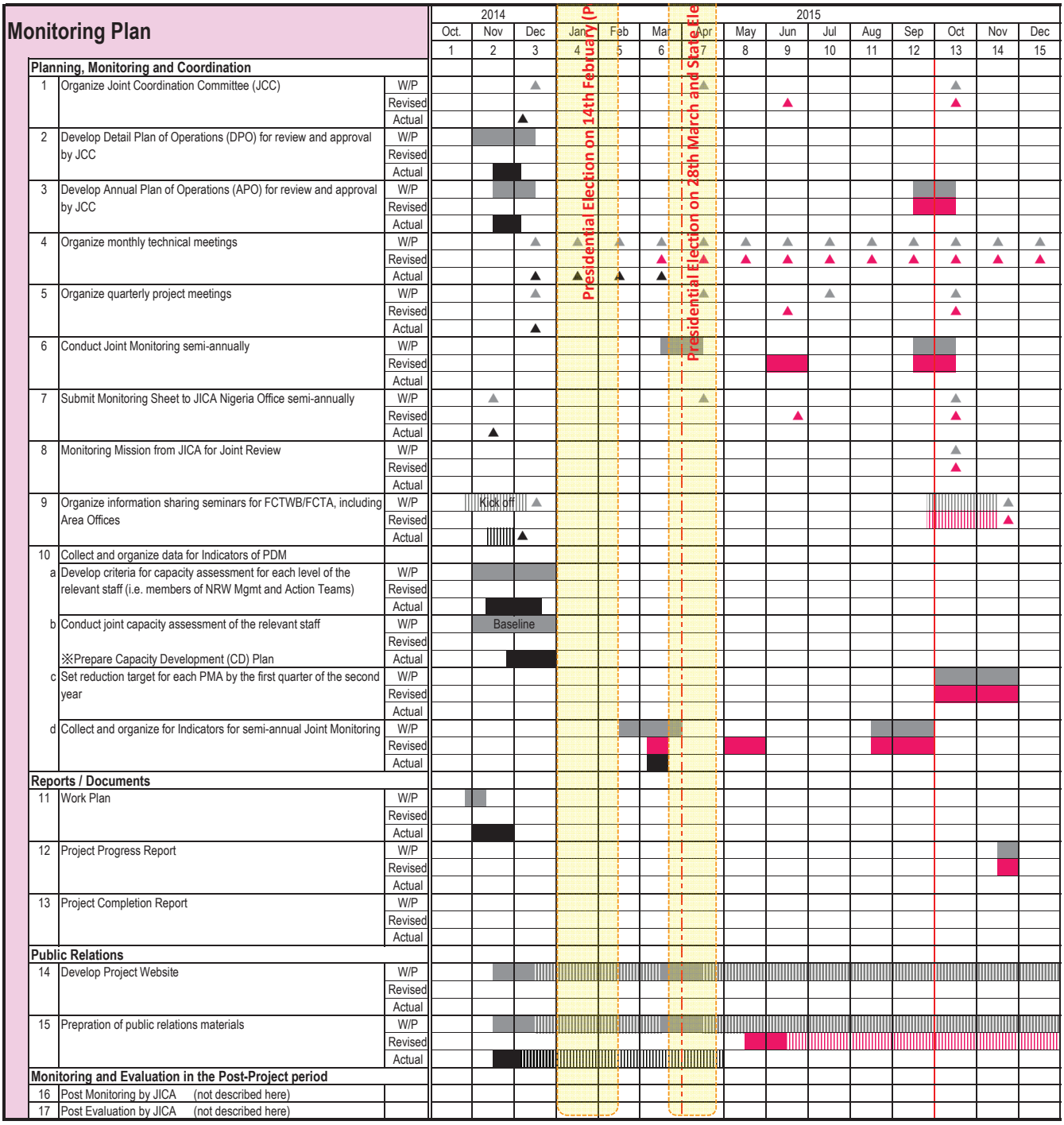
No	Position in the Project	Name	Title in FCTA/FCTWB or other
1	Deputy PM	Mr. S.T Bello	Head of Administration and Supply Department, FCTWB
NRW Management Team			
2	Technical Manager	Engr. A. A. Nahuche	Head of Distribution Department, FCTWB
3	Technical Manager	Mr. Adis S. Muhammad	Head of Commerce Department, FCTWB
Distribution Department			
4	Coordinator	Abolade. R. Lawal	Head of Special Projects Unit
5		Moh. Kabir Rabiu	Head of Logistics Unit
6		Musa Dikko	Head of Pipeline Unit
7		Shehu Suleiman	Head of GIS Unit
8		Douglas E. Oloton	Head of Metering General
9		A.O. Akande	Head of Metering Unit (AMR Meter)
11		Abdullahi Masaud	Head of Metering Unit (Pre-paid Meter)
12		Abubakar Ubale Abubakar	Civil Engr. II, Logistics Unit,
13		Mohammed Dauda	Technical Officer, Pipeline Unit
Commerce Department			
14		Danjuma Isah	Head of Monitoring and Detection Unit
15		Taiwo Adeyemi	Monitoring staff, Monitoring and Detection Unit
16		Aliyu Maradun	Head of Major Consumers Unit
17		Rose Akpan	Head of Billing Unit
NRW Action Team			
Jabi Area Office			
18	Team Leader	Muhammed A. S. Ramat	Area Manager (Distribution)
Gudu Area Office			
19	Team Leader	Habib A. Kiru	Area Manager (Distribution)
Garki I Area Office			
20	Team Leader	Adesoji Adenuga	Area Manager (Commerce)
Other Participants			
21		Aliyu S. B. Muazu	Assistant to Head, Commerce Department
22		Kenneth N. Azih	Head of Operation Unit
23		Engr. Mumini A. Raifu	Assistant Area Manager of Gwarimpa
24		Engr. A. G. Adamu	Assistant Procuremernt Officer, Distribution Department
JICA Expert Team			
25		Akinori Miyoshi	Chief Advisor

Project Title: The Federal Capital Territory Reduction of Non-Revenue Water Project




Output-3
A medium-term strategic plan of FCTWB for NRW reduction is developed, utilizing the results of Output-1&2
3-1 Establish a Working Group for NRW reduction planning
3-2 Review existing plans, implementation structure, on-the-job training mechanism, etc. related to NRW reduction at FCTWB
3-3 Conduct hydraulic and water pressure distribution analyses of the pipeline networks
3-4 Develop outlines of the medium-term strategic plan and its annual NRW reduction plan (approval by the Director)
3-5 Develop the first medium-term strategic plan (2018-2022) for approval by FCTA
3-6 Develop an annual NRW reduction plan based on the strategic plan as an integral part of an annual recurrent and capital plan of FCTWB for approval by FCTA
3-7 Develop a planning manual for NRW reduction
W/P
Revised
Actual
Inputs (the Japanese side)
2014
2015
Oct. Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
JICA Expert
1 Akinori MIYOSHI
Chief Advisor / NRW Reduction Planning
2 Taketoshi FUJIYAMA
Deputy Chief Advisor / NRW Reduction Planning
3 Toru TOYODA
NRW Reduction Operations Management
4 Kiyoshi KIYAMA
Leakage Detection Technology
5 Takuji OKUBO
Commercial Loss
6 Shinta SEGAWA
Hydraulic Analysis / GIS
7 Kazuhiro ISHIURA
Procurement Management / Coordinator
Equipment
1 Leakage detection equipment
*3PMAs in Japan (JICA)
Tender & Delivery
2 Bulk meters (ultrasonic flow meter)
*WTP in Japan (JICA)
Tender
Meter Installation
3 Water meter, flow meter and valves
*3PMAs in Nigeria (JICA Expert)
Tender & Delivery
4 Pipe repair equipment
*3PMAs in Nigeria (JICA Expert)
5 Vehicles (Pickup truck)
*Leakage Detection in Nigeria (JICA)
6 GIS software, office equipment
*FCTWB HQs in Nigeria/Other (JICA Expert)
Local Consultant
1 Modification of billing and collection system
2 GIS and database training
ostponed)
ction on 11th April

Monitoring Plan



The Federal Capital Territory Reduction of Non-Revenue Water Project

Technical Notes
on
2nd Quarterly Project Meeting and 5th Monthly Technical Meeting

25th June 2015

As a result of discussions in 2nd Quarterly Project Meeting and 5th Monthly Technical Meeting, members confirmed the matters mentioned below:

1. **Final Confirmation of Size and Material of Pipeline at where Valves and Flow Meters will be installed**

   Due to inadequate Counterpart Fund, FCTWB and JICA Expert Team agreed to prioritize procurement/ construction by FCTWB and do practicable design modification of PMAs/SMAs. Based on presentation on PMAs/SMAs prepared by JICA Expert Team, Technical members consisting of Mr. Musa Dikko, Head of Pipeline Unit and pilot Area Offices Managers will confirm size and material of pipeline at where valves and flow meters will be installed, as well as Mr. Mumini Raifu will finalize bill of quantities and drawings with support from JICA Expert Team, before Mr. Toyoda's, JICA Expert leaving in the end of June 2015. Then, FCTWB should start necessary procurement/construction.

2. **Temporary-Excavated Pit for Ultrasonic Flow Meter and Security/Safety Issues**

   Based on JICA Expert Team's suggestion and considering cost reduction and future expansion of NRW reduction operations, FCTWB adopts temporary-excavated pit for ultrasonic flow meter installation as a trial in PMAs/SMAs and will make sure of security as well as safety.

3. **Change from Chamber to Casing with Spindle for 300mm Dia. Valve**

   Based on JICA Expert Team's suggestion and considering cost reduction and future expansion of NRW reduction operations, FCTWB adopts exceptionally casing with spindle for 300mm dia. valve as a trial in pilot project.

4. **Appointment of Coordinator for Commercial Loss**

   JICA Expert Team requested FCTWB to appoint Coordinator from Commerce Department because JICA Experts have had difficulty in collecting scattered information. In response, FCTWB appointed Mr, Aliyu S. B. Muazu of Commerce Department.

5. **Restriction of Meter Replacement in selected PMAs**

   In order to find the facts in the field, JICA Expert Team requested FCTWB not to install any new meters or replace any faulty meters (all three types of meters) in the selected PMAs until NRW reduction operations are done under pilot projects. In case meters have to be installed or replaced for particular reasons, FCTWB should keep all records. FCTWB accepted the request.

6. **AGIS Issues**

   JICA Expert Team has requested removal of restriction by AGIS. FCTWB submitted official letter to AGIS and was expecting early response from AGIS, so will keep following up.

7. Project Monitoring Sheet

FCTWB accepted Project Monitoring Sheet (Draft), which was presented at 2nd Joint Coordinating Committee on 23rd June, 2015.

Appendix: Programme, Attendance List, Documents distributed

Mr. S.T. Bello
Deputy Project Manager,
HOD, Admin&Supply, FCT Water Board,
Federal Republic of Nigeria

Mr. Akinori Miyoshi
Chief Advisor for
FCT Reduction of NRW Project
Japan International Cooperation Agency (JICA)

Federal Capital Territory Administration (FCTA)
Federal Capital Territory Water Board (FCTWB)
assisted by
Japan International Cooperation Agency (JICA)

THE FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER PROJECT

PROGRAMME/AGENDA FOR

2ND QUARTERLY MEETING and 5TH MONTHLY TECHNICAL MEETING

Venue: Board Room, Headquarters of FCTWB, Area 3, Garki, Abuja
Date: Thursday, 25th December 2015

10:30 - 10:35 Welcome Remarks by Mr. Hudu Bello, Project Manager
10:35 - 10:40 Introduction

10:40 - 10:55 Results of 2nd JCC on 23rd June (Brief of Problems, Issues and Estimation of NRW)
10:55 - 11:10 Follow-up of 2nd JCC, Removal of Restriction on GIS, Handover of Equipment
11:10 - 11:30 Modification of Design of PMAs and SMAs and Provisional Implementation
11:30 - 11:50 Commercial Loss
11:50 - 12:10 Technical Discussion

12:10 Closing

Addition
12:15 - 13:00 GIS Lecture (with Video Picture)

Attendance List

No	Position in the Project	Name	Title in FCTA/FCTWB or other	2nd Qtrly 6/2015	Monthly 6/2015
1	Project Director	Mr. Ari, Isa Muhammad	Director of EPRS, FCTA		
2	Project Manager	Mr. Hudu Bello	Director of FCTWB		
3	Deputy PM	Mr. S.T Bello	Head of Administration and Supply Department, FCTWB	✔	✔
4		Hafsat Ahmed Lawi	Head of Finance and Accounts Department	✔	✔
5		Aliyu Usman	Head of Reservoir and Production Department	✔	✔
6		Bunmi Olowookere	Head of Planning, Research and Statistics Unit		
7		Abbas A. Ahmed	Head of Public Relations Unit	✔	✔
8		Vincent Obeh	Head of Management Information System Unit		
NRW Management Team					
9	Technical Manager	Engr. A. A. Nahuche	Head of Distribution Department, FCTWB	✔	✔
10	Technical Manager	Mr. Adis S. Muhammad	Head of Commerce Department, FCTWB	✔	✔
Distribution Department					
11	Coordinator	Abolade. R. Lawal	Head of Special Projects Unit	✔	✔
12		Moh. Kabir Rabiu	Head of Logistics Unit	✔	✔
13		Musa Dikko	Head of Pipeline Unit	✔	✔
14		Shehu Suleiman	Head of GIS Unit	✔	✔
15		Douglas E. Oloton	Head of Metering General	✔	✔
16		A.O. Akande	Head of Metering Unit (AMR Meter)	✔	✔
17		Yetunde Olaniyan	Head of Water Monitoring Unit	✔	✔
18		Abdullahi Masaud	Head of Metering Unit (Pre-paid Meter)		
19		Abubakar Ubale Abubakar	Civil Engr. II, Logistics Unit,	✔	✔
20		Mohammed Dauda	Technical Officer, Pipeline Unit	✔	✔
21		Ezeh Hilary	Surveyor, GIS Unit	✔	✔
Commerce Department					
22		Isaac O. Owolabi	Head of Customer Care Unit	✔	✔
23		Danjuma Isah	Head of Monitoring and Detection Unit	✔	✔
24		Taiwo Adeyemi	Monitoring staff, Monitoring and Detection Unit		
25		Aliyu Maradun	Head of Major Consumers Unit	✔	✔
26		Rose Akpan	Head of Billing Unit	✔	✔
27		Suleman Agbawn	Billing Officer,Billing Unit		
Administration and Supply Department					
28		Francisca Samuel	Head of Training/ Welfare Unit		
29		Akudike Ike D.	Head of Facility Management Unit	✔	✔
NRW Action Team					
Jabi Area Office					
30	Team Leader	Muhammed A. S. Ramat	Area Manager (Distribution)		
31		Sadiq Salihu	Assistant Area Manager (Distribution)	✔	✔
32		Abawonse J. K	Assistant Area Manager (Commerce)	✔	✔
33		Jummai Ugbodaga	Senior Commercial Officer (Commerce)		
34		Mohammed Moh'd	Planning Officer (Commerce)		
35		Aliyu Ibrahim	Senior Works Superintendent (Distribution)		
36		Abubakar Danladi	Foreman (Distribution)		
37		Raliat Zubairu	Higher Trade Officer (Commerce)		
38		Mahmud Muhammed	Forman (Distribution)		
39		Hassan Yelwa	STA (Commerce)		
Gudu Area Office					
40	Team Leader	Habib Ahmed Kiru	Area Manager (Distribution)		
41		Ogbu O. Williams	Assistant Area Manager (Commerce)	✔	✔
42		Abdul Ozumi	Assistant Area Manager (Distribution)	✔	✔
43		Adamu Ismaila	Unit Head (Commerce)	✔	✔
44		Umar I. Adamu	Assistant Tech. Officer (Commerce)	✔	✔
45		Kontagora Mohammed	Assistant Unit Head (Distribution)	✔	✔
46		Salisu Mohammed	Plumber (Distribution)	✔	✔
Garki I Area Office					
47	Team Leader	Adesoji Adenuga	Area Manager (Commerce)	✔	✔
48		Choji Pam	Assistant Area Manager (Commerce)	✔	✔
49		Mohammed Gana	Assistant Area Manager (Distribution)	✔	✔
50		Olusegun Rose	Senior Trade Office (Commerce)		
51		Abdulahi Ibrahim	Assistant Tech. Officer (Commerce)		
52		Iliya Galadima	HigherWorks Super intendant (Distribution)		
53		Raymond Olowookere	Forman (Distribution)		
54		Ibrahim Yelwa	Forman (Distribution)		
55		Hassan Abubakar	Commerce Officer (Commerce)		
56		Shehu Isa	Craftsman (Distribution)		

