

# The Federal Capital Territory Reduction of Non-Revenue Water Project

## Technical Notes on Monthly Technical Meeting

23<sup>rd</sup> March 2016

At the beginning, Engr. A. R. Lawal, the Coordinator, gave an opening remark to officially start the meeting. Mr. Mori of JICA Expert Team also gave address to everyone concerning Mr. Miyoshi's message.

Report of project progress as of the end of March 2016;

### 1. Activities for Output-1

The chamber construction will be completed by the end of April. JICA Expert Team will have been monitoring the progress of construction of the chambers (see Appendix 2).

### 2. Activities for Output-2

Chamber construction for flowmeter and valves has been delayed due to CP fund but is not critical pass. The works like tank survey, illegal connections, major consumer survey, etc. on commercial loss has definitely been delayed due to data compilation, etc. Appendix 2 shows current issues on the Pilot Project activities and future measures to fulfil it steadily.

### Appendix 1: Attendance List

### Appendix 2: Monthly Meeting Record as of March 2016

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Mr. S.T. Bello  
Deputy Project Manager  
Head of Administration and Supply Department  
Federal Capital Territory Water Board

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

**Appendix 1: Attendance List**

**FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER PROJECT**

**TECHNICAL MEETING**

**DATE: 23rd MARCH 2016**

**VENUE: FCTWB**

S/N	NAME	POSITION
1	Mr. S.T Bello	H.O.D Admin & Supply
2	Mr. Muhammed Adis	H.O.D Commerce
3	Engr. A.R Lawal	Project Coordinator
4	Mr. Shehu Suleiman	Head G.I.S
5	Mrs Rose Akpan	Head Billing
6	Engr. Douglas Oloton	Head Metering
7	Mr. Muazo Aliyu S.B	A.D commerce
8	Mr. W. E Gana	AAM Dist. Garki 1
9	Mr. Nma Yahaya	AAM Dist. Kubwa 3
10	Mr. Adenuga A.O	AM Garki 1
11	Mr. Abbas Ahmed	Head P.R.
12	Mr. Aminu Umar	C.T.O head(ops&wm)
13	Mr. M.K Rabiu	Head Logistics
14	Mr. Moh'd A.S Ramat	AM Jabi
15	Engr. Musa Dikko	Head Pipeline
16	Engr. Moh'd Abdul Ozumi	AAM Dist. Gudu
17	Mr. Abdulrahman Mohammed	S.E ( ops& wm)
18	Engr. Abdullahi Masuad	Head PPM
19	Mr. Abdulrahman Shehu	APM (VUL)
20	Mr. Takayuki Ohira	JICA Nigeria
21	Mr. Toru Toyoda	JICA Expert team
22	Mr Takashi Mori	JICA Expert Team

## Pilot Project (GUDU Office)

23 March 2016

Activities	State of Progress	Issues	Measures	Person in Charge			Scheduled Time of Completion	
				HQs	GUDU	JICA Expert Team		
PMA/SMA Creation	Construction of Chambers	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Excavation <input checked="" type="checkbox"/> Chamber Construction <input type="checkbox"/> Cover <input type="checkbox"/> Finishing	- No covers constructed for the chambers - CP fund	Monitored by JICA Expert Team	Dikko Dauda Laif Douglas	Habib	Toyoda	End of April
	Installation of Flow Meters and Valves	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Installation	One no of 100mmΦ valve on Drive 4 line and 100mmΦ at Drive 1 not functioning	-	Dikko Dauda	Habib	Toyoda	End of April
Commercial Loss	Meter Reading (1 week)	<input checked="" type="checkbox"/> First Reading <input checked="" type="checkbox"/> Second Reading <input checked="" type="checkbox"/> Data Submission	Few properties refused access, metre not functioning, some on flat rate	Flat rate properties are temporarily metred, follow up on access	Isah Masaud	Habib	Toyoda Morita	To be confirmed by next
	Tank Survey	<input checked="" type="checkbox"/> Survey <input type="checkbox"/> Data Submission	Exercise completed on stage of compilation	-	Dikko Dauda Douglas	Habib	Toyoda	To be confirmed by next
	Meter Error Test	<input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> Data Submission	-	-	Masaud	Habib	Toyoda	To be confirmed by next
	Illegal Connection	<input checked="" type="checkbox"/> Survey <input type="checkbox"/> Data Submission	Survey in progress, exercise suspended when water supply improves	Checking houses with bore holes	Dikko Dauda Douglas	Habib	Toyoda	To be confirmed by next
	Major Consumer (One Year Consumption)	<input type="checkbox"/> Compression of Each Categories <input type="checkbox"/> Data Submission	-	-	Isah	Habib	Toyoda	To be confirmed by next
	Customer List (One Year Consumption)	<input type="checkbox"/> Compression of Each Categories <input type="checkbox"/> Data Submission	On progress due to non access of record for proceeding years (Prepaid has not completed yet)	Collected metre reading for extraction	Rose Masaud	Habib	Toyoda	To be confirmed by next
	Temporary Meter (Setting and Meter Reading)	<input checked="" type="checkbox"/> Meter Setting <input checked="" type="checkbox"/> Meter Reading <input checked="" type="checkbox"/> Data Submission	-	-	Douglas	Habib	Toyoda	To be confirmed by next

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Activities	State of Progress	Issues	Measures	Person in Charge			Scheduled Time of Completion	
				HQs	GUDU	JICA Expert Team		
Leakage Survey	24 hrs & MNF Water Flow Measurement	<input checked="" type="checkbox"/> Measurement <input checked="" type="checkbox"/> Data Submission	-	-	Dikko Dauda Douglas	Habib	Kiyama	To be confirmed by next
	1 Week Water Flow Measurement	<input checked="" type="checkbox"/> Measurement <input checked="" type="checkbox"/> Data Submission	-	-	Dikko Dauda Douglas	Habib	Kiyama	To be confirmed by next
	Step Test	<input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> Data Submission	-	-	Dikko Dauda Douglas	Habib	Kiyama	To be confirmed by next
	Leakage Detection (Acoustic Bar)	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	No SMA3	-	Dikko Dauda Douglas	Habib	Kiyama	To be confirmed by next
	Leakage Detection (Ground Microphone)	<input checked="" type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	SMA2 not done	-	Dikko Dauda Douglas	Habib	Kiyama	To be confirmed by next
	Repair of Leakage (Provisional)	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Mostly materials for the repair and excavation	Expecting LUD to have some of these materials	Dikko Dauda Douglas	Habib	Kiyama	To be confirmed by next
Overall	Data Analysis	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Done only SMA1	About 20m <sup>3</sup> /h Reduction	Dikko Dauda Douglas	Habib	Toyoda	To be confirmed by next
	Water Balance Sheet	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	The physical losses has been taken come of. Working on the commercial loss	Using acoustic bar and microphone to detect illegal connection	Dikko Dauda Douglas	Habib	Toyoda	To be confirmed by next
	NRW Reduction Plan	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Commercial loss continuously checking on leakage and illegal connection	House to house checking	Dikko Dauda Douglas	Habib	Toyoda	To be confirmed by next

Activities	State of Progress	Issues	Measures	Person in Charge			Scheduled Time of Completion	
				HQs	JABI	JICA Expert Team		
PMA/SMA Creation	Construction of Chambers	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Excavation <input type="checkbox"/> Chamber Construction <input type="checkbox"/> Cover <input type="checkbox"/> Finishing	- No covers constructed for the chambers - CP fund	Monitored by JICA Expert Team	Dikko Dauda Laif Douglas	Ramat	Toyoda	End of April
	Installation of Flow Meters and Valves	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Installation	Installation has been finished	-	Dikko Dauda	Ramat	Toyoda	End of April
Commercial Loss	Meter Reading (1 week)	<input checked="" type="checkbox"/> First Reading <input checked="" type="checkbox"/> Second Reading <input checked="" type="checkbox"/> Data Submission	-	-	Isah	Ramat	Morita Toyoda	To be confirmed by next
	Tank Survey	<input type="checkbox"/> Survey <input type="checkbox"/> Data Submission	Not yet started	Area manager is listing properties	Dikko Dauda Douglas	Ramat	Morita Toyoda	To be confirmed by next
	Meter Error Test	<input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> Data Submission	-	-	Masaud	Ramat	Morita Toyoda	To be confirmed by next
	Illegal Connection	<input checked="" type="checkbox"/> Survey <input checked="" type="checkbox"/> Data Submission <input type="checkbox"/> Survey (Independent)	After analysing data of water-usage by customer, Jabi office will implement survey again	-	Dikko Dauda Douglas	Ramat	Morita Toyoda	To be confirmed by next
	Major Consumer (One Year Consumption)	<input type="checkbox"/> Compression of Each Categories <input type="checkbox"/> Data Submission	Some of data has not been submitted to JICA Expert Team	Monitored by JICA Expert Team	Isah	Ramat	Morita Toyoda	To be confirmed by next
	Customer List (One Year Consumption)	<input checked="" type="checkbox"/> Compression of Each Categories <input checked="" type="checkbox"/> Data Submission	-	JICA Expert Team is analysing data	Rose	Ramat	Morita Toyoda	To be confirmed by next
	Temporary Meter (Setting and Meter Reading)	<input type="checkbox"/> Meter Setting <input type="checkbox"/> Meter Reading <input type="checkbox"/> Data Submission	Jabi office has received meter, but other materials not bought yet.	JICA Expert Team has requested WaterBoard to set flat rate meter at 10 houses	Douglas	Ramat	Morita Toyoda	To be confirmed by next

Activities	State of Progress	Issues	Measures	Person in Charge			Scheduled Time of Completion	
				HQs	JABI	JICA Expert Team		
Leakage Survey	24 hrs & MNF Water Flow Measurement	<input checked="" type="checkbox"/> Measurement <input checked="" type="checkbox"/> Data Submission	SMA1 completed. SMA2&3 not completed.	Monitored by JICA Expert Team In addition, water protection accessories like cooler box will be procured	Dikko Dauda Douglas	Ramat	Kiyama	To be confirmed by next
	1 Week Water Flow Measurement	<input type="checkbox"/> Measurement <input type="checkbox"/> Data Submission	SMA1 completed. SMA2&3 not completed.	Monitored by JICA Expert Team In addition, water protection accessories like cooler box will be procured	Dikko Dauda Douglas	Ramat	Kiyama	To be confirmed by next
	Step Test	<input type="checkbox"/> Test <input type="checkbox"/> Data Submission	SMA1 completed. SMA2&3 not completed.	Monitored by JICA Expert Team In addition, water protection accessories like cooler box will be procured	Dikko Dauda Douglas	Ramat	Kiyama	To be confirmed by next
	Leakage Detection (Acoustic Bar)	<input checked="" type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	SMA1 completed. SMA2&3 not finished	Monitored by JICA Expert Team	Dikko Dauda Douglas	Ramat	Kiyama	To be confirmed by next
	Leakage Detection (Ground Microphone)	<input checked="" type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	SMA1 completed. SMA2&3 not finished	Monitored by JICA Expert Team	Dikko Dauda Douglas	Ramat	Kiyama	To be confirmed by next
	Repair of Leakage (Provisional)	<input checked="" type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	SMA1 completed. SMA2&3 not finished	Monitored by JICA Expert Team	Dikko Dauda Douglas	Ramat	Kiyama	To be confirmed by next
Overall	Data Analysis	<input checked="" type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	SMA1 completed. SMA2&3 not started yet	Monitored by JICA Expert Team	Dikko Dauda Douglas	Ramat	Toyoda	To be confirmed by next
	Water Balance Sheet	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3			Dikko Dauda Douglas	Ramat	Toyoda	To be confirmed by next
	NRW Reduction Plan	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3			Dikko Dauda Douglas	Ramat	Toyoda	To be confirmed by next

Activities	State of Progress	Issues	Measures	Person in Charge			Scheduled Time of Completion
				HQs	GARKI	JICA Expert Team	
PMA/SMA Creation	Construction of Chambers	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Excavation <input type="checkbox"/> Chamber Construction <input type="checkbox"/> Cover <input type="checkbox"/> Finishing	- No covers constructed for the chambers - CP fund	Monitored by JICA Expert Team	Dikko Dauda Laif Douglas	Adesoji Toyoda	End of April
	Installation of Flow Meters and Valves	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Chamber construction has not been finished	Flowmeter will be installed on completing the chamber	Dikko Dauda	Adesoji Toyoda	End of April
Commercial Loss	Meter Reading (1 week)	<input checked="" type="checkbox"/> First Reading <input checked="" type="checkbox"/> Second Reading <input type="checkbox"/> Data Submission	Not yet completed	Area manager is sorting out data	Isah Suleiman	Adesoji Morita Toyoda	To be confirmed by next
	Tank Survey	<input type="checkbox"/> Survey <input type="checkbox"/> Data Submission	Test has not been started	Monitored by JICA Expert Team	Dikko Dauda Douglas	Adesoji Morita Toyoda	To be confirmed by next
	Meter Error Test	<input type="checkbox"/> Test <input type="checkbox"/> Data Submission	Test has not been started	It will be started by the beginning of April 2016.	Masaud	Adesoji Morita Toyoda	To be confirmed by next
	Illegal Connection	<input type="checkbox"/> Survey <input type="checkbox"/> Data Submission	Test has not been started	Monitored by JICA Expert Team	Dikko Dauda Douglas	Adesoji Morita Toyoda	To be confirmed by next
	Major Consumer (One Year Consumption)	<input type="checkbox"/> Compression of Each Categories <input type="checkbox"/> Data Submission	Some of data has not been submitted to JICA Expert Team	Monitored by JICA Expert Team	Isah	Adesoji Morita Toyoda	To be confirmed by next
	Customer List (One Year Consumption)	<input type="checkbox"/> Compression of Each Categories <input type="checkbox"/> Data Submission	Not yet completed	Area manager is sorting out data	Rose Suleiman	Adesoji Morita Toyoda	To be confirmed by next
	Temporary Meter (Setting and Meter Reading)	<input type="checkbox"/> Meter Setting <input type="checkbox"/> Meter Reading <input type="checkbox"/> Data Submission	Garki office has received meter.	JICA Expert Team has requested WaterBoard to set flat rate meter at 10 houses.	Douglas	Adesoji Morita Toyoda	To be confirmed by next

Activities	State of Progress	Issues	Measures	Person in Charge			Scheduled Time of Completion	
				HQs	GARKI	JICA Expert Team		
Leakage Survey	24 hrs & MNF Water Flow Measurement	<input type="checkbox"/> Measurement <input type="checkbox"/> Data Submission	Cooler box must be bought by HQs to ensure waterproof	Monitored by JICA Expert Team In addition, water protection accessories like cooler box will be procured by FCTWB to protect flowmeter.	Dikko Dauda Douglas	Adesoji Gana	Kiyama	To be confirmed by next
	1 Week Water Flow Measurement	<input type="checkbox"/> Measurement <input type="checkbox"/> Data Submission	Cooler box must be bought by HQs to ensure waterproof	Monitored by JICA Expert Team In addition, water protection accessories like cooler box will be procured by FCTWB to protect flowmeter.	Dikko Dauda Douglas	Adesoji Gana	Kiyama	To be confirmed by next
	Step Test	<input type="checkbox"/> Test <input type="checkbox"/> Data Submission	Cooler box must be bought by HQs to ensure waterproof	Monitored by JICA Expert Team In addition, water protection accessories like cooler box will be procured by FCTWB to protect flowmeter.	Dikko Dauda Douglas	Adesoji Gana	Kiyama	To be confirmed by next
	Leakage Detection (Acoustic Bar)	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3			Dikko Dauda Douglas	Adesoji Gana	Kiyama	To be confirmed by next
	Leakage Detection (Ground Microphone)	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3			Dikko Dauda Douglas	Adesoji Gana	Kiyama	To be confirmed by next
	Repair of Leakage (Provisional)	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3			Dikko Dauda Douglas	Adesoji Gana	Kiyama	To be confirmed by next
	Overall	Data Analysis	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3			Dikko Dauda Douglas	Adesoji	Toyoda
Water Balance Sheet		<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3			Dikko Dauda Douglas	Adesoji	Toyoda	To be confirmed by next
NRW Reduction Plan		<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3			Dikko Dauda Douglas	Adesoji	Toyoda	To be confirmed by next

Construction of Chambers at LUD WTP Outlet (HQs)

23 March 2016

Activities	State of Progress	Issues	Measures	Person in Charge			Scheduled Time of Completion	
				HQs	Contractor	JICA Expert Team		
Chamber (D1500) for Tank 2&5	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Slab (Roof)	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Bar Arrangement <input type="checkbox"/> Concrete Casting <input type="checkbox"/> Curing <input type="checkbox"/> Finishing	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Appurtenant Works	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Opening <input type="checkbox"/> Installation of Manhole Cover <input type="checkbox"/> Installation of Ladder	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Demobilization		CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April

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Activities	State of Progress	Issues	Measures	Person in Charge			Scheduled Time of Completion	
				HQs	Contractor	JICA Expert Team		
Chamber (D1500) for Tank 3&4	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Slab (Roof)	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Bar Arrangement <input type="checkbox"/> Concrete Casting <input type="checkbox"/> Curing <input type="checkbox"/> Finishing	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Appurtenant Works	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Opening <input type="checkbox"/> Installation of Manhole Cover <input type="checkbox"/> Installation of Ladder	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Demobilization		CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April

Activities	State of Progress	Issues	Measures	Person in Charge			Scheduled Time of Completion	
				HQs	Contractor	JICA Expert Team		
Chamber (D1200) for Kubwa	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input type="checkbox"/> Bar Arrangement <input type="checkbox"/> Concrete Casting <input type="checkbox"/> Curing <input type="checkbox"/> Finishing	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Slab (Roof)	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Bar Arrangement <input type="checkbox"/> Concrete Casting <input type="checkbox"/> Curing <input type="checkbox"/> Finishing	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Appurtenant Works	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Opening <input type="checkbox"/> Installation of Manhole Cover <input type="checkbox"/> Installation of Ladder	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Demobilization		CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April

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Activities	State of Progress	Issues	Measures	Person in Charge			Scheduled Time of Completion	
				HQs	Contractor	JICA Expert Team		
Chamber (D600) for Bwari	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input type="checkbox"/> Bar Arrangement <input type="checkbox"/> Concrete Casting <input type="checkbox"/> Curing <input type="checkbox"/> Finishing	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Slab (Roof)	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Bar Arrangement <input type="checkbox"/> Concrete Casting <input type="checkbox"/> Curing <input type="checkbox"/> Finishing	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Appurtenant Works	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Opening <input type="checkbox"/> Installation of Manhole Cover <input type="checkbox"/> Installation of Ladder	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April
	Demobilization		CP fund	Monitored by JICA Expert Team	Laif	Local	Miyoshi Fujiyama	End of April

Construction of Chambers for Zonal Meter (HQs)

23 March 2016

Activities		State of Progress	Issues	Measures	Person in Charge			Scheduled Time of Completion
					HQs	Contractor	JICA Expert Team	
Chamber	Preparation	<input checked="" type="checkbox"/> Procedures for Contract	INTELES has received advance payment and preparing for receipt	-		INTELES (Integrated Logistics & Engineering Solutions Ltd.)	Miyoshi Mori	Beginnig of April
	Construction	<input type="checkbox"/> Activities regarding Construction	Trial mixing test has not been completed	Start from middle of April		INTELES	Fujiyama Satoh	August
Zonal Meter (Ultra-sonic Flowmeter)	Installation	After the completion of chamber construction						
	Measurement							
GIS	Distribution Drawing	<input checked="" type="checkbox"/> Gudu Office						To be confirmed by next
		<input type="checkbox"/> Jabi Office						To be confirmed by next
		<input type="checkbox"/> Garki Office						To be confirmed by next



# **The Federal Capital Territory Reduction of Non-Revenue Water Project**

## **Technical Notes on Monthly Technical Meeting**

28 April 2016

At the beginning, Engr. A. R. Lawal, Head of Special Projects Unit, as the chairperson of the meeting gave an opening remark to officially start the meeting (see Appendix 1).

Three Area Managers reported the activities in their own PMAs, while Engr. Moh. Kabir Rabiou & Engr. Douglas Oloton, Engr. Abdullahi Masaud, Mr. Danjuma Isah and Mr. Shehu Suleim reported progress of chamber construction in three PMAs & USUMA treatment plant site, progress of meter error test, collection of large consumer list and progress of database development in three PMAs respectively. The progress, current issues on their activities for Output-1 and Output-2 and future measures to fulfil it steadily are summarized in Appendix 2.

On behalf of Mr. Mohammed Dauda, Mr. Satoh who is in charge of supervision for the chamber construction of the zonal meters reported current progress of the chamber construction and brought up difficulties of construction in existing pipe (outlet, inlet, drain) intervals (see Appendix 3). The participants agreed on that technical staff and JICA Expert Team would have meeting on 4 May 2016 so as to solve the difficulties of construction.

Finally, FCTWB remarked that FCTWB officially had requested Director of Treasury (DOT) to deal with disbursement of CP fund for 2015 budget last week. DOT is expected to send account No., etc. to the Central Bank within a month for remittance to the contractor and other claims within a couple of days.

### **Appendix 1: Attendance List**

### **Appendix 2: Monthly Meeting Record as of April 2016**

### **Appendix 3: Situation of Site for the Chamber of Zonal Flowmeters**

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

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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****ATTENDANCE LIST****28TH APRIL 2016**

S/N	NAME	POSITION	TELEPHONE	EMAIL
1	Mr. S.T Bello	DPM/ H.O.D [A&S]		
2	Engr. A.R Lawal	Head S.P		
3	Engr. M.K Rabi	Head Logistics		
4	Mohammed Gana	AAM[D] Garki 1		
5	Choji Pam	AAM[C] Garki 1		
6	Adenuga A.O	AM Garki 1		
7	Habib A. Kiru	AM Gudu		
8	Moh'd A.S Ramat	AM Jabi		
9	Shehu Sulaiman	Head G.I.S		
10	Ezeh Hillary	Logistics/G.I.S		
11	Abdulrahman Mohammed	S.E [ops&wm]		
12	Engr. Ogbeide Uche	Head Facility Mgt.		
13	Rose Akpan	Head Billing		
14	Isah Danjuma	HOU Monitoring		
15	Idris Hassan	Head Tanks		
16	Abubakar Danladi	Senior Foreman		
17	Nma Yahaya	AAM Kubwa 2		
18	Engr. Abdullahi Masaud	Head PPM		
19	Abdulrahman Sani	Asst. Project Man.		
20	Engr. Moh'd Ozumi	AAM Gudu		
21	Bunmi Olowookere	ADC[PRS]		
22	Abubakar Ubale	Senior Engr.		
23	S.B Aliyu	A.D [Comm] HQ		
24	Taiwo Adeyemi	AD Commerce		
25	Abbas Ahmed	HOU[PR]		
26	Engr. Douglas Oloton	AM Gwarinpa		
27	Aminu Umar	Head [ops&wm]		
28	Fabikun Adedeji	Head M.I.S		
29	Isaac Owolabi	AD[comm] C.C		
30	Engr. C.E Ottah	Distribution		
31	Mohammed S. Adis	HOD Commerce		
32	Dr. Joachim Ezeji	JICA Consultant		

## Output-1: Construction of Chambers at LUD WTP Outlet (HQs)

28 April 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	Contractor	JICA Expert Team		
Chamber (D1500) for Tank 2&5	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	None	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	None	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	
	Slab (Roof)	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Bar Arrangement <input type="checkbox"/> Concrete Casting <input type="checkbox"/> Curing <input type="checkbox"/> Finishing	Disbursement of CP fund was delayed but now FCTWB requested DOT to proceed to deal with disbursement of CP fund.	Disbursement of CP fund	On-going to remittance payment to the contractor	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May
	Appurtenant Works	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Opening <input type="checkbox"/> Installation of Manhole Cover <input type="checkbox"/> Installation of Ladder	Ditto	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	Ditto	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Ditto	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May
	Demobilization		Ditto	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May

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Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	Contractor	JICA Expert Team		
Chamber (D1500) for Tank 3&4	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	None	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	None	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	
	Slab (Roof)	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Bar Arrangement <input type="checkbox"/> Concrete Casting <input type="checkbox"/> Curing <input type="checkbox"/> Finishing	Disbursement of CP fund was delayed but now FCTWB requested DOT to proceed to deal with disbursement of CP fund.	Disbursement of CP fund	On-going to remittance payment to the contractor	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May
	Appurtenant Works	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Opening <input type="checkbox"/> Installation of Manhole Cover <input type="checkbox"/> Installation of Ladder	Ditto	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	Ditto	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Ditto	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May
	Demobilization		Ditto	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	Contractor	JICA Expert Team		
Chamber (D1200) for Kubwa	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	None	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input type="checkbox"/> Bar Arrangement <input type="checkbox"/> Concrete Casting <input type="checkbox"/> Curing <input type="checkbox"/> Finishing	Disbursement of CP fund was delayed but now FCTWB requested DOT to proceed to deal with disbursement of CP fund.	Disbursement of CP fund	On-going to remittance payment to the contractor	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May
	Slab (Roof)	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Bar Arrangement <input type="checkbox"/> Concrete Casting <input type="checkbox"/> Curing <input type="checkbox"/> Finishing	Ditto	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May
	Appurtenant Works	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Opening <input type="checkbox"/> Installation of Manhole Cover <input type="checkbox"/> Installation of Ladder	Ditto	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	Ditto	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Ditto	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May
	Demobilization		Ditto	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May

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Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	Contractor	JICA Expert Team		
Chamber (D600) for Bwari	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	None	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input type="checkbox"/> Bar Arrangement <input type="checkbox"/> Concrete Casting <input type="checkbox"/> Curing <input type="checkbox"/> Finishing	Disbursement of CP fund was delayed but now FCTWB requested DOT to proceed to deal with disbursement of CP fund.	Disbursement of CP fund	On-going to remittance payment to the contractor	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May
	Slab (Roof)	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Bar Arrangement <input type="checkbox"/> Concrete Casting <input type="checkbox"/> Curing <input type="checkbox"/> Finishing	Ditto	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May
	Appurtenant Works	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Opening <input type="checkbox"/> Installation of Manhole Cover <input type="checkbox"/> Installation of Ladder	Ditto	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	Ditto	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Ditto	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May
	Demobilization		Ditto	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of May

Annex4-103

1-4

## Output-1: Construction of Chambers for Zonal Meter (HQs)

28 April 2016

Activities		State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion
						HQs	Contractor	JICA Expert Team	
Chamber	Preparation	■ Procedures for Contract					INTELES (Integrated Logistics & Engineering Solutions Ltd.)	Miyoshi Mori	Beginnig of April
	Construction	□ Activities regarding Construction	On-going	Location of the existing pipelines is different from expected that.	Design Modification will be examined.	Dauda Raifu	INTELES	Fujiyama Satoh	By the Middle of August
Zonal Meter (Ultra-sonic Flowmeter)	Installation	After the completion of chamber construction							
	Measurement								