Attendance List

No	Position in the Project	Name	Title in FCTA/FCTWB or other	2nd Qtrly 6/2015	Monthly 6/2015
Other Participants					
		Ottah Chiejuna	KPWSS	✔	✔
		Raifu Mumini	Assitant Manager (Distribution) Gwarinpa	✔	✔
		Maju S. B.	Assistant Director	✔	✔
		Azih K. N.	PTO	✔	✔
		Umar A. B.	Assistan Manager/CTO(w) Gwarinpa	✔	✔
		Ms. Chie Shimodaira	JICA Nigeria Office	✔	✔
		Mr. Joachim I. Ezeji	Water Sector Specialist, JICA Nigeria Office	✔	✔

Federal Capital Territory Administration
Federal Capital Territory Water Board
Japan International Cooperation Agency

The Federal Capital Territory
Reduction of Non-Revenue Water Project

Major Problems, Issues and Estimation of NRW

2nd Quarterly Meeting
25 June 2015

JICA Expert Team & FCTWB

1

1. Major Problems raised

Inadequate Counterpart Fund

Counterpart Fund of FCTWB, currently-allocated to procurement/ construction of chambers for Output-1 and Output-2, comes **short** of the total estimated cost based on Bill of Quantities.

Duplicated/Return Bills

A large number of **duplicated/return bills** have existed in FCTWB, which may have caused various **wastefulness** as well as **unreliable financial analysis** including NRW.

Customs Clearance and Tax Exemption

Ultrasonic flow meter and equipment for leakage detection will be procured by JICA in Japan, and will arrive by air in September or October 2015. Customs clearance and tax exemption, of which FCTWB is in charge, may bring about some **issues**.

2

2. Solutions to Major Problems

Inadequate Counterpart Fund

To reduce the cost,
- Readjustment of locations of valves
- Downscaling valve chambers to casings in PMAs/SMAs

However, the cost still exceeds the allocated fund.
- Postponement of procurement/ construction of chambers for bulk/flow meters until additional fund is disbursed.
- Focusing on procurement/ construction of some valves casing that the fund accommodates.

Duplicated/Return Bills

Treatment of the bills, such as invalidation or elimination from billing system

Customs Clearance and Tax Exemption

Advance careful preparation based on advice by FMWR being aware of procedures

3

3. Issues and Challenges

Inadequate Counterpart Fund

Prompt disbursement of additional fund to make the Project be like it should and avoid further delay, to be facilitated / accelerated by FCTA and FCTWB

Duplicated/Return Bills

- Fact finding based on information from related Units and Area Offices
- Appropriate and accurate analysis
- Proper treatment under the initiative and leadership of FCTWB's management.

Customs Clearance and Tax Exemption

Close communication and timely information sharing between FCTWB and JICA with advisory support of FMWR.

4

4. Water Balance/Audit and Components

System Input Volume	Authorized Consumption	Billed Authorized Consumption	Billed Metered Consumption	Revenue Water
			Billed Unmetered Consumption	
		Unbilled Authorized Consumption	Unbilled Metered Consumption	Non-Revenue Water (NRW)
			Unbilled Unmetered Consumption	
	Water Losses	Apparent (Commercial) Losses	Unauthorized Consumption	
			Customer Metering Inaccuracies and Data Handling Errors	
		Physical (Real) Losses	Leakage on Transmission and/or Distribution Mains	
			Leakage and Overflows at Utility's Storage Tanks	
			Leakage on Service Connections up to Point of Customer Use	

NRW (m^3) = [**System Input Volume** (m^3)] – [**Revenue Water** (m^3)]

NRW Ratio (%) = **NRW** (m^3) / [**System Input Volume** (m^3)]

5

5. NRW in Water Supply by FCTWB

NRW can **NOT** be calculated properly in FCTWB because;

1. Existing **billing system** doesn't have capability of summation of consumption but no. of bills and billed amount.
2. **Flat-rate** consumption including **duplicated/return bills**
3. Metered-rate consumption
   - Meter reading consumption
   - **Estimate** consumption including **duplicated/return bills**
4. Meter type
   - Conventional/mechanical meter
   - Automatic meter reading (AMR)
   - **Prepaid** meter, which is outside of the billing system and consumption can not be measured automatically.

6

6. NRW in Water Supply by FCTWB (Continued)

Findings about **flat-rate** in the estimating process of NRW as monthly average in 2014. (including **duplicated/return bills**)

Total Bills (flat rate, all 3 meter types): approx. **48,300**

Flat Rate Bills: approx. **7,100**

Proportion of Flat-Rate Bills to Total Bills

- Bills-based: approx. **15%**
- Billed Amount-based: approx. **18%**
- Billed Consumption-based: approx. **15%**

7

6. NRW in Water Supply by FCTWB (Continued)

Findings about **estimate bills of conventional/mechanical meter** in the estimating process of NRW as monthly average in 2014. (including **duplicated/return bills**)

Total Meter Bills: approx. **24,600**

Estimate Bills: approx. **11,200**

Proportion of Estimate Bills to Total Meter Bills

- Bills-based: approx. **45%**
- Billed Amount-based: approx. **58%**
- Billed Consumption-based.: approx. **60%**

8

6. NRW in Water Supply by FCTWB (Continued)

Findings about **estimate bills of AMR meter** in the estimating process of NRW as monthly average in 2014. (including **duplicated/return bills**)

Total Meter Bills: approx. **11,700**

Estimate Bills: approx. **5,800**

Proportion of Estimate Bills to Total Meter Bills

- Bills-based: approx. **49%**
- Billed Amount-based: approx. **24%**
- Billed Consumption-based.: approx. **44%**

9

6. NRW in Water Supply by FCTWB (Continued)

Based on water production, existing commercial(billing) and financial documents, NRW and revenue collection ratio in Year 2014 are estimated at:

NRW Ratio: **40%** (m^3-based)

Revenue Collection Ratio : **35%** (Naira-based)

Assuming that **duplicated/return bills** roughly-estimated at **6,600** (actually more?) are invalidated or eliminated:

NRW Ratio: **52%** (m^3-based)

Revenue Collection Ratio : **44%** (Naira-based)

10

PMA (Pilot Metering Area)
SMA (Sub Metering Area)

Toru Toyoda JICA Expert Team

1

Purpose of Making PMAs

- To get data for calculation of Revenue Water Rate and Non-Revenue Water Rate
- To reduce Non-Revenue Water Rate

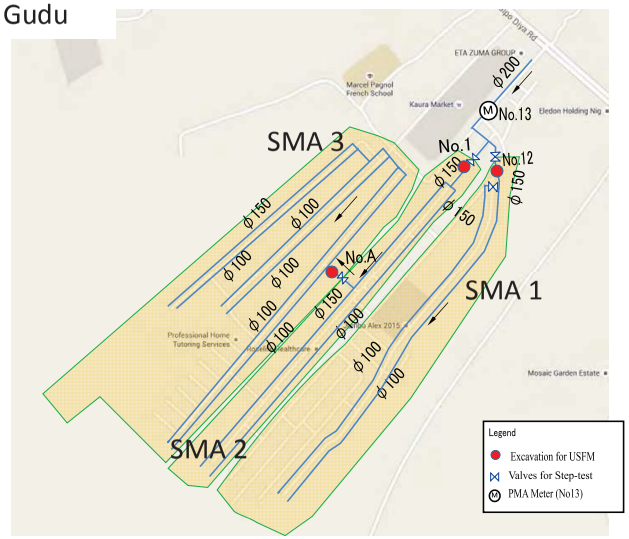
2

Methods for Getting Data

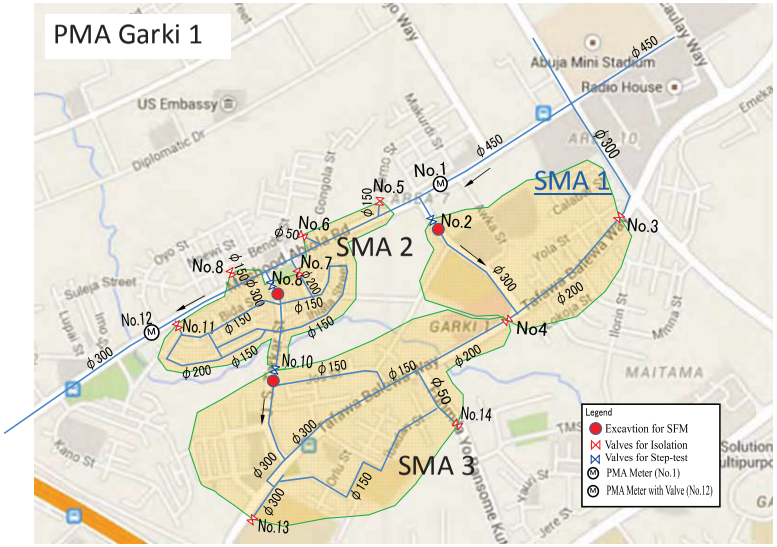
- Minimum Night Flow Method (Using Portable USFM)
- Step Test (Using Portable USFM or Mechanical Flow Meter)

- To Give Priority to SMA for Leakage Survey and Repair
- Evaluation for Leakage Repair

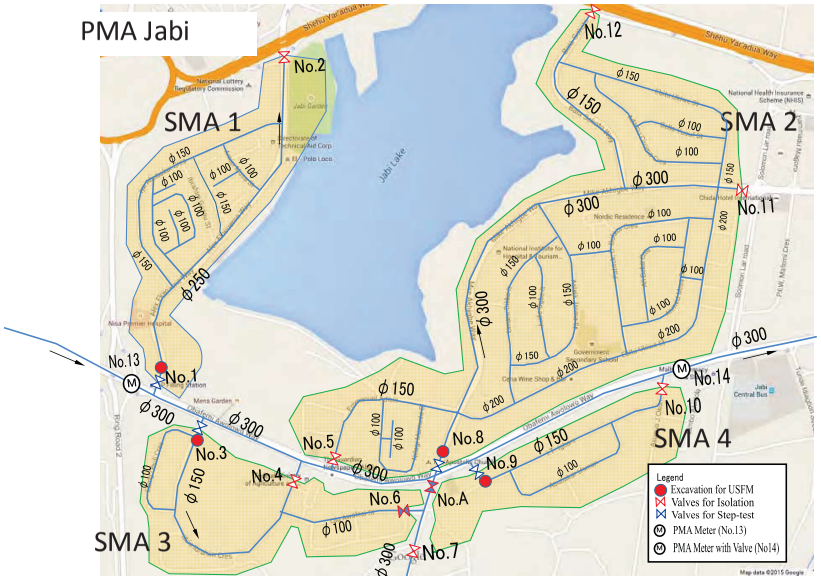
PMA Gudu



PMA Garki 1



PMA Jabi



Changing Structure of Chambers for Making PMAs

- Meter with Valve : Same to Original Plan (Chamber)
- Valve : Changed to Casing from Chamber
- Excavation for USFM Setting

Number of Chambers and Casing for Meters and Valves

- Garki-1

  Meter Chamber : 1, Meter with Valve Chamber : 1, Step Test Valve Casing : 3, Isolation Valve Casing : 9, Excavation for USFM Setting : 3

- Gudu

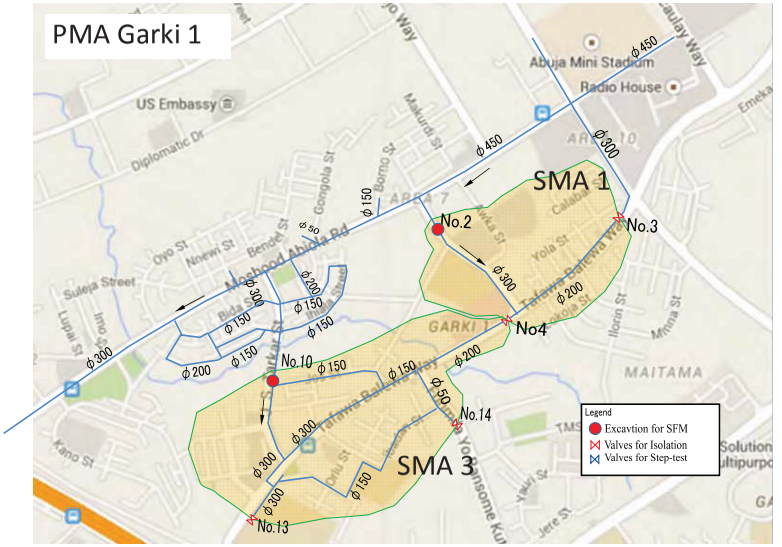
  Meter with Valve Chamber : 1, Step Test Valve Casing : 1, Valve Replacement 2 Vales, Excavation for USFM Setting : 3

- Jabi

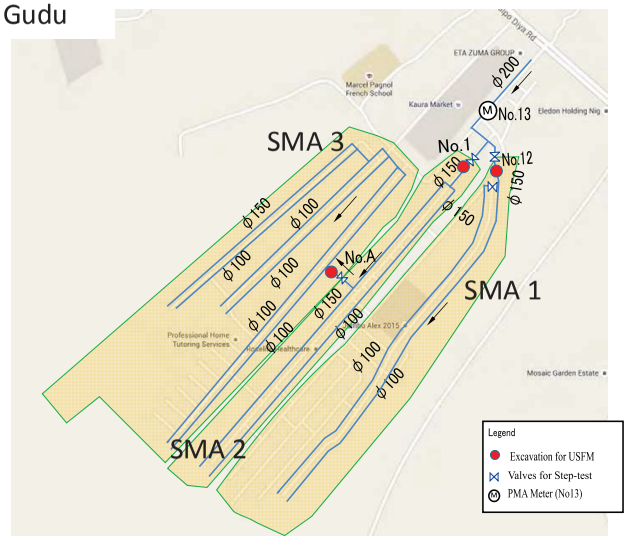
  Meter with Valve Chamber : 2, Step Test Valve Casing : 4, Isolation Valve Casing : 8, Excavation for USFM Setting : 4

Cost for Making PMAs

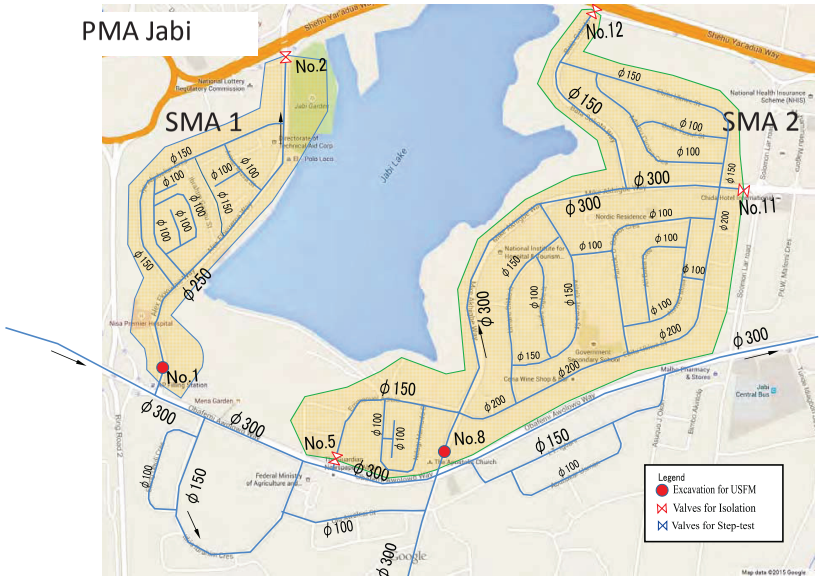
	Original Plan	Revised Plan
• Garki-1	3 SMAs : 12,084,359	(7,086,087)Naira
• Gudu	3 SMAs : 5,178,382	(3,499,142)Naira
• Jabi	4 SMAs : 1,4960,451	(8,151,764) Naira
• Total	25,635,005	(18,736,993)Naira



PMA Gudu



PMA Jabi



Changing Structure of Chambers for PMAs (Tentative Plan)

- Meter with Valve : Same to Original Plan (Chamber)

  → Postpone

- Valve : Changed to Casing

  → Valves for Step Test & Some Valves for Isolation are Postponed

Number of Chambers and Casing for Tentative Plan

- Garki-1

Isolation Valve Casing : 4, Excavation for USFM Setting : 2

- Gudu

Step Test Valve Casing : 1, Valve Replacement 2 Vales, Excavation for USFM Setting : 3

- Jabi

Isolation Valve Casing : 4, Excavation for USFM Setting : 2

Cost for Making PMAs

- Garki-1 2 SMAs : 2,060,793Naira
- Gudu 3 SMAs : 1,911,515Naira
- Jabi 2 SMAs : 2,163,105Naira

- Total 6,135,413Naira

Technical Notes
on
Technical Meeting
for
The Federal Capital Territory
Reduction of
Non-Revenue Water Project

At the 23 July 2015

At the beginning of Technical Meeting, Engr. A. A. Nauche, (Technical Manager), as the Chairperson of the meeting gave an opening remark.

Mr. Toyoda, JICA Expert Team confirmed result and follow-up of 2nd JCC and explained the necessity of changes made on PMA of Garki 1 from the tentative plan. Bill of quantity (BQ) of PMAs has been calculated as uPVC pipeline. But some of pipelines are Ductile Cast Iron Pipe. So, the cost of plumbing work should be estimated again.

Technical members and JICA Expert Team confirmed the following assignment:

1. Results of 2nd JCC on 23rd June (Brief of Problems, Issues and Estimation of NRW)
   - Counterpart Fund of FCTWB
     The budget, amount of 60 million Naira has already approved by the government.
   - Duplicate/Return Bills
     Improvement for accurate billing has commenced.
   - Customs Clearance and Tax Exemption
     JICA HQ will submit necessary documents to FCTWB on/before 24th July.
2. Follow-up of 2nd JCC, Removal of Restriction on GIS, Handover of Equipment
   - Removal of Restriction on GIS
     Removal of restriction on GIS has been accepted already. Implementation will be done by the end of July.
   - Handover of Equipment
     Handover of equipment has been done already.
3. Change on PMA Garki 1 Recommendation from JICA Expert
   - Change on PMA Garki 1
     Recommendation of the change on PMA Grki 1 has been accepted.
   - Change of Flow Meter Size
     Change of Flow Meter Size from DN300 to DN450 will be decided after further discussion.

Annex: Attendance List

Documents distribution: Hand out of Presentation on the meeting and PMA

Engr. A. a. Nauche
Technical Manager
Federal Capital Territory Water Board
Federal Republic of Nigeria

P.P.

Mr. Akinori Miyoshi
Chief Advisor for
FCT Reduction of NRW Project
Japan International cooperation Agency (JICA)

Federal Capital Territory Administration (FCTA)
Federal Capital Territory Water Board (FCTWB)
assisted by
Japan International Cooperation Agency (JICA)

THE FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER PROJECT

PROGRAMME/AGENDA FOR

6TH MONTHLY TECHNICAL MEETING

Venue: Board Room, Headquarters of FCTWB, Area 3, Garki, Abuja
Date: Wednesday, 23rd July 2015

10:00 - 10:05 Welcome Remarks by Engr. A. A. Nahuche, Technical Manager
10:05 - 10:10 Introduction

10:10 - 10:25 Results of 2nd JCC on 23rd June (Brief of Problems, Issues and Estimation of NRW)
10:25 - 10:35 Follow-up of 2nd JCC, Removal of Restriction on GIS, Handover of Equipment
10:35 - 11:00 Explanation of Change on Garki 1 PMA
11:00 - 11:30 Explanation of PMA
11:30 – 11:45 Technical Discussion

11:45 Closing

FFEDERAL CAPITAL TERITORY REDUCTION OF NON-REVENUE WATER PROJECT

TECHNICAL MEETING

DATE: 22ND JULY 2015 VENUE: FCTWB

ATTENDANCE LIST

S/N	NAME	DESIGNATION
1	S. T. Bello	H. O. D. Admin
2	Engr. A.A. Nauche	H. O. D Distribution
3	A. R. Lawal	Head Special Project
4	Dikko Musa	Head Pipeline
5	Engr. Mohammed Kabir	Head Logistics
6	Engr. Raifu M.Adekunle	H/Q
7	Ogbu O. Williams	AAM (c) Gudu
8	Engr. Moh'd Adul	AAM (d) Gudu
9	Yetunde Olaniyan	P. E
10	Bunmi Olowokere	H. O. U. PRSS
11	Taiwo a. Adeyemi	Head EMB, Banks, Corps
12	Kenneth N. Azih	Head Operations
13	Adenuga A.O.	AM Garki
14	Ezech Hillary	Surveyor/GIS/Logistics
15	Choji Pam	AAM (c) Garki 1
16	Gana E. Mohammed	AAM (d) Garki 1
17	Engr. Abubakar Ubale A	Distribution
18	Engr. Akande	Head Procurement
19	Mrs. Rose Akpan	Head Billing
20	Muazo Aliyu S. B.	A.D. Commerce
21	Engr. Doghlas Oloton	Head Metering
22	Aliyu N. Maradun	Head Major Cnsumers
23	S.O. Sadiq	AAM Jabi
24	Engr. Abdullahi M.	Head PPM
25	Isreal Juma	H. O. U P/tops/Plaza
26	Chie Matsudaira	JICA Nigeria Office
27	Dr. Joachim Ezeji	JICA Nigeria Office
28	Toru Toyoda	JICA Expert Team

The Federal Capital Territory Reduction of Non-Revenue Water Project

6th Monthly Technical Meeting
23 July 2015

JICA Expert Team & FCTWB

Results of 2nd JCC on 23rd June (Brief of Problems, Issues and Estimation of NRW)

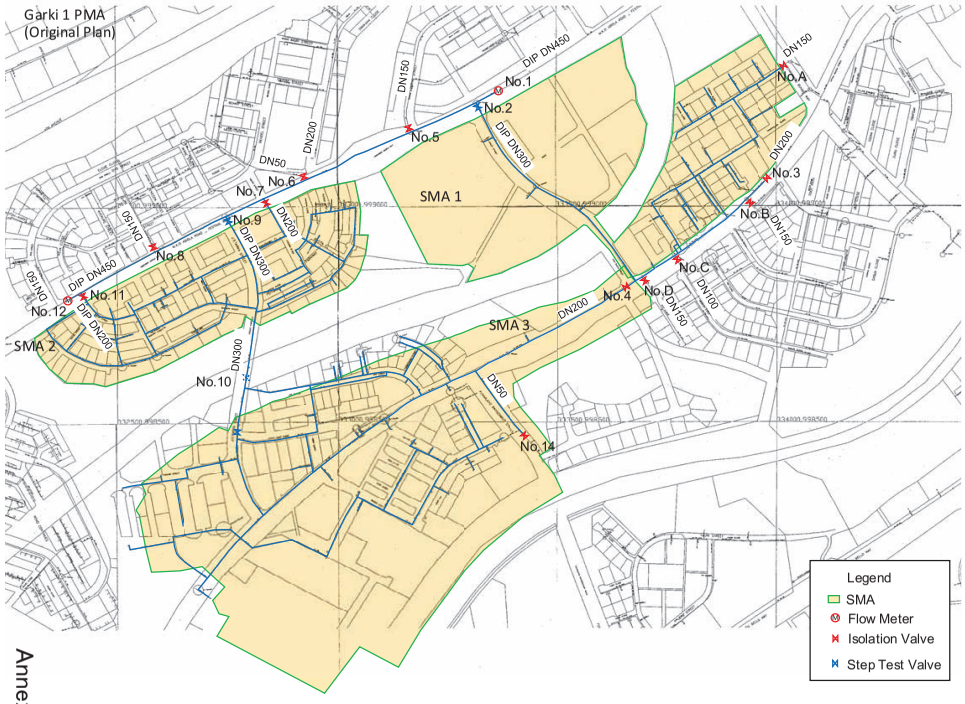
- Counterpart Fund of FCTWB
- Duplicate/Return Bills
- Customs Clearance and Tax Exemption

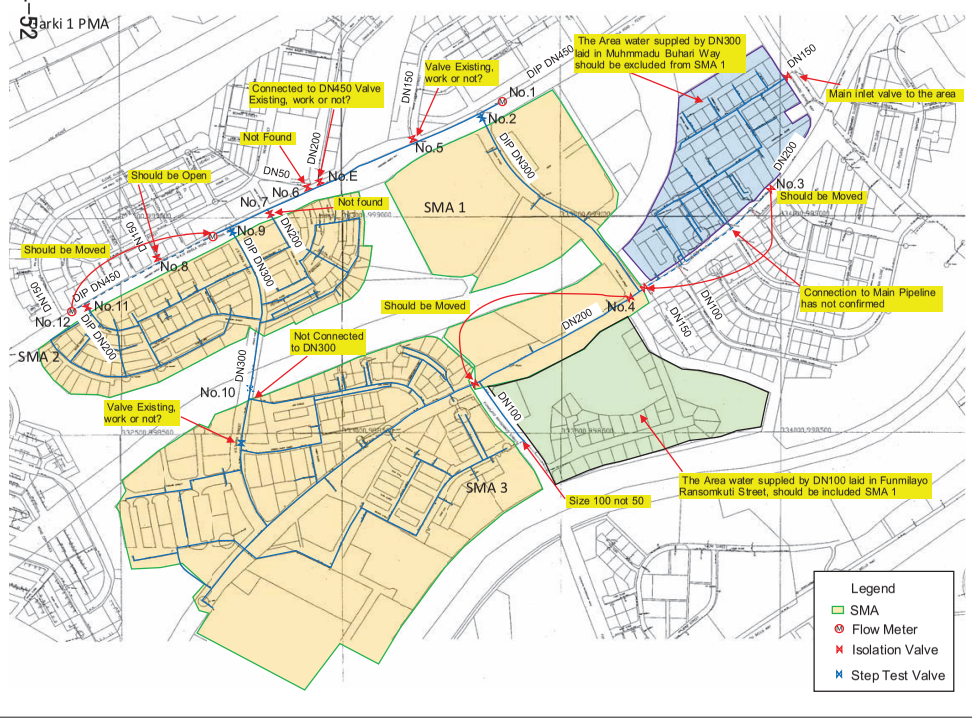
Follow-up of 2nd JCC, Removal of Restriction on GIS, Handover of Equipment

- Removal of Restriction on GIS
- Handover of Equipment

Change on PMA Garki 1 Recommendation from JICA Expert

- Change of SMA
- Change the Size of Flow Meter?
- Move the Setting Place of Flow Meter and Valves





Annex4–52

Other PMAs

- Jabi PMA

  GIS Map has not completed

- Gudu PMA

  Sketch of pipeline in Prince & Princes has not completed

PMA (Pilot Metering Area)
SMA (Sub Metering Area)

Toru Toyoda JICA Expert Team

Purpose of Making PMAs

- To get data for calculation of Revenue Water Rate and Non-Revenue Water Rate
- To reduce Non-Revenue Water Rate

To get data for calculation of Revenue Water Rate and Non-Revenue Water Rate

- To measure inlet volume into the PMA by the master meter : Va
- To get actual water consumption volume (except illegal use) : Vb