2-1

## Output-2: Pilot Project (GUDU Office)

28 April 2016

Activities		State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion
						HQs	GUDU	JICA Expert Team	
PMA/SMA Creation	Construction of Chambers	<ul style="list-style-type: none"> <li>■ Procurement of Materials</li> <li>■ Excavation</li> <li>■ Chamber Construction</li> <li>■ Cover</li> <li>■ Finishing</li> </ul>	All the chambers (5) were completed	- None	- None	Dikko Dauda Raifu Douglas	Habib	Toyoda	
	Installation of Flow Meters and Valves	<ul style="list-style-type: none"> <li>■ Procurement of Materials</li> <li>■ Installation</li> </ul>		- A 100mmΦ valve on Drive 4 and a 100mm Φ on Drive 1 are not functioning, but no effect on the Project	- FCTWB should replace or repair them.	Dikko Kabir Dauda	Habib	Toyoda	By the end of April
Commercial Loss	Meter Reading (1 week)	<ul style="list-style-type: none"> <li>■ First Reading</li> <li>■ Second Reading</li> <li>■ Data Submission</li> </ul>	Completed basically	Few properties in pre-paid were not accessed, and some are on flat rate	flat rate properties are temporarily metered and follow up on non accessed properties	Isah Masaud	Habib	Toyoda Morita	Within a couple of days
	Tank Survey	<ul style="list-style-type: none"> <li>■ Survey</li> <li>□ Data Submission</li> </ul>		Survey completed and data will be submitted	nil	Dikko Dauda Douglas	Habib	Toyoda	By 29 April
	Meter Error Test	<ul style="list-style-type: none"> <li>■ Test</li> <li>■ Data Submission</li> </ul>	Re-test was conducted and 70 households were completed.	- None	- None	Masaud	Habib	Toyoda	
	Illegal Connection	<ul style="list-style-type: none"> <li>■ Consumption Data</li> <li>□ Detection Survey</li> </ul>		Survey still on process	Checking all house claiming using bor hole	Dikko Dauda Douglas	Habib	Toyoda	By the middle of May
	Major Consumer (One Year Consumption)	<ul style="list-style-type: none"> <li>■ Compression of Each Categories</li> <li>■ Data Submission</li> </ul>	Major consumer is only British school. This data was submitted to JICA Expert Team	- None	- None	Isah	Habib	Toyoda	
	Customer List (One Year Consumption)	<ul style="list-style-type: none"> <li>□ Compression of Each Categories</li> <li>□ Data Submission</li> </ul>	Compilation completed		It will be submitted. Six month record was considered	Rose Masaud	Habib	Toyoda	By 29 April
	Temporary Meter (Setting and Meter Reading)	<ul style="list-style-type: none"> <li>■ Meter Setting</li> <li>■ Meter Reading</li> <li>■ Data Submission</li> </ul>	Completed and submitted			Douglas	Habib	Toyoda	

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	GUDU	JICA Expert Team		
Leakage Survey	24 hrs & MNF Water Flow Measurement	<input checked="" type="checkbox"/> Measurement <input checked="" type="checkbox"/> Data Submission	Completed and submitted			Kabir Dikko Dauda Douglas	Habib	Kiyama	
	1 Week Water Flow Measurement	<input checked="" type="checkbox"/> Measurement <input checked="" type="checkbox"/> Data Submission	Completed and submitted except for British Academy			Kabir Dikko Dauda Douglas	Habib	Kiyama	
	Step Test	<input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> Data Submission	Completed and submitted			Kabir Dikko Dauda Douglas	Habib	Kiyama	
	Leakage Detection (Acoustic Bar)	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2 <input type="checkbox"/> SMA3				Kabir Dikko Dauda Douglas	Habib	Kiyama	
	Leakage Detection (Ground Microphone)	<input checked="" type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3				Kabir Dikko Dauda Douglas	Habib	Kiyama	
	Repair of Leakage (Provisional)	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2 <input type="checkbox"/> SMA3				Kabir Dikko Dauda Douglas	Habib	Kiyama	
Overall	Data Analysis	<input checked="" type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3				Kabir Dikko Dauda Douglas	Habib	Toyoda	
	Water Balance Sheet	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3				Kabir Dikko Dauda Douglas	Habib	Toyoda	
	NRW Reduction Plan	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3				Kabir Dikko Dauda Douglas	Habib	Toyoda	

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## Output-2: Pilot Project (JABI Office)

28 April 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion		
					HQs	JABI	JICA Expert Team			
PMA/SMA Creation	Construction of Chambers	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Excavation <input type="checkbox"/> Chamber Construction <input type="checkbox"/> Cover <input type="checkbox"/> Finishing	Four (4) chambers in total were not completed so far. The construction has been delayed because it took time to find out proper location to set flowmeter. FCTWB requested DOT to proceed to deal with disbursement of CP	Disbursement of CP fund	On-going to remittance payment to the contractor	Dikko Dauda Raifu Douglas	Ramat	Toyoda	By the end of May	
	Installation of Flow Meters and Valves	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Installation		- None	- None	Dikko Kabir Dauda	Ramat	Toyoda		
Commercial Loss	Meter Reading (1 week)	<input checked="" type="checkbox"/> First Reading <input checked="" type="checkbox"/> Second Reading <input checked="" type="checkbox"/> Data Submission	Completed	- None	- None	Isah	Ramat	Morita Toyoda		
	Tank Survey	<input checked="" type="checkbox"/> Survey <input checked="" type="checkbox"/> Data Submission	Completed	- None	- None	Dikko Dauda Douglas	Ramat	Morita Toyoda		
	Meter Error Test	<input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> Data Submission	Completed in 50 households in total	- None	- None	Masaud	Ramat	Morita Toyoda	To be confirmed	
	Illegal Connection	<input checked="" type="checkbox"/> Consumption Data <input checked="" type="checkbox"/> Detection Survey <input type="checkbox"/> Data Submission	Completed in SMA 1	On-going in SMA 2 & 3			Dikko Dauda Douglas	Ramat	Morita Toyoda	By the end of May
	Major Consumer (One Year Consumption)	<input checked="" type="checkbox"/> Compilation of Each Categories <input checked="" type="checkbox"/> Data Submission	Private school, hospital, clinic, etc. were submitted to JICA Expert Team in this Month. All the data were submitted.	- None	- None		Isah	Ramat	Morita Toyoda	
	Customer List (One Year Consumption)	<input checked="" type="checkbox"/> Compilation of Each Categories <input checked="" type="checkbox"/> Data Submission		- None	- None		Rose	Ramat	Morita Toyoda	By the end of May
Temporary Meter (Setting and Meter Reading)	<input type="checkbox"/> Meter Setting <input type="checkbox"/> Meter Reading <input type="checkbox"/> Data Submission	The fittings are going to arrive in FCTWB head quarters on 28 April.	- None	- None		Douglas	Ramat	Morita Toyoda	By the beginning of May	

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	JABI	JICA Expert Team		
Leakage Survey	24 hrs & MNF Water Flow Measurement	<input type="checkbox"/> Measurement <input type="checkbox"/> Data Submission (Completed in SMA1, but not in SMA2&3)		Data were missing from flowmeter.	Repeat measurement from 2 May	Kabir Dikko Dauda Douglas	Ramat	Kiyama	3 May 2016
	1 Week Water Flow Measurement	<input type="checkbox"/> Measurement <input type="checkbox"/> Data Submission (Completed in SMA1, but not in SMA2&3)	Not yet	- None	- None	Kabir Dikko Dauda Douglas	Ramat	Kiyama	
	Step Test	<input type="checkbox"/> Test <input type="checkbox"/> Data Submission (Completed in SMA1, but not in SMA2&3)	Not yet	- None	- None	Kabir Dikko Dauda Douglas	Ramat	Kiyama	
	Leakage Detection (Acoustic Bar)	<input checked="" type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	On-going in SMA 2 & 3	- None	- None	Kabir Dikko Dauda Douglas	Ramat	Kiyama	Not decided yet
	Leakage Detection (Ground Microphone)	<input checked="" type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	On-going in SMA 2 & 3	- None	- None	Kabir Dikko Dauda Douglas	Ramat	Kiyama	Not decided yet
	Repair of Leakage (Provisional)	<input checked="" type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	On-going in SMA 2 & 3	- None	- None	Kabir Dikko Dauda Douglas	Ramat	Kiyama	Not decided yet
Overall	Data Analysis	<input checked="" type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3				Kabir Dikko Dauda Douglas	Ramat	Toyoda	
	Water Balance Sheet	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3				Kabir Dikko Dauda Douglas	Ramat	Toyoda	
	NRW Reduction Plan	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3				Kabir Dikko Dauda Douglas	Ramat	Toyoda	

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## Output-3: Pilot Project (GARKI I Office)

28 April 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	GARKI	JICA Expert Team		
PMA/SMA Creation	Construction of Chambers	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Excavation <input type="checkbox"/> Chamber Construction <input type="checkbox"/> Cover <input type="checkbox"/> Finishing	One (1) out of five (5) chambers were completed so far, other chambers are on-going. It took time to find out the existing valves. FCTWB requested DOT to proceed to deal with disbursement of CP fund.	Disbursement of CP fund	On-going to remittance payment to the contractor	Dikko Dauda Raifu Douglas	Adesoji	Toyoda	By the end of May
	Installation of Flow Meters and Valves	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation		- None (for now)	- None (for now)	Dikko Kabir Dauda	Adesoji	Toyoda	By the end of May
Commercial Loss	Meter Reading (1 week)	<input checked="" type="checkbox"/> First Reading <input checked="" type="checkbox"/> Second Reading <input checked="" type="checkbox"/> Data Submission		Conventional completed AMR is not yet because of access to	On-going to measure AMR.	Isah Suleiman	Adesoji	Morita Toyoda	AMR will be completed by the middle of May
	Tank Survey	<input checked="" type="checkbox"/> Survey (Not existed) <input checked="" type="checkbox"/> Data Submission	No tank exist			Dikko Dauda Douglas	Adesoji	Morita Toyoda	
	Meter Error Test	<input checked="" type="checkbox"/> Test (partially) <input checked="" type="checkbox"/> Data Submission (partially)	25 out of 145 was completed.	The remaining 95 cannot be measured because of no-access.	Another 25 out of 145 will be completed.	Masaud	Adesoji	Morita Toyoda	BY the end of May
	Illegal Connection	<input checked="" type="checkbox"/> Consumption Data (Impossible to measure consumption because of non meter) <input checked="" type="checkbox"/> Detection Survey (Only two properties are illegal users.	Gardening shop and Car Washing were illegal users and disconnected and has been monitored by FCTWB. Their water consumption was not		Daily monitoring to avoid reconnection	Dikko Dauda Douglas	Adesoji	Morita Toyoda	
	Major Consumer (One Year Consumption)	<input type="checkbox"/> Compilation of Each Categories <input type="checkbox"/> Data Submission	Private school, hospital, clinic, etc. were submitted to JICA expert Team in this Month. All the data were submitted.	- None	- None	Isah	Adesoji	Morita Toyoda	
	Customer List (One Year Consumption)	<input checked="" type="checkbox"/> Compilation of Each Categories <input checked="" type="checkbox"/> Data Submission		Completed		Rose Suleiman	Adesoji	Morita Toyoda	By 28 April
	Temporary Meter (Setting and Meter Reading)	<input type="checkbox"/> Meter Setting <input type="checkbox"/> Meter Reading <input type="checkbox"/> Data Submission	The fittings are going to arrive in FCTWB head quarters on 28 April.	- None	- None	Douglas	Adesoji	Morita Toyoda	By the middle of May

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5-1

Activities		State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion
						HQs	GARKI	JICA Expert Team	
Leakage Survey	24 hrs & MNF Water Flow Measurement	<input type="checkbox"/> Measurement <input type="checkbox"/> Data Submission		Data were missing from flowmeter. The causes were unknown. In addition, flowmeter is not functional well. Display on main unit cannot show indicator.	Repeat measurement. Flowmeter should be lent from other Area office. Problems and solution must be included in the operation manual of ultra-sonic	Kabir Dikko Dauda Douglas	Adesoji Gana	Kiyama	To be confirmed
	1 Week Water Flow Measurement	<input type="checkbox"/> Measurement <input type="checkbox"/> Data Submission	Not yet	- None (for now)	- None (for now)	Kabir Dikko Dauda Douglas	Adesoji Gana	Kiyama	
	Step Test	<input type="checkbox"/> Test <input type="checkbox"/> Data Submission	Not yet	- None (for now)	- None (for now)	Kabir Dikko Dauda Douglas	Adesoji Gana	Kiyama	
	Leakage Detection (Acoustic Bar)	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Not yet	- None (for now)	- None (for now)	Kabir Dikko Dauda Douglas	Adesoji Gana	Kiyama	
	Leakage Detection (Ground Microphone)	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Not yet	- None (for now)	- None (for now)	Kabir Dikko Dauda Douglas	Adesoji Gana	Kiyama	
	Repair of Leakage (Provisional)	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Not yet	- None (for now)	- None (for now)	Kabir Dikko Dauda Douglas	Adesoji Gana	Kiyama	
Overall	Data Analysis	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Not yet	- None (for now)	- None (for now)	Kabir Dikko Dauda Douglas	Adesoji Gana	Toyoda	
	Water Balance Sheet	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Not yet	- None (for now)	- None (for now)	Kabir Dikko Dauda Douglas	Adesoji Gana	Toyoda	
	NRW Reduction Plan	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Not yet	- None (for now)	- None (for now)	Kabir Dikko Dauda Douglas	Adesoji Gana	Toyoda	



# Construction Schedule

ACTIVITIES	Start	End	Duration	Start	End	Duration	Start	End	Duration	Start	End	Duration
1 Mobilization	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1
2 General Items	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1
3 Procuring of Mobilization and	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1
4 Tools & Equipment Cranes, excavator,	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1
5 Clearing of bush, cutting of trees and	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1
6 Excavation by Machinery &	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1
7 Piling of 150mm gravel to support	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1
8 Casting of Concrete foundation works	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1
9 Laying of reinforcement bar commences	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1
10 Casting of Concrete works in	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1
11 Laying of 50mm as slabs pipe for	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1
12 Final works, Fin and lay plaster	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1
13 Commissioning	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1
14 Handover	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1	01/04/16	01/04/16	1

# Tank 2

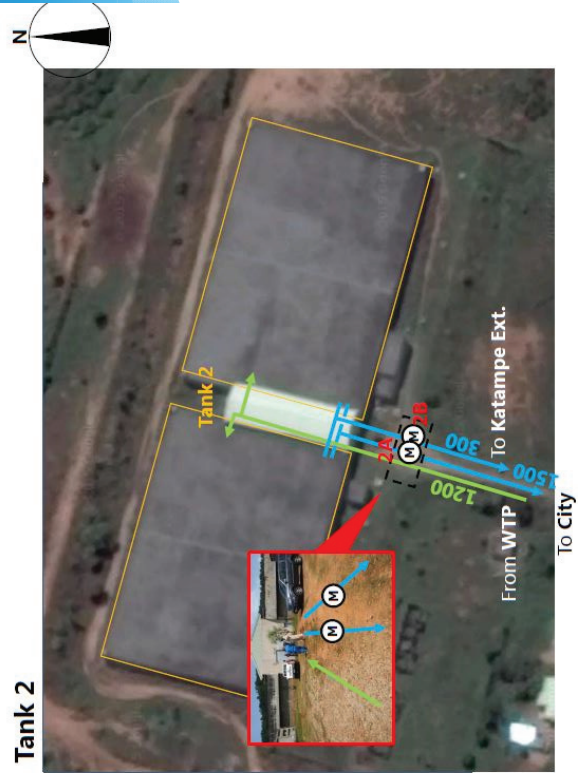
- \* Excavation
- \* Difficulty
- \* **D1 : Water Leakage**
  - \* One was arrested on 19<sup>th</sup> April
  - \* One will be arrested on 26<sup>th</sup> April
- \* **D2 : Interval narrow for Construction**
  - \* **City side 500mm but Tank side 600mm**
  - \* In side Building 900mm
  - \* **Solution : We have to Construct Chamber at Tank side**

# THE FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER PROJECT

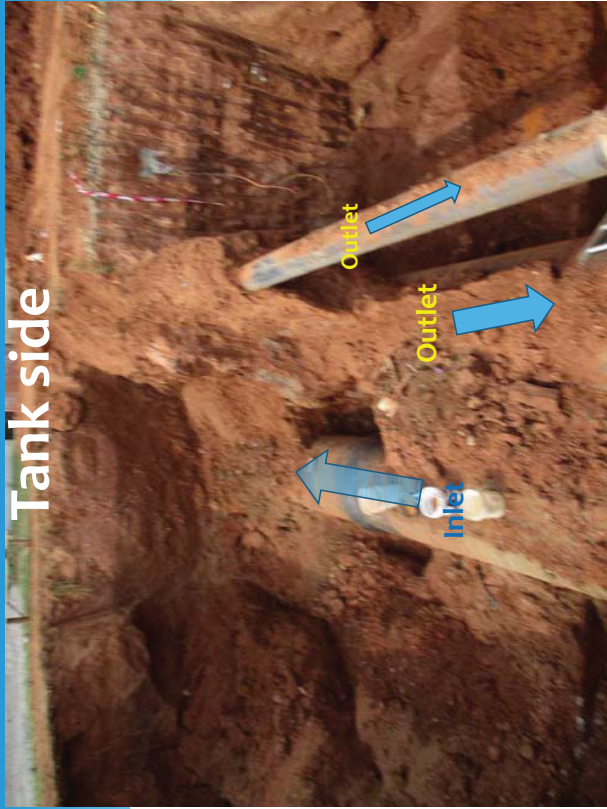
Situation of Site for the Chamber of  
Zonal Flowmeters

28 April 2016

Project Team  
JICA Expert Team



# Tank side

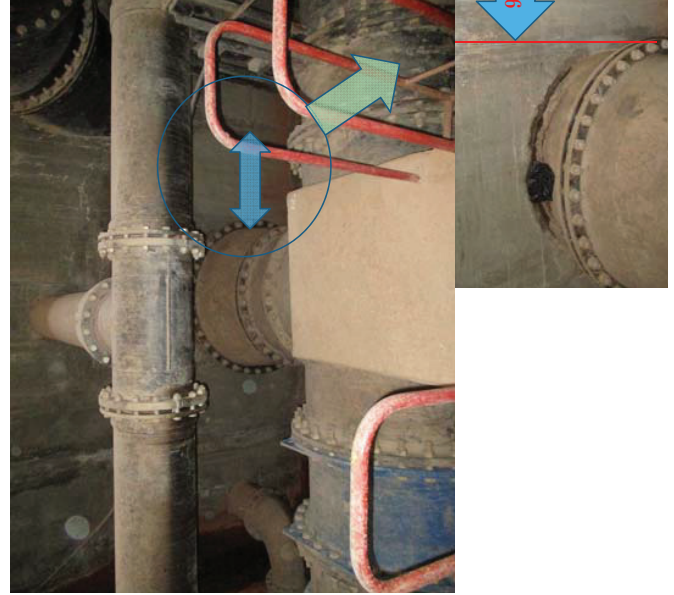


5

# City side View



6



7

# Tank 3.1

- \* Excavation :
- \* Difficulty :

**D1: Bed rock is soft rock**  
**D2: Pipe interval is narrow**

Tank 3.1



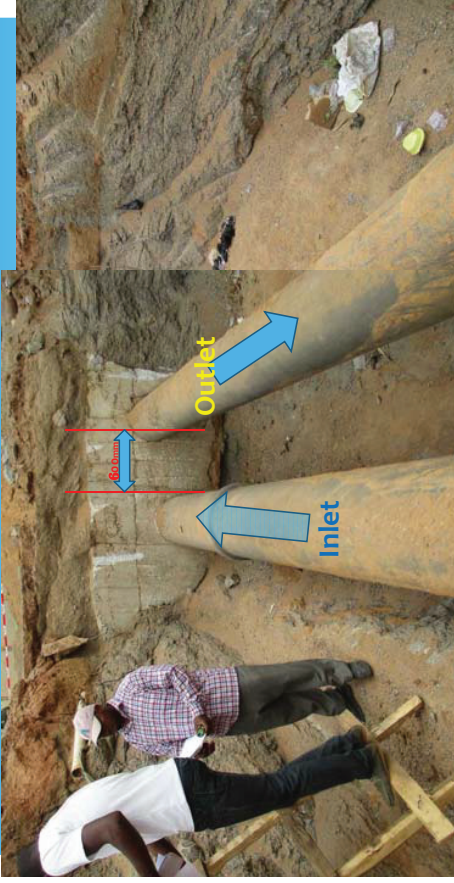
8

## City side View



9

## Tank Side View



10

## Tank 4.2

- \* Excavation
- \* Difficulty
  - \* D1: Very weak soil bed : Garbage dump place
  - \* D2: Rain water come from upper side



11

## City side

Inlet pipe, Outlet pipe, Drainage



12

## Tank side

After dewatering final excavation



13

## Make Rain water drainage



14

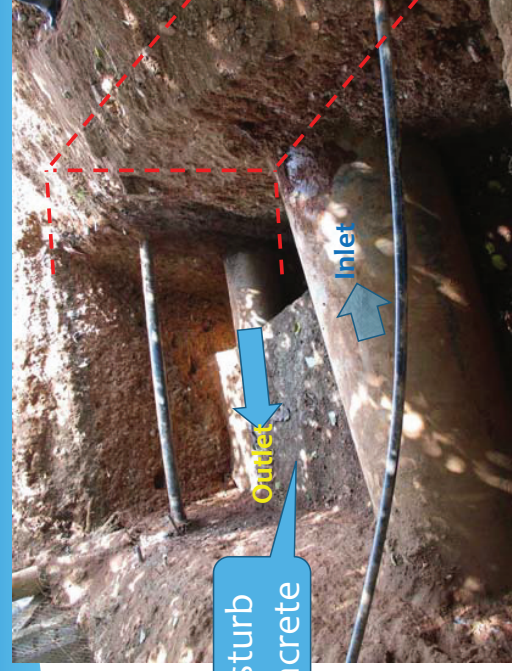
## Tank Kubwa

- \* Excavation
- \* Difficulty
- \* **D1: Border side Concrete disturb**
- \* Solution :  
**Shift chamber 2m to Tank side**



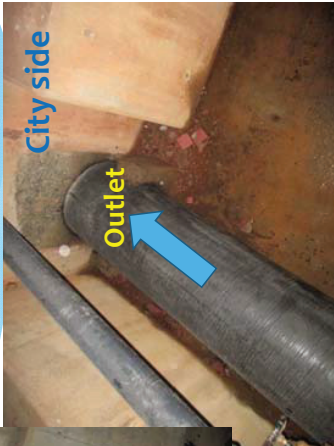
15

## Boarder side, Tank side



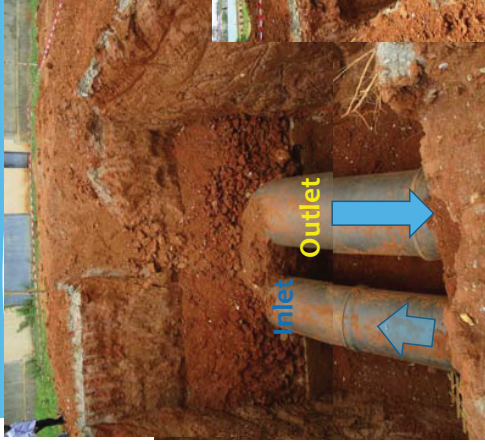
16

# Inside of Tank Building

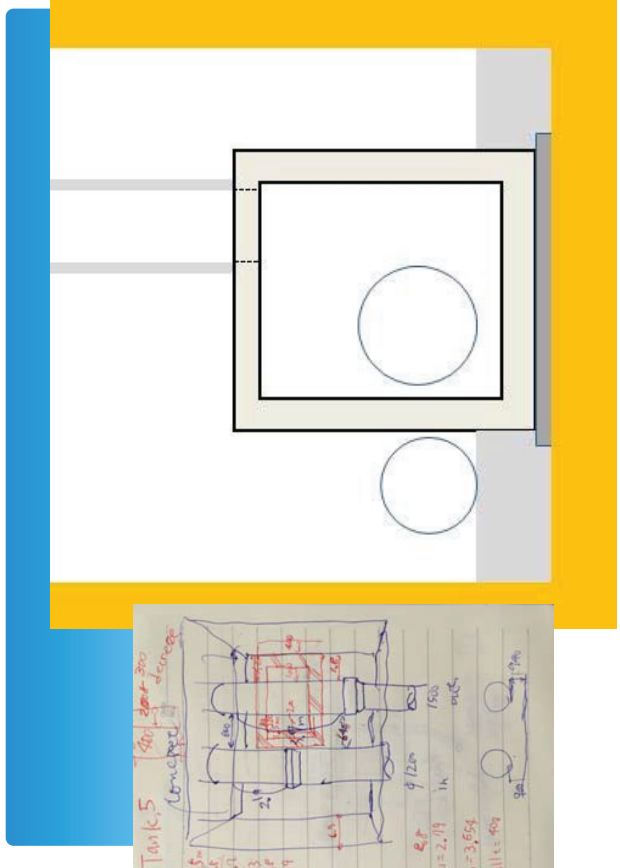


17

# Tank 5



18



19

# Chamber Layout



20

# **The Federal Capital Territory Reduction of Non-Revenue Water Project**

## **Technical Notes on Monthly Technical Meeting**

15 June 2016

Engr. A. A. Nahuche, Technical Manager, HoD Distribution as the chairperson of the meeting gave an opening remark to officially start the meeting (See attendance in Appendix 1).

As a matter of project operations by FCTWB Management, Mr. Akinori Miyoshi, Chief Advisor explained the next Joint Monitoring and Joint Coordinating Committee (JCC) meeting scheduled in late August 2016. Also, he asked for project members' cooperation for field visit to our project site by the President of JICA on 16<sup>th</sup> June 2016. All attendances consented willingly to receive him.

Mr. Danjuma Isah, HoU Monitoring and Detection reported that FCTWB deactivated about 3,000 return bills out of 4,800. Mr. Miyoshi asked FCTWB to keep on deactivation and eliminate them entirely for modification of existing billing system.

Mr. Shehu Suleiman, HoU GIS reported that GIS mapping in three Pilot Metering Areas (PMA) has been updated but AGIS restriction remains an obstacle to updating.

Reporting and discussion about pilot project activities were done based on monthly meeting record for progress monitoring (see Appendix 2).

Mr. Musa Dikko, HoU Pipeline reported progress of chamber construction for bulk flowmeters at Lower Usuma water treatment plant as a part of Output-1 activities and mentioned the construction works were resumed by contractor. Mr. Miyoshi made a presentation on installation of four cables for ultrasonic flowmeter, for which FCTWB is responsible (see Appendix 3).