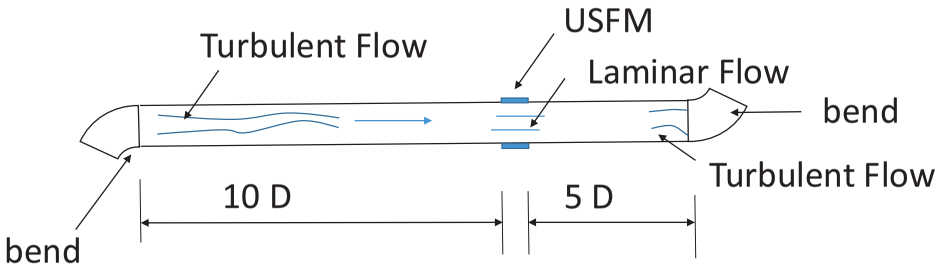
  Vb/Va*100=Revenue Water Rate (Volume)

- To measure inlet volume into the PMA by mobile USFM (Minimum Night Flow Measurement Method)

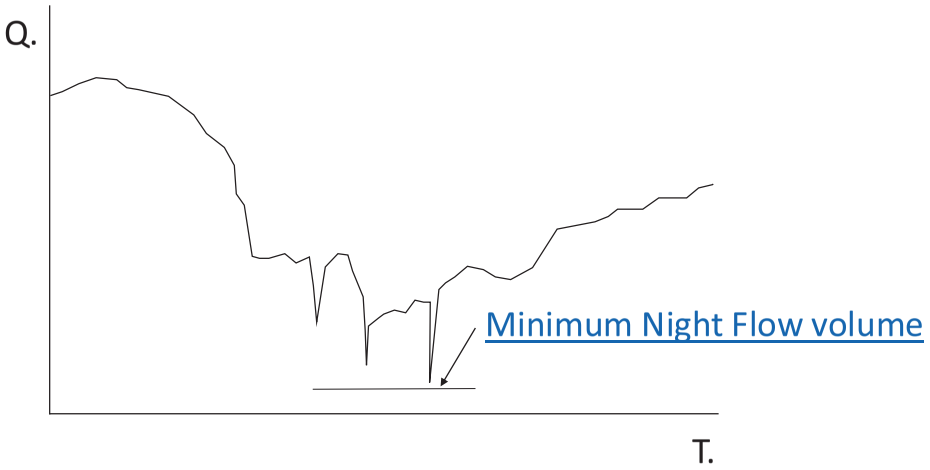
  Minimum Night Flow Volume is estimated as Leakage Volume in PMA or SMA.
- Step Test (Using Portable USFM or Mechanical Flow Meter)

Setting of Ultra Sonic Flow Meter and Electromagnetic Flow Meter

- To get distance 10 D after fittings such as valves, bends and so on
- To get distance 5 D before fittings.
- It needs Laminar Flow

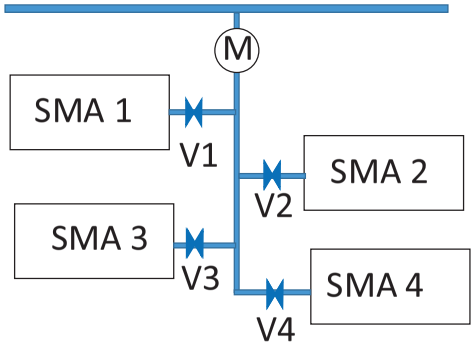


Minimum Night Flow Measurement Method



Step Test

- Open V1 and shut V2,3,4. Measure by Meter. Leakage➡SMA1:Q1
- Open V2. Measure by Meter. ➡Qa Qa-Q1=Q2 Leakage SMA2:Q2
- Open V3. Measure by Meter.➡Qb Qb-Qa=Q3 Leakage SMA3:Q3
- Open V4. Measure by Meter.➡Qc Qc-Qb=Q4 Leakage SMA4:Q4



NRW Reduction Work in PMA

- To survey and reduce commercial loss
- To survey and repair leakages

Evaluation of the NRW Reduction Work

- To compare Leakage Rate Before and After the NRW Reduction Work by the Value of Minimum Night Flow.

The Federal Capital Territory Reduction of Non-Revenue Water Project

Technical Notes
on
7h Monthly Technical Meeting

17th September 2015

As a result of discussions in 7th Monthly Technical Meeting, members confirmed the matters mentioned below:

1. Creation of PMAs/SMAs Verification of Pipe Size and Materials in PMAs

Verification of Pipe Size and Materials in PMAs: While Jabi and Gudu (Prince&Princess) were verified, Garki I has not been fully verified. Pipeline Unit and Garki I Area Office will complete it with support of JICA Expert Team by the end of September.

Procurement of Materials: JICA Expert Team started preparation of procurement of materials for PMAs in Jabi and Gudu (Prince&Princess), and procure them by the end of September, and also materials for PMA in Garki I as soon as the above verification is completed.

Construction of Chambers in PMAs: FCTWB finished preparation with local contractor and will construct as soon as the above materials are procured. Construction period will be from the end of September to the middle of November.

GIS Drawings: Drawings for Jabi was completed. GIS Unit will complete those for Gudu (Prince&Princess) by 23rd of September and for Garki I by the end of September.

2. Duplicated/Return Bills

All area offices and related units in Headquarters submitted information of duplicated/return bills, but due to lack of necessary information for analysis, the committee for the bills will communicate with area offices to obtain and verify them by the end of October. The bills will be deactivated eventually after decision making of FCTWB Management. Through the analysis, the Project will discuss about specifications of modification of existing billing system.

3. AGIS Issues

Due to AGIS policy, restriction cannot be removed. For the time being, GIS activities will be done by the following formation:

A. Existing PC (Geomedia) with AGIS

B. New PC (Geomedia) with AGIS

C. New PC (ArcGIS) for standalone use

* A and B will be connected through network by FCTWB.

4. Counterpart Fund

FCTWB secured a certain amount of fund for construction of the prioritized chambers/casings in PMAs. Request for remaining fund was approved but has not yet released. FCTWB will keep following up it for immediate release to avoid further delay.

5. Tax Exemption and NCC

FCTWB and JICA Nigeria Office have worked on approval of tax exemption by the Federal Ministry of

Finance, but the approval has not been done. FCTWB has inquired radio equipment to NCC, but NCC has not replied. FCTWB will keep following up them.

6. Third JCC Meeting and Annual Joint Monitoring

Third JCC will be held in the second week and annual joint monitoring will be from the end of October to the middle of November. JICA Expert Team requested an initiative of the JCC meeting with support from JICA Expert Team, and FCTWB accepted it willingly.

7. Schedule of the Project Activities

Major activities of the Project will be implemented temporarily as follows:

Items	Sep			Oct			Nov			Dec			Jan		
Project Activities															
- Procurement of Equipment from Japan					■										
- Procurement of Materials in Nigeria			■	■	■	■									
- Construction of Chambers/Casings in PMAs				■	■	■	■	■							
- GIS Drawings for PMAs	■	■	■												
- NRW Reduction Operations in PMAs						■	■	■	■	■	■	■	■	■	■
Related Activities															
- Duplicated/Return Bills	■	■	■	■	■	■									
- GIS Training					■	■									
Project Operation															
- 3rd JCC Meeting								■							
- Annual Joint Monitoring						■	■	■							

8. Weekly/Biweekly Meeting

Once construction works and NRW reduction operations start in PMAs, weekly or biweekly meeting will be considered for progress management.

Appendix: Programme, Attendance List, Documents distributed

19/9/15

Engr. A. A. Nahuche
Manager,
HOD, Distribution, FCT Water Board,
Federal Republic of Nigeria

Mr. Akinori Miyoshi
Chief Advisor for
FCT Reduction of NRW Project
Japan International Cooperation Agency (JICA)

FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER PROJECT

TECHNICAL MEETING

DATE: 17TH SEPTEMBER 2015

VENUE: FCTWB

S/N	NAME	DESIGNATION
1	Mr S.T Bello	
2	Engr. A.A Nahuche	H.O.D Distribution
3	Mohammed Addis	H.O.D Commerce
4	Engr. A.R Lawal	Head of special project unit
5	Engr. Rabiu Kabir	Head of logistics unit
6	Engr Musa Dikko	Head of pipeline unit
7	Mr Shehu Suleiman	Acto/ Head G.I.S
8	Engr Douglas Oloton	Head Metering
9	Adenuga A.O	A.M garki 1
10	Aliyu S.B. Nwazu	A.D commerce
11	Taiwo Adeyemi	Head Ent, Banks, corps
12	Mohammed E. Gana	AAM. Garki 1
13	Isah Danjuma	H.O.U Monitoring and detect
14	Nma Yahaya	AAM Kubwa 3
15	Sadiq O. Sadiq	AAM Jabi
16	Mohammed Dauda	Pipeline
17	Kenneth N. Azih	Head operations
18	Abubakar A. Ubale	Asst. logistics
19	Ezeh Hillary	Surveyor/ G.I.S
20	Yetunde. O. Olaniyan	P.E (water)
21	Rose Akpan	Head Billing
22	Issac .O.Owolabi	H.E.C.R
23	Toru Toyoda	JICA Expert Team
24	Akinori Miyoshi	JICA Expert Team

14th September, 2015

List of Materials for Gudu (Prince&Princess) and Jabi

S/N	Item	Quantity
G-1	Flange Mechanical Flow Meter (200mm)	1
G-2	Flange Adaptor (200mm)	2
G-3	Free Socket (200mm)	1
G-4	Gasket Rubber (200mm)	2
G-5	Bolt & Nut (24")	24
G-6	Sluice Valve (150mm)	3
G-7	Flange Adaptor (150mm)	6
G-8	Free Socket (150mm)	3
G-9	Gasket Rubber (150mm)	6
G-10	Bolt & Nut (24")	48
G-11	UPVC Pipe (150mm/6mL)	1
J-1	Flange Mechanical Flow Meter (300mm)	2
J-2	Flange Adaptor (300mm)	4
J-3	Gasket Rubber (300mm)	4
J-4	Bolt & Nut (24")	48
J-5	Butterfly Valve (300mm)	2
J-6	Gasket Rubber (300mm)	4
J-7	Bolt & Nut (24")	48
J-8	Sluice Valve (200mm)	4
J-9	Flange Adaptor (200mm)	8
J-10	Gasket Rubber (200mm)	8
J-11	Bolt & Nut (24")	96
J-12	Sluice Valve (150mm)	3
J-13	Flange Adaptor (150mm)	6
J-14	Gasket Rubber (150mm)	6
J-15	Bolt & Nut (24")	48

Remarks: PN10 is applied to all items.

The Federal Capital Territory Reduction of Non-Revenue Water Project

Technical Notes
on
Monthly Technical Meeting

21st October 2015

At the beginning of the meeting, Engr. A. A. Nahuche (Technical Manager) as the chairperson of the meeting gave an opening remark to officially start the meeting.

As a result of discussions, members confirmed the matters mentioned below:

1. Creation of PMAs

Gudu and Jabi: JICA Expert Team procured materials for creating PMAs of Gudu and Jabi. Then, the materials were delivered to FCTWB by supplier and inspected by technical members and JICA Expert Team. Mr. Toyoda, JICA Expert made a presentation of maps and design of the PMA.

Garki I: Technical members and JICA Expert Team confirmed design of PMA and each pipe size in Garki I. Request of quotation for the material to create PMA of Garki I were sent to three suppliers. Opening of envelop is scheduled on 22nd of October.

Construction of Chambers/Casings: Technical members and JICA Expert Team agreed that Engr. Lawal will coordinate construction of chambers/casings and installation of valves for Jabi and Gudu simultaneously from October 23, 2015. Both also agreed that the detailed schedule will be discussed on 22nd October which is the day of site visit for the final confirmation of construction and installation in Gudu and Jabi.

2. Progress of GIS Network Drawings

Technical members and JICA Expert Team confirmed that GIS data for Jabi and Gudu has been completed by Mr. Shehu Suleiman. A segment map of Garki I has been printed for distribution to the area office to make pipeline sketches on 26th October. He also emphasized the necessity of information on washout and air release valves for better GIS system.

3. Duplicated/Returned Bills

Gudu Area Manager stated that list of duplicated/returned bills has been completed. Jabi Area Manager and Garki I Area Managers agreed to submit list on/before 23rd October. JICA Expert Team reminded that information of duplicated/returned bills from all area offices should be gathered before the end of October.

4. GIS Training

Technical Manager requested to increase trainees to eight persons from planned five persons. JICA Expert Team agreed to re-consider number of trainees. The training is tentatively scheduled in the end of November. Request of quotation will be sent out to three companies before the end of this week.

5. Counterpart Fund

Due to Treasury Single Account (TSA) policy, the Fund is yet to be released, although the Fund has been approved.

6. Equipment from Japan

Equipment from Japan was delivered to FCTWB. The equipment won't be moved until handing over ceremony. Waiver was gotten although 83,000 naira demurrage has been incurred, which will be paid by

FCTWB.

7. **Weekly/Biweekly Meetings**

JICA Expert Team proposed again to conduct biweekly or weekly meeting by working group for particular subject such as chamber construction, commercial loss activities and leak detection activities to monitor and share progress closely and timely. Technical members and JICA Expert Team agreed to consider the meeting according to its effectiveness.

Appendix: Attendance List

Engr. A. A. Nahuche
Technical Manager,
HOD Distribution
Federal Capital Territory Water Board

for

Mr. Akinori Miyoshi
Chief Advisor for
FCT Reduction of NRW Project
Japan International Cooperation Agency (JICA)

FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER PROJECT

TECHNICAL MEETING

DATE: 21ST OCTOBER 2015 VENUE: FCTWB

ATTENDANCE LIST

S/N	NAME	TITLE	EMAIL	TELEPHONE
1	Mr. S.T Bello	HOD Admin		
2	Engr. A.A Nahuche	HOD Distribution		
3	Engr. A.R Lawal	Head S.P Unit		
4	Aliyu S.B Muazu	Asst. Head of Com		
5	Kabir Mohammed	Head Logistics		
6	Musa Dikko	Head Pipeline		
7	Shehu Suleiman	Head GIS		
8	Nma Yahaya	AAM Kubwa 3		
9	Muhammed Dauda	Tech. Officer Pipeline Unit		
10	Mohammed E. Gana	AAM Garki I		
11	Adamu U. Hussain	-		
12	Adenuga A.O	AM Garki I		
13	Engr. Douglas Oloton	Head Metering General		
14	Isah Danjuma	Head Monitoring and Detection unit		
15	Kenneth Azih	Head Operations		
16	Abubakar Ubale A	Civil Engr II Logistics Unit		
17	Habib Ahmed Kiru	AM Gudu		
18	Ottah Chiejina Eleje	-		
19	Dele Olatunji	-		
20	Salihu o. Sadiq	AAM Jabi		
21	Yetunde O. Olaniyan	Head of Water Monitoring Unit		
22	Abdullahi Masud	Head Metering (Pre-paid Meter)		
23	Abdulrahman S.Sani	-		
24	Mumini Adekunle R.	Structure Engr.		
25	Ezeh Hillary	Surveyor GIS unit		
26	Rose A. Akpan	Head billing unit		
27	Toru Toyoda	JICA Expert Team		
28	Hiroki Niimura	JICA Expert Team		

The Federal Capital Territory Reduction of Non-Revenue Water Project

Technical Notes
on
Monthly Technical Meeting

17th November 2015

At the beginning of the meeting, Engr. A. A. Nahuche (Technical Manager) as the chairperson of the meeting gave an opening remark to officially start the meeting and mentioned that most of project members are not available in this week due to other assignment such as attendance in conference of the Nigerian Society of Engineers.

This monthly technical meeting aims particularly at smooth implementation of the first pilot project in Gudu from the next week. As a result of discussions, members confirmed the matters mentioned below:

1. Creation of PMAs

Procurement of Flow Meters and Valves: JICA Expert Team procured them for creating all three PMAs except some materials which were identified additionally in the following construction and installation works. The additionally-identified materials will be procured by JICA Expert Team.

Construction of Chambers/Casings and Installation: Construction and installation works in Gudu were completed, but the ones in Jabi and Garki I will be commenced soon by FCTWB, which is supposed to be completed by the beginning of January 2016.

2. Implementation of Pilot Project

Schedule, Roles and Responsibilities: FCTWB and JICA Expert Team confirmed the schedule of pilot project in Gudu, and roles and responsibilities of project members as shown in Appendix 2.

Logistics: FCTWB and JICA Expert Team confirmed that FCTWB will arrange staff and vehicles for NRW reduction operations such as midnight works, leakage detection, water meter error test and water meter readings as well as security of equipment during data acquisition in the field.

Police: Police escort will be arranged by JICA Expert Team, but FCTWB will be in charge of transportation.

Explanatory Meeting: More detailed explanation of procedures of NRW reduction operations for Gudu Area Office's staff will be scheduled on 23rd November before implementation. FCTWB and JICA Expert Team confirmed necessity of active involvement of Headquarters' project members and cooperative teamwork for smooth implementation.

3. Duplicated/Returned Bills

As of the middle of November, information of duplicated/returned bills from all area offices has not yet been submitted to JICA Expert Team. FCTWB promised to submit it by the end of November.

4. GIS Training

Contractor for GIS training was selected through proposal method. Needs assessment of each trainee will be done between 18th and 20th November, then the training is scheduled from 23rd November to 1st December.

5. Counterpart Fund

Due to Treasury Single Account (TSA) policy, the Fund is yet to be released, although the Fund has been approved.

Appendix 1: Attendance List

Appendix 2: Schedule of Pilot Project in Prince & Princess, a PMA of Gudu Area Office

Engr. A. A. Nahuche
Technical Manager,
HOD Distribution
Federal Capital Territory Water Board

Mr. Akinori Miyoshi
Chief Advisor for
FCT Reduction of NRW Project
Japan International Cooperation Agency (JICA)

Appendix 1

FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER PROJECT

MONTHLY TECHNICAL MEETING

DATE: 17TH NOVEMBER 2015

VENUE: FCTWB

S/N	NAME	DESIGNATION
1	S.T. Bello	H.O.D Admin & Supply
2	Engr. A.A Nahuche	H.O.D Distribution
3	Mohammed Addis	H.O.D Commerce
4	Engr. Rabiu Kabir	Head of Logistics unit
5	Musa Dikko	Head of Pipeline unit
6	Abdullahi Masud	Head Metering (Pre-paid Meter)
7	Rose Akpan	Head Billing
8	Akinori Miyoshi	CA, JICA Expert Team
9	Toru Toyoda	JICA Expert Team
10	Kiyoshi Kiyama	JICA Expert Team
11	Shinta Segawa	JICA Expert Team

Appendix 2 Schedule of Pilot Project in Prince & Princess, a PMA of Gudu Area Office

No.	Activity	In Charge		November 2015																												December 2015																							
		HQs	AO	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	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
				M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T
2-10	**Detect target NRW components (i.e. invisible leakage, customer meter malfunction, and illegal connection) of each SMA**																																																							
	Commercial Loss																																																							
	1 Making Customer List of Each SMA (All Categories of Users)	Each Category's Unit	AAM and staff (C)	1.0	1.0	1.0	1.0	1.0																																															
	2 Meter Error Test of Conventional Meters	Meter (General), Pipeline, Detection Units	AAM(C), Meter Readers								1.0	1.0	1.0	1.0	0.5																																									
	3 Meter Error Test of Prepaid Meters	Meter (General+Prepaid), Pipeline, Detection Units	-								1.0	1.0	1.0	1.0	0.5			1.0	1.0	1.0	1.0	0.5																																				
	4 Installation/Removal of Temporary Meters at Faulty Prepaid Meters and Flat Ra	Meter (General+Prepaid), Pipeline, Detection Units	AAM(C), Meter Readers								1.0	1.0	1.0	1.0	0.5																		1.0	1.0	1.0	1.0	0.5																						
	5 Meter Reading of All Customer Meters	Each Category's Unit	AAM(C), Meter Readers															1.0	1.0	1.0	1.0	0.5			1.0	1.0	1.0	1.0	0.5																												
	6 Data Compilation and Analysis	Meter (General+Prepaid), Detection Units	Area Manager, AAM(C)												0.5							0.5							0.5																												
	7 Revenue Water & Commercial Loss Report	Meter (General+Prepaid), Detection Units	Area Manager, AAM(C)																													1.0	1.0	1.0																							
	Physical Loss (Leakage)																																																						
	1 Equipment Handling and Lecture	Pipeline, Logistics Units	AAM and staff (D)					0.5			1.0																																												
	2 Excavation/Backfilling for Installation of Ultrasonic Meter	Pipeline, Logistics Units	AAM and staff (D)								1.0				0.5																																							
	3 24 hrs Flow + Minimum Flow Measurement	Pipeline, Logistics Units	AAM and staff (D)									0.5	0.5	with Security																																								
	4 Step Test in Minimum (Night) Flow Time	Pipeline, Logistics Units	AAM and staff (D)											0.5	with Security																																							
	5 Data Analysis	Pipeline, Logistics Units	AAM and staff (D)												0.5																																							
	6 Acoustic Identication Survey at All Customer Meters (Listening Bar)	Pipeline, Logistics Units	AAM and staff (D)															1.0	1.0	1.0	1.0	0.5																																	
	7 Acoustic Identication Survey on the Road (Ground Microphone)	Pipeline, Logistics Units	AAM and staff (D)																						1.0	1.0	1.0	1.0	0.5																										
	8 Confirmation Survey	Pipeline, Logistics Units	AAM and staff (D)																													1.0	1.0																							
	9 Leakage Report	Pipeline, Logistics Units	Area Maneger, AAM (D)																															1.0																					
2-11	**Develop a NRW reduction operation plan of each SMA, including reduction target for review by Head of Distribution Department**																																																					
	NRW General																																																						
	1 Weekly Flow Meter Reading (Mechanical Meter)	Pipeline, Logistics Units	AAM (C)								0.5							0.5							0.5							0.5							0.5							0.5							
	2 Data Compilation and Analysis	Logistics, Meter (General+Prepaid), Monitoring, Detection Units	Area Maneger, AAMs											1.0				1.0							1.0							1.0																					
	3 Water Balance (Audit) Analysis	Logistics, Meter (General+Prepaid), Monitoring, Detection Units	Area Maneger, AAMs																													1.0	1.0																					
	4 Planning	Logistics, Meter (General+Prepaid), Monitoring, Detection Units	Area Maneger, AAMs																																1.0	0.5																	
2-12	**Review and approve NRW reduction operation plan of each SMA**																																																				
	1 Review	HODs, Coordinator	-																																				1.0													
	2 Approval	HODs, Coordinator	-																																					1.0											
3-3	**Conduct hydraulic and water pressure distribution analyses of the pipeline networks**																																																			
	1 7 Days Flow Measurement (Ultrasonic)	Pipeline, Logistics, Monitoring Units	AAM (D)															0.5	1.0	1.0	1.0	1.0	1.0	1.0	0.5	with Security																											
	Hilux and Driver																																																			
	1 No.1																																																			
	2 No.2																																																			

The Federal Capital Territory Reduction of Non-Revenue Water Project

Technical Notes
on
3rd Quarterly Project Meeting and Monthly Technical Meeting

22nd December 2015

Engr. Lawal, Head of Special Project anchored the meeting.

The meeting was started by opening remarks of Engr. Nahuche, HOD Distribution.

As a result of discussions in 3rd Quarterly Project Meeting and Monthly Technical Meeting, members confirmed the matters mentioned below:

1. **Follow-up of 3rd JCC**
   - Treasury Single Account (TSA): Mr. Hudu Bello, the Director explained background of TSA and challenges which FCTWB has faced. However, FCWTB has communicated with other authorities for release of approved Counterpart Fund.
   - Chamber Construction at outlet of LUD-WTP: Regardless of difficulty in assurance of counterpart fund due to TSA, FCTWB has communicated with contractor to implement the construction and the Director has already approved the forwarding. The construction is scheduled to commence soon and be completed before the end of January 2016. (Engr. Nahuche).
   - Chamber Construction in PMAs of Jabi & Garki I: The Project Team has challenged confirming location of chamber for a main flow meter, but it has not yet been done because of pipeline depth and property of petrol station. As soon as the Team and Mr. Toyoda finalize it within the next few days, FCTWB will accelerate the construction and installation of materials which have been supplied by JICA, and complete it by the end of January 2016. (Mr. Dikko)
   - Duplicated/Return Bills and Schedule of Deactivation: The committee has worked on this problem and already submitted summarized information to JICA Expert Team. FCTWB will complete deactivation of them by the middle of January 2016. But, in case of any possible delay cause by server down, it should be immediately shared to take action. (Mr. Adis)
   - Modification of Billing System: The selected Project Members from Commerce Department and JICA Expert Team has discussed it but not yet reached a conclusion, so will continue discussion to propose specifications of modification by the middle of January 2016. (Mr. Adis and JICA Expert)
   - Non-Availability of As-Built Drawings: FCTWB will access archive of the Engineering Service of FCDA to copy and scan the drawings, as well as, establish proper procedures of information management and own archive to assemble existing drawings and documents in FCTWB so as not to keep them within particular staff. (Engr. Lawal)
   - AGIS / GIS Training: FCTWB will try to set up a network among PCs in which GIS software is installed, and then commence transferring from AGIS to FCTWB's own GIS database. (Mr. Shehu)
     JICA Expert suggested trainees participated in GIS Training continue operating GIS software routinely, and also FCTWB prepare internal training for transfer of knowledge and skills gained from GIS training to staff. FCTWB agreed to suggestions.

2. **Progress of Pilot Project in Prince & Princess**

Mr. Habib, Gudu Area Manager made a presentation on the progress of pilot project in a PMA "Prince & Princess", particularly results and challenges about leakage survey and meter reading. Mr. Masaud, Head of Prepaid Metering Unit also made an explanation about meter error test. FCTWB and JICA Expert Team confirmed as follows:

- Gudu Area Office will conduct midnight step test of pipeline along Drive 1 on 23rd-24th December 2015, then submit the data obtained to JICA Expert Team on 24th December 2015.
- Meter error test of the sampled meter has been done at 60 prepaid metes and 8 conventional meters. To complete 133 in total, Prepaid Meter Unit will test remaining 50 for prepaid meters and Gudu Area Office will test remaining 15 for conventional meters by the middle of January 2016.
- Gudu Area Office will do meter reading of temporarily-installed meters soon.
- Gudu Area Office will clarify a meter reading category "Refusal" soon.
- Gudu Area Office will clarify a meter reading category "Others (No Comment)".
- FCTWB HQs will follow up obtaining customer list of the prepaid meters installed from contractor.
- Jabi and Garki I Area Offices will prepare customer list of PMA by the middle of January 2016.
- Commerce Dep't will prepare customer list of major consumers if any in PMAs of Jabi and Garki Area Offices by the middle of January 2016.

3. **Overall Schedule of Pilot Project in 2016**

Mr. Toyoda, JICA Expert Team made a short presentation on overall schedule of pilot project in 2016 and procedures of NRW reduction. FCTWB and JICA Expert Team confirmed as follows:

- Schedule of pilot project will be discussed and revised if necessary in the middle of January 2016.
- The Project members will check the procedures and make comments to JICA Expert Team before Mr. Toyoda returns.

4. **Design of Water Distribution Management and Zonal Meters**

Engr. Lawal, Head of Special Project made a presentation on design of water distribution management and zonal meters. Then, FCTWB and JICA Expert Team confirmed design criteria, location of equipment such as ultrasonic flow meters, chambers, telemetry system and solar power system, and also number and specification. Regarding the length of straight section between bend pipe and installation point of ultrasonic flow meter which is supposed be more than "10 x Pipe Diameter" at the upstream side as a standard, both agreed to apply more than "5 x Pipe Diameter" exceptionally to two locations (Bwari and Airport tanks) because of existing pipe arrangement.

5. **Progress of Action Plan (presented in Training in Japan)**

Engr. Nahuche, HOD Distribution mentioned enabling laws for autonomy of FCTWB will be hopefully passed by the National Assembly next year because of presence of strong supporter, and also restructuring has been in process. Other proposed Plans have been suspended due to TSA, However provision were made in the 2016 budget for possible implementation.

FCTWB and JICA Expert Team confirmed that the Action Plans should be monitored periodically to make them realized.

6. **Newsletter Volume 3**

Mr. Abbas, PR and Mr. Miyoshi, JICA Expert Team explained Newsletter Volume 3, which is supposed to be

finalized by the end of January 2016. Based on schedule, Mrs. Bunmi, PRS and Mr Abbas will request some Project members writing.

Candidates are: Engr. Nahuche, Mr. Addis, Engr. Aliyu and Mr. Dikko for training in Japan, Mr. Shehu for GIS training, Mr. Habib for pilot project, and other members.

7. **Workshop and Stakeholder Forum scheduled in February 2016**

Mr. Miyoshi, JICA Expert Team announced that 2nd workshop for information sharing among FCTWB staff about the Project and stakeholders forum (group discussion) inviting other State Water Agencies will be held in February 2016, and requested FCTWB be at the initiative and ownership of FCTWB.

Ms. Chie Shimodaira, JICA Nigeria Office added the concept of stakeholder forum to Mr. Miyoshi's explanation. She also requested FCTWB be keen to follow timeline of the Project to avoid delay, and mentioned possible actions to be taken by JICA to higher authorities for smooth implementation of the Project can be considered.

The meeting was closed by remarks of Mr. S. T. Bello, HOD Admin&Supply. Mr. Bello on behalf of the Director assured JICA Representative and Expert Team the readiness of FCTWB to ensure the success of the Project. He admonished all Project members to be more dedicated and take ownership of the Project.