Three pilot Area Managers, Mr. Habib A. Kiru, Mr. M. A. S. Ramat and Mr. Adesoji Adenuga reported progress of each activity for Output-2 and discussed among relevant project members, then set expected time to complete.

As provisional figures, Mr. Toru Toyoda, Expert made a presentation on how to prepare water balance analysis in a PMA of Jabi (see Appendix 4).

As additional equipment for the Project, Engr. Nahuche and Mr. Miyoshi agreed that JICA Expert Team procures three compact reciprocating saws for leakage repair in pilot Area Offices and a projector for operation of the Project.

**Appendix 1: Attendance List**

**Appendix 2: Monthly Meeting Record as of June 2016**

**Appendix 3: Installation of Four Cables for Ultrasonic Flowmeter (Bulk Meter)**

**Appendix 4: Water Balance Analysis (Provisional)**

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

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

**FEDERAL CAPITAL TERRITORY WATER BOARD NON-REVENUE WATER  
PROJECT**

**MONTHLY TECHNICAL MEETING**

**ATTENDANCE LIST**

**15TH JUNE 2016**

<b>S/N</b>	<b>NAME</b>	<b>POSITION</b>	<b>TEL</b>	<b>EMAIL ADDRESS</b>
1	Bello S.T	Deputy Project Manager		
2	Engr. Nahuche A.A	Technical Manager		
3	Muhammad S. Adis	HOD Commerce		
4	Engr. Lawal A.R	Project Coordinator		
5	Abubakar Ubale A.	Asst. Logistics Officer		
6	Engr. Douglas Oloton	AM Gwarinpa		
7	Aminu Umar B.	Chief Tech. Officer [Ops&WM]		
8	Aliyu M. Maradun	Head Major Consumers		
9	Muhammed Husain	Technical Officer		
10	Engr. C.E Ottah	S.E [tech]		
11	Dr Joachim Ezeji	JICA Advisor		
12	Habib Ahmed Kiru	AM Gudu		
13	Mahmud Mohammed	Distribution[Jabi]		
14	Abubakar Danladi	Distribution [Jabi]		
15	Ibrahim Umar	AAM Gudu		
16	Abdul Yusuf	Sup. P&P estate		
17	Engr. A.O Akande	PM [AMR]		
18	Isaac O. Owolabi	Customer Care Unit		
19	Abdulrahman Shehus	Head PPM		
20	Ezeh Hillary	GIS/Logistics		
21	Muazo S.B	Asst. HOD Commerce		
22	Isah Danjuma	Monitoring/ Detection		
23	Moh'd A.S Ramat	AM Jabi		
24	Mohammed Moh'd	Commerce		
25	Muhammed Dauda	Distribution [pipeline]		
26	Musa Dikko	Head pipeline		
27	Mh'd E. Gana	Garki Area office		
28	Raifu Mumini	AAM Distribution		
29	Engr. Abdullahi Masaud	Head [metering]		
30	Shehu Sulaiman	Head GIS		
31	Rose Akpan	Head Billing		
32	Engr. Amos Bulus	Electro-Mechanical		
33	Olaniyan yetunde	H/Q		
34	Toru Toyoda	JICA Expert Team		
35	Kiyoshi Kiyama	JICA Expert Team		
36	Akinori Miyoshi	CA, JICA Expert Team		



## Output-1: Construction of Chambers at LUD WTP Outlet (HQs)

15 June 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	Contractor	JICA Expert Team		
Chamber (D1500) for Tank 2&5	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	None	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	None	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Slab (Roof)	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	None	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Appurtenant Works	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Opening <input type="checkbox"/> Installation of Manhole Cover <input type="checkbox"/> Installation of Ladder	Works had been suspended works, but contractor restarted works. Budget was approval by the President.	CP fund has not yet been released.	Follow up to FCTA but no effective measures because of waiting for budget approval by national assembly.	Kabir Raifu	Local	Miyoshi Fujiyama	End of June
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of August
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Demobilization		Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto

1-1

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	Contractor	JICA Expert Team		
Chamber (D1500) for Tank 3&4	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	None	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	None	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Slab (Roof)	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	None	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Appurtenant Works	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Opening <input type="checkbox"/> Installation of Manhole Cover <input type="checkbox"/> Installation of Ladder	Works had been suspended works, but contractor restarted works. Budget was approval by the President.	CP fund has not yet been released.	Follow up to FCTA but no effective measures because of waiting for budget approval by national assembly.	Kabir Raifu	Local	Miyoshi Fujiyama	End of June
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of August
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Demobilization		Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	Contractor	JICA Expert Team		
Chamber (D1200) for Kubwa	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	None	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	None	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Slab (Roof)	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Works had been suspended works, but contractor restarted works. Budget was approval by the President.	CP fund has not yet been released.	Follow up to FCTA but no effective measures because of waiting for budget approval by national assembly.	Kabir Raifu	Local	Miyoshi Fujiyama	End of June
	Appurtenant Works	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Opening <input type="checkbox"/> Installation of Manhole Cover <input type="checkbox"/> Installation of Ladder	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of July
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of August
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Demobilization		Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto

1-3

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	Contractor	JICA Expert Team		
Chamber (D600) for Bwari	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	None	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Works had been suspended works, but contractor restarted works. Budget was approval by the President.	CP fund has not yet been released.	Follow up to FCTA but no effective measures because of waiting for budget approval by national assembly.	Kabir Raifu	Local	Miyoshi Fujiyama	End of June
	Slab (Roof)	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Bar Arrangement <input type="checkbox"/> Concrete Casting <input type="checkbox"/> Curing <input type="checkbox"/> Finishing	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of July
	Appurtenant Works	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Opening <input type="checkbox"/> Installation of Manhole Cover <input type="checkbox"/> Installation of Ladder	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Middle of August
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Demobilization		Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto

Annex4-117

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## Output-1: Construction of Chambers for Zonal Meter (HQs)

15 June 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion
					HQs	Contractor	JICA Expert Team	
Chamber Preparation	■ Procedures for Contract	Completed	None	None		INTELES (Integrated Logistics & Engineering)	Miyoshi Mori	-
Construction (Tank 2)	■ Floor ■ Wall □ Slab □ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	Middle of August
Construction (Tank 3.1)	□ Floor □ Wall □ Slab □ Manhole, Others	Non progress	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	Ditto
Construction (Tank 3.2)	■ Floor ■ Wall □ Slab □ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	Ditto
Construction (Tank 4.1.1)	■ Floor □ Wall □ Slab □ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	Ditto
Construction (Tank 4.2)	■ Floor ■ Wall ■ Slab ☒ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	Ditto
Construction (Tank 5)	■ Floor ■ Wall ■ Slab ☒ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	Ditto
Construction (Tank Kubwa)	■ Floor ■ Wall ■ Slab ☒ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	Ditto
Construction (Tank Gwako)	□ Floor □ Wall □ Slab □ Manhole, Others	Non progress	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	Ditto
Zonal Meter (Ultra-sonic Flowmeter)	Installation Measurement	After the completion of chamber construction and procurement of equipment						

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## Output-2: Pilot Project (GUDU Office)

15 June 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion
					HQs	GUDU	JICA Expert Team	
PMA/SMA Creation	Construction of Chambers ■ Procurement of Materials ■ Excavation ■ Chamber Construction ☒ Cover ☒ Finishing	Cover and finishing have been suspended by delay in release of CP fund	Release of CP fund	None	Dikko Dauda Raifu Douglas	Habib	Toyoda	End of June
	Installation of Flow Meters and Valves ■ Procurement ■ Installation	Completed	A D100mm valve on Drive 4 and a D100mm on Drive 1 are not functioning, but no effect on the Project	FCTWB should replace or repair them.	Dikko Kabir Dauda	Habib	Toyoda	-
Commercial Loss	Meter Reading & Temporary Meter Reading (1 week) ■ Temporary Meter Installation ■ First Reading ■ Second Reading ■ Data Submission	Completed	None	None	Isah Masaud	Habib	Toyoda Morita	-
	Tank Survey ■ Survey ■ Data Submission	Completed	None	None	Dikko Dauda Douglas	Habib	Toyoda	-
	Meter Error Test ■ Test ■ Data Submission	Completed	None	None	Masaud	Habib	Toyoda	-
	Illegal Connection Survey ■ Consumption Data ☒ Detection Survey □ Data Submission	Ongoing	None	None	Dikko Dauda Douglas	Habib	Toyoda	End of June
	Major Consumer (One Year Consumption) ■ Compilation of Each Categories ■ Data Submission	Completed (only British school)	None	None	Isah	Habib	Toyoda	-
	Customer List (One Year Consumption) ■ Compilation of Each Categories ■ Data Submission	Completed (6 months record)	None	None	Rose Masaud	Habib	Toyoda	-
	24 hrs Customer Consumption Survey □ Measurement □ Data Submission	Non progress	None	None	Douglas	Habib	Toyoda	End of July

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	GUDU	JICA Expert Team		
Leakage Survey	24 hrs & MNF Water Flow Measurement	<input checked="" type="checkbox"/> Measurement <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Kabir Dikko Dauda Douglas	Habib	Kiyama	-
	1 Week Water Flow Measurement	<input checked="" type="checkbox"/> Measurement <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Kabir Dikko Dauda Douglas	Habib	Kiyama	-
	Step Test	<input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Kabir Dikko Dauda Douglas	Habib	Kiyama	-
	Leakage Detection (Acoustic Bar)	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2	Ongoing	None	None	Kabir Dikko Dauda Douglas	Habib	Kiyama	End of June
	Leakage Detection (Ground Microphone)	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2	Ongoing	None	None	Kabir Dikko Dauda Douglas	Habib	Kiyama	Ditto
	Repair of Leakage (Provisional)	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2	Ongoing	None	None	Kabir Dikko Dauda Douglas	Habib	Kiyama	Ditto
Overall	Data Analysis	<input checked="" type="checkbox"/> SMA1 <input type="checkbox"/> SMA2	Ongoing	None	None	Kabir Dikko Dauda Douglas	Habib	Toyoda	End of June
	Water Balance Sheet	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2	Non progress	None	None	Kabir Dikko Dauda Douglas	Habib	Toyoda	Ditto
	NRW Reduction Plan	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2	Non progress	None	None	Kabir Dikko Dauda Douglas	Habib	Toyoda	Ditto
	Monthly/Weekly PMA Meter Reading	<input type="checkbox"/> Reading <input type="checkbox"/> Data Submission	Non progress	None	None	Kabir Dikko Dauda Douglas	Habib	Toyoda	Every month

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## Output-2: Pilot Project (JABI Office)

15 June 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	JABI	JICA Expert Team		
PMA/SMA Creation	Construction of Chambers	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Excavation <input checked="" type="checkbox"/> Chamber Construction <input checked="" type="checkbox"/> Cover <input checked="" type="checkbox"/> Finishing	Cover and finishing have been suspended by delay in release of CP fund	Release of CP fund	None	Dikko Dauda Raifu Douglas	Ramat	Toyoda	End of June
	Installation of Flow Meters and Valves	<input checked="" type="checkbox"/> Procurement <input checked="" type="checkbox"/> Installation	Completed	None	None	Dikko Kabir Dauda	Ramat	Toyoda	-
Commercial Loss	Meter Reading & Temporary Meter Reading (1 week)	<input checked="" type="checkbox"/> Temporary Meter Installation <input checked="" type="checkbox"/> First Reading <input checked="" type="checkbox"/> Second Reading	Dom. & com.: completed, Major consumers and temporary meter:	None	None	Isah	Ramat	Morita Toyoda	End of June
	Tank Survey	<input checked="" type="checkbox"/> Survey <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Dikko Dauda Douglas	Ramat	Morita Toyoda	-
	Meter Error Test	<input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Masaud	Ramat	Morita Toyoda	-
	Illegal Connection	<input checked="" type="checkbox"/> Consumption Data <input type="checkbox"/> Detection Survey <input type="checkbox"/> Data Submission	Ongoing	None	None	Dikko Dauda Douglas	Ramat	Morita Toyoda	End of July
	Major Consumer (One Year Consumption)	<input checked="" type="checkbox"/> Compilation of Each Categories <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Isah	Ramat	Morita Toyoda	-
	Customer List (One Year Consumption)	<input checked="" type="checkbox"/> Compilation of Each Categories <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Rose	Ramat	Morita Toyoda	-
	24 hrs Customer Consumption Survey	<input checked="" type="checkbox"/> Measurement <input type="checkbox"/> Data Submission	Ongoing	None	None	Douglas	Ramat	Morita Toyoda	End of June

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	JABI	JICA Expert Team		
Leakage Survey	24 hrs & MNF Water Flow Measurement	■ Measurement ■ Data Submission	Completed	None	None	Kabir Dikko Dauda Douglas	Ramat	Kiyama	-
	1 Week Water Flow Measurement	□ Measurement □ Data Submission	Non progress	None	None	Kabir Dikko Dauda Douglas	Ramat	Kiyama	When available
	Step Test	■ Test ■ Data Submission	Completed	None	None	Kabir Dikko Dauda Douglas	Ramat	Kiyama	-
	Leakage Detection (Acoustic Bar)	■ SMA1 □ SMA2 □ SMA3	Ongoing	None	None	Kabir Dikko Dauda Douglas	Ramat	Kiyama	Middle of August
	Leakage Detection (Ground Microphone)	■ SMA1 □ SMA2 □ SMA3	Ongoing	None	None	Kabir Dikko Dauda Douglas	Ramat	Kiyama	Ditto
	Repair of Leakage (Provisional)	■ SMA1 □ SMA2 □ SMA3	Ongoing	None	None	Kabir Dikko Dauda Douglas	Ramat	Kiyama	Ditto
Overall	Data Analysis	□ SMA1 □ SMA2 □ SMA3	Non progress	None	None	Kabir Dikko Dauda Douglas	Ramat	Toyoda	End of July
	Water Balance Sheet	□ SMA1 □ SMA2 □ SMA3	Non progress	None	None	Kabir Dikko Dauda Douglas	Ramat	Toyoda	Ditto
	NRW Reduction Plan	□ SMA1 □ SMA2 □ SMA3	Non progress	None	None	Kabir Dikko Dauda Douglas	Ramat	Toyoda	Ditto
	Monthly/Weekly PMA Meter Reading	□ Reading □ Data Submission	Non progress	None	None	Kabir Dikko Dauda Douglas	Ramat	Toyoda	Every month

4-9

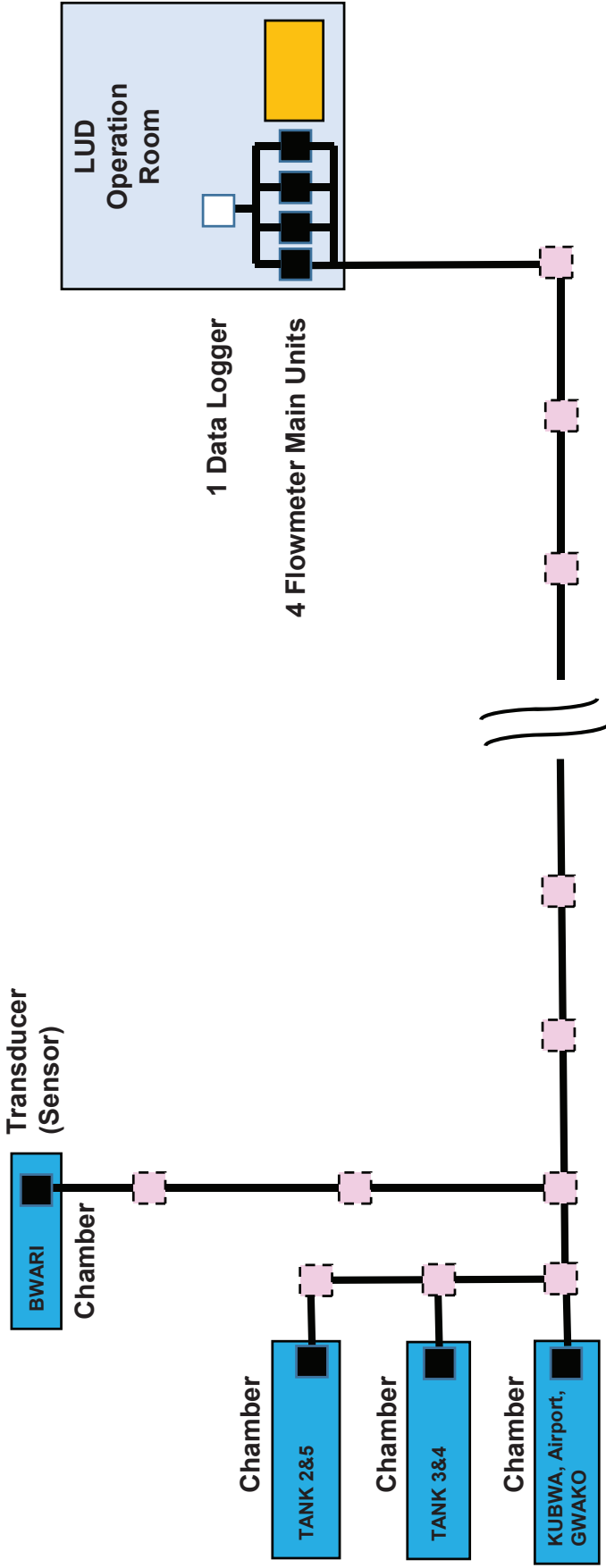
## Output-3: Pilot Project (GARKI I Office)

15 June 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	GARKI	JICA Expert Team		
PMA/SMA Creation	Construction of Chambers	■ Procurement of Materials ■ Excavation ■ Chamber Construction ☒ Cover ☒ Finishing	Cover and finishing at chamber for ultrasonic flowmeter have been suspended by delay in release of CP fund	Release of CP fund	None	Dikko Dauda Raifu Douglas	Adesoji	Toyoda	End of June
	Installation of Flow Meters and Valves	■ Procurement ☒ Installation	Ultrasonic flowmeter has not yet been installed because of suspension of electric works by delay in release of CP fund.	Release of CP fund	None	Dikko Kabir Dauda	Adesoji	Toyoda	Ditto
Commercial Loss	Meter Reading & Temporary Meter Reading (1 week)	☒ First Reading ☒ Second Reading ☒ Data Submission	Ongoing	Acceleration	Work dividing	Isah Suleiman	Adesoji	Morita Toyoda	Ditto
	Tank Survey	■ Survey ■ Data Submission	No tanks exist (to be confirmed)	None	None	Dikko Dauda Douglas	Adesoji	Morita Toyoda	-
	Meter Error Test	☒ Test ☒ Data Submission	Ongoing (62)	Acceleration	Team dividing	Masaud	Adesoji	Morita Toyoda	End of June
	Illegal Connection	□ Consumption Data □ Detection Survey	Non progress	None	None	Dikko Dauda Douglas	Adesoji	Morita Toyoda	End of July
	Major Consumer (One Year Consumption)	■ Compilation of Each Categories ■ Data Submission	Completed	None	None	Isah	Adesoji	Morita Toyoda	-
	Customer List (One Year Consumption)	■ Compilation of Each Categories ■ Data Submission	Completed	None	None	Rose Suleiman	Adesoji	Morita Toyoda	-
	24 hrs Customer Consumption Survey	□ Measurement □ Data Submission	Non progress	None	None	Douglas	Adesoji	Morita Toyoda	End of July

Activities		State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion
						HQs	GARKI	JICA Expert Team	
Leakage Survey	24 hrs & MNF Water Flow Measurement	<input checked="" type="checkbox"/> Measurement <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Kabir Dikko Dauda Douglas	Adesoji Gana	Kiyama	-
	1 Week Water Flow Measurement	<input type="checkbox"/> Measurement <input type="checkbox"/> Data Submission	Non progress	None	None	Kabir Dikko Dauda Douglas	Adesoji Gana	Kiyama	When available
	Step Test	<input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Kabir Dikko Dauda Douglas	Adesoji Gana	Kiyama	-
	Leakage Detection (Acoustic Bar)	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Ongoing	None	None	Kabir Dikko Dauda Douglas	Adesoji Gana	Kiyama	Middle of August
	Leakage Detection (Ground Microphone)	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Ongoing	None	None	Kabir Dikko Dauda Douglas	Adesoji Gana	Kiyama	Ditto
	Repair of Leakage (Provisional)	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Non progress	None	None	Kabir Dikko Dauda Douglas	Adesoji Gana	Kiyama	Ditto
Overall	Data Analysis	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Non progress	None	None	Kabir Dikko Dauda Douglas	Adesoji Gana	Toyoda	End of July
	Water Balance Sheet	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Non progress	None	None	Kabir Dikko Dauda Douglas	Adesoji Gana	Toyoda	Ditto
	NRW Reduction Plan	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Non progress	None	None	Kabir Dikko Dauda Douglas	Adesoji Gana	Toyoda	Ditto
	Monthly/Weekly PMA Meter Reading	<input type="checkbox"/> Reading <input type="checkbox"/> Data Submission	Non progress	None	None	Kabir Dikko Dauda Douglas	Adesoji Gana	Toyoda	Every month

# Installation of Four Cables for Ultrasonic Flowmeter (Bulk Meter)



Waved PVC with inlying Pilot Wire to pull out Cable



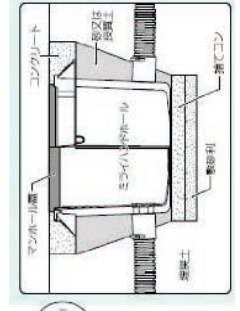
Switchboard In Cabinet Box



- 5 Breakers for
- 4 Flowmeter Main Units (27VA) and
- 1 Logger (50VA)



Connection Box  
At every bending points, cable connection points, And every 47m interval points along straight line



# THE FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER PROJECT

## Water Balance Analysis (Provisional) in Prince & Princess PMA Gudu Area Office

15 July 2016

FCTWB

JICA Expert Team

### Water Balance Analysis

		Revenue Water		Billed Metered Consumption		Billed Unmetered Consumption (Flat rate)		System Input Volume		(m <sup>3</sup> /day)	
System Input Volume ① 3,222	Revenue Water ④ 1,224.51									② 1,118.19	
	Non Revenue Water ⑩ 1,997.49									③ 106.32	
				Unbilled Authorized						⑤ 170.82	
				Customer Meter Inaccuracies						⑥ 3.92	
				Illegal Connection						⑦ 21.56	
				Unidentified Consumption						⑧ 1,321.19	
				Physical Losses						⑨ 480	
				Leakage						⑩ 62.0 %	

2

### Billed Consumption

Categories		Number	Volume m <sup>3</sup> /day
Billed Metered Consumption	Conventional	measured customer (bill)	⑫/68 ⑬/266.67
	Prepaid	Available data customer average of available data customer consumption	321 382.88
Billed Unmetered Consumption		Unavailable data customer	404 468.64*
		Sub Total	②/1,118.19
Flat Rate		conventional	10 ⑬/22.6
		prepaid	54 ⑭/66.42
		Major (British school)	1 17.3
		Sub Total	③/106.32
		Total	④/1,224.51

- ✓ Average available data customer's consumption (382.88m<sup>3</sup>/d. / 321 = 1.19m<sup>3</sup>/d.) is used for consumption of unavailable data customer  
404 x 1.19 m<sup>3</sup>/d. = 468.64m<sup>3</sup>/d.

3

4



## Billed Unmetered Consumption (Flat Rate)

- (Conventional)
- $N5,500 / \text{month} / N80/m^3 = 68.75m^3/\text{month} \times 12 / 365 = 2.26m^3/\text{day}$   
 $2.26 \times 10 = 22.6m^3/d.$   
 Excess from  $2.26m^3/\text{day}$  becomes commercial loss
- (Prepaid)
- $N3,000 / \text{month} / N80/m^3 = 37.5m^3/\text{month} \times 12 / 365 = 1.23m^3/\text{day}$   
 $1.23 \times 54 = 66.42m^3/d.$   
 Excess from  $1.23m^3/\text{day}$  becomes commercial loss
- (Major Consumer)
- $N78,000 / 150_{NGN/m^3} / 30\text{day} = 17.3m^3/\text{day}$   
 Excess from  $17.3m^3/\text{day}$  becomes commercial loss
- (Total Volume)
- $22.6 + 66.42 + 17.3 = 106.32m^3/\text{day}$

5

## Commercial Loss of Billed Unmetered Consumption (Flat Rate)

- (Conventional)
- Average Consumption of temporary meter reading result is  $4.06m^3/\text{day}$ .  $4.06 - 2.26 = 1.8m^3/\text{day} \times 10 = 18.0m^3/\text{day}$  is commercial loss
- (Prepaid)
- $4.06 - 1.23 = 2.83m^3/\text{day} \times 54 = 152.82m^3/\text{day}$  is commercial loss
- (Total Volume)  $18.0 + 152.82 = 170.82m^3/\text{day}$

6

## Unbilled Authorized

- Consumption of Religious Facility is unbilled unmetered authorized consumption
- Assumption : same volume to the average of domestic because small church  $\frac{12}{13} \times 6 = 3.92m^3/\text{day}$   
 $\frac{13}{13} \times 266.67m^3/d. / 68 = 3.92m^3/\text{day}$

7

## Customer Meter Inaccuracies

- Average actual error is NRW
- Allowable error of using meter is 4%
- Differences between average actual error and allowable error is Commercial Loss

Result of Meter Error Test

Items	Number of Samples	%
Allowable Errored Meter (in +- 4% error)	72	54.1
Over 4% Errored Meter	32	24.1
Under -4% Errored Meter	29	21.8
Total	133	100
Average of Total Error Percentage	$15 - 1.56\%$	
Average of exceeded point from + 4%	$16$	15.7
Average of exceeded point from - 4%	$17$	24.6

### (Average of Total Error Percentage)

- Total volume of customer's meter reading : 13,245.5m3/d.
- Total volume of test meter reading : 13,453.1m3/d.  
(13,245.5 - 13,453.1) / 13,453.1 = <sup>(13)</sup>-1.54%

### (Average of exceeded point from +4%)

- Total test meter reading volume for plus range exceeded samples: 3,236.1m3/d.
- Total volume of customer's meter reading exceeded from +4% : 3,873.8 m3/d.  
(3,873.8 - 3,236.1) / 3,236.1 x 100 - 4% = <sup>(16)</sup>15.7%

### (Average of exceeded point from -4%)

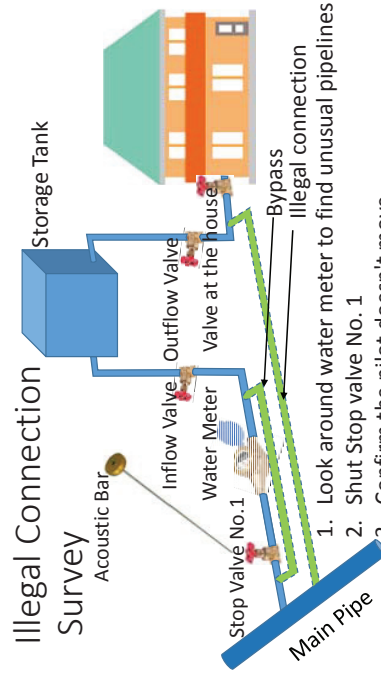
- Total test meter reading volume for minus range exceeded samples: 3,011.0m3/d.
- Total volume of customer's meter reading exceeded from -4% : 2,148.6m3/d.  
(2,148.6 - 3,011.0) / 3,011.0 x 100 + 4% = <sup>(17)</sup>-24.6%

### (Volume of Customer Meter Inaccuracies)

- Meter Inaccuracies are related to total measured consumption.
- Total measured consumption : <sup>(2)</sup>1,118.19 + <sup>(13)</sup>22.6 + <sup>(14)</sup>66.42 + <sup>(5)</sup>170.82 + <sup>(6)</sup>3.92 = 1,381.95m3/day
- Volume of customer meter inaccuracies <sup>(15)</sup>1,381.95 x <sup>(7)</sup>0.0156 = **21.56m3/day**

## Illegal Connection

- Consumption of Illegal connection can't be measured
- **Illegal connection survey is on going**



1. Look around water meter to find unusual pipelines
2. Shut Stop valve No. 1
3. Confirm the pilot doesn't move
4. Shut Out flow valve
5. Hear the sound at stop valve No. 1 using Acoustic Bar
6. If you hear water flow sound, shut in flow Valve
7. Hear the sound at stop valve No. 1
8. If you can't hear water flow sound, there is an bypass
9. Shut the valve at the house
10. Hear the sound at stop valve No. 1
11. If you can't hear water flow sound, there is an illegal connection

## Leakage

- Actual volume of Leakage is difficult to know because leak term and quantity is not measured
- When you find leakage measure leakage volume by leakage measure device.
- Compare the volume before repair work and after it by minimum night flow measurement  
(Leakage volume)
- The volume compared before leakage repair work and after it about SMA 1 :  $20\text{m}^3/\text{hr}$ .  
 $20\text{m}^3/\text{hr} \times 24 \text{ hr./day} = 480 \text{ m}^3/\text{day}$

13

## Unidentified Consumption

- Unidentified consumption is remaining volume from volume of other factors
- Unidentified Consumption + Illegal connection :  
 $3222 - 1,118.19 - 106.32 - 170.82 - 3.92 - 21.56 - 480 = 9,321.19\text{m}^3/\text{day}$

14

## Study from the water Balance Analysis

- Flat Rate Customer use more water than customers charged be meter reading
- Average of customer inaccuracies is not so high in P&P. But its value is minus, it means non-revenue water
- About 46% of meter are inaccurate in P&P
- The Volume of unidentified consumption and illegal connection is very high. It's about 70 % of non-revenue water. There might be many illegal connections. Therefore, illegal connection survey should be continued.
- The volume of minimum night flow is very high. Therefore, 24 hours water flow measurement should be done to know trend of water usage.

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# **The Federal Capital Territory Reduction of Non-Revenue Water Project**

## **Technical Notes on Quarterly Project Meeting and Monthly Technical Meeting**

27 July 2016

Prior to commencement, Mr. Akinori Miyoshi, Chief Advisor explained programme and agenda of the meetings (see Appendix 1).

### **Session 1: Quarterly Project Meeting**

Mr. Hudu Bello, Project Manager, the Director of FCTWB as the chairperson of the Quarterly Project Meeting gave an opening remark to officially start the meeting (see attendance in Appendix 2).

#### **1. Joint Monitoring and Joint Coordinating Committee (JCC) Meeting**

Mr. Miyoshi informed that joint monitoring with mission from the JICA headquarters is scheduled in 14<sup>th</sup> to 22<sup>nd</sup> September and JCC meeting on 21<sup>st</sup> or 22<sup>nd</sup> September, and also explained its purposes:

- Based on results of previous joint monitoring in November 2015, joint monitoring team confirms achievement and implementing process, and then clarifies positive and negative factors. The team also observes the measures to be taken according to suggestions made in previous joint monitoring.
- For smooth project operation and achievement of project purpose, the team discusses measures, suggestions and revision of Record of Discussion if necessary. These are approved in the JCC meeting.

FCTWB understood these purposes and confirmed that there are no conflicting schedules.

#### **2. Action Plan by Participants in the 2nd Training in Japan**

Engr. A. R. Lawal, Coordinator, HoU Special Projects representing eight participants made a presentation on the action plan for 100% metering (see Appendix 3), which was prepared at the end of the training in Japan, and also explained discussion and process of how they concluded it.

Mr. ST Bello, Deputy Project Manager, HoD Admin&Supply congratulated participants and appreciated the action plan as the outcome of training and this opportunity of presentation for FCTWB. He emphasized the necessity for opening up what they learned and requested participants to contribute more to improvement of FCTWB in terms of both distribution and commerce.

Mrs. Bunmi Olowookere, HoU Planning, Research and Statistics, suggested incorporating the action plan to annual action plan of FCTWB for budgeting and implementation and phasing proposed actions. Also, she mentioned that training on staff behavior particularly for junior staffs should be conducted regularly in house.

Mr. Miyoshi suggested participants polish off presentation material and then make another presentation in the JCC meeting for stakeholders, and FCTWB agreed it.

### **3. AGIS Challenges and Possible Solutions for FCTWB**

Mr. Shehu Suleiman, HoU GIS made a presentation on AGIS challenges and possible solutions for FCTWB (see Appendix 4).

Mr. Miyoshi explained this issue has been raised and emphasized the necessity for prompt response, and FCTWB Management understood its significance anew and promised to present this to Permanent Secretary of FCTA to sort out.

### **4. Deactivation of Return Bills and Modification of Billing System**

As a follow-up to the previous monthly technical meeting in June 2016, Mr. Danjuma Isah, HoU Monitoring and Detection reported that FCTWB deactivated all 4,800 return bills. He mentioned some of deactivated bills were reactivated because of improvement of water supply in particular areas and promised to submit updated billing information to Mrs. Hafsat A. Lawi, HoD Finance.

Mr. Miyoshi requested relevant project members to be involved in finalizing proposal of specification of modification of billing system for sponsorship by JICA.

### **5. Update of Counterpart (CP) Fund and Autonomy of FCTWB**

Mrs. Lawi reported CP fund will be released soon because budget was already approved by the National Assembly (both Representatives and Senators) last week and all administrative procedures were done.

Mr. ST Bello explained that bill for the autonomy of FCTWB is with the National Assembly and that the Director is in close touch with some members of the National Assembly to facilitate its passage.

### **Session 2: Monthly Technical Meeting**

Engr. A. A. Nahuche, Technical Manager, HoD Distribution as the chairperson of the Monthly Technical Meeting gave an opening remark to officially start the meeting.

Reporting and discussion were done based on monthly meeting record for progress monitoring (see Appendix 5).

Mr. Musa Dikko, HoU Pipeline reported progress of chamber construction for bulk flowmeters at Lower Usuma water treatment plant as a part of Output-1 activities and mentioned the construction works has been suspended again by contractor due to delay in release of CP fund. Engr. Nahuche promised that the works would continue as soon as CP fund is released.

Three pilot Area Managers, Mr. Habib A. Kiru, Mr. M. A. S. Ramat and Mr. Adesoji Adenuga reported progress of each activity for Output-2 and discussed among relevant project members, then set expected time to complete.

As provisional figures, Engr. Abdullahi Masaud, HoU Metering General made a presentation on some results of 24 hours consumption measurement of the sampled customers including major consumers in Jabi pilot area (see Appendix 6). He mentioned some customers seem to consume or store water in the midnight time but the Project needs to analyze these results further.

**Appendix 1: Programme and Agenda**

**Appendix 2: Attendance List**

**Appendix 3: Action Plan by Participants in the 2nd Training in Japan**

**Appendix 4: AGIS Challenges and Possible Solutions for FCTWB**

**Appendix 5: Monthly Meeting Record as of June 2016**

**Appendix 6: Installation of Four Cables for Ultrasonic Flowmeter (Bulk Meter)**

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

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

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

**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 AND AGENDA FOR**

**QUARTERLY PROJECT MEETING & 15<sup>TH</sup> MONTHLY TECHNICAL MEETING**

**Venue:** Board Room, Headquarters of FCTWB, Area 3, Garki, Abuja

**Date:** Wednesday, 27<sup>th</sup> July 2016

10:00 - 10:05 Opening Remarks

**Session 1: Quarterly Project Meeting**

10:05 - 10:10 Joint Monitoring with JICA Mission from HQs in mid-September (14<sup>th</sup> to 22<sup>nd</sup> Sep.) and the 4<sup>th</sup> JCC Meeting (21<sup>st</sup> or 22<sup>nd</sup> Sep.)

10:10 - 10:40 Presentation of Action Plan by Participants in the 2<sup>nd</sup> Training in Japan

10:40 - 10:50 Presentation of AGIS Challenges and Possible Solutions for FCTWB

10:50 - 10:55 Deactivation of Return Bills and Modification of Billing System

10:55 - 11:05 Update of CP Fund and Autonomy of FCTWB and AOB

**Session 2: Monthly Technical Meeting**

11:10 - 11:15 Progress and Schedule of Output-1 (LUD Bulk Meter Chambers)

11:15 - 11:20 Progress and Schedule of Output-1 (Zonal Meter Chambers)

11:20 - 11:50 Progress and Schedule of Output-2 (Pilot Projects) by Three Area Offices

11:50 - 11:55 Data Collection from other Area Offices and Data Entry in HQs

11:55 - 12:00 Closing Remarks

**FEDERAL CAPITAL TERRITORY WATER BOARD NON-REVENUE WATER PROJECT****QUARTERLY PROJECT MEETING AND MONTHLY TECHNICAL MEETING****ATTENDANCE LIST****27TH JULY 2016**

<b>S/N</b>	<b>NAME</b>	<b>POSITION</b>	<b>TEL</b>	<b>EMAIL ADDRESS</b>
1	Hudu Bello	Dierctor /PM		
2	Bello S.T	Deputy Project Manager		
3	Okobi O.Y [Mrs]	HOD Quality Control		
4	Engr. Nahuche A.A	Technical Manager		
5	Hasfat Ahamed Lawi	HOD F&A		
6	Bunmi Olowookere	HOU PRS		
7	Abbas A. Ahmed	HOU [PR]		
8	Engr. Lawal A.R	Project Coordinator		
9	Aminu Umar	Head OPS&WM		
10	Douglas oloton	AM Gwarinpa		
11	Shehu Sulaiman	Head GIS		
12	Abdullahi Masaud	Head [metering]		
13	Ahmed G. Adamu	ACTO Water		
14	Habib Ahmed Kiru	AM Gudu		
15	Moh'd A.S Ramat	AM Jabi		
16	Adenuga Adesoji O	AM Garki 1		
17	Mahmud Mohammed	Distribution[jabi]		
18	Abubakar Danladi	Distribution [Jabi]		
19	Isaac O. Owolabi	Customer Care Unit		
20	Abdulrahman Shehus	Head PPM		
21	Ezeh Hillary	GIS/Logistics		
22	Isah Danjuma	Monitoring/ Detection		
23	Muhammed Dauda	Distribution [pipeline]		
24	Musa Dikko	Head pipeline		
25	Mh'd E. Gana	Garki Area office		
26	Engr. Amos Bulus	Electro-Mechanical		
27	Salihu O. sadiq	AAM[dist.] Jabi		
28	Mumini Raifu	AAM [dist.]		
29	Bello Abubakar Tata	HD[conventional meter]		
30	Dele Olatunji	Head [Technical Coop]		
31	Sulaiman A. Muhammad	AAM[Comm.] Jabi		
32	Abubakar Ubale A.	SE [Civil]		
33	Abdul Yusuf	Sup. P&P Estate		
34	Abdulrahman Muhammed	S.E[OPS&WM]		
35	Muhammed Husseni	HTO[Comm.]		
36	Wasiu Olajide	PA[MIS]		
37	Choji Pam	AAM[comm.] Garki 1		
38	Takayuki Ohira	JICA Nigeria		
39	Shinta Segawa	JICA Expert Team		
40	Hiroyuki Morita	JICA expert Team		
41	Akinori Miyoshi	JICA Expert Team		





# Action Plan

By

Team of FCTWB Delegates for  
The FCT Reduction of NRW Project,

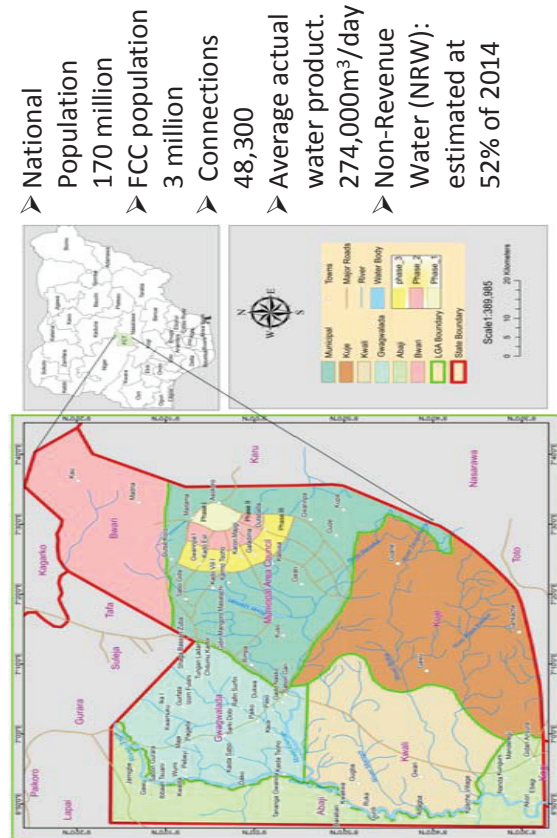
The 2<sup>nd</sup> Training in Japan  
(Distribution & Commerce)

Engr. A. R. Lawal (Team Leader)

July ,2016



## 1-2. Features



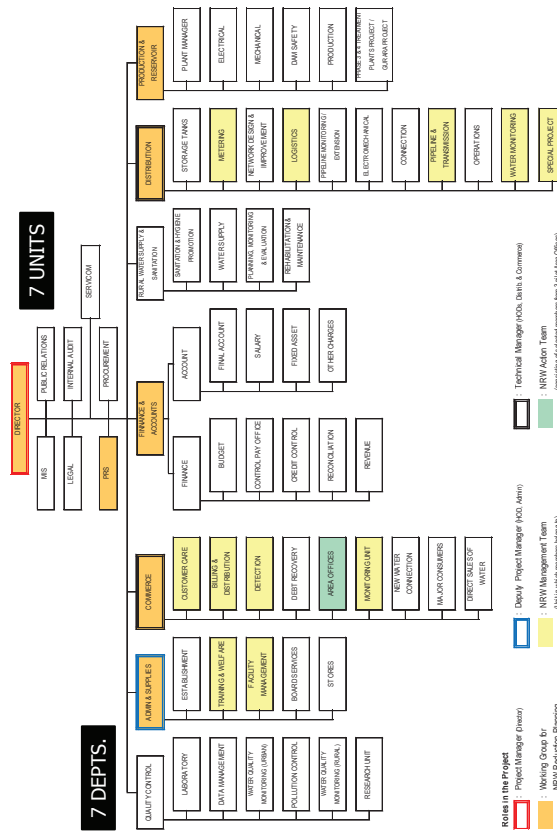
- The water sub-sector of the FCT is well documented under the support infrastructure system of the Master Plan of Abuja.

- The manner in which the water is supplied, distributed, used and disposed off in the FCT properly documented in the Abuja Water supply Master Plan

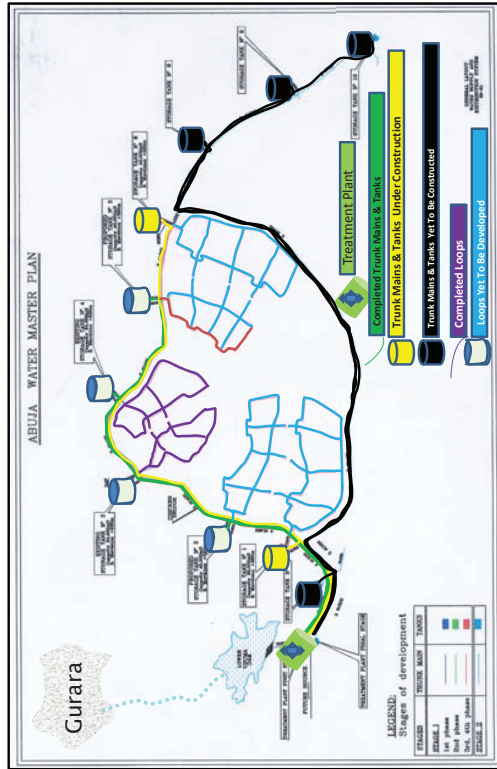
- The Federal Capital Development Authority (FCDA) Engineering Services Department is responsible for the provision of Water Infrastructure in FCT

- The FCT Water Board (FCTWB) is the Government Agency responsible for the provision of water supply to the residents of FCT

## 1-3. FCTWB Organization and Members involved



### 1-4. Master Plan for Water Supply in the FCC



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### 1-5. Water Sources & Water Infrastructure



- **Lower Usuma Dam**  
Capacity: 100 mil. m<sup>3</sup>
  - **Gurara Dam**  
Capacity: 880 mil. M<sup>3</sup>
  - **Treatment Plants 1 & 2**  
Capacity 10,000m<sup>3</sup>/hr designed to operate 24hrs a day thus the total output of 240,000m<sup>3</sup>/day is expected
  - **Treatment Plants 3 & 4**  
Designed capacity: To provide 20,000m<sup>3</sup>/hr treated water each boosting treated water supply to 480,000m<sup>3</sup>/day.
- Total Treatment Capacity: 720,000m<sup>3</sup>/day.

6

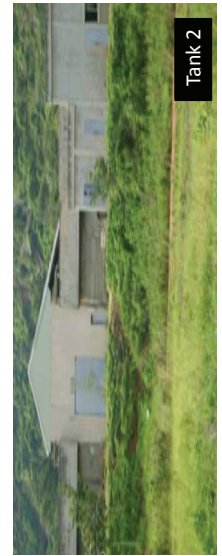
### Experience from Yokohama Case

1. Leakage Detection Equipment and Training Yard
2. Standard GIS/Mapping Section
3. Standard Meter Accuracy Test (Meter Laboratory)
4. 100 % Customer Metering
5. Meter Reading: Once in Two Months (2-month Billing Cycle)

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### 1-4. Master Plan for Water Supply in the FCC

TANK	LOOP	CAPACITY (m <sup>3</sup> )	PHASE	STATUS	DISTRICTS SUPPLIED
Tank 1	1	30,000	III	Under construction	Wupa, Karmo, Bunkoro, Nbora, Kafé, Gwarimpa I, Gwarimpa II, Dape, Industrial (Area 1)
Tank 2	2	45,000	II	Completed	Jahi, Utako, Katampe, Dakibiyu, Kado, Wuye, Mabushi, Kukwaba, Jabi, Recreational park
Tank 3	3	24,000	I	Completed	Maitama, Wuse I and Wuse II
Tank 4	4	24,000	I	Completed	Garki I, Garki II, Asokoro
Tank 5	5	40,000	II	Completed	Durumi, kaura, Gudu, Duboyi, Guzape, Gaduwa, Dutse
Tank 6	6	40,000	III	Under construction	Galadimawa, Dakwo, Lokogoma, Wumba, Saraji, Kabusa, Okanje, Pyakasa, Institutional Are Industrial Area II



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### Customer Category

Customer Category	No. of Bill (Nos.)	Percentage (%)
Domestic	46,900	96.7
Commercial (un-coded)	(30,700+11,100+5,100)	
Major Consumers	1,600	3.3
Institutions	(1,000+600+0)	
<b>Total</b>	<b>48,500</b>	<b>100.0</b>

Customer Category	Billed Charge (Mil. N)	Percentage (%)
Domestic	356.6	76.4
Commercial (un-coded)	(293.1+56.1+7.4)	
Major Consumers	110.2	23.6
Institutions	(104.0+6.2+0)	
<b>Total</b>	<b>466.8</b>	<b>100.0</b>

### Customer Meter

Meter Type	No. of Bill (Nos.)	Percentage (%)
Conventional	24,600	50.7
AMR	11,700	24.1
Prepaid	5,100	10.5
Flat-rate	7,100	14.6
<b>Total</b>	<b>48,500</b>	<b>100.0</b>

Meter Type	Billed Charge (Mil. N)	Percentage (%)
Conventional	313.2	67.1
AMR	62.3	13.3
Prepaid	7.4	1.6
Flat-rate	83.9	18.0
<b>Total</b>	<b>466.8</b>	<b>100.0</b>

### Billing Measures

Meter Type	No. of Bill (Nos.)	Percentage (%)
Conventional_ Reading	11,100	35.0
Conventional_ Estimate	13,500	42.6
Conventional_ Flat-rate	7,100	22.4
Sub-Total	31,700	100.0
AMR_ Reading	5,900	50.4
AMR_ Estimate	5,800	49.6
Sub-Total	11,700	100.0
Prepaid	N/A	N/A
Prepaid_ Flat-rate	N/A	N/A
Sub-Total	5,100	100.0
<b>Total</b>	<b>48,500</b>	<b>-</b>

### Action Plan against

#### Meter Reading

#### Reason for inability to achieve 100% Meter Reading

1. Lack of Logistics (Utility Vehicle and meter reading devices);
2. Existence of faulty meters;
3. Lack of meter fittings and spare parts (Battery, etc);
4. Existence of flat rate properties;
5. Location of water meter and poor quality of meter installation;
6. Lack of guideline and manual for the location of water meter and installation;
7. Lack of meter laboratory & standardization for quality management;

## Action Plan against (cont....)

### Meter Reading

#### Reason for inability to achieve 100% Meter Reading (Cont.)

8. Lack of training & Standard Operation Procedures (SOP) for meter reading;
9. Lack of monitoring and feedback from meter readers
10. Inability of billing system to measure consumption, Existence of estimated billing;
11. Customer/Staff behavior; and
12. Unauthorized removal of meters

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## Action Plan against (cont.....)

### Action needed to achieve 100% Meter Reading

- **Presentation & Fact finding (Statistical data)**
  - Presentation to FCTWB Management for approval of the plan & budget proposal;
  - Create a team & make Presentation to all relevant FCT WB Staff;
  - Incorporate comments & observations from Staff into the Proposal;
  - Collect all data & information to prepare the Plan;
- **Planning and Budget proposal**
  - Develop the plan and budget proposal base on information and data collected.
  - Presentation & follow-up for approval and release of fund for implementation of the plan.

14

## Action Plan against (cont.....)

### Meter Reading

#### Fact Finding:

1. Lack of Logistics (Utility Vehicle and meter reading devices)

#### Action Needed

- Collect information about current situations and any other we have to do;
- Analysis of each Area Office;
- Nos. of Meter Readers and Distribution
- Procurement

#### Who is in Charge

- HOD Commerce, HOD Admin&Supply

15

## Action Plan against (cont.....)

### Meter Reading

#### Fact Finding:

2. Existence of faulty meters;

#### Action Needed

- Identification of faulty meter by survey;
- Verification of faulty meters by meter readers and relevant units;
- Procurement, replacement of the faulty meter & possible change of location.

#### Who is in Charge

- HOD Commerce, HOU (Meter), Area Managers, & Meter Readers.

16

## Action Plan against (cont.....)

### Meter Reading

#### Fact Finding:

- Lack of meter fittings and spare parts (Battery, etc);

#### Action Needed

- Identify the required spare parts based on historical records of the meters;
- Adopt preventive maintenance.
- Procurement

#### Who is in Charge

- HOD Distribution, relevant Units

## Action Plan against (cont.....)

### Meter Reading

#### Fact Finding:

- Existence of flat rate properties;

#### Action Needed

- Identify the flat rate customers and location;
- Collect all information for the procurement;
- Procurement;
- Install new meters in a suitable location.

#### Who is in Charge

- HOD Commerce, HOD (Dist.), Area Manager, and other relevant HOU (Meter)

## Action Plan against (cont.....)

### Meter Reading

#### Fact Finding:

- Location of water meter and poor quality of meter installation

#### Action Needed

- Identify all meters that were poorly installed & not accessible for reading and where customer behavior not favorable;
- Collect all information;
- Procurement;
- Install or reinstall meters in a suitable location

#### Who is in Charge

- HOD Commerce, HOD (Dist.), Area Manager, and other relevant HOU (Meter)

## Action Plan against (cont.....)

### Meter Reading

#### Fact Finding:

- Lack of guideline and manual for the location of water meter and installation

#### Action Needed

- Set-up committee
- Based on the fact finding information from Location of water meter and poor quality of meter installation Committee prepare the guideline and manual;

#### Who is in Charge

- HOD Distribution, HOD Commerce, & Committee members,

## Action Plan against (cont.....)

### Meter Reading

#### Fact Finding:

7. Lack of meter laboratory & standardization for quality management

#### Action Needed

- Planning and setting-up of meter laboratory suitable for FCT WB
- Survey and Identify all type of meters in FCT;
- Collect the samples, evaluate, assess the meters;
- Discuss about the Standardization using the three JICA pilot project

#### Who is in Charge

- HOD Distribution, HOD Commerce, and HOU (Meter)

21

## Action Plan against (cont.....)

### Meter Reading

#### Fact Finding:

8. Lack of training & Standard Operation Procedures (SOP) for meter reading

#### Action Needed

- Assess the meter readers ability and their activities;
- Identify the training needs;
- Prepare the training plan;
- Prepare the SOP

#### Who is in Charge

- HOD (Admin & Supply), HOD Commerce, and relevant Unit

22

## Action Plan against (cont.....)

### Meter Reading

#### Fact Finding:

9. Lack of monitoring and feedback from meter readers

#### Action Needed

- Identify the current situation physically and on the record;
- Set-up meter monitoring plan for all kinds of meters;
- Revise/update Feedback form;
- Set-up proper workflow for the implementation of the feedback
- Training of the personnel in conjunction with meter reading training plan

#### Who is in Charge

- HOD Commerce, Area Manager, and other relevant unit

23

## Action Plan against (cont.....)

### Meter Reading

#### Fact Finding:

10. Inability of billing system to measure consumption, Existence of estimated billing

#### Action Needed

- Fact finding of existing billing systems
- Clarification of estimated bills;
- Defining new parameters;
- Modification of billing system;
- Discussion of by-monthly meter reading

#### Who is in Charge

- Management Team, facilitated by HOD Commerce

24

## Action Plan against (cont.....)

### Meter Reading

#### Fact Finding:

- 11. Customer/Staff behavior

#### Action Needed

- Identify the customers who has un-favorable behaviors towards FCT WB Staff and Meter Reader and vice versa;
- Discussion with the PR Unit for strategic public relation
- Customer Relations training and awareness;
- Preparation of Code of Ethics for relating with customer.
- Implementation of the Code of Ethics by FCT WB Staff

#### Who is in Charge

- HOD Commerce, HOU (PR), Customer Care Unit and Legal Unit.