Appendix: Programme, Attendance List, Documents distributed

Mr. Hudu Bello
Project Manager,
The Director, FCT Water Board,
Federal Republic of Nigeria

Mr. Akinori Miyoshi
Chief Advisor for
FCT Reduction of NRW Project
Japan International Cooperation Agency (JICA)

Federal Capital Territory Administration (FCTA)
Federal Capital Territory Water Board (FCTWB)
assisted by
Japan International Cooperation Agency (JICA)

THE FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER PROJECT

PROGRAMME/AGENDA FOR

3RD QUARTERLY MEETING and 10TH MONTHLY TECHNICAL MEETING

Venue: Board Room, Headquarters of FCTWB, Area 3, Garki, Abuja
Date: Tuesday, 22nd December 2015

10:00 - 10:05	Opening Remarks
10:05 - 10:35	Follow-up of 3rd JCC TSA Chamber Construction at outlet of LUD WTP (by end-Feb. 2016) Chamber Construction in PMAs of Jabi & Garki I (by end-Jan. 2016) Duplicated/Return Bills and Schedule of Deactivation Modification of Billing System (by mid-Jan. 2016) Non-Availability of As-Built Drawings / Remedial Measures AGIS / Remedial Measures, GIS Training
10:35 - 11:05	Progress of Pilot Project in P&P (Distribution, Commerce)
11:05 - 11:10	Overall Schedule of Pilot Project 2016
11:10 - 11:30	Design of Water Distribution Management and Zonal Meters
11:30 - 11:35	Progress of Action Plan (presented in Training in Japan)
11:35 - 11:45	Newsletter Vol.3
11:45 - 11:55	Workshop and Stakeholder Forum scheduled in Feb. 2016
11:55 - 12:15	Q&A and Discussion
12:15	Closing Remarks

FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER PROJECT

3rd QUARTERLY MEETING AND MONTHLY TECHNICAL MEETING

Venue: FCTWB Board Room

Date: Tuesday, 22nd December 2015

S/N	Name	Position
1	Hudu Bello	Project Manager
2	S.T Bello	Deputy Project Manager
3	A.A Nahuche	Technical manager
4	Muhammed Addis	Technical manager
5	Hafsat A. Lawi	H.O.U (Finance and Account)
6	Aliyu U.A	H.O.D (reservoir and production)
7	Abolade R. Lawal	Project coordinator
8	Isah Danjuma	H.O.U(monitoring)
9	M.K. Rabiu	Head Logistics
10	Adenuga A.O	A.M Garki 1
11	Habib Ahmed Kiru	A.M Gudu
12	Dikko Musa	H.O.U (PL/WC)
13	Mumini Raifu	Project Engineer
14	Moh'd A. Ozumi	Asst. A.M Gudu
15	Abdulrahman Muhammed	S.E
16	Ejimonu Declan	Rep.H.O.U(Billing)
17	Mohammed Dauda	Pipeline
18	Ogbu Williams Onuoha	Asst. A.M Gudu
19	Ohiweremen A. Samson	Asst. head unit (M.C)
20	Aluko Tope	Head (E&M)
21	Amos Bulus	P.E
22	Abdullahi Masud	Head PPM
23	Abibu Imonikhe	Asst. H.O.U (Emb. Coop. Fin. Inst.)
24	Abubakar Ubale	S.E
25	Shehu Suleiman	Head G.I.S
26	Garba Yakubu	Foreman
27	Ottah C.E	S.E
28	Salihu O. Sadiq	Asst. AM Jabi
29	Nma Yahaya	Asst. Distribution Kubwa
30	Abbas A. Ahmed	Head PR
31	Fabikun Adedeji .K.	Head M.I.S
32	Umar Famk Abdullahi	Pre- paid Metering
33	Chie Shimodaira	JICA Nigeria Office
34	Seigo Goto	JICA Expert Team
35	Kenji Yoshida	JICA Expert Team
36	Toru Toyoda	JICA Expert Team
37	Taketoshi Fujiyama	JICA Expert Team
38	Akinori Miyoshi	JICA Expert Team

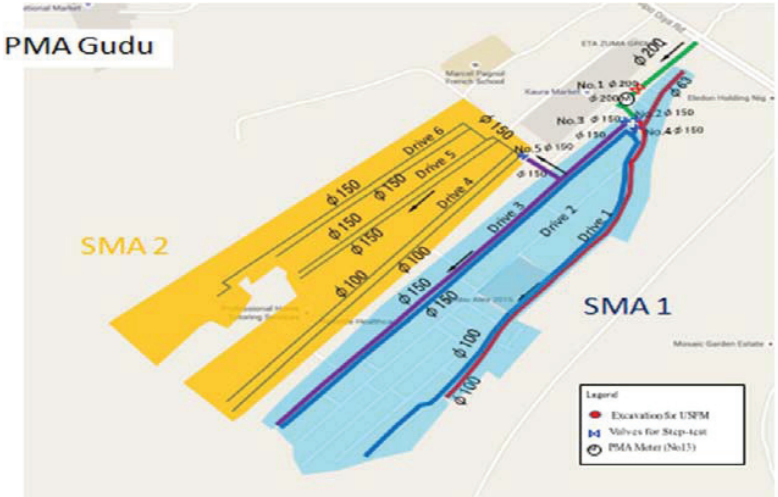
Survey of Leakage

Gudu Area office

Flow of Leakage Survey

- Select of Area
- Confirm of Function of Valve (Isolation Valve)
- Measure of Flow Rate
- Survey of Leakage
- Repair
- Analyze of Leakage

Select of Area

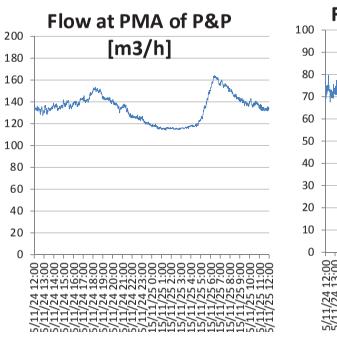


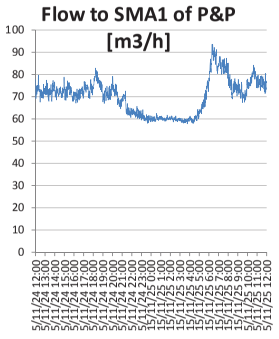
Confirm of Function of Valve

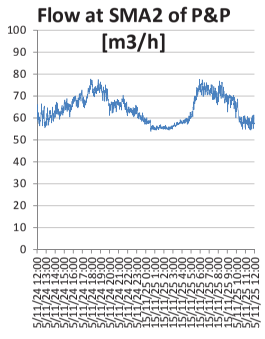
Confirm of Existing Valve

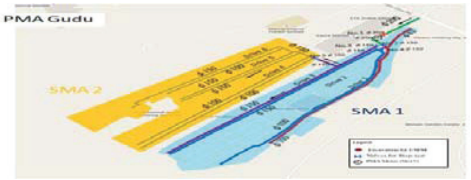
Exchange to New Valve

Measure of Flow Rate

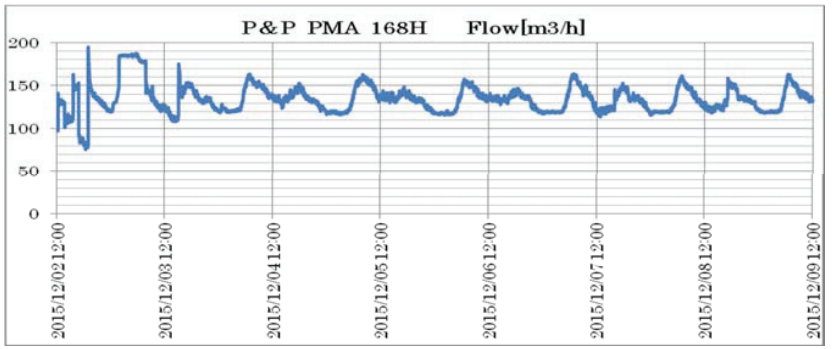








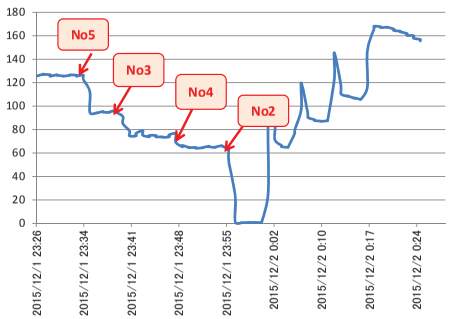
Measure of Flow Rate

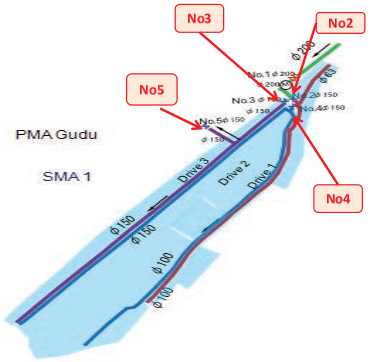


Annex4-72

Measure of Flow Rate (Step Test)

Minimum Night Flow Survey (Gudu) 01/12/2015						
Close of Valve	Flow Rate at Before Valve Operation	Current Flow Rate	Flow Rate Difference	Area	Line	Flow Rate of Area
—	126.3m3/H	126.3m3/H	— m3/H	ALL		126.3m3/H
No5	126.3m3/H	94.9m3/H	31.4m3/H	SMA1	Drive 1.2.3	94.9m3/H
				SMA2	Drive 4.5.6	31.4m3/H
No3	94.9m3/H	75.1m3/H	19.8m3/H	SMA1	Drive 3	19.8m3/H
No4	75.1m3/H	65.1m3/H	10.0m3/H	SMA1	Drive 3 +Drive 2	10.0m3/H
No2	65.1m3/H	0.7m3/H	64.4m3/H	SMA1	Drive 1 +Drive 2	64.4m3/H



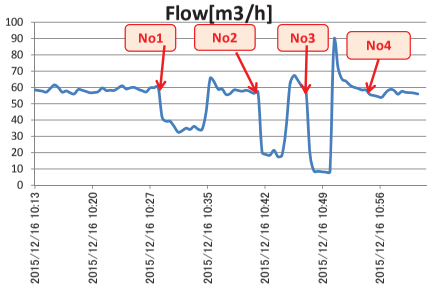


Result of Step Test (SMA1)

Minimum Night Flow Survey (Gudu) 01/12/2015						
Close of Valve	Flow Rate at Before Valve Operation	Current Flow Rate	Flow Rate Difference	Area	Line	Flow Rate of Area
—	126.3m3/H	126.3m3/H	— m3/H	ALL		126.3m3/H
No5	126.3m3/H	94.9m3/H	31.4m3/H	SMA1	Drive 1.2.3	94.9m3/H
				SMA2	Drive 4.5.6	31.4m3/H
No3	94.9m3/H	75.1m3/H	19.8m3/H	SMA1	Drive 3	19.8m3/H
No4	75.1m3/H	65.1m3/H	10.0m3/H	SMA1	Drive 3 +Drive 2	10.0m3/H
No2	65.1m3/H	0.7m3/H	64.4m3/H	SMA1	Drive 1 +Drive 2	64.4m3/H

Measure of Flow Rate (Step Test)

Step Test Flow Survey (P&P Drive1) 16/12/2015					
Close of Valve	Flow Rate at Before Valve Operation	Current Flow Rate	Flow Rate Difference	Line	Flow Rate of Line
—	58.55m3/H	58.55m3/H	—	Drive1	58.55m3/H
No1		36.17m3/H	22.38m3/H		22.38m3/H
No2		19.18m3/H	39.37m3/H		—
			16.99m3/H		16.99m3/H
No3		8.38m3/H	50.17m3/H		—
			8.38m3/H		8.38m3/H
No4		55.21m3/H	3.34m3/H		3.34m3/H
			7.46m3/H		7.46m3/H



Result of Step Test (P&P Drive1)

Step Test Flow Survey (P&P Drive1) 16/12/2015					
Close of Valve	Flow Rate at Before Valve Operation	Current Flow Rate	Flow Rate Difference	Line	Flow Rate of Line
—	58.55m3/H	58.55m3/H	—	Drive1	58.55m3/H
No1		36.17m3/H	22.38m3/H		22.38m3/H
No2		19.18m3/H	39.37m3/H		—
			16.99m3/H		16.99m3/H
No3		8.38m3/H	50.17m3/H		—
			8.38m3/H		8.38m3/H
No4		55.21m3/H	3.34m3/H		3.34m3/H
			7.46m3/H		7.46m3/H

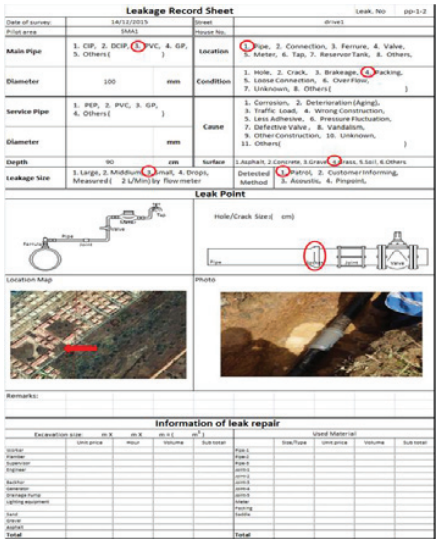
Survey of Leakage

Acoustic Survey at House

Acoustic Survey on the Ground

We found leakage of 24 points

Repair (ongoing)



Analyze of Leakage

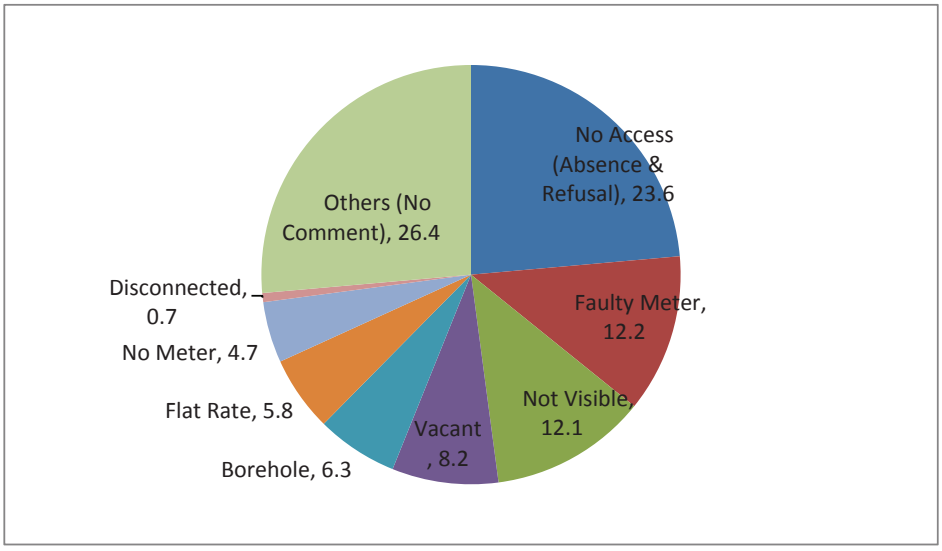
NOT YET

Thank you for your attention!