## Action Plan against (cont.....)

### Meter Reading

#### Fact Finding:

- 12. Unauthorized removal of meters

#### Action Needed

- Identify all unauthorized removed meters;
- Replacement of the meters;

#### Who is in Charge

- HOD (Dist.), HOD Commerce, Area Manager, and other relevant Unit.

## Proposed Schedule

No	Actions against	2016				2017				2018				
		3rd Qtr.	4th Qtr.	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.			
-	Presentation & Fact finding													
-	Planning and Budget proposal													
1	Lack of Logistics (Utility Vehicle and meter reading devices).													
2	Existence of faulty meters;													
3	Lack of meter fittings and spare parts (Battery, etc).													
4	Existence of flat rate properties;													
5	Location of water meter and poor quality of meter installation;													
6	Lack of guideline and manual for the location of water meter and installation;													
7	Lack of meter laboratory & standardization for quality management;													
8	Lack of training & Standard Operation Procedures (SOP) for meter reading;													
9	Lack of monitoring and feedback from meter readers													
10	Inability of billing system to measure consumption, existence of estimated billing													
11	Customer/Staff behavior;													
12	Unauthorized removal of meters													

## List of Participants

- Engr. A. R. Lawal (Team Leader) - Danjumma Isah
- Habib Ahmed Kiru - Shehu Sulaiman
- Debo Dauda Mohammed - Aliyu Muhammad Maradun
- Shehu Abdulrahman Sani - Mrs. Akpan Rose Aniekan



Thank you for your kind Attention !!

# Challenges in GIS

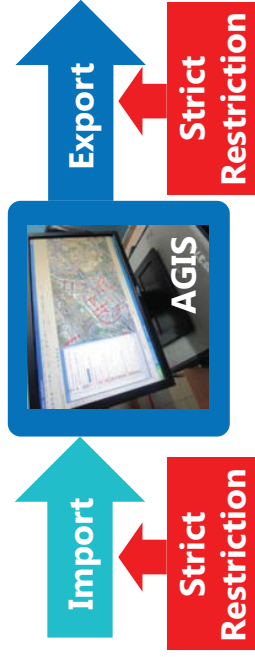
JICA Expert Team and GIS Unit

1

Abuja Geographic Information System (AGIS) has developed GIS database of FCT since 2003, which FCTWB has adopted.

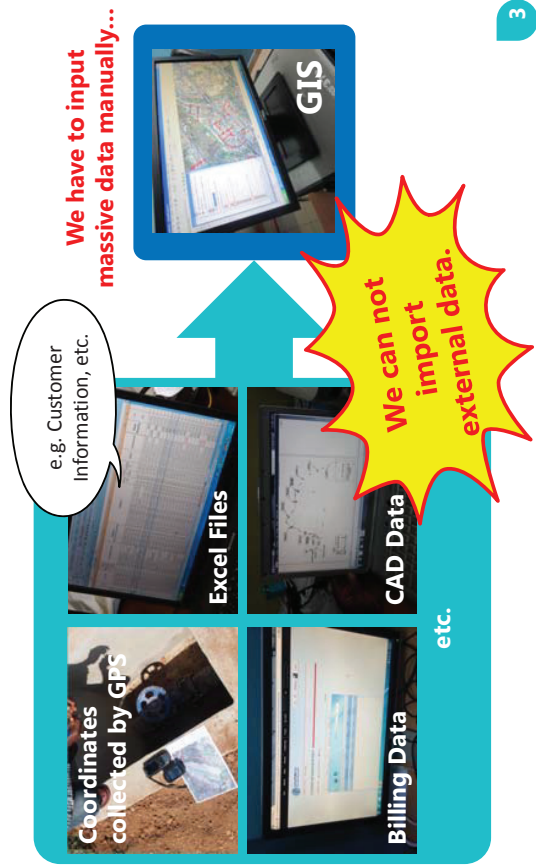
However, security of AGIS is too strict to import/export data through any devices.

Therefore, FCTWB cannot utilize GIS functions.



2

## GIS can import massive information



3

## GIS can connect a lot of information



4



## GIS can be utilized for various purposes



## Possible Solutions

### Remove the AGIS restriction by AGIS

**Advantage**

- AGIS has the satellite image of FCT, cadastral information, and street information, so FCTWB can utilize these information.

**Challenge**

- AGIS permission to remove the restriction is required.

### Develop independent systems by FCTWB

**Advantage**

- FCTWB can develop its own system freely without any restriction.

**Challenge**

- FCTWB will lose AGIS information such as the satellite image of FCT, cadastral information and street information.

## Output-1: Construction of Chambers at LUD WTP Outlet (HQs)

27 July 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	Contractor	JICA Expert Team		
Chamber (D1500) for Tank 2&5	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Slab (Roof)	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Appurtenant Works	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Opening <input checked="" type="checkbox"/> Installation of Manhole Cover <input type="checkbox"/> Installation of Ladder	Works has been suspended again, but budget was approval by both the President and national assembly.	CP fund has not yet been released.	Follow up with FCTA.	Kabir Raifu	Local	Miyoshi Fujiyama	As soon as CP fund is released, but before the end of August
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Demobilization		Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto

1-1

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	Contractor	JICA Expert Team		
Chamber (D1500) for Tank 3&4	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Slab (Roof)	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Appurtenant Works	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Opening <input checked="" type="checkbox"/> Installation of Manhole Cover <input type="checkbox"/> Installation of Ladder	Works has been suspended again, but budget was approval by both the President and national assembly.	CP fund has not yet been released.	Follow up with FCTA.	Kabir Raifu	Local	Miyoshi Fujiyama	As soon as CP fund is released, but before the end of August
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	Non progress	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Non progress	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Demobilization		Non progress	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto

Annex4-141

1-2

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	Contractor	JICA Expert Team		
Chamber (D1200) for Kubwa	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Slab (Roof)	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Appurtenant Works	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Opening <input checked="" type="checkbox"/> Installation of Manhole Cover <input type="checkbox"/> Installation of Ladder	Works has been suspended again, but budget was approval by both the President and national assembly.	CP fund has not yet been released.	Follow up with FCTA.	Kabir Raifu	Local	Miyoshi Fujiyama	As soon as CP fund is released.
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Demobilization		Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto

1-3

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	Contractor	JICA Expert Team		
Chamber (D600) for Bwari	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Works had been suspended works, but contractor restarted works. Budget was approval by the President.	CP fund has not yet been released.	Follow up to FCTA but no effective measures because of waiting for budget approval by national assembly.	Kabir Raifu	Local	Miyoshi Fujiyama	As soon as CP fund is released, but before the end of August
	Slab (Roof)	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Bar Arrangement <input type="checkbox"/> Concrete Casting <input type="checkbox"/> Curing <input type="checkbox"/> Finishing	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Appurtenant Works	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Opening <input type="checkbox"/> Installation of Manhole Cover <input type="checkbox"/> Installation of Ladder	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Demobilization		Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto

Annex4-142

1-4

## Output-1: Construction of Chambers for Zonal Meter (HQs)

27 July 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	Contractor	JICA Expert Team		
Chamber	Preparation	■ Procedures for Contract	Completed	None	None		INTELES (Integrated Logistics & Engineering)	Miyoshi Mori	-
	Construction (Tank 2)	■ Floor ■ Wall ■ Slab □ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	1st week of August
	Construction (Tank 3.1)	☒ Floor □ Wall □ Slab □ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	End of August
	Construction (Tank 3.2)	■ Floor ■ Wall ■ Slab ■ Manhole, Others	Completed	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	-
	Construction (Tank 4.1.1)	■ Floor ■ Wall ☒ Slab □ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	2nd week of August
	Construction (Tank 4.2)	■ Floor ■ Wall ■ Slab ■ Manhole, Others	Completed	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	-
	Construction (Tank 5)	■ Floor ■ Wall ■ Slab ■ Manhole, Others	Completed	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	-
	Construction (Tank Kubwa)	■ Floor ■ Wall ■ Slab ■ Manhole, Others	Completed	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	-
	Construction (Tank Gwako)	☒ Floor □ Wall □ Slab □ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	End of August
Zonal Meter (Ultra-sonic Flowmeter)	Installation	After the completion of chamber construction and procurement of equipment							
	Measurement								

2-5

## Output-2: Pilot Project (GUDU Office)

27 July 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	GUDU	JICA Expert Team		
PMA/SMA Creation	Construction of Chambers	■ Procurement of Materials ■ Excavation ■ Chamber Construction ☒ Cover ☒ Finishing	Cover and finishing have been suspended by delay in release of CP fund	Release of CP fund	None	Dikko Dauda Raifu	Habib	Toyoda	1st week of August
	Installation of Flow Meters and Valves	■ Procurement ■ Installation	Completed	A D100mm valve on Drive 4 and a D100mm on Drive 1 are not functioning, but no effect on the Project	FCTWB should replace or repair them.	Dikko Kabir Dauda	Habib	Toyoda	-
Commercial Loss	Meter Reading & Temporary Meter Reading (1 week)	■ Temporary Meter Installation ■ First Reading ■ Second Reading ■ Data Submission	Completed	None	None	Isah Masaud	Habib	Toyoda Morita	-
	Tank Survey	■ Survey ■ Data Submission	Completed	None	None	Dikko Dauda	Habib	Toyoda	-
	Meter Error Test	■ Test ■ Data Submission	Completed	None	None	Masaud	Habib	Toyoda	-
	Illegal Connection Survey	■ Consumption Data ■ Detection Survey □ Data Submission	Ongoing. 4 illegals in SMA-1.	None	None	Dikko Dauda	Habib	Toyoda	1st week of August
	Major Consumer (One Year Consumption)	■ Compilation of Each Categories ■ Data Submission	Completed (only British school)	None	None	Isah	Habib	Toyoda	-
	Customer List (One Year Consumption)	■ Compilation of Each Categories ■ Data Submission	Completed (6 months record)	None	None	Rose Masaud	Habib	Toyoda	-
	24 hrs Customer Consumption Survey	□ Measurement □ Data Submission	Non progress	None	None	Masaud	Habib	Toyoda	1st week of August

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	GUDU	JICA Expert Team		
Leakage Survey	24 hrs & MNF Water Flow Measurement	<ul style="list-style-type: none"> <li>■ Measurement</li> <li>■ Data Submission</li> </ul>	Completed	None	None	Kabir Dikko Dauda	Habib	Kiyama	-
	1 Week Water Flow Measurement	<ul style="list-style-type: none"> <li>■ Measurement</li> <li>■ Data Submission</li> </ul>	Completed	None	None	Kabir Dikko Dauda	Habib	Kiyama	-
	Step Test	<ul style="list-style-type: none"> <li>■ Test</li> <li>■ Data Submission</li> </ul>	Completed	None	None	Kabir Dikko Dauda	Habib	Kiyama	-
	Leakage Detection (Acoustic Bar)	<ul style="list-style-type: none"> <li>■ SMA1</li> <li>■ SMA2</li> </ul>	Completed	None	None	Kabir Dikko Dauda	Habib	Kiyama	-
	Leakage Detection (Ground Microphone)	<ul style="list-style-type: none"> <li>■ SMA1</li> <li>■ SMA2</li> </ul>	Completed	None	None	Kabir Dikko Dauda	Habib	Kiyama	-
	Repair of Leakage (Provisional)	<ul style="list-style-type: none"> <li>■ SMA1</li> <li>■ SMA2</li> </ul>	Completed	None	None	Kabir Dikko Dauda	Habib	Kiyama	-
Overall	Data Analysis	<ul style="list-style-type: none"> <li>☒ SMA1</li> <li>☒ SMA2</li> </ul>	Ongoing	None	None	Kabir Dikko Dauda	Habib	Toyoda	1st week of August
	Water Balance Sheet	<ul style="list-style-type: none"> <li>☐ SMA1</li> <li>☐ SMA2</li> </ul>	Non progress	None	None	Kabir Dikko Dauda	Habib	Toyoda	Ditto
	NRW Reduction Plan	<ul style="list-style-type: none"> <li>☐ SMA1</li> <li>☐ SMA2</li> </ul>	Non progress	None	None	Kabir Dikko Dauda	Habib	Toyoda	Ditto. Meter installation can be started in the 2nd week of Aug at 15 per day.
	Monthly/Weekly PMA Meter Reading	<ul style="list-style-type: none"> <li>☒ Reading</li> <li>☐ Data Submission</li> </ul>	Ongoing	None	None	Kabir Dikko Dauda	Habib	Toyoda	Every month

3-7

## Output-2: Pilot Project (JABI Office)

27 July 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	JABI	JICA Expert Team		
PMA/SMA Creation	Construction of Chambers	<ul style="list-style-type: none"> <li>■ Procurement of Materials</li> <li>■ Excavation</li> <li>■ Chamber Construction</li> <li>■ Cover</li> <li>■ Finishing</li> </ul>	Completed	None	None	Dikko Dauda Raifu	Ramat	Toyoda	-
	Installation of Flow Meters and Valves	<ul style="list-style-type: none"> <li>■ Procurement</li> <li>■ Installation</li> </ul>	Completed	None	None	Dikko Kabir Dauda	Ramat	Toyoda	-
Commercial Loss	Meter Reading & Temporary Meter Reading (1 week)	<ul style="list-style-type: none"> <li>■ Temporary Meter Installation</li> <li>■ First Reading</li> <li>■ Second Reading</li> </ul>	Completed	None	None	Isah	Ramat	Morita Toyoda	-
	Tank Survey	<ul style="list-style-type: none"> <li>■ Survey</li> <li>■ Data Submission</li> </ul>	Completed	None	None	Dikko Dauda	Ramat	Morita Toyoda	-
	Meter Error Test	<ul style="list-style-type: none"> <li>■ Test</li> <li>■ Data Submission</li> </ul>	Completed	None	None	Masaud	Ramat	Morita Toyoda	-
	Illegal Connection	<ul style="list-style-type: none"> <li>■ Consumption Data</li> <li>☒ Detection Survey</li> <li>☐ Data Submission</li> </ul>	Ongoing (4 illegals in the first half of SMA2)	None	None	Dikko Dauda	Ramat	Morita Toyoda	2nd week of August
	Major Consumer (One Year Consumption)	<ul style="list-style-type: none"> <li>■ Compilation of Each Categories</li> <li>■ Data Submission</li> </ul>	Completed	None	None	Isah	Ramat	Morita Toyoda	-
	Customer List (One Year Consumption)	<ul style="list-style-type: none"> <li>■ Compilation of Each Categories</li> <li>■ Data Submission</li> </ul>	Completed	None	None	Rose	Ramat	Morita Toyoda	-
	24 hrs Customer Consumption Survey	<ul style="list-style-type: none"> <li>☒ Measurement</li> <li>☒ Data Submission</li> </ul>	Ongoing (19 completed)	None	None	Masaud	Ramat	Morita Toyoda	1st week of August

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	JABI	JICA Expert Team		
Leakage Survey	24 hrs & MNF Water Flow Measurement	<input checked="" type="checkbox"/> Measurement <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Kabir Dikko Dauda	Ramat	Kiyama	-
	1 Week Water Flow Measurement	<input type="checkbox"/> Measurement <input type="checkbox"/> Data Submission	Non progress	None	None	Kabir Dikko Dauda	Ramat	Kiyama	When available
	Step Test	<input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Kabir Dikko Dauda	Ramat	Kiyama	-
	Leakage Detection (Acoustic Bar)	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Ongoing (the first half of SMA2 was completed)	None	None	Kabir Dikko Dauda	Ramat	Kiyama	2nd week of August
	Leakage Detection (Ground Microphone)	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Ongoing (the first half of SMA2 was completed)	None	None	Kabir Dikko Dauda	Ramat	Kiyama	Ditto
	Repair of Leakage (Provisional)	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Ongoing (the first half of SMA2 was completed)	None	None	Kabir Dikko Dauda	Ramat	Kiyama	Ditto
Overall	Data Analysis	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Non progress	None	None	Kabir Dikko Dauda	Ramat	Toyoda	3rd week of August
	Water Balance Sheet	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Non progress	None	None	Kabir Dikko Dauda	Ramat	Toyoda	Ditto
	NRW Reduction Plan	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Non progress	None	None	Kabir Dikko Dauda	Ramat	Toyoda	Ditto
	Monthly/Weekly PMA Meter Reading	<input checked="" type="checkbox"/> Reading <input type="checkbox"/> Data Submission	Ongoing	None	None	Kabir Dikko Dauda	Ramat	Toyoda	Every month

Output-3: Pilot Project (GARKI I Office)

27 July 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	GARKI I	JICA Expert Team		
PMA/SMA Creation	Construction of Chambers	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Excavation <input checked="" type="checkbox"/> Chamber Construction <input checked="" type="checkbox"/> Cover <input checked="" type="checkbox"/> Finishing	Cover and finishing at chamber for ultrasonic flowmeter have been suspended by delay in release of CP fund	Release of CP fund	None	Dikko Dauda Raifu	Adesoji	Toyoda	1st week of August
	Installation of Flow Meters and Valves	<input checked="" type="checkbox"/> Procurement <input checked="" type="checkbox"/> Installation	Ultrasonic flowmeter has not yet been installed because of suspension of electric works by delay in release of CP fund.	Release of CP fund	None	Dikko Kabir Dauda	Adesoji	Toyoda	2nd week of August
Commercial Loss	Meter Reading & Temporary Meter Reading (1 week)	<input checked="" type="checkbox"/> First Reading <input checked="" type="checkbox"/> Second Reading <input checked="" type="checkbox"/> Data Submission	Completed	Acceleration	Work dividing	Isah Suleiman	Adesoji	Morita Toyoda	Ditto
	Tank Survey	<input checked="" type="checkbox"/> Survey <input checked="" type="checkbox"/> Data Submission	No tanks exist (to be confirmed)	None	None	Dikko Dauda	Adesoji	Morita Toyoda	-
	Meter Error Test	<input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> Data Submission	Ongoing (62)	Acceleration	Team dividing	Masaud	Adesoji	Morita Toyoda	2nd week of August
	Illegal Connection	<input type="checkbox"/> Consumption Data <input type="checkbox"/> Detection Survey	Non progress	None	None	Dikko Dauda	Adesoji	Morita Toyoda	3rd week of August
	Major Consumer (One Year Consumption)	<input checked="" type="checkbox"/> Compilation of Each Categories <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Isah	Adesoji	Morita Toyoda	End of June
	Customer List (One Year Consumption)	<input checked="" type="checkbox"/> Compilation of Each Categories <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Rose Suleiman	Adesoji	Morita Toyoda	-
24 hrs Customer Consumption Survey	<input type="checkbox"/> Measurement <input type="checkbox"/> Data Submission	Non progress	None	None	Masaud	Adesoji	Morita Toyoda	End of August	

Activities		State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion
						HQs	GARKI I	JICA Expert Team	
Leakage Survey	24 hrs & MNF Water Flow Measurement	<input checked="" type="checkbox"/> Measurement <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Kabir Dikko Dauda	Adesoji Gana	Kiyama	-
	1 Week Water Flow Measurement	<input type="checkbox"/> Measurement <input type="checkbox"/> Data Submission	Non progress	None	None	Kabir Dikko Dauda	Adesoji Gana	Kiyama	When available
	Step Test	<input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Kabir Dikko Dauda	Adesoji Gana	Kiyama	-
	Leakage Detection (Acoustic Bar)	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Ongoing	None	None	Kabir Dikko Dauda	Adesoji Gana	Kiyama	1st week of August
	Leakage Detection (Ground Microphone)	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Ongoing	None	None	Kabir Dikko Dauda	Adesoji Gana	Kiyama	Ditto
	Repair of Leakage (Provisional)	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Ongoing	None	None	Kabir Dikko Dauda	Adesoji Gana	Kiyama	Ditto
Overall	Data Analysis	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Ongoing	None	None	Kabir Dikko Dauda	Adesoji Gana	Toyoda	2nd week of August
	Water Balance Sheet	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Non progress	None	None	Kabir Dikko Dauda	Adesoji Gana	Toyoda	Ditto
	NRW Reduction Plan	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Non progress	None	None	Kabir Dikko Dauda	Adesoji Gana	Toyoda	Ditto
	Monthly/Weekly PMA Meter Reading	<input type="checkbox"/> Reading <input type="checkbox"/> Data Submission	Non progress	None	None	Kabir Dikko Dauda	Adesoji Gana	Toyoda	Every month

# 24 Hours Water Consumption Measurement (Provisional)

## JABI PMA Case

Engr. Masaud  
27th July 2016

# WHAT IS ULTRASONIC FLOW METERING?

Ultrasonic flow meters use sound waves to determine the velocity of a water flowing in a pipe. At no flow conditions, the frequencies of an ultrasonic wave transmitted into a pipe and its reflections from the fluid are the same.

Under flowing conditions, the frequency of the reflected wave is different due to the Doppler effect. When the fluid moves faster, the frequency shift increases linearly. The transmitter processes signals from the transmitted wave and its reflections to determine the flow rate.

Transit time ultrasonic flow meters send and receive ultrasonic waves between transducers in both the upstream and downstream directions in the pipe. At no flow conditions, it takes the same time to travel upstream and downstream between the transducers.

Under flowing conditions, the upstream wave will travel slower and take more time than the (faster) downstream wave. When the fluid moves faster, the difference between the upstream and downstream times increases. The transmitter processes upstream and downstream times to determine the flow rate.

# Installation of Ultrasonic Flowmeter (with extra battery)



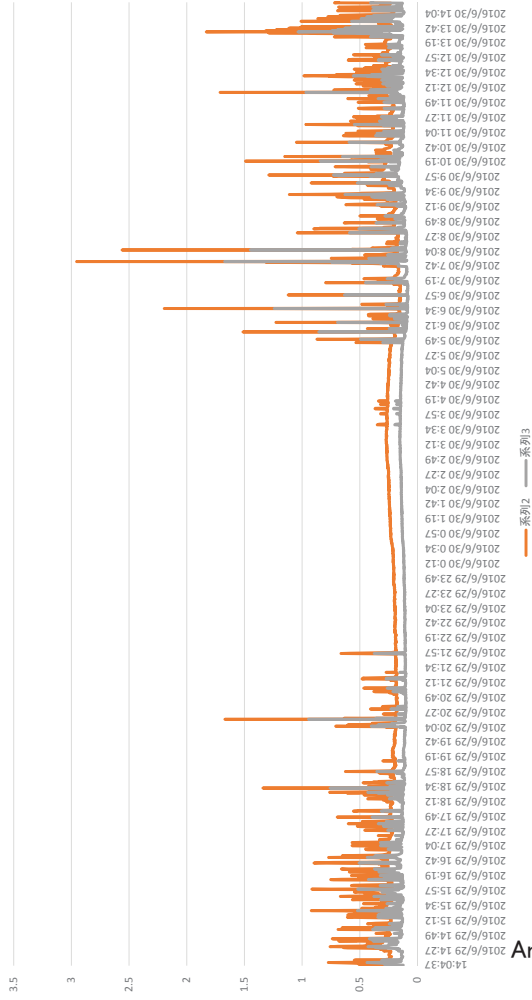
# Installation of Ultra-sonic Flowmeter





# OFFICE

803NCDC

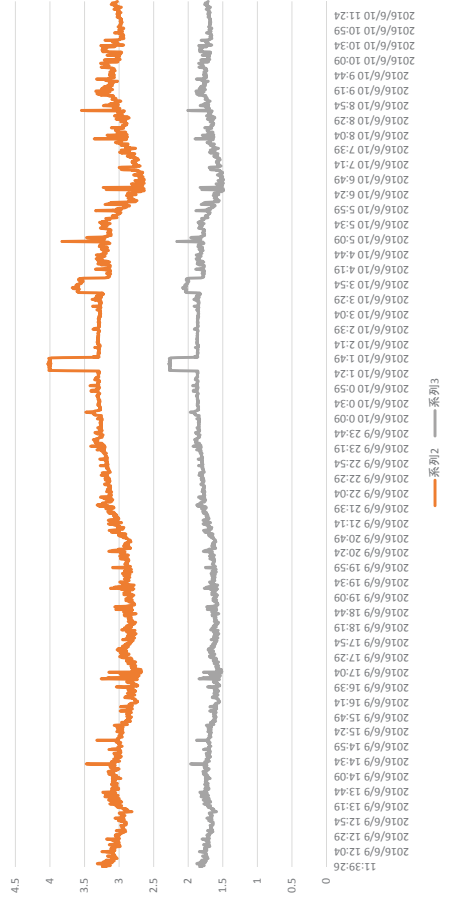


Annex4-148

5

# RESIDENTIAL

280 Residential



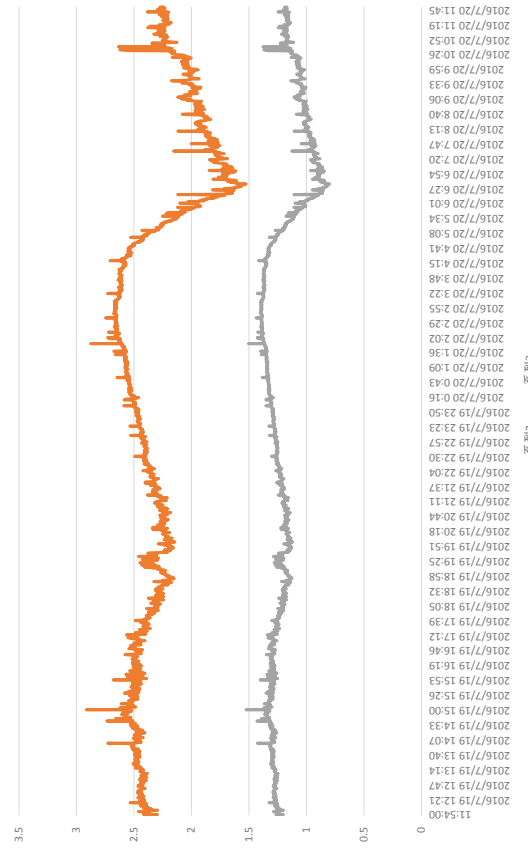
6

# SANDRIA HOTEL



# SANDRIA HOTEL

SANDRIA

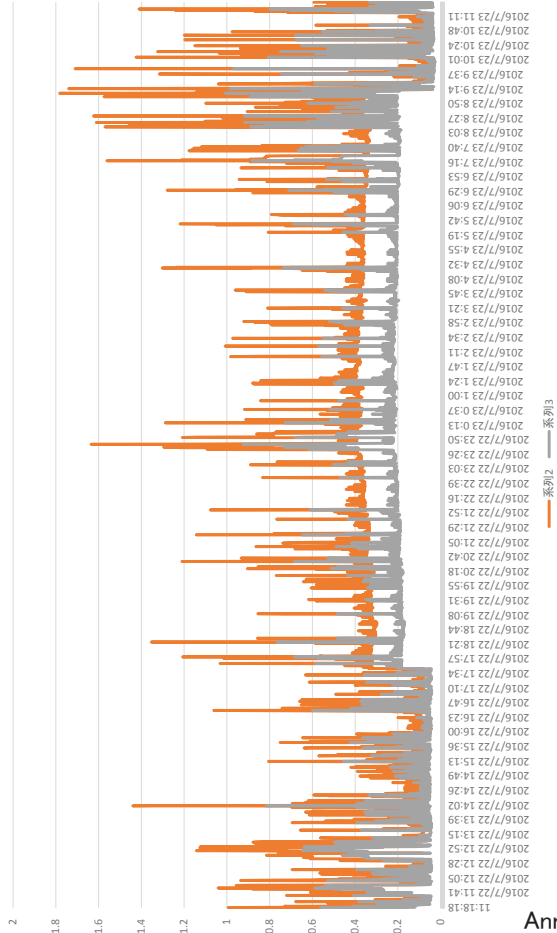


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8

# HART FEED HOTEL

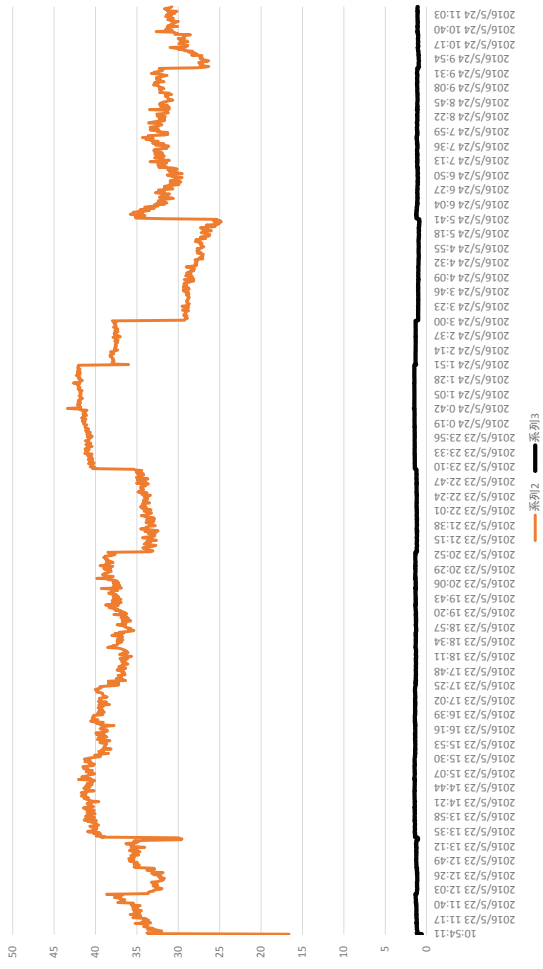
HAERTFEED



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# SHOPRITE JABI (100mm)

JABISSHP



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## **The Federal Capital Territory Reduction of Non-Revenue Water Project**

### **Technical Notes on Monthly Technical Meeting**

24 August 2016

Engr. A. A. Nahuche, Technical Manager, HoD Distribution as the chairperson of the meeting gave an opening remark to officially start the meeting (See attendance in Appendix 1).

As a matter of project operations, Mr. Akinori Miyoshi, Chief Advisor explained the next Joint Project Monitoring and Joint Coordinating Committee (JCC) meeting will be postponed to the middle of September 2016. He also asked project members to be involved in preparation of Joint Project Monitoring Sheet in the second week of September. All attendances consented willingly.

Mr. Danjuma Isah, HoU Monitoring and Detection reported that members from Unit of Billing, AMR, Revenue, Audit, Credit Control and IT have discussed specification of billing system modification. It will be finalized soon with system engineering company and then outsourced.

Mr. Shehu Suleiman, HoU GIS reported that network drawings in three Pilot Metering Areas (PMA) has been updated and sketches from six out of 13 Area Offices has been submitted. Letter from FCTWB to Permanent Secretary of FCTA on relaxation of AGIS restriction is being submitted.

Reporting and discussion about project activities were done based on monthly meeting record for progress monitoring (see Appendix 2).

Mr. Mumini Raifu, Project Engineer reported the progress and suspension of chamber construction for bulk meter due to non-payment to contractors.

Mr. Akinor Miyoshi, CA reported the progress of chamber construction for zonal meter and challenge due to consistent rain and difficulty in excavation of rock at one of chamber sites.

Pilot Area Managers, Mr. Ramat (Jabi) and Mr. Adesoji (Garki I) and staff Mr. Abdul Yusuf (Gudu) reported progress of each activity for Output-2 and discussed among relevant project members, then set expected time to complete.

Mr. Akinor Miyoshi requested FCTWB to complete properly covering of chambers in Gudu and Garki I and Mr. Musa Dikko promised to let contractors do it.

As provisional figures, Mr. Hiroyuki Morita, Expert made an explanation on results of meter error test (see Appendix 3).

**Appendix 1: Attendance List**

**Appendix 2: Monthly Meeting Record as of August 2016**

**Appendix 3: Provisional Result of Meter Error Test**

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

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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**

**MONTHLY TECHNICAL MEETING**

**ATTENDANCE LIST**

**24TH AUGUST 2016**

S/N	NAME	POSITION
1	Nahuche A.A	H.O.D Dist.
2	Adis S. muhammad	H.O.D Comm.
3	Lawal A.R	Project Coord.
4	Akpan Rose	Head Billing
5	Isah Danjuma	H/Mon & Plaza
6	Taiwo Adeyemi	Commerce HQ
7	Adenuga A.O	A.M Garki 1
8	Ottah E. Chiejina	S.E
9	Aminu Umar	Head [Ops&WM]
10	Isaac Owolabi	HOU [Customer care]
11	Gana M.E	AAM [Dist] Garki 1
12	Sulaiman A Mulid	AAM [Comm]
13	Ezeh C. Hillary	GIS [Dist]
14	Mumini Raifu	Project Engr
15	Abizmu Joseph	Ag AAM Gudu
16	Abdul Yusuf	Sup [P&P]
17	Adbulrahman Shehus	Head [PPM]
18	Muhammed Dauda	Pipeline
19	Samson Ohiweremen	Asst Unit head [MC]
20	Abubakar Ubale A.	Head [AMR]
21	Adamu A.G	ACTO Water
22	Uche Ogbeide	Head [F&M]
23	Musa Dikko	Head [Pipeline]
24	Ramat A.S Moh'd	AM Jabi
25	Hussain Muhammed	Commerce
26	Masaud Abdullahi	Head [metering]
27	Sadiq O. Salihu	AAM [Dist] Jabi
28	Aluko Tope	Head [E&M]
29	Amos Bulus	M&E
30	Hiroyuki Morita	JICA Expert
31	Akinori Miyoshi	JICA Expert

## Output-1: Construction of Chambers at LUD WTP Outlet (HQs)

24 August 2016

Activities		State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion
						HQs	Contractor	JICA Expert Team	
Chamber (D1500) for Tank 2&5	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Slab (Roof)	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Appurtenant Works	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Opening <input checked="" type="checkbox"/> Manhole Cover <input type="checkbox"/> Installation of Ladder <input checked="" type="checkbox"/> Backfilling	Works has been suspended again, but budget was approval by both the President and national assembly.	CP fund has not yet been released.	Follow up with FCTA.	Kabir Raifu	Local	Miyoshi Fujiyama	As soon as CP fund is released.
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Demobilization		Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto

1-1

Activities		State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion
						HQs	Contractor	JICA Expert Team	
Chamber (D1500) for Tank 3&4	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Slab (Roof)	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Appurtenant Works	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Opening <input checked="" type="checkbox"/> Manhole Cover <input type="checkbox"/> Installation of Ladder <input checked="" type="checkbox"/> Backfilling	Works has been suspended again, but budget was approval by both the President and national assembly.	CP fund has not yet been released.	Follow up with FCTA.	Kabir Raifu	Local	Miyoshi Fujiyama	As soon as CP fund is released.
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	Non progress	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Non progress	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Demobilization		Non progress	Ditto	Ditto	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto

Activities		State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion
						HQs	Contractor	JICA Expert Team	
Chamber (D1200) for Kubwa	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Slab (Roof)	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Appurtenant Works	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Opening <input checked="" type="checkbox"/> Manhole Cover <input type="checkbox"/> Installation of Ladder <input checked="" type="checkbox"/> Backfilling	Works has been suspended again, but budget was approval by both the President and national assembly.	CP fund has not yet been released.	Follow up with FCTA.	Kabir Raifu	Local	Miyoshi Fujiyama	As soon as CP fund is released. Backfilling will be done in two weeks.
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Demobilization		Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto

1-3

Activities		State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion
						HQs	Contractor	JICA Expert Team	
Chamber (D600) for Bwari	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Works had been suspended works, but contractor restarted works. Budget was approval by the President.	CP fund has not yet been released.	Follow up to FCTA but no effective measures because of waiting for budget approval by national assembly.	Kabir Raifu	Local	Miyoshi Fujiyama	As soon as CP fund is released.
	Slab (Roof)	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Bar Arrangement <input type="checkbox"/> Concrete Casting <input type="checkbox"/> Curing <input type="checkbox"/> Finishing	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Appurtenant Works	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Opening <input type="checkbox"/> Manhole Cover <input type="checkbox"/> Installation of Ladder <input type="checkbox"/> Backfilling	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Demobilization		Non progress	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto

## Output-1: Construction of Chambers for Zonal Meter (HQs)

24 August 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	Contractor	JICA Expert Team		
Chamber	Preparation	■ Procedures for Contract	Completed	None	None		INTELES (Integrated Logistics & Engineering)	Miyoshi Mori	-
	Construction (Tank 2)	■ Floor ■ Wall ■ Slab ☒ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	1st week of September
	Construction (Tank 3.1)	☒ Floor □ Wall □ Slab ☒ Manhole, Others	Ongoing	Rock exists. Chemical feeding cannot be used due to rainy weather.	Waiting for clear weather	Dauda Raifu	INTELES	Fujiyama Satoh	End of September
	Construction (Tank 3.2)	■ Floor ■ Wall ■ Slab ☒ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	1st week of September
	Construction (Tank 4.1.1)	■ Floor ■ Wall ■ Slab ☒ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	Ditto
	Construction (Tank 4.2)	■ Floor ■ Wall ■ Slab ☒ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	Ditto
	Construction (Tank 5)	■ Floor ■ Wall ■ Slab ☒ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	Ditto
	Construction (Tank Kubwa)	■ Floor ■ Wall ■ Slab ☒ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	Ditto
	Construction (Tank Gwako)	■ Floor ■ Wall ☒ Slab □ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	Middle of September
Zonal Meter (Ultra-sonic Flowmeter)	Installation	After the completion of chamber construction and procurement of equipment							
	Measurement								

2-5

## Output-2: Pilot Project (GUDU Office)

24 August 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	GUDU	JICA Expert Team		
PMA/SMA Creation	Construction of Chambers	■ Procurement of Materials ■ Excavation ■ Chamber Construction ☒ Cover ☒ Finishing	Putting cover have not been done.	None	None	Dikko Dauda Raifu	Habib	Toyoda	1st week of September
	Installation of Flow Meters and Valves	■ Procurement ■ Installation	Completed	A D100mm valve on Drive 4 and a D100mm on Drive 1 are not functioning, but no effect on the Project	FCTWB should replace or repair them.	Dikko Kabir Dauda	Habib	Toyoda	-
Commercial Loss	Meter Reading & Temporary Meter Reading (1 week)	■ Temporary Meter Installation ■ First Reading ■ Second Reading ■ Data Submission	Completed	None	None	Isah Masaud	Habib	Toyoda Morita	-
	Tank Survey	■ Survey ■ Data Submission	Completed	None	None	Dikko Dauda	Habib	Toyoda	-
	Meter Error Test	■ Test ■ Data Submission	Completed	None	None	Masaud	Habib	Toyoda	-
	Illegal Connection Survey	■ Consumption Data ■ Detection Survey ☒ Data Submission	Ongoing. 4 illegals in SMA-1 and 3 illegals in SMA-2	None	None	Dikko Dauda	Habib	Toyoda	1st week of September
	Major Consumer (One Year Consumption)	■ Compilation of Each Categories ■ Data Submission	Completed (only British school)	None	None	Isah	Habib	Toyoda	-
	Customer List (One Year Consumption)	■ Compilation of Each Categories ■ Data Submission	Completed (6 months record)	None	None	Rose Masaud	Habib	Toyoda	-
	24 hrs Customer Consumption Survey	■ Measurement ☒ Data Submission	Ongoing (20 completed)	None	None	Masaud	Habib	Toyoda	End of August



Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	GUDU	JICA Expert Team		
Leakage Survey	24 hrs & MNF Water Flow Measurement	■ Measurement ■ Data Submission	Completed	None	None	Kabir Dikko Dauda	Habib	Kiyama	-
	1 Week Water Flow Measurement	■ Measurement ■ Data Submission	Completed	None	None	Kabir Dikko Dauda	Habib	Kiyama	-
	Step Test	■ Test ■ Data Submission	Completed	None	None	Kabir Dikko Dauda	Habib	Kiyama	-
	Leakage Detection (Acoustic Bar)	■ SMA1 ■ SMA2	Completed	None	None	Kabir Dikko Dauda	Habib	Kiyama	-
	Leakage Detection (Ground Microphone)	■ SMA1 ■ SMA2	Completed	None	None	Kabir Dikko Dauda	Habib	Kiyama	-
	Repair of Leakage (Provisional)	■ SMA1 ■ SMA2	Completed	None	None	Kabir Dikko Dauda	Habib	Kiyama	-
Overall	Data Analysis	☒ SMA1 ☒ SMA2	Ongoing	None	None	Kabir Dikko Dauda	Habib	Toyoda, Morita	Middle of September
	Water Balance Sheet	☒ SMA1 ☒ SMA2	Ongoing	None	None	Kabir Dikko Dauda	Habib	Toyoda, Morita	Ditto
	NRW Reduction Plan	☒ SMA1 ☒ SMA2	Being prepared	None	None	Kabir Dikko Dauda	Habib	Toyoda, Morita	Ditto. Meter installation or replacement as a countermeasure is ongoing at 15 per day.
	Monthly/Weekly PMA Meter Reading	☒ Reading ☐ Data Submission	Ongoing	None	None	Kabir Dikko Dauda	Habib	Toyoda, Morita	Every month

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## Output-2: Pilot Project (JABI Office)

24 August 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	JABI	JICA Expert Team		
PMA/SMA Creation	Construction of Chambers	■ Procurement of Materials ■ Excavation ■ Chamber Construction ■ Cover ■ Finishing	Completed	None	None	Dikko Dauda Raifu	Ramat	Toyoda	-
	Installation of Flow Meters and Valves	■ Procurement ■ Installation	Completed	None	None	Dikko Kabir Dauda	Ramat	Toyoda	-
Commercial Loss	Meter Reading & Temporary Meter Reading (1 week)	■ Temporary Meter Installation ■ First Reading ■ Second Reading	Completed	None	None	Isah	Ramat	Morita Toyoda	-
	Tank Survey	■ Survey ■ Data Submission	Completed	None	None	Dikko Dauda	Ramat	Morita Toyoda	-
	Meter Error Test	■ Test ■ Data Submission	Completed	None	None	Masaud	Ramat	Morita Toyoda	-
	Illegal Connection	■ Consumption Data ■ Detection Survey ☒ Data Submission	Ongoing (4 illegals in SMA2)	None	None	Dikko Dauda	Ramat	Morita Toyoda	1st week of September
	Major Consumer (One Year Consumption)	■ Compilation of Each Categories ■ Data Submission	Completed	None	None	Isah	Ramat	Morita Toyoda	-
	Customer List (One Year Consumption)	■ Compilation of Each Categories ■ Data Submission	Completed	None	None	Rose	Ramat	Morita Toyoda	-
	24 hrs Customer Consumption Survey	■ Measurement ☒ Data Submission	Ongoing (20 completed)	None	None	Masaud	Ramat	Morita Toyoda	End of August

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	JABI	JICA Expert Team		
Leakage Survey	24 hrs & MNF Water Flow Measurement	<input checked="" type="checkbox"/> Measurement <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Kabir Dikko Dauda	Ramat	Kiyama	-
	1 Week Water Flow Measurement	<input type="checkbox"/> Measurement <input type="checkbox"/> Data Submission	Non progress	None	None	Kabir Dikko Dauda	Ramat	Kiyama	When available
	Step Test	<input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Kabir Dikko Dauda	Ramat	Kiyama	-
	Leakage Detection (Acoustic Bar)	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Completed	None	None	Kabir Dikko Dauda	Ramat	Kiyama	-
	Leakage Detection (Ground Microphone)	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Completed (4 leaks in SMA-2, 4 leaks in SMA-3)	None	None	Kabir Dikko Dauda	Ramat	Kiyama	-
	Repair of Leakage (Provisional)	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Ongoing	None	None	Kabir Dikko Dauda	Ramat	Kiyama	2nd week of September
Overall	Data Analysis	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Non progress	None	None	Kabir Dikko Dauda	Ramat	Toyoda, Morita	Ditto
	Water Balance Sheet	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Non progress	None	None	Kabir Dikko Dauda	Ramat	Toyoda, Morita	Ditto
	NRW Reduction Plan	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Non progress	None	None	Kabir Dikko Dauda	Ramat	Toyoda, Morita	Ditto
	Monthly/Weekly PMA Meter Reading	<input checked="" type="checkbox"/> Reading <input type="checkbox"/> Data Submission	Ongoing	None	None	Kabir Dikko Dauda	Ramat	Toyoda, Morita	Every month

4-9

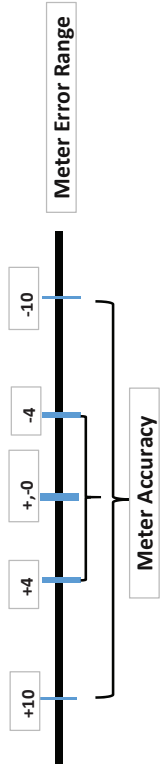
## Output-3: Pilot Project (GARKI I Office)

24 August 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	GARKI I	JICA Expert Team		
PMA/SMA Creation	Construction of Chambers	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Excavation <input checked="" type="checkbox"/> Chamber Construction <input checked="" type="checkbox"/> Cover <input checked="" type="checkbox"/> Finishing	Cover and finishing at chamber for ultrasonic flowmeter have been delayed.	Permission of electricity	Facilitation by Electro-mechanical Unit	Dikko Dauda Raifu	Adesoji	Toyoda	Middle of September
	Installation of Flow Meters and Valves	<input checked="" type="checkbox"/> Procurement <input checked="" type="checkbox"/> Installation	Ultrasonic flowmeter has not yet been installed due to delay in the above.	None	None	Dikko Kabir Dauda	Adesoji	Toyoda	Middle of September
Commercial Loss	Meter Reading & Temporary Meter Reading (1 week)	<input checked="" type="checkbox"/> First Reading <input checked="" type="checkbox"/> Second Reading <input checked="" type="checkbox"/> Data Submission	Completed	Acceleration	Work dividing	Isah Suleiman	Adesoji	Morita Toyoda	-
	Tank Survey	<input checked="" type="checkbox"/> Survey <input checked="" type="checkbox"/> Data Submission	No tanks exist (to be confirmed)	None	None	Dikko Dauda	Adesoji	Morita Toyoda	-
	Meter Error Test	<input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> Data Submission	Completed (62)	None	None	Masaud	Adesoji	Morita Toyoda	End of August
	Illegal Connection	<input checked="" type="checkbox"/> Consumption Data <input checked="" type="checkbox"/> Detection Survey	Ongoing (3 illegals)	None	None	Dikko Dauda	Adesoji	Morita Toyoda	Ditto
	Major Consumer (One Year Consumption)	<input checked="" type="checkbox"/> Compilation of Each Categories <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Isah	Adesoji	Morita Toyoda	End of June
	Customer List (One Year Consumption)	<input checked="" type="checkbox"/> Compilation of Each Categories <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Rose Suleiman	Adesoji	Morita Toyoda	-
24 hrs Customer Consumption Survey	<input checked="" type="checkbox"/> Measurement <input type="checkbox"/> Data Submission	Ongoing	None	None	Masaud	Adesoji	Morita Toyoda	End of September	

Activities		State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion
						HQs	GARKI I	JICA Expert Team	
Leakage Survey	24 hrs & MNF Water Flow Measurement	<input checked="" type="checkbox"/> Measurement <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Kabir Dikko Dauda	Adesoji Gana	Kiyama	-
	1 Week Water Flow Measurement	<input type="checkbox"/> Measurement <input type="checkbox"/> Data Submission	Non progress	None	None	Kabir Dikko Dauda	Adesoji Gana	Kiyama	When available
	Step Test	<input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Kabir Dikko Dauda	Adesoji Gana	Kiyama	-
	Leakage Detection (Acoustic Bar)	<input checked="" type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Ongoing	None	None	Kabir Dikko Dauda	Adesoji Gana	Kiyama	End of September
	Leakage Detection (Ground Microphone)	<input checked="" type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Ongoing	None	None	Kabir Dikko Dauda	Adesoji Gana	Kiyama	Ditto
	Repair of Leakage (Provisional)	<input checked="" type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Ongoing	None	None	Kabir Dikko Dauda	Adesoji Gana	Kiyama	Ditto
Overall	Data Analysis	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Ongoing	None	None	Kabir Dikko Dauda	Adesoji Gana	Toyoda, Morita	Ditto
	Water Balance Sheet	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Non progress	None	None	Kabir Dikko Dauda	Adesoji Gana	Toyoda, Morita	Ditto
	NRW Reduction Plan	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Non progress	None	None	Kabir Dikko Dauda	Adesoji Gana	Toyoda, Morita	Ditto
	Monthly/Weekly PMA Meter Reading	<input type="checkbox"/> Reading <input type="checkbox"/> Data Submission	Non progress	None	None	Kabir Dikko Dauda	Adesoji Gana	Toyoda, Morita	Every month

# RESULT of METER ERROR TEST (Provisional)



## 【Accuracy: +-4%】

GUDU	Prepaid	Conventional
All	133	
4=>>=-4%	72	54.1%
Number of meters: Out of standard	32	
>4	29	61
<-4	29	61
Average % of Error Range		
Range	%	%
>4	20.7	
<-4	-28.0	
4=>>=-4%	0.2	

Prepaid	Conventional
88	
4=>>=-4%	54
Number of meters: Out of standard	
>4	20
<-4	14
Average % of Error Range	
Range	%
>4	22.7%
<-4	15.7%

Convent	Conventional
36	
4=>>=-4%	13
Number of meters: Out of standard	
>4	10
<-4	13
Average % of Error Range	
Range	%
>4	30.6%
<-4	31.5%

## 【Accuracy: +-10%】

GUDU	Prepaid	Conventional
All	133	
10=>>=-10%	99	74.4%
Number of meters: Out of standard	17	
>10	17	34
<-10	17	34
Average % of Error Range		
Range	%	%
>10%	31.9	
<-10	-42.4	
10=>>=-10%	0.5	

Prepaid	Conventional
88	
10=>>=-10%	68
Number of meters: Out of standard	
>10	10
<-10	10
Average % of Error Range	
Range	%
>10	22.7%
<-10	22.7%

Convent	Conventional
36	
10=>>=-10%	23
Number of meters: Out of standard	
>10	6
<-10	7
Average % of Error Range	
Range	%
>10	36.1%
<-10	36.1%

JABI	Conventional	GARKI	AM/R, Conventional
All	125	61	
4=>>=-4%	19	21	34.4%
Number of meters: Out of standard	46	11	
>4	60	29	40
<-4	60	29	40
Average % of Error Range			
Range	%	%	%
>4	105.9	28.0	
<-4	-71.5	-76.0	
4=>>=-4%	0.6	-1.7	

\* Figure of minus range of "Average % of Error Range" is laget than plus, it means reading volume is less than actual flow volume, less charge amount.

JABI	Conventional	GARKI	AM/R, Conventional
All	125	61	
10=>>=-10%	34	30	49.2%
Number of meters: Out of standard	36	8	
>10	55	23	31
<-10	55	23	31
Average % of Error Range			
Range	%	%	%
>10%	105.9	36.1	
<-10	-71.5	-94.3	
10=>>=-10%	0.6	-1.7	

\* More Data Analysis /Manufactured year /Manufacturer

## The Federal Capital Territory Reduction of Non-Revenue Water Project

### Technical Notes on Monthly Technical Meeting

1<sup>st</sup> Session

6 October 2016

Engr. A. R. Lawal, Project Coordinator as the chairperson of the meeting on behalf of the Technical Manager gave an opening remark to officially start the meeting (See attendance in Appendix 1).

As a matter of project operations, Mr. Akinori Miyoshi, Chief Advisor expressed appreciation for involvement in preparation of Joint Project Monitoring Sheet and explained the result of the Joint Project Monitoring and the fourth Joint Coordinating Committee (JCC) meeting held in the middle of September 2016.

- Because of non-release of the CP fund, taking over the chamber construction for bulk flowmeter and procurement of small materials for Pilot activities was requested from the Nigerian side to the Japanese side.
- Both side agreed that SMA 1 of Jabi and a part of SMA 2 of Garki I will be out of PMA monitoring area.
- Challenges and updates of AGIS security and as-built drawings

Mr. Miyoshi also requested FCTWB's initiatives of AGIS staff attendance in the next joint monitoring and Engr. A. R. Lawal, Project Coordinator accepted it on behalf of FCTWB.

Mr. Miyoshi reported modification of billing system has started by system Engineering Consultant and requested members concerned (Billing, AMR, Revenue, Audit, Credit Control and IT) to work with the consultant for smooth communication and avoidance of misunderstanding. Mr. Adis S. Muhammad, Technical Manager (HOD Commerce) accepted the request.

Mr. Shehu Suleiman, HoU GIS reported that AGIS had answered they can relax restriction at working level. He also reported that the workflow of FCTWB's GIS activities had been submitted to AGIS for verification.

Reporting and discussion about project activities were done based on monthly meeting record for progress monitoring (see Appendix 2).

Mr. Mumini Raifu, Project Engineer reported the suspension of chamber construction for bulk meter at Lower Usuma Dam (LUD) and progress of work for the chamber construction for zonal meter.

Mr. Miyoshi requested FCTWB to expedite the completion of chamber covers in Gudu and Garki I, PMA. Mr. Musa Dikko, HoU Pipeline promised to liaise with the contractor.