Tentative Result of Meter Reading in Prince and Princess Estate (Gudu Area Office)

	Drive						Total	
	1	2	3	4	5	6		
Number of Total Customers	167	246	215	186	142	87	1,043	
Number of Consumption Counted Customers	39	63	66	45	45	25	283	
Number of Consumption Uncounted Customers	128	183	149	141	97	62	760	
No Access (Absence & Refusal)	22	34	55	31	30	7	179	23.6
Faulty Meter	27	14	19	17	12	4	93	12.2
Not Visible	9	22	11	23	13	14	92	12.1
Vacant	18	18	9	11	1	5	62	8.2
Borehole	9	11	6	8	7	7	48	6.3
Flat Rate	5	5	3	14	7	10	44	5.8
No Meter	4	11	11	2	5	3	36	4.7
Disconnected	2			2		1	5	0.7
Others (No Comment)	32	68	35	33	22	11	201	26.4
Rate of Consumption Counted Customers (%)	23.4	25.6	30.7	24.2	31.7	28.7	27.1	
Metered Daily Consumption Amount (m3)	83.58	119.51	61.02	99.38	84.86	40.71	489.06	

Breakdown of Consumption Uncounted Customers



NRW Reduction Activities' Plan for Gudu Area Office (Draft)

1 SMA Isolation Method and Isolation History

1-1 Isolation Method (Common)

a At the first, it has to be done the selection of areas which can be isolated from 2 to 4 in the PM. A SMA has to have one inlet dosing point and zero or one outlet point.

b When there are multiple inlet points in the SMA, inlet water volume has to be considered for selection of the only one inlet point and other inlet points have to be closed by installed valves.

c A valve will be installed and a chamber will be constructed which has enough space to set a portable ultra-sonic flow meter (here in after PUSM) at the inlet point of each SMA. Or before setting USFM, the pipeline should be exposed.

d A ultra-sonic flow meter has to be set away from more than 10 times pipe diameter size (upstream) and 5 times pipe diameter size (downstream) in the distance between a PUSM and deformed pipe such as bend, T-joint and others or valves and other materials.

e When it is impossible to shut the outlet point of SMA and it is an inlet point of another area (out of PMA), a flow meter has to be installed and out let water volume will be counted by it. And a chamber with enough space to set USFM should be installed, or before setting USFM the pipeline should be exposed at every time.

1-2 Isolation History

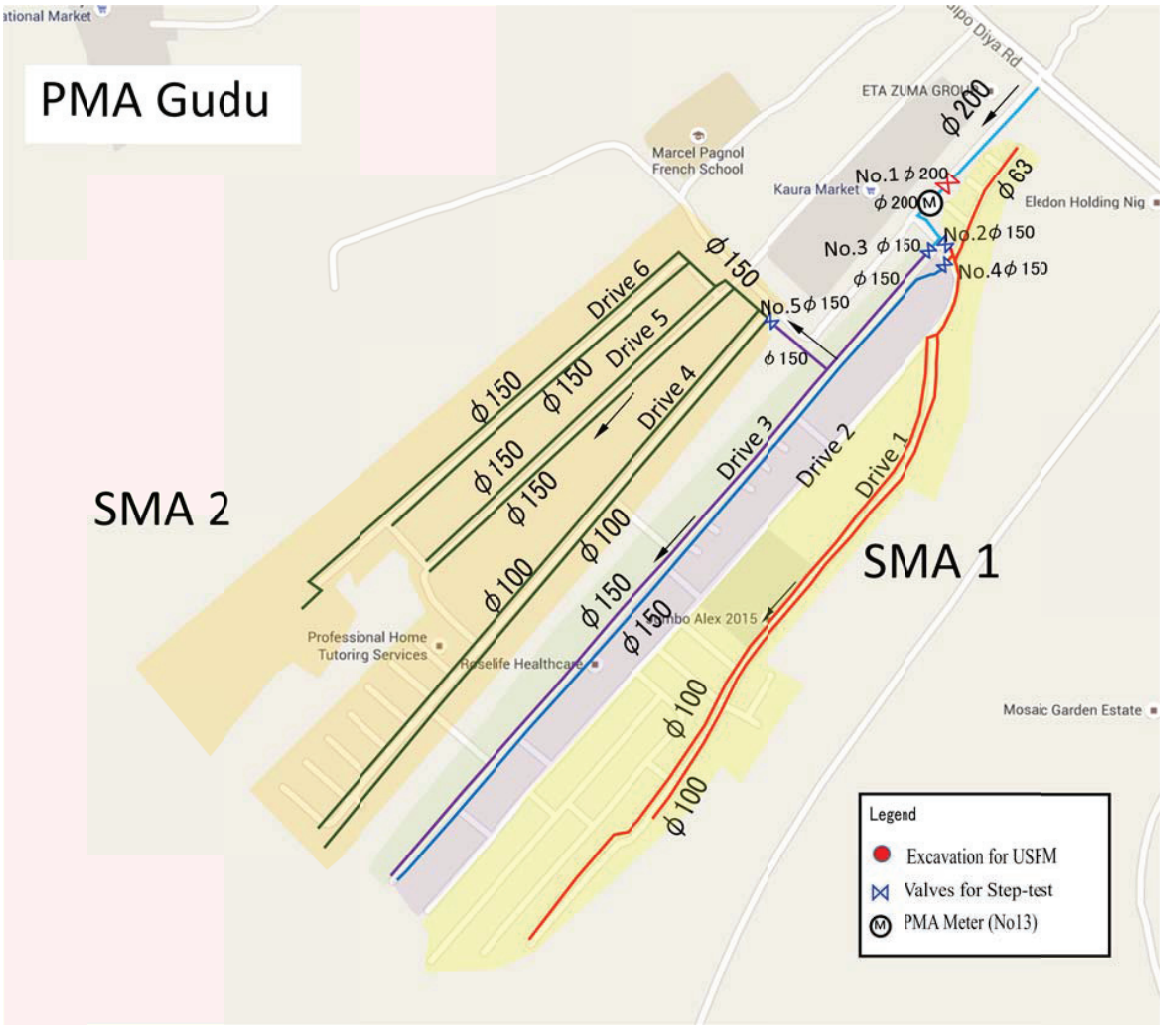
a There are 6 main roads in Prince & Princess Estate and two pipe lines are laid in the both side of drive 1, 3, 4, 5 and 6. No pipeline on is laid in drive 2. Therefore, houses belong drive 2 are supplied water from pipelines laid in drive 1 and 3, and it is not clear which house gets water from pipeline laid in which drive

b Therefore, drive 1, 2 and 3 are allocated as SMA 1 and drive 4, 5 and6 are allocated as SMA 2.

c There are existing flow meter and valve at the inlet point of PMA. We use the existing valve because it is working and can be shut. We have purchased and replaced mechanical flow meter (200mm) and its fittings because it was no working.

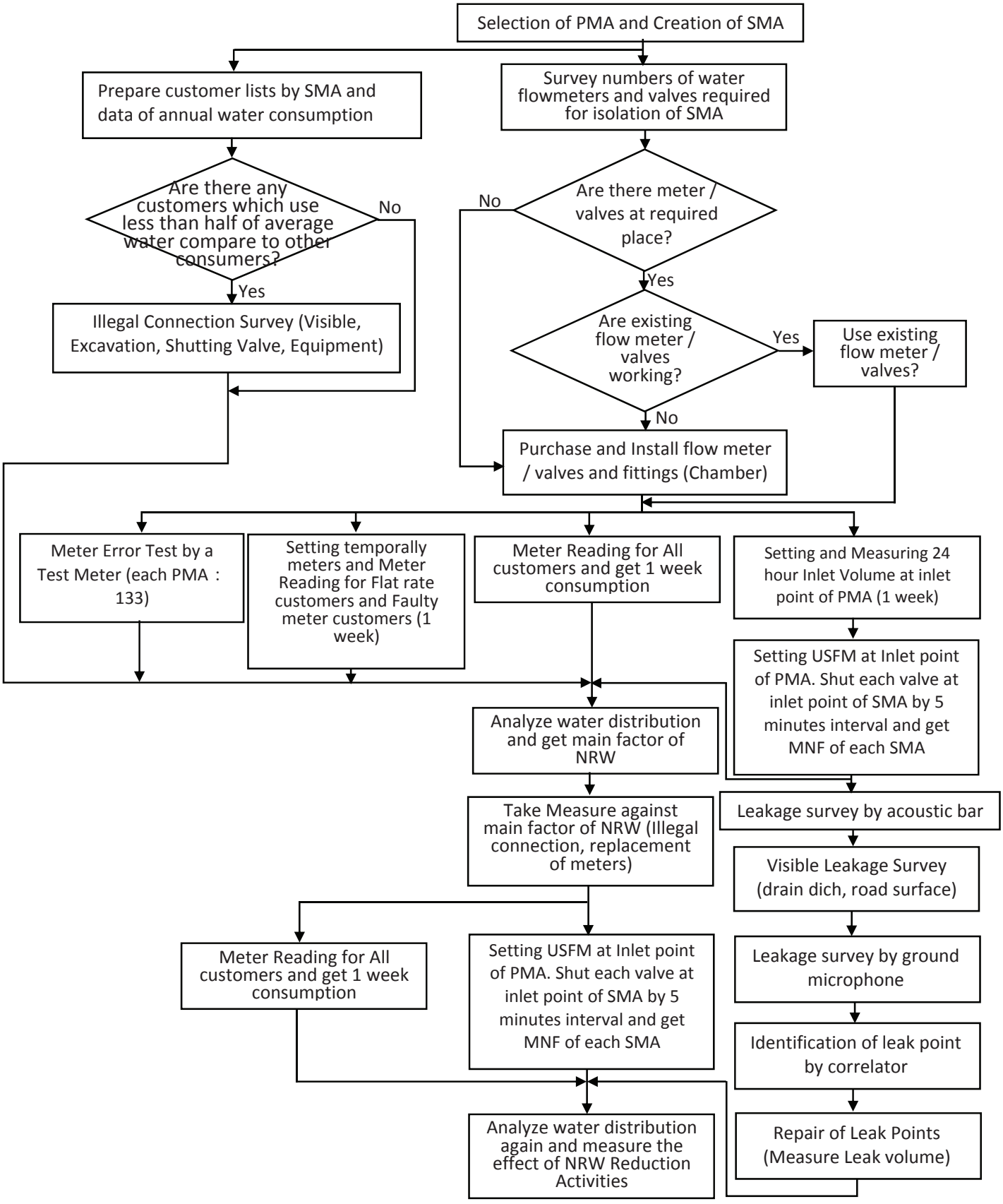
d We have purchased and replaced no.2, 3 and 5 valves and their fittings (150mm) because they were not working and necessary for making SMA

2 SMA Location Diagram



SMA Location Diagram

3 SMA NRW Reduction Activities' Flow (common)



4. NRW Reduction Activities

4-1 Before NRW Reduction Operations

4-1-1 Creation of PMA and SMA

a Selection of PMA and Creation of SMA

b Survey numbers of water flowmeters and valves required for isolation of SMA

c Survey the covering depth, diameter, materials of the existing pipelines to install water flowmeters and valves

d Design structure drawing of the chambers for ultra-sonic flowmeters and isolation valves

e Final equipment and materials to be purchased

f Install flowmeters and isolation valves

4-1-2 Measure Commercial Loss

a Prepare customer lists by SMA and data of annual water consumption

b Learn water consumption in SMA for a week

c Measure water meter errors for 117 pre-paid water meters and 16 conventional water meters. (total: 133 meters)

d Measure water consumption of five customers whom flat rate is imposed and of 10 customers who has defective water meters or no water meters in order to learn a gap between fixed consumption for flat rate and actual water consumption.

4-1-3 Measure Minimum Night Flow

a Measure daily average inflow rate (SIV: System Input Volume) for a week at an inlet of PMA

b Measure Minimum Night Flow by SMA to identify characteristics of each SMA

4-1-4IWA Water Balance Analysis

a Prepare IWA Water Balance Sheet based on data of SIV, read water consumption, meter inaccuracy, a gap between the fixed consumption for flat rate and actual water consumption

4-2 NRW Reduction Operations

4-2-1NRW Reduction Operations on Commercial Loss

a Inspect illegal connections while reading water meters and conducting hearing water flow noise using acoustic bar.

b Examine if water consumption of the particular customers is one second lower than that of other customers to select customers which should be surveyed in order to find out illegal connections.

c Detect the existing service pipelines of customers whose water consumption is small and or wells are used. Pipe locator is used for detection.

d Check water discharge from faucet and inflow to individual overhead tank after closing gate valve of service pipes.

e Replace water meters which is malfunctioning and whose error is high.

4-2-2 NRW Reduction Operations on Leakage

a Detect leaks by using acoustic bar at water meters

b Survey on surface leakage

c Detect leaks by using electric leak detectors

d Identify leak points by using correlator

e Repair leak points

4-3 After NRW Reduction Operations

a Learn water consumption for a week

b Measure Minimum Night Flow by SMA to measure effect of NRW Reduction Operation

c Analyze IWA water balance to learn effect by NRW reduction operations

5. Noticeable Points on NRW Reduction Operations

a There is possibility of dosing water to private tank in night and Illegal water usage by potable water factory in SMA 1, because there is little difference between Minimum Night Flow Rate and daytime water consumption.

b It is difficult to narrow down target consumers for illegal connection survey in Prince and Princess Estate, because it is insufficient the information of prepaid meter customers.

c It is necessary to make an illegal connection survey team, because there might be many illegal connections.

d The most of leak are pipe joint leakages because of defective workmanship. Therefore, it is necessary to improve the quality of contractors.