Mr. Ramat (Jabi AM), Mr. Sadiq (Jabi AAM-Dist.), Mr. Muhammad (Jabi AAM-Com.), Mr. Ozumi (Gudu AAM-Dist.), Mr. Gana (Garki I AAM-Dist.) and Mr. Choji (Garki I AAM-Com.) reported progress of each activity for Output-2 and discussed among relevant project members, then set expected time to complete. Selling of sachet water by one of Public Tap owner in SMA 2 and extension to villages from other Public Tap owners in SMA 3 of Jabi were brought up. Mr. Danjuma Isah, HoU Monitoring and Detection reported his Unit had installed water meters to Public Tap owners in order to achieve 100% reading. But, Engr. A. R. Lawal said the meters should have not been installed before clarifying water usage as NRW and suggested this should be considered in the remaining project activities and analysis. Meeting adjourned to re-convene on 12<sup>th</sup> Oct, 2016 for the second session.

## **2<sup>nd</sup> Session**

12 October 2016

Following the first Session of the monthly technical meeting on 6<sup>th</sup> October, the second session took place on 12<sup>th</sup> October.

At the beginning of the second session, aiming at consideration of advantage and disadvantage of all water meter used by the FCTWB and the action plan for scaling-up NRW reduction activities to other areas. Engr. A. R. Lawal, Project Coordinator, gave opening remarks addressing importance of second session for their information sharing and discussions.

### **1. Presentations of Three Types of Water Meters**

Advantages and disadvantages of three types of water meters, (1) Conventional meter, (2) Pre-paid meter (3) AMR, were presented by Engr. Mohammed Abdul Ozumi (Gudu Assistant Area Manager), Mr. Adesoji Adenuga (Garki I Area Manager), Engr. Abdullahi Masaud (HoU Metering) respectively. The three types of water meters were explained in terms of the following, maintenance, operation, procurement, durability, depreciation period, initial cost, possibility of regular reading, data compilation, reading accuracy and illegal connections.

### **2. Questions and Observations**

The following questions were asked at the end of presentation.

- Are AMRs or pre-paid meters appropriate for the conditions in Nigeria?
- AMR has a higher accuracy and data reliability. However, the cost effectiveness and the failure rate should be re-investigated.
- From experiences for three types of water meters in FCTWB, AMR doesn't function well, especially for large consumption customers, such as industrial customers.
- Conventional water meter is common equipment used in Japan. What is the reason in Nigeria those conventional water meters do not work well.

The following were responses for the above questions,



- Mr. Adesoji Adenuga: Most of AMRs are functional, but staff are not well trained and other issue is human error in operation.
- Mr. Abdullahi Masaud: We are in the stage of utilizing AMR, or Pre-paid system.

### 3. Comments

- Engr. A. A. Nahuche, Technical Manager (HoD Distribution) commented that this meeting is meaningful to share the ideas of the working of various water meters and for the future of FCTWB. There are reasons for the adoption of new water meter such as pre-paid meter and AMR in Abuja. The reasons should be shared in coming next monthly-meeting.
- Mr. Adis S. Muhammad, Technical Manager (HoD Commerce) commented that human error is a key issue for the operation all metering system. We therefore, need to consider capacity development of staff. He suggested in next meeting to have a presentation of “General evaluation of meter reading especially in Gudu (Prince and Princess)” performed by Mr. Danjuma Isah or Mr. Aliyu Maradun.
- Mr. Fujiyama, JICA Expert Team suggested that water meter used by FCTWB should be unified for ease of operation. In addition, he recommends that cost comparison of each category of water meter should be an agenda in the next meeting.

### 4. Action Plan of Gudu Area Office

Mr. Mohammad Abdul Ozumi presented an action plan of Reduction NRW supply in National Assembly Quarters of Gudu which was prepared by him in the training course in Japan. He mentioned that the implementation budget for this action plan is shared with an area manager and yet to request officially. (see Appendix 4)

### 5. Next Meeting

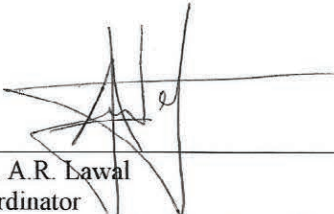
Engr. A. R. Lawal, Project Coordinator confirmed in the next meeting to have a presentation of “General evaluation of meter reading especially in Gudu (Prince and Princess)” by Mr. Danjuma Isah or Mr. Aliyu Maradun.

#### Appendix 1: Attendance List

#### Appendix 2: Monthly Meeting Record as of October 2016


#### Appendix 3: Summary Sheet for Advantages and Disadvantages of Three Types of Water Meters

#### Appendix 4: Action Plan for Reduction of NRW in National Assembly Quarters Gudu



Eng. A.R. Lawal  
Coordinator  
Federal Capital Territory Water Board,  
Federal Republic of Nigeria

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**

**MONTHLY TECHNICAL MEETING**

**ATTENDANCE LIST**

**SESSION-1**

**6TH OCTOBER 2016**

S/N	NAME	POSITION
1	Muhammed Adis	HOD Commerce
2	Abolade R. Lawal	Project Coordinator
3	Shehu Sulaiman	Head GIS
4	Abdulrahman Mohammed	Ops&WM
5	Raifu Mumini	AAM [Dist&Project Engineer]
6	Sulaiman A. Muhammad	AAM [C] Jabi
7	Mohammed E. Gana	AAM [D] Garki 1
8	Abdullahi Masaud	Head Metering
9	Abdulrahman Shehu Sani	Head Prepaid
10	Mohammed Dauda	Pipeline Unit
11	Abubakar Ubale Abubakar	Head AMR
12	Mohammed A.S Ramat	Area Manager Jabi
13	Mohammed Baba-man	-
14	Aluko Temitope	Head [E&M]
15	Ozumi M.A	AAM [D] Gudu
16	Rose Akpan	Head Billing
17	Aliyu S.B Muazu	A.D Commerce
18	Choji Pam	AAM [C] Garki 1
19	Salihu O Sadiq	AAM [Dist] Jabi
20	Aliyu Maradun	Head Major Consumer Unit
21	Dikko Musa	Head [PL& WC]
22	Isah Danjuma	Head Monitoring
23	Isaac Owolabi	Head Customer care



**FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER PROJECT****MONTHLY TECHNICAL MEETING****ATTENDANCE LIST****SESSION-2****12TH OCTOBER 2016**

S/N	NAME	POSITION
1	Engr. A.A Nahuche	Technical manager
2	Engr. Abolade R. Lawal	Project coordinator
3	Adenuga, A.O.	Area manager GARKI 1
4	M.K. Rafiu	Hydro logistics
5	Abubakar Ubale. A	H (AMR)
6	Aliyu Maradun	H (M.C)
7	Danjuma Isah	H (M)
8	Mohamed E. Gana	Asist. area manager GARKI 1
9	Abduralman Shehu Sani	H(PPM)
10	Ihoji Nam	Assist. area manager (COM) GARKI 1
11	Mohammed Husani	H.T.O (COMM)
12	Engr. Mohammed Abdul Ozumi	Assist. area manager dist. GUDU
13	Engr. Abdullali Mosiud	Head metering
14	Mohammed A.S.	Area manager JABI
15	Sulaiman A. Mohammad	Assist. area manager (COM) JABI
16	Muhammed Dauda	Pipeline H/Q
17	Engr. Chuejina E. Ottah	S.E
18	Muhammad S. Adis	Commerce
19	Ahmed S. Abudullah	Customer care/reconciliation
20	Aminu Umar	HD (OPS/WIN)

## Output-1: Construction of Chambers at LUD WTP Outlet (HQs)

06 October 2016

Activities		State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion
						HQs	Contractor	JICA Expert Team	
Chamber (D1500) for Tank 2&5	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Slab (Roof)	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Appurtenant Works	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Opening <input checked="" type="checkbox"/> Manhole Cover <input type="checkbox"/> Installation of Ladder <input checked="" type="checkbox"/> Backfilling	Once JICA approves project monitoring sheet, the Work will be resumed by JICA.	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Before the end of November.
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	Once JICA approves project monitoring sheet, the Work will be taken by JICA.	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Once JICA approves project monitoring sheet, the Work will be resumed by JICA.	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Demobilization		Ditto	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto

1-1

Activities		State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion
						HQs	Contractor	JICA Expert Team	
Chamber (D1500) for Tank 3&4	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Slab (Roof)	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Appurtenant Works	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Opening <input checked="" type="checkbox"/> Manhole Cover <input type="checkbox"/> Installation of Ladder <input checked="" type="checkbox"/> Backfilling	Once JICA approves project monitoring sheet, the Work will be resumed by JICA.	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Before the end of November.
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	Once JICA approves project monitoring sheet, the Work will be taken by JICA.	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Once JICA approves project monitoring sheet, the Work will be resumed by JICA.	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Demobilization		Ditto	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto

Activities		State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion
						HQs	Contractor	JICA Expert Team	
Chamber (D1200) for Kubwa	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Slab (Roof)	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Appurtenant Works	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Opening <input checked="" type="checkbox"/> Manhole Cover <input type="checkbox"/> Installation of Ladder <input checked="" type="checkbox"/> Backfilling	Once JICA approves project monitoring sheet, the Work will be resumed by JICA.	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Before the end of November.
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	Once JICA approves project monitoring sheet, the Work will be taken by JICA.	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Once JICA approves project monitoring sheet, the Work will be resumed by JICA.	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Demobilization		Ditto	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto

1-3

Activities		State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion
						HQs	Contractor	JICA Expert Team	
Chamber (D600) for Bwari	Floor	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Completed	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	-
	Wall	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Bar Arrangement <input checked="" type="checkbox"/> Concrete Casting <input checked="" type="checkbox"/> Curing <input checked="" type="checkbox"/> Finishing	Once JICA approves project monitoring sheet, the Work will be resumed by JICA.	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Before the end of November.
	Slab (Roof)	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Bar Arrangement <input type="checkbox"/> Concrete Casting <input type="checkbox"/> Curing <input type="checkbox"/> Finishing	Ditto	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Appurtenant Works	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Opening <input type="checkbox"/> Manhole Cover <input type="checkbox"/> Installation of Ladder <input type="checkbox"/> Backfilling	Ditto	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Cable Installation	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Excavation <input type="checkbox"/> Installation <input type="checkbox"/> Backfilling	Once JICA approves project monitoring sheet, the Work will be taken by JICA.	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Fencing Work	<input type="checkbox"/> Procurement of Materials <input type="checkbox"/> Installation	Once JICA approves project monitoring sheet, the Work will be resumed by JICA.	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto
	Demobilization		Ditto	None	None	Kabir Raifu	Local	Miyoshi Fujiyama	Ditto

## Output-1: Construction of Chambers for Zonal Meter (HQs)

06 October 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	Contractor	JICA Expert Team		
Chamber	Preparation	■ Procedures for Contract	Completed	None	None		INTELES (Integrated Logistics & Engineering)	Miyoshi Mori	-
	Construction (Tank 2)	■ Floor ■ Wall ■ Slab ☒ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	The middle of October
	Construction (Tank 3.1)	■ Floor ■ Wall ■ Slab ☒ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	Ditto
	Construction (Tank 3.2)	■ Floor ■ Wall ■ Slab ☒ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	Ditto
	Construction (Tank 4.1.1)	■ Floor ■ Wall ■ Slab ☒ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	Ditto
	Construction (Tank 4.2)	■ Floor ■ Wall ■ Slab ☒ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	Ditto
	Construction (Tank 5)	■ Floor ■ Wall ■ Slab ☒ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	Ditto
	Construction (Tank Kubwa)	■ Floor ■ Wall ■ Slab ☒ Manhole, Others	Ongoing	Leakage water from air valve is getting through chamber.	FCTWB will bring this issue to the Management for solution.	Dauda Raifu	INTELES	Fujiyama Satoh	Ditto
	Construction (Tank Gwako)	■ Floor ■ Wall ■ Slab ☒ Manhole, Others	Ongoing	None	None	Dauda Raifu	INTELES	Fujiyama Satoh	Ditto
Zonal Meter (Ultra-sonic Flowmeter)	Installation	After the completion of chamber construction and procurement of equipment							
	Measurement								

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## Output-2: Pilot Project (GUDU Office)

06 October 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	GUDU	JICA Expert Team		
PMA/SMA Creation	Construction of Chambers	■ Procurement of Materials ■ Excavation ■ Chamber Construction ☒ Cover	Putting cover have not been done.	Rubbish and muddy conditions inside the chamber	None	Dikko Dauda Raifu	Habib	Toyoda	3rd week of October (in one week)
	Installation of Flow Meters and Valves	■ Procurement ■ Installation	Completed	A D100mm valve on Drive 4 and a D100mm on Drive 1 are not functioning, but no effect on the Project	FCTWB should replace or repair them.	Dikko Kabir Dauda	Habib	Toyoda	-
Commercial Loss	Meter Reading & Temporary Meter Reading (1 week)	■ Temporary Meter Installation ■ First Reading ■ Second Reading ■ Data Submission	Completed	None	None	Isah Masaud	Habib	Toyoda Morita	-
	Tank Survey	■ Survey ■ Data Submission	Completed	None	None	Dikko Dauda	Habib	Toyoda	-
	Meter Error Test	■ Test ■ Data Submission	Completed	None	None	Masaud	Habib	Toyoda	-
	Illegal Connection Survey	■ Consumption Data ■ Detection Survey ☒ Data Submission	Completed (4 illegals in SMA-1 and 3 illegals in SMA-2)	None	None	Dikko Dauda	Habib	Toyoda	3rd week of October (in one week)
	Major Consumer (One Year Consumption)	■ Compilation of Each Categories ■ Data Submission	Completed (only British school)	None	None	Isah	Habib	Toyoda	-
	Customer List (One Year Consumption)	■ Compilation of Each Categories ■ Data Submission	Completed (6 months record)	None	None	Rose Masaud	Habib	Toyoda	-
	24 hrs Customer Consumption Survey	■ Measurement ■ Data Submission	Completed (20)	None	None	Masaud	Habib	Toyoda	Authorized unbilled customers information will be ready in a few days.

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	GUDU	JICA Expert Team		
Leakage Survey	24 hrs & MNF Water Flow Measurement	<input checked="" type="checkbox"/> Measurement <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Kabir Dikko Dauda	Habib	Kiyama	-
	1 Week Water Flow Measurement	<input checked="" type="checkbox"/> Measurement <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Kabir Dikko Dauda	Habib	Kiyama	-
	Step Test	<input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Kabir Dikko Dauda	Habib	Kiyama	-
	Leakage Detection (Acoustic Bar)	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2	Completed	None	None	Kabir Dikko Dauda	Habib	Kiyama	-
	Leakage Detection (Ground Microphone)	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2	Completed	None	None	Kabir Dikko Dauda	Habib	Kiyama	-
	Repair of Leakage (Provisional)	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2	Completed	None	None	Kabir Dikko Dauda	Habib	Kiyama	-
Overall	Data Analysis	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2	Ongoing	None	None	Kabir Dikko Dauda	Habib	Toyoda, Morita	4th week of October (in two week)
	Water Balance Sheet	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2	Ongoing	None	None	Kabir Dikko Dauda	Habib	Toyoda, Morita	Ditto
	NRW Reduction Plan	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2	Being prepared	None	None	Kabir Dikko Dauda	Habib	Toyoda, Morita	Ditto. As a countermeasure meter replacement was completed but newly-installation has not been done (15 per
	Monthly/Weekly PMA Meter Reading	<input checked="" type="checkbox"/> Reading <input type="checkbox"/> Data Submission	Ongoing	None	None	Kabir Dikko Dauda	Habib	Toyoda, Morita	Every month

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## Output-2: Pilot Project (JABI Office)

06 October 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	JABI	JICA Expert Team		
PMA/SMA Creation	Construction of Chambers	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Excavation <input checked="" type="checkbox"/> Chamber Construction <input checked="" type="checkbox"/> Cover <input checked="" type="checkbox"/> Finishing	Completed	None	None	Dikko Dauda Raifu	Ramat	Toyoda	-
	Installation of Flow Meters and Valves	<input checked="" type="checkbox"/> Procurement <input checked="" type="checkbox"/> Installation	Completed	None	None	Dikko Kabir Dauda	Ramat	Toyoda	-
Commercial Loss	Meter Reading & Temporary Meter Reading (1 week)	<input checked="" type="checkbox"/> Temporary Meter Installation <input checked="" type="checkbox"/> First Reading <input checked="" type="checkbox"/> Second Reading	Completed	None	None	Isah	Ramat	Morita Toyoda	-
	Tank Survey	<input checked="" type="checkbox"/> Survey <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Dikko Dauda	Ramat	Morita Toyoda	-
	Meter Error Test	<input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Masaud	Ramat	Morita Toyoda	-
	Illegal Connection	<input checked="" type="checkbox"/> Consumption Data <input checked="" type="checkbox"/> Detection Survey <input checked="" type="checkbox"/> Data Submission	Completed (4 illegals in SMA2)	None	None	Dikko Dauda	Ramat	Morita Toyoda	3rd week of October (in one week)
	Major Consumer (One Year Consumption)	<input checked="" type="checkbox"/> Compilation of Each Categories <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Isah	Ramat	Morita Toyoda	-
	Customer List (One Year Consumption)	<input checked="" type="checkbox"/> Compilation of Each Categories <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Rose	Ramat	Morita Toyoda	-
	24 hrs Customer Consumption Survey	<input checked="" type="checkbox"/> Measurement <input checked="" type="checkbox"/> Data Submission	Completed (20)	None	None	Masaud	Ramat	Morita Toyoda	Unbilled authorized customer will be additionally targetted.

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	JABI	JICA Expert Team		
Leakage Survey	24 hrs & MNF Water Flow Measurement	<input checked="" type="checkbox"/> Measurement <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Kabir Dikko Dauda	Ramat	Kiyama	-
	1 Week Water Flow Measurement	<input type="checkbox"/> Measurement <input type="checkbox"/> Data Submission	Non progress	None	None	Kabir Dikko Dauda	Ramat	Kiyama	When available
	Step Test	<input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Kabir Dikko Dauda	Ramat	Kiyama	-
	Leakage Detection (Acoustic Bar)	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Completed	None	None	Kabir Dikko Dauda	Ramat	Kiyama	-
	Leakage Detection (Ground Microphone)	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Completed (4 leaks in SMA-2, 4 leaks in SMA-3)	None	None	Kabir Dikko Dauda	Ramat	Kiyama	-
	Repair of Leakage (Provisional)	<input checked="" type="checkbox"/> SMA1 <input checked="" type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Ongoing	None	List of materials should be submitted.	Kabir Dikko Dauda	Ramat	Kiyama	3rd week of October (in one week)
Overall	Data Analysis	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Non progress	None	None	Kabir Dikko Dauda	Ramat	Toyoda, Morita	4th week of October (in two week)
	Water Balance Sheet	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Non progress	None	None	Kabir Dikko Dauda	Ramat	Toyoda, Morita	Ditto
	NRW Reduction Plan	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input type="checkbox"/> SMA3	Non progress	None	None	Kabir Dikko Dauda	Ramat	Toyoda, Morita	Ditto Meter will be procured and installed soon
	Monthly/Weekly PMA Meter Reading	<input checked="" type="checkbox"/> Reading <input type="checkbox"/> Data Submission	Ongoing	None	None	Kabir Dikko Dauda	Ramat	Toyoda, Morita	Every month

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## Output-3: Pilot Project (GARKI I Office)

06 October 2016

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	GARKI I	JICA Expert Team		
PMA/SMA Creation	Construction of Chambers	<input checked="" type="checkbox"/> Procurement of Materials <input checked="" type="checkbox"/> Excavation <input checked="" type="checkbox"/> Chamber Construction <input checked="" type="checkbox"/> Cover <input checked="" type="checkbox"/> Finishing	Cover and finishing at chamber for ultrasonic flowmeter have been delayed.	Permission of electricity	Facilitation by Electro-mechanical Unit	Dikko Dauda Raifu	Adesoji	Toyoda	The end of October
	Installation of Flow Meters and Valves	<input checked="" type="checkbox"/> Procurement <input checked="" type="checkbox"/> Installation	Ultrasonic flowmeter has not yet been installed due to delay in the above.	None	None	Dikko Kabir Dauda	Adesoji	Toyoda	The beginning of November
Commercial Loss	Meter Reading & Temporary Meter Reading (1 week)	<input checked="" type="checkbox"/> First Reading <input checked="" type="checkbox"/> Second Reading <input checked="" type="checkbox"/> Data Submission	Completed	Acceleration	Work dividing	Isah Suleiman	Adesoji	Morita Toyoda	-
	Tank Survey	<input checked="" type="checkbox"/> Survey <input checked="" type="checkbox"/> Data Submission	No tanks exist (to be confirmed)	None	None	Dikko Dauda	Adesoji	Morita Toyoda	-
	Meter Error Test	<input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> Data Submission	Completed (62)	None	None	Masaud	Adesoji	Morita Toyoda	-
	Illegal Connection	<input checked="" type="checkbox"/> Consumption Data <input checked="" type="checkbox"/> Detection Survey	Completed (3 illegals in SMA3)	None	None	Dikko Dauda	Adesoji	Morita Toyoda	-
	Major Consumer (One Year Consumption)	<input checked="" type="checkbox"/> Compilation of Each Categories <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Isah	Adesoji	Morita Toyoda	-
	Customer List (One Year Consumption)	<input checked="" type="checkbox"/> Compilation of Each Categories <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Rose Suleiman	Adesoji	Morita Toyoda	-
24 hrs Customer Consumption Survey	<input checked="" type="checkbox"/> Measurement <input checked="" type="checkbox"/> Data Submission	Completed (20)	None	None	Masaud	Adesoji	Morita Toyoda	Unbilled authorized customer will be additionally targetted.	

Activities	State of Progress	Note	Issues	Measures	Person in Charge			Scheduled Time of Completion	
					HQs	GARKI I	JICA Expert Team		
Leakage Survey	24 hrs & MNF Water Flow Measurement	<input checked="" type="checkbox"/> Measurement <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Kabir Dikko Dauda	Adesoji Gana	Kiyama	-
	1 Week Water Flow Measurement	<input type="checkbox"/> Measurement <input type="checkbox"/> Data Submission	Non progress	None	None	Kabir Dikko Dauda	Adesoji Gana	Kiyama	When available
	Step Test	<input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> Data Submission	Completed	None	None	Kabir Dikko Dauda	Adesoji Gana	Kiyama	-
	Leakage Detection (Acoustic Bar)	<input checked="" type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Ongoing	None	None	Kabir Dikko Dauda	Adesoji Gana	Kiyama	3rd week of October (in one week)
	Leakage Detection (Ground Microphone)	<input checked="" type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Ongoing	None	None	Kabir Dikko Dauda	Adesoji Gana	Kiyama	Ditto
	Repair of Leakage (Provisional)	<input checked="" type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Ongoing	None	List of materials should be submitted.	Kabir Dikko Dauda	Adesoji Gana	Kiyama	4th week of October (in two week)
Overall	Data Analysis	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Ongoing	None	None	Kabir Dikko Dauda	Adesoji Gana	Toyoda, Morita	Ditto
	Water Balance Sheet	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Non progress	None	None	Kabir Dikko Dauda	Adesoji Gana	Toyoda, Morita	Ditto
	NRW Reduction Plan	<input type="checkbox"/> SMA1 <input type="checkbox"/> SMA2 <input checked="" type="checkbox"/> SMA3	Non progress	None	None	Kabir Dikko Dauda	Adesoji Gana	Toyoda, Morita	Ditto AMR meter will be prepared.
	Monthly/Weekly PMA Meter Reading	<input type="checkbox"/> Reading <input type="checkbox"/> Data Submission	Non progress	None	None	Kabir Dikko Dauda	Adesoji Gana	Toyoda, Morita	Every month

Summary Sheet for Advantages and Disadvantages of Three Types (Conventional, Pre-paid and AMR) of Water Meters

Water Meters	Items	Main Points to be described	Advantages	Disadvantages
Conventional	1. Maintenance	- Ease of maintenance - Repair - Maintenance cost	Maintenance cost is the cheapest among water meters. Maintenance and repair are easier than AMR and Pre-paid meter.	Manufactures seal is usually broken in the process of maintenance
	2. Operation	- Ease of operation - Operation cost	It is easy to install water meters. Meter reading is easy for staff members. Operational cost is at the lower side.	Fuel of staff members are required to read water meters. Cost for vehicle and personnel cost are more expensive than that of AMRs and Pre-paid meters.
	3. Procurement	- Suppliers, agents, etc.	It is easy to procure water meters in the market.	No Supplier no Agent.
	4. Durability	- Durability in terms of humidity, wet, dry, muddy, dusty, etc.	Seems to be very durable and adaptable to African weather	No Manufacturers Certifications Durability is low because of Chinese products.
	5. Depreciation Period	- Depreciation Period	No specific period.	Less than three years Short period.
	6. Initial Cost	- Initial cost	Cheaper (NGN88,000) than other two types of water meters.	It can be manipulated arbitrarily. Sometimes it is very difficult to read water meters in fenced property.
	7. Possibility of Regular Reading	- Ease of billing	It is easy to read water meters.	Presence of human errors. Subject to the type of software use
	8. Data Compilation	- Ease of compilation of data such as water consumption and customers	It is easy to compile water consumption by manual.	Data is not accurate because it is not standardized. It is very easy to connect illegally.
	9. Reading Accuracy	- Accuracy of water consumption	To some extend.	A lot of training for capacity building required
	10. Illegal connection	- Ease of illegal connection		Monitoring is required periodically to check condition.
Pre-paid	1. Maintenance	- Ease of maintenance - Repair - Maintenance cost	Very easy to maintain/ repair. Maintenance cost is required after the expiration of warranty period.	
	2. Operation	- Ease of operation - Operation cost	Very easy to operate and Operational cost is at the lower side compared with other types of water meters.	
	3. Procurement	- Suppliers, agents, etc.	ECT Water Board deals with Manufacturer directly, while PPP arrangement are mostly Environment.	Funding issues (Management)
	4. Durability	- Durability in terms of humidity, wet, dry, muddy, dusty, etc.	The Meter is very durable as it is designed to be operated in African (Tropical) Environment.	Some (Mechanical types) are not suitable for the environment
	5. Depreciation Period	- Depreciation Period	30 and 50 years design life.	Depreciation type of some mechanical types are some times not certain. It depends on currency fluctuations.
	6. Initial Cost	- Initial cost	N 35,000 and N 45,000	
	7. Possibility of Regular Reading	- Ease of billing	Very easy as it has multiple billing/tariff systems	Some of the applications are not flexible
	8. Data Compilation	- Ease of compilation of data such as water consumption and customers	As it has multiple queries systems for various data, it is easy to compile data. Much accurate with ultrasonic flow meter in principle.	
	9. Reading Accuracy	- Accuracy of water consumption		In case that pre-paid meters are located in the premises, it is difficult to monitor the pre-paid meter to detect illegal connection like bypass.
	10. Illegal connection	- Ease of illegal connection		It is not easy to maintain AMRs compared with conventional water meters because electric devices mounted. No workshop. Spare parts must be ordered from abroad.
AMR	1. Maintenance	- Ease of maintenance - Repair - Maintenance cost	Maintenance and repair are easier. Maintenance cost is higher than conventional water meters. The spare parts are replaceable.	
	2. Operation	- Ease of operation - Operation cost	Operation is very easy. Operational cost is lower than conventional water meters.	
	3. Procurement	- Suppliers, agents, etc.		AMRs must be procured from only the agent in abroad. Funding issues (Bureaucracy)
	4. Durability	- Durability in terms of humidity, wet, dry, muddy, dusty, etc.	The meter is very durable as it is designed to be operated in African (Tropical) Environment.	Some AMR Meters are not suitable to west African environment.
	5. Depreciation Period	- Depreciation Period	Battery life is more than 10 years. Longer than conventional water meters.	
	6. Initial Cost	- Initial cost		Higher (NGN120,000) than the other two types of water meters. Price depends on currency fluctuations
	7. Possibility of Regular Reading	- Ease of billing	Very easy as it has multiple billing/tariff systems Reduces work force meter reading and bill distribution	
	8. Data Compilation	- Ease of compilation of data such as water consumption and customers	It is very easy to transfer raw data to PC. As it has multiple queries systems for various data, it is easy to compile data. Some of AMRS are equipped with remote sensing device which can be used to disconnect the customer from the terminal	Some of the applications are not flexible
	9. Reading Accuracy	- Accuracy of water consumption	It can detect internal leakage because of sensitive meters. It is very difficult to manipulate the water consumption. Very accurate (Some uses volumetric while some uses ultrasonic flow systems).	It does not specify quantity of water leakage.
	10. Illegal connection	- Ease of illegal connection		It is very easy to connect illegally.