6 SMA Overview

SMA1 Overview Table

Items		Before Operation		After Operation	
Number of House Hold			house		house
	Number of Contract house hold		house		house
	Number of Non-contract house hold		house		house
	Number of Flat Rate customer		house		house
	Number of Illegal Connection		house		house
Pipeline Length			km		Km
Minimum Night flow (amount)			m3/h		m3/h
Minimum Night flow (time)			h:m		h:m

SMA2 Overview Table

Items		Before Operation		After Operation	
Number of House Hold			house		house
	Number of Contract house hold		house		house
	Number of Non-contract house hold		house		house
	Number of Flat Rate customer		house		house
	Number of Illegal Connection		house		house
Pipeline Length			km		Km
Minimum Night flow (amount)			m3/h		m3/h
Minimum Night flow (time)			h:m		h:m

7 Water Balance Analysis

SMA 1 Water Balance Analysis Table

Items			Before Operation	After Measure
Revenue Water	Billed Authorized Consumption （m3/d）	Billed Metered Consumption		
		Billed Unmetered Consumption		
Non-Revenue Water	Unbilled Authorized Consumption （m3/d）	Unbilled Metered Consumption		
		Unbilled Unmetered Consumption		
	Commercial Loss （m3/d）	Unauthorized Consumption		
		Customer Metering Inaccuracies		
	Real Losses （m3/d）	Leakage		
System Input Volume （SIV）				
Non-Revenue Water Rate （NRW） （%）				

SMA 2 Water Balance Analysis Table

Items			Before Measure	After Measure
Revenue Water	Billed Authorized Consumption （m3/d）	Billed Metered Consumption		
		Billed Unmetered Consumption		
Non-Revenue Water	Unbilled Authorized Consumption （m3/d）	Unbilled Metered Consumption		
		Unbilled Unmetered Consumption		
	Commercial Loss （m3/d）	Unauthorized Consumption		
		Customer Metering Inaccuracies		
	Real Losses （m3/d）	Leakage		
System Input Volume （SIV）				
Non-Revenue Water Rate （NRW） （%）				

8 Schedule of Activities

Overall Activates Schedule

PMA	SMA	Activities		2016								
			12	1	2	3	4	5	6	7	8	9
Gudu	Making Customer List											
	SMA 1	Meter Reading										
		Leakage Survey										
		NRW Reduction Operation										
		Meter Reading										
	SMA 2	Meter Reading										
		Leakage Survey										
		NRW Reduction Operation										
		Meter Reading										
Jabi	Making Customer List											
	SMA 1	Meter Reading										
		Leakage Survey										
		NRW Reduction Operation										
		Meter Reading										
	SMA 2	Meter Reading										
		Leakage Survey										
		NRW Reduction Operation										
		Meter Reading										
	SMA 3	Meter Reading										
		Leakage Survey										
		NRW Reduction Operation										
		Meter Reading										
Garki 1	Making Customer List											
	SMA 1	Meter Reading										
		Leakage Survey										
		NRW Reduction Operation										
		Meter Reading										
	SMA 2	Meter Reading										
		Leakage Survey										
		NRW Reduction Operation										
		Meter Reading										
	SMA 3	Meter Reading										
		Leakage Survey										
		NRW Reduction Operation										
		Meter Reading										

Detail Activities Schedule of Gudu Area Office

	Activities	11	12	1	2	3	4	days
SMA 1	Customers' List							45
	1 year's Water consumption							45
	Meter Reading							4X4
	Meter Inaccuracies							21
	Temporally Meter							3
	Data Analysis							3x2
	24 hr. Input Volume							7x2
	NRW Measurement							1X2
	Acoustic Bar							7
	Visible Survey							7
	Repair and Operation							21
SMA 2	Customers' List							45
	1 year's Water consumption							45
	Meter Reading							4X4
	Meter Inaccuracies							14
	Temporally Meter							3
	Data Analysis							3x2
	24 hr. Input Volume							7x2
	NRW Measurement							1X2
	Acoustic Bar							7
	Visible Survey							7
	Repair and Operation							21

9 Cost

Total Manpower Input (Man X Days)	
Estimated Cost of NRW Reduction Activities (Personnel, Transportation & Materials)	

Federal Republic of Nigeria
The Federal Capital Territory Reduction of Non-Revenue Water Project

Procurement
[Additional Activities on Distribution Management]

22 December 2015

NRW Reduction Project Team

Contents

A. Component of Procurement

1. Ultra-sonic Flowmeters + Data Logger
2. Chambers of Ultra-sonic Flowmeters
3. Telemetry System to monitor Flow Rate of distributed Water
4. Solar System
5. Water Pressure Logger (Potable)

B. Purpose of Equipment-1

1. **Ultra-sonic Flowmeters + Data Logger**
- Learn distributed water and analyze IWA water balance
- Prioritize NRW reduction activities in FCT

2. **Chambers of Ultra-sonic Flowmeters**
- Maintain flowmeters regularly

3. **Telemetry System to monitor Flow Rate of distributed water**
- Monitor water flow rate to maintain NRW at low level
- Verify relevance on introduction of SCADA system in future

4. **Solar System**
- Back-up power source for ultra-sonic flowmeters and telemetry
- Permanent power source for Gwako and Bwari for the time being

5. **Water Pressure Logger**
- Monitor water pressure in FCT to maintain an optimum water pressure

C. Design Criteria- 1)

1. Ultra-sonic Flowmeters

- Installed on the distribution mains that water is supplied to users
- Not to be installed on transmission mains that water conveyed to service reservoirs
- Not to be installed on the pipelines which is diverged from transmission mains

2. Chambers of Ultra-sonic Flowmeters

- Constructed in case of that ultra-sonic flowmeters cannot be installed in the existing operation house because of insufficient space

C. Design Criteria- 2)

3. Telemetry System to monitor Flow Rate of distributed Water

- Installed in FCC which is prioritized to be developed by FCTA
- Installed in the sites where water distribution facilities are completed
- Installed in the sites where large water consumers such as main administrative offices exist

4. Solar System

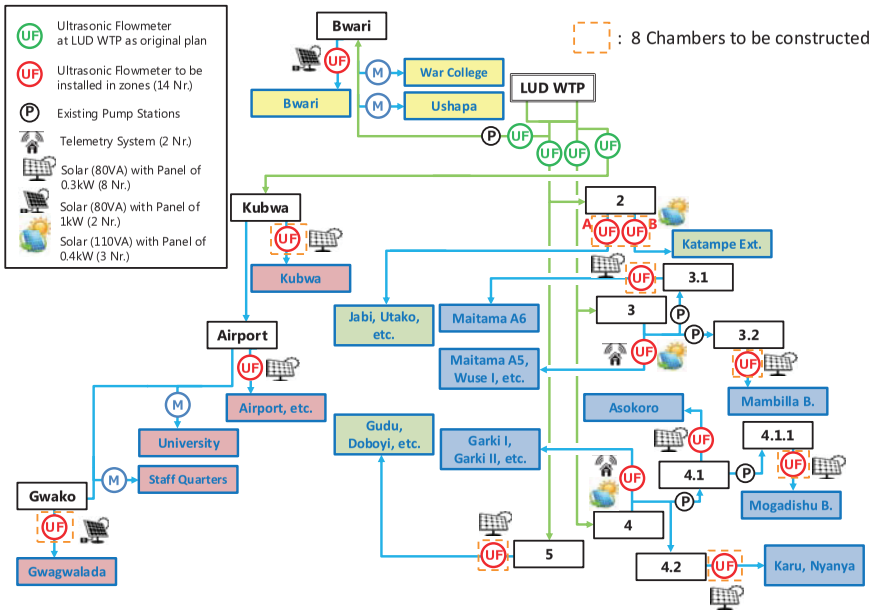
- Installed in the sites where ultra-sonic flowmeters are loaded on the distributed mains

C. Design Criteria- 3)

5. Water Pressure Logger (Potable)

- Is Not stationary equipment.
- Potable water pressure logger will be introduced to learn distribution of water pressure

D. Location of Ultra-sonic Flowmeter, Solar System and Chambers



E. Summary of Procurement- 1)

Ultra-sonic Flowmeters		
Diameter of the Existing Pipes (mm)	Nr.	Site of Tank
1500	2	2 & 5
1200	2	3 & 4
600	3	Bwari, Kubwa & Gwako
500	2	3.1 & 4.2
400	1	4.1
300	3	2, 3.2 & Airport
250	1	4.1.1
Total	**14**	

Note: Data loggers will be installed in each site of tank. Total data loggers are 13 sets.

E. Summary of Procurement- 2)

Chambers of Ultra-sonic Flowmeters			
Diameter of the Existing Pipes (mm)	Nr.	Type of Chambers	Site of Tank
1500	1	Type- D	5
1500 +300	1	Type- A	2
600	2	Type- B and - G	Kubwa & Gwako
500	2	Type- B and - C	3.1 & 4.2
300	1	Type- E	3.2
250	1	Type- F	4.1.1
Total	**8**		

E. Summary of Procurement- 3)

Solar System and Telemetry System		
Specification	Nr.	Site of Tank
Solar System of 80VA (1.0kW)	2	Bwari & Gwako
Solar System of 80VA (0.3kW)	8	3.1, 3.2, 4.1, 4.1.1, 4.2, 5, Kubwa & Airport
Solar System of 110VA (0.4kW)	1	2
Solar System of 110VA (0.4kW) with Telemetry System	2	3 & 4
Total	**13**	

E. Summary of Procurement- 4)

Potable Water Pressure Logger	
Specification	Nr.
Potable Water Pressure Logger (PN25)	2

The Federal Capital Territory Reduction of Non-Revenue Water Project

Technical Notes
on
Monthly Technical Meeting

20th January 2016

As the first technical meeting in 2016, Engr. A. A. Nahuche (Technical Manager) as the chairperson of the meeting gave an opening remark to officially start the meeting and mentioned that most of project members have been on leave.

This monthly technical meeting aims particularly at follow-up and update of progress of the project activities at the working level. As a result of discussions, members confirmed the matters mentioned below:

1. **Activities for Output-1**

Chamber Construction at outlet of LUD-WTP: Contractor commenced construction under supervision of FCTWB. Excavation of all four chambers has been conducted and construction materials has been procured and delivered to the site. The construction is scheduled to be completed before the end of not January 2016 but February 2016. JICA Expert Team accepted it.

Duplicated /Return Bills and Schedule of Deactivation, and Modification of Billing System: FCTWB has not yet commenced deactivation of those bills due to the routine billing works, so FCTWB suggested to postpone it from the middle of January 2016 to the middle of February 2016. JICA Expert Team accepted it and confirmed continue discussion on billing system.

Equipment for the Project (Additional Activities and Inputs): Both sides confirmed quantity, specifications of equipment for the Project (additional activities and inputs) to be procured by JICA and their location, which is shown in Appendix 2 and 3.

2. **Activities for Output-2**

Chamber Construction in PMAs of Jabi and Garki-I: Contractor commenced construction under supervision of FCTWB. The construction and installation of flow meters or valves are scheduled to be completed before the end of January 2016 for Jabi and the middle of February 2016 for Garki-I. JICA Expert Team accepted it.

Pilot Project in PMA of Gudu:

- Prepaid-meter Unit will submit result of meter error test by 23rd January 2016.
- Gudu Area Office will submit result of meter re-reading by the end of January 2016.
- Jabi and Garki I area office will prepare customer list of PMA by the end of January 2016.
- Commerce Dep't will prepare customer list of major consumers of Jabi and Garki-I Area Offices by the end of January 2016.

Pilot Project in PMA of Jabi and Garki-I:

- As soon as chamber construction and installation of flow meters and valves are completed, activities such as measurement of water inflow and step test will commence in the beginning of February 2016.

3. **Any Other Business**

Newsletter No.3: Mrs. Bunmi, PRS will collect manuscript from the selected members and draft newsletter together with JICA Expert Team by the end of January 2016.

Workshop and Stakeholder Forum: Both side agreed to hold workshop for FCTWB internal information sharing on temporarily Thursday 11th February 2016 and stakeholder forum inviting other state water agencies and donners in the third week of February 2016.

Appendix 1: Attendance List

Appendix 2: Equipment for the Project (Additional Activities and Inputs)

Appendix 3: Location of Ultra-sonic Flowmeter, Telemetry and Solar System

Engr. A. A. Nahuche
Technical Manager,
HOD Distribution
Federal Capital Territory Water Board

Mr. Akinori Miyoshi
Chief Advisor for
FCT Reduction of NRW Project
Japan International Cooperation Agency (JICA)

Appendix 1

FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER PROJECT

MONTHLY TECHNICAL MEETING

DATE: 20TH JANUARY 2016

VENUE: FCTWB

S/N	NAME	DESIGNATION
1	S.T. Bello	H.O.D Admin & Supply
2	Engr. A.A Nahuche	H.O.D Distribution
3	Mohammed Addis	H.O.D Commerce
4	Engr. Lawal	Head of Special Projects
5	Engr. Rabiu Kabir	Head of Logistics unit
6	Musa Dikko	Head of Pipeline unit
7	Engr. Douglas Oloton	Head of Meter General
8	Abdullahi Masud	Head Metering (Pre-paid Meter)
9	Danjuma Isah	Head of Monitoring and Detection Unit
10	Rose Akpan	Head Billing
11	Bummi Olowookere	Head of PRS
12	Habib Ahmed Kiru	Area Manager, Gudu
13	Sadiq Salihu	Assistant Area Manager, Jabi
14	Akinori Miyoshi	CA, JICA Expert Team
15	Kiyoshi Kiyama	JICA Expert Team

Appendix 2

Updated on 20/1/2016

List of Equipment for the Project (Additional Activities and Inputs)

No.	Equipment	Specification	County to Purchase		Quantity	Remarks
			Japan	Nigeria		
For Activity 1-6						
1	Ultrasonic flow meter (stationary)	Ultrasonic pulse transmit time difference method. sensor for 300-1,500mm, 10m cable (provisional)	●		6	including installation, commissioning and training
2	Ultrasonic flow meter (stationary)	Ultrasonic pulse transmit time difference method. sensor for 300-1,500mm, 20m cable (provisional)	●		3	including installation, commissioning and training
3	Ultrasonic flow meter (stationary)	Ultrasonic pulse transmit time difference method. sensor for 300-1,500mm, 30m cable (provisional)	●		2	including installation, commissioning and training
4	Ultrasonic flow meter (stationary)	Ultrasonic pulse transmit time difference method. sensor for 300-1,500mm, 40m cable (provisional)	●		2	including installation, commissioning and training
5	Ultrasonic flow meter (stationary)	Ultrasonic pulse transmit time difference method. sensor for 25-250mm, 10m cable (provisional)	●		1	including installation, commissioning and training
6	Data logger (stationary)	Paperless, 6 points, 1s-1h record cycle. 4-20mA, trend, bar graph and histrical trend displays (provisional)	●		13	for the above No.1-5 ultrasonic flow meters
7	Data logger (portable)	2ch (flow and pressure), 1s - 24h record cycle. 4-20mA, 5 years battery life (provisional)	●		2	
8	Remote Monitoring System	Telemetry with transmission, modem/router, container, interface, PC, printer, UPS, server, etc (provisional)	●		2	Pilot system
9	Solar System	80VA, 1.0kW (provisional)		●	2	for the above ultrasonic flow meter
10	Solar System	80VA, 0.3kW (provisional)		●	8	for the above ultrasonic flow meter
11	Solar System	110VA, 0.4kW (provisional)		●	1	for the above ultrasonic flow meter
12	Solar System	110VA, 0.4kW (provisional)		●	2	for the above ultrasonic flow meter and telemetry system

Annex 3 Location of Ultra-sonic Flowmeter, Telemetry and Solar System