## **ACTION PLAN REDUCTION**

### **NON REVENUE WATER SUPPLY IN NATIONAL ASSEMBLY QUARTERS GUDU.**

**ENGR. MOHAMMED ABDUL OZUMI**

**FCT WATER BOARD**

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**OCTOBER, 2016.**

## **CONTENT**

- Background
- Challenges
- Objective
- Applicable knowledge from the training
- Output
- Activities
- Input (cost)
- Schedule
- Evaluation

## **BACKGROUND**

### **Assistant area manager distribution**

- Total commerce and distribution staffs 27 in number
- In Gudu area office we have five units  
Apo/Gudu  
Adisa  
Prince and Princess  
Durumi  
Gaduwa
- The total number of properties within this area is about 400
- All properties on prepaid meter
- About 60% of the prepaid within this estate the national assembly are malfunction, bypass or direct connection
- 200mm diameter UPVC pipe
- Length of the network is about 1800meters
- Pipe depth 1meter to 1.5meters

## **PHOTOGRAPHS OF PREPAID METER AND CONVENTIONAL**



### Objective

The objective of this action plan is to reduce the non revenue water supply in national assembly quarter in Gudu.

### Applicable knowledge

Applicable knowledge from this training Comprehensive Engineering on Water Supply System

- Development plan of block distribution system using software like Epanet in design to determine water pressure to higher/low elevated area
- Laying plans for distribution system like Block connection system
- Leak repair work and leak detection by using Acoustic rod to determine flow

### Output

1. Replacement of malfunction prepaid
2. Illegal connection by passing prepaid meter will be checkmate
3. Leakage repair

### Activities

- Drawing of the national assembly quarters water supply system (1,2&3)
- Installation of ultrasonic flow meter to determine the average daily supply and also minimum night flow (1,2&3)
- Installation of control valves (1,2&3)
- House to house check of the malfunction prepaid meter by removing the smart card and see if water still runs (1&2)
- Using acoustic rod to determine illegal connection to each properties
- Replacement of malfunction meter(2)
- Disconnection of illegal connection properties with sub charge (2)
- Comparing the minimum night flow and average daily supply of water after replacement of malfunction meter and illegal connection is the non revenue water of the national assembly quarters
- Evaluation exercise, after the replacement of malfunction meters. If the minimum night flow and average daily supply is still high then we go for leakage detection and leak repair(3)
- Using error meter test machine to determine selected properties meter for accuracy (1)

## Input

The source of these exercise will come directly from FCT water board Human resources for the exercise

S/NO	Descriptions	NO	Days	Rate	Cost(USD)
1	Engineer	1	-	-	staff
2	Technologist	1	-	-	Staff
3	Plumbers	6	-	-	Staff
4	Prepaid staffs	2	-	-	staff

Logistic and Labor for the exercise

S/NO	Descriptions	NO	Days	Rate	Cost(USD)
1	Security for the ultra sonic flow meter	-	4	LS	100
2	Transportation for midnight test	-	12	LS	100
3	Manual excavation and backfilling	-	-	LS	300
Total					500usd

Equipment and materials

S/NO	Description	NO	Days	Rate	Cost(USD)
1	Computer	1	-	-	Office
2	Printer	1	-	-	Office
3	Ultra sonic flow meter	2	-	-	Office
4	Leakage detector machine	2	-	-	Office
5	Acoustic rod	2	-	-	Office
6	Error meter test machine	2	-	-	Office
7	Stationeries	-	-	LS	30
8	Toner	-	-	LS	50
Total					80usd

## IMPLEMENTATION SCHEDULE

S/NO	Description	SEP	OCT	NOV	DEC	JAN	FEB
1	Management staff consultation	■					
2	Training staff	■	■				
3	Data acquisition	■	■				
4	Design and updating data	■	■				
5	Installation of ultrasonic meter				■	■	
6	Malfunction meter check				■	■	
7	Replacement of malfunction meter				■	■	
8	Illegal connections				■	■	
9	Random selection of error meter test				■	■	
10	Leak detect and repair				■	■	

## Evaluation

After the leak repairs, disconnection of illegal connection and malfunction prepaid meter replaced. I will determine the minimum night flow again. The difference water volume in current minimum night flow and current revenue generated is the reduction achieved on non revenue water.

# **The Federal Capital Territory Reduction of Non-Revenue Water Project**

## **Technical Notes on Monthly Technical Meeting**

9 March 2017

Engr. A. R. Lawal, Project Coordinator, HoU Special Projects as the chairperson of the meeting gave an opening remark to officially start the meeting (See attendance in Appendix 1).

As a matter of project operations, Mr. Akinori Miyoshi, Chief Advisor looked back on activities and results in the Phase 1 of the Project and explained particularly necessity of follow-up of Pilot projects to be utilized for Output-3 in the Phase-2. He also requested Project members proceed to follow-up of Pilot projects before official launch of the Phase-2 and conclude them successfully.

To implement the Pilot projects smoothly and effectively for a short period, the Project Team suggested deploying two supervisors and a dedicated vehicle in each pilot areas. Considering non-release of CP fund 2017, Mr. Miyoshi told that JICA Expert Team procures materials required for Pilot projects and fuel for vehicles.

Mr. Hiroyuki Morita and Mr. Kiyoshi Kiyama, JICA Experts explained schedule of the Pilot projects by using a document distributed (Appendix 2).

All project members understood the above and agreed.

### **Appendix 1: Attendance List**

### **Appendix 2: Schedule of Follow-up of Pilot Project**

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Eng. A. R. Lawal  
Project Coordinator  
HoU Special Projects, Distribution  
Federal Capital Territory Water Board,  
Federal Republic of Nigeria

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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 ATTENDANCE**

**9<sup>th</sup> March 2017**

S/N	NAME	POSITION
1	Mohammed Adis	HOD Commerce
2	Lawal A.R	Project Coordinator
3	Choji Pam	AAM Garki 1
4	Fatima A. Abdullahi	Commerce officer 1
5	Ohamma Sandra	S.E.O
6	Mercy Egwu	-
7	Adamu S. koko	SEO/GM
8	Ibrahim M. Umar	AAM Commerce
9	Isah Danjuma	HOU[Monitoring]
10	Nma yahaya	AAM Kubwa II
11	Husain Mohammad	Commercial officer
12	Abdullahi Masaud	Head Metering
13	Fabikun Adedeji	Head MIS
14	Aminu Umar	Head[OPS&WM]
15	Amos Bulus	PEE[M&E]
16	Aluko Tope	ACE
17	Adenuga Adesoji	A.M GArki I
18	Ezechiedo Norah	F/HOU[Billing]
19	Ottah C.E	S.N.R Mech. Engr.
20	Abubakar Ubale	S.N.R Civil Engr.
21	Mohammed Ozumi	AAM Gudu
22	Abdulrahman S Sani	Head PPM
23	Ahmed Abdullahi	F/Head CCR
24	Adeyemi Taiwo	Head[Emb.Corps.F/WS]
25	Mohammed Ramat	A.M Jabi
26	M.K Rabi	Head Logistics
27	Abdulrahman Mohammed	S.E [Meter]
28	Gana Mohammed	AAM Garki I
29	Shehu Sulaiman	Head GIS
30	Kiyoshi Kiyama	JICA Expert Team
31	Hiroyuki Morita	JICA Expert Team
32	Akinori Miyoshi	JICA Expert Team / CA



# **The Federal Capital Territory Reduction of Non-Revenue Water Project**

## **Technical Notes on Monthly Technical Meeting**

31 March 2017

Engr. A.A. Nahuche, Technical Manager, HoD Distribution as the chairperson of the meeting gave an opening remark to officially start the meeting (See attendance in Appendix 1).

Mr. Akinori Miyoshi, Chief Advisor expressed condolences for late S.T. Bello, Deputy Project Manager, and emphasized importance of the success of the Project for him.

Each Area Office reported progress and challenges of the Pilot Projects. Attendances discussed them and suggested dividing filed teams into more and accelerating activities against delay. All Area Offices promised to deal with them and do their best.

Mr. Hiroyuki Morita and Mr. Kiyoshi Kiyama, JICA Experts explained the updated schedule of the Pilot projects by using a document distributed (Appendix 2).

All project members understood the above and agreed.

### **Appendix 1: Attendance List**

### **Appendix 2: Schedule of Follow-up of Pilot Project**

---

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

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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 ATTENDANCE**

**31<sup>st</sup> March 2017**

S/N	NAME	POSITION
1	Courage I.O	-
2	Sulaiman A. Muhammed	AAM(C) Jabi
3	Abdul Ozumi	AAM(C) Gudu
4	Abdulrahman Shehu Sani	Head prepaid
5	Abdul Yusuf	Sup P&P Gudu
6	Ibrahim Yarua	Snr. foreman
7	Raymond Olowokere	Snr Foreman
8	Abubakar Shawbu	Snr Craftman
9	Yaluton Ibrahim	Snr Craftman
10	Nma Yahaya	AAM Kubwa
11	Kenneth Madu	Snr Craftman
12	Abdullahi Masuad	Head metering
13	Choji Pam	AAM(C) Garki
14	Titus Dawan	Garki 1
15	Amodu Oyidi	-
16	Mainasara Ibrahim	Commerce Jabi
17	Mahmud Mohammed	Dist. Jabi
18	Leo Yunnusa	Dist H/Q
19	Iliya Galadinma	Dist. Garki
20	Usman Mohammed	Dist. Garki
21	Abdulrahman Mohammed	S.E
22	Engr M.K Rabi	H[logistics]
23	Engr A.A Nahuche	Tech Manager
24	Abubakar Danladi	Dist. Jabi
25	Mohammed Hussain	Comm. Jabi
26	Kiyoshi Kiyama	JICA Expert Team
27	Hiroyuki Morita	JICA Expert Team
28	Akinori Miyoshi	JICA Expert Team / CA

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		March														April																							
		25	26	27	28	29	30	31	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
		Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
Date	Working days																																						
Responsible person																																							
Mr. KITAMA ←-----→ Mr. MORITA ←-----→	Field survey	[Arrows]																																					
	Area office works	[Arrows]																																					
	(GUDU)	[Arrows]																																					
	Meter reading	[Arrows]																																					
	Flow measurement	[Arrows]																																					
Area office works	Field survey	[Arrows]																																					
	Data Collection	[Arrows]																																					
	Meter reading	[Arrows]																																					
	Flow measurement	[Arrows]																																					
	Step test	[Arrows]																																					
(JABI)	Field survey	[Arrows]																																					
	Data Collection	[Arrows]																																					
	Meter reading	[Arrows]																																					
	Flow measurement	[Arrows]																																					
	Step test	[Arrows]																																					
Area office works	Field survey	[Arrows]																																					
	Data Collection	[Arrows]																																					
	Meter reading	[Arrows]																																					
	Flow measurement	[Arrows]																																					
	Step test	[Arrows]																																					
(GARKU)	Field survey	[Arrows]																																					
	Data Collection	[Arrows]																																					
	Meter reading	[Arrows]																																					
	Flow measurement	[Arrows]																																					
	Step test	[Arrows]																																					
HQ works	Data collection	[Arrows]																																					
	Meter Reading	[Arrows]																																					
	Prepaid Meter	[Arrows]																																					
	AMR Meter	[Arrows]																																					
	Authorized unlabelled facilities	[Arrows]																																					
Area/HQ	NRW calculation	[Arrows]																																					
	NRW Manual	[Arrows]																																					
	Replaced meters harmonization with the filling system	[Arrows]																																					
	Prepaid meter customer's water consumption volume	[Arrows]																																					
	Method of NRW rate calculation	[Arrows]																																					

# **The Federal Capital Territory Reduction of Non-Revenue Water Project**

## **Technical Notes on Monthly Technical Meeting**

31 July 2017

Engr. A.R. Lawal, Ag. HoD Distribution as the chairperson of the meeting gave an opening remark to officially start the meeting (See attendance in Appendix 1).

Mr. Akinori Miyoshi, Chief Advisor explained joint project monitoring and JCC meeting scheduled in August and importance of all members' participation in preparation of Monitoring Sheet II (Plan of Operations) as a tool of sharing of updated situation of each activity.

Engr. Kabir, Head of NRW Unit facilitated the meeting and coordinated reports and opinions from participants.

All project members agreed results of meeting, in particular, achievement, issues and countermeasures of each activity

### **Appendix 1: Attendance List**

### **Appendix 2: Monitoring Sheet II (Plan of Operations)**

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Eng. A. R. Lawal  
Project Coordinator  
Ag. HoD, Distribution  
Federal Capital Territory Water Board,  
Federal Republic of Nigeria

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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 ATTENDANCE**

**31<sup>st</sup> July 2017**

S/N	NAME	POSITION
1	A.R Lawal	Ag/HOD (Dist.)
2	Kabir M. Rabi	Head NRW
3	Dikko Musa	Head Pipeline
4	Muazo Aliyu S.B	Ag HOD (Comm.)
5	Shehu Suleiman	Head GIS
6	Mohammed E Gana	AAM (Dist.) Garki 1
7	Choji Pam	Ag/AM Garki 1
8	Aluko Tope	Head E&M
9	Amos Bulus	PEE (M&E)
10	Mumini Raifu	Ag/AM Gwarinpa
11	Salihu O Sadiq	AAM (Dist.) Jabi
12	Sulaiman A Muhammad	Ag/AM Jabi
13	Abubakar Danladi	Distribution Dept.
14	Abdul Yusuf	Sup. P&P estate
15	Abdul Ozumi	AAM (Dist.) Gudu
16	Abbas A. Ahmed	HOU PR
17	Ibrahim Umar	Ag/AM Gudu
18	Muhammed Dauda	Pipeline Unit
19	Kenneth Madu	Snr. Craftman
20	Titus Dawan	Commerce-Garki 1
21	Ezeh Hillary	Surveyor/ GIS
22	Rose Akpan	Head Billing
23	Abdularahman shehu Sani	Head prepaid Meter
24	Akinori Miyoshi	JICA Expert Team / CA







# **The Federal Capital Territory Reduction of Non-Revenue Water Project**

## **Technical Notes on Monthly Technical Meeting**

29<sup>th</sup> August 2017

Engr. A.R. Lawal, Ag. HoD Distribution as the chairperson of the meeting gave an opening remark to officially start the meeting and also facilitated the meeting (refer to attendance in Appendix 1).

Engr. Kabir, Head of NRW Unit made a presentation on results of project monitoring which was ended in the 7<sup>th</sup> JCC meeting and schedule of activities including follow-up pilot project in Garki I, distribution management, hydraulic analysis and GIS (refer to Appendix 2).

Also, Engr. Kabir, Head of NRW Unit explain contents of medium-term strategic plan, then confirmed persons in charge and new dates of meetings.

All project members agreed results, discussions of the meeting.

### **Appendix 1: Attendance List**

### **Appendix 2: Results of Project Monitoring and Schedule of Activities**

### **Appendix 3: Contents of the Medium-term Strategic Plan**

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Eng. A. R. Lawal  
Ag. HoD, Distribution  
Federal Capital Territory Water Board,  
Federal Republic of Nigeria

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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 ATTENDANCE**

**29<sup>th</sup> August 2017**

S/N	NAME	POSITION
1	Courage I. O	NRW Unit, Distribution Dept.
2	Abdul Ozumi	AAM(D) Gudu
3	Iliya M. Galadima	Work Superintendent
4	Abdularahman Shehu Sani	Head prepaid Meter
5	Abdullahi Masaud	Head Metering
6	Kenneth Madu	Distribution Dept.
7	Ibrahim Umar	AM Gudu
8	Abubakar Ubale A.	S.E Civil
9	Shehu Suleiman	Head GIS
10	Phoebe Ocheja	HOD/A&S
11	Rose Akpan	Head Billing
12	Abolade R. Lawal	HOD/ Distribution
13	Usman A. Aliyu	Distribution Dept.
14	Mohammed Gana	AAM Garki
15	Abbas Ahmed	Head PR
16	Fabikun Adedeji K	Head MIS
17	Ibrahim Yauri	SNR Foreman
18	Nma Yahaya	AAM Asokoro
19	Yahaya D. Kuki	Auditor
20	Amos Bulus	PEE (M&E)
21	Raymond Olowokere	SNR Foreman
22	Tope Aluko	Head/ E&M
23	Sulaiman A. Mulid	AAM Jabi
24	Rabiu M.K	Head/NRW
25	Tomohiro Shimizu	JICA Expert Team
26	Takeshi Yajima	JICA Expert Team
27	Hiroyuki Morita	JICA Expert Team
28	Taketoshi Fujiyama	JICA Expert Team
29	Norobu Osakabe	JICA Expert Team
30	Akinori Miyoshi	JICA Expert Team





**The Federal Capital Territory  
Reduction of Non-Revenue Water Project  
Monthly Technical Meeting**

**Results of Project Monitoring  
(Period: January 2017 - July 2017)  
and Schedule of Activities**

**Engr. M. K. Rabiou, HOU NRW, FCTWB**

29<sup>th</sup> August, 2017

**Contents**

1. Overall Goal, Project Purpose and Three Outputs
2. Progress of Activity for Output-1
3. Progress of Activity for Output-2
4. Progress of Activity for Output-3
5. Achievement of the Three Outputs
6. Remarkable/Considerable Issues
7. Actions raised in the past Monitoring
8. Delay of Work Schedule and/or Problems
9. Necessity of Revision of PDM & PO
10. Schedule of Activities
11. Content of Medium Term- Strategic Plan

**1. Overall Goal, Project Purpose and Three Outputs**

<b>Overall Goal</b>	Level of Non-Revenue Water (NRW) is reduced at the service area of FCTWB. ▲
<b>Project Purpose</b>	<b>Capacity of FCTWB for NRW reduction is strengthened.</b> ▲
<b>Output-1</b>	Level of NRW of both the service area of FCTWB and water distribution areas is monitored regularly.
<b>Output-2</b>	Methods/operational procedures for effective NRW reduction are established through pilot projects at Pilot Metering Areas (PMAs) under pilot Area Offices.
<b>Output-3</b>	A medium-term strategic plan of FCTWB for NRW reduction is developed, utilizing the results of Output 1-2.

**2. Progress of Activity for Output-1**

**Level of NRW of both the service area of FCTWB and water distribution areas is monitored regularly.**

No	Activity	Current Monitoring (as at July 2017)
1-1	Install bulk meters to water treatment plants 1 and 2	Completed.
1-2	Measure monthly water production of water treatment plants 1, 2, 3, and 4	Flow data measurement has not always been available, which is due to <b>non-full of water flow</b> inside pipelines and <b>electrical challenges</b> (fuse burning).
1-3	Tally the above water production data monthly	The Project needs at least 6 months for monitoring this Activity.
1-4	Calculate the monthly water consumption based on the billing data	<ul style="list-style-type: none"> <li>■ Calculation pending</li> <li>■ Zonal coding is ongoing for water distribution management.</li> <li>■ <b>Re-evaluation</b> and <b>update</b> of the modified billing system is required.</li> <li>■ <b>Constant power supply, adequate provision for consumables and SOP</b> are highly required</li> </ul>

## 2. Progress of Activity for Output-1

Level of NRW of both the service area of FCTWB and water distribution areas is monitored regularly.

No	Activity	Current Monitoring (as at July 2017)
1-5	Calculate monthly NRW ratio of the service area of FCTWB using the data obtained from Activity 1-3 and 1-4	The Project needs at least 6 months for monitoring this Activity.
1-6	Install zonal meters, water pressure sensor and pilot remote monitoring (telemetry) system	<ul style="list-style-type: none"> <li>Progress :95%,</li> <li>Setting-up of zonal meters has not been done properly due to non-full of water flow inside pipelines (Automatic Gain Adjustment for data correction).</li> <li>Constant power supply and adequate provision for logistics are necessary.</li> </ul>
1-7	Measure and collect data for water distribution management such as water flow of zonal meters and water pressure	The Activity will be implemented after the completion of Activity 1-6.

Annex 4-189

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## 3. Progress of Activity for Output-2

Methods/operational procedures for effective NRW reduction are established through pilot projects at Pilot Metering Areas (PMAs) under pilot Area Offices.

No	Activity	Current Monitoring (as at July 2017)
2-7	Isolate a SMA by installing valves	<ul style="list-style-type: none"> <li>Progress: 90%, (Follow-up) Completed in Gudu and Jabi Area Offices, but provisionally completed in Garki I because of unsuccessful NRW reduction.</li> <li>Discrepancy between as-built drawings and actual situation on ground exist, and updated as-built drawings are not available.</li> <li>Information management with standardization and quality should be improved.</li> </ul>
2-8	Update the distribution network drawings for each SMA	<ul style="list-style-type: none"> <li>Progress: 90%, (Follow-up) Completed in Gudu and Jabi Area Offices, but provisionally completed in Garki I because of unsuccessful NRW reduction.</li> </ul>
2-9	Measure an initial level of NRW of each SMA	<ul style="list-style-type: none"> <li>Progress: 90%, (Follow-up) Completed in Gudu and Jabi Area Offices, but provisionally completed in Garki I because of unsuccessful NRW reduction. Activity in Garki I will be repeated.</li> <li>Administrative complication with respect to Commerce operations (mixture of customer categories, meter type, reading division, water tariff, etc.) has affected</li> </ul>

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## 3. Progress of Activity for Output-2

Methods/operational procedures for effective NRW reduction are established through pilot projects at Pilot Metering Areas (PMAs) under pilot Area Offices.

No	Activity	Current Monitoring (as at July 2017)
2-1	Review existing NRW reduction operations at each pilot Area Office	Completed.
2-2	Conduct capacity assessment of organization and the relevant staff	Progress: 50%, Behind: 2.0 months To be done after the completion of follow-up activities in Garki I and also NRW monitoring in pilot Area offices. Completed.
2-3	Identify and select a Pilot Metering Area (PMA) for each Pilot Area Office based on the selection criteria of PMA	Completed.
2-4	Prepare/update distribution network drawings for each PMA	Completed.
2-5	Install water flow meters to each PMA and measure in/outflows monthly	Completion (installation only). Meter reading in Gudu is ongoing. Adequate provision for logistics and SOP are necessary for monitoring monthly in/outflows. Completed.
2-6	Zone each PMA into Sub Metering Areas (SMA)	Completed.

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## 3. Progress of Activity for Output-2

Methods/operational procedures for effective NRW reduction are established through pilot projects at Pilot Metering Areas (PMAs) under pilot Area Offices.

No	Activity	Current Monitoring (as at July 2017)
2-10	Detect target NRW components (i.e. invisible leakage, customer meter malfunction, and illegal connection) of each SMA	<ul style="list-style-type: none"> <li>Progress: 90%, (Follow-up) Completed in Gudu and Jabi Area Offices, but provisionally completed in Garki I because of unsuccessful NRW reduction. Activity in Garki I will be repeated and will be kept in pilot Area offices based on results of Activity 2-5.</li> </ul>
2-11	Develop a NRW reduction operation plan of each SMA, including reduction target for review by Head of Distribution Department	<ul style="list-style-type: none"> <li>Progress: 90%, (Follow-up) Completed in Gudu and Jabi Area Offices, but provisionally completed in Garki I because of unsuccessful NRW reduction.</li> <li>Revision will be done in Garki I.</li> </ul>
2-12	Review and approve NRW reduction operation plan of each SMA	<ul style="list-style-type: none"> <li>Progress: 90%, (Follow-up) Completed in Gudu and Jabi Area Offices, but not completed in Garki I because of unsuccessful NRW reduction.</li> <li>Revision will be done in Garki I.</li> </ul>
2-13	Implement NRW reduction operations at each SMA	<ul style="list-style-type: none"> <li>Progress: 90%, (Follow-up) Completed in Gudu and Jabi Area Offices, but not completed in Garki I because of unsuccessful NRW reduction.</li> <li>Further operations will be done in Garki I.</li> </ul>

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### 3. Progress of Activity for Output-2

Methods/operational procedures for effective NRW reduction are established through pilot projects at Pilot Metering Areas (PMAs) under pilot Area Offices.

No	Activity	Current Monitoring (as at July 2017)
2-14	Monitor the progress of the NRW reduction operations of each SMA	<ul style="list-style-type: none"> <li>Progress: <b>90%</b>, (Follow-up) <b>Completed in Gudu and Jabi Area Offices</b>, but <b>not completed in Garki I</b> because of unsuccessful NRW reduction.</li> <li>Further operations will be done in Garki I.</li> </ul>
2-15	Measure level of NRW of each SMA at the end of the respective operations	<ul style="list-style-type: none"> <li>Progress: <b>90%</b>, (Follow-up) <b>Completed in Gudu and Jabi Area Offices</b>, but <b>not completed in Garki I</b> because of unsuccessful NRW reduction.</li> <li>Further operations will be done in Garki I.</li> </ul>
2-16	Prepare a report on pilot projects, covering Activity 2-1~2-15	<ul style="list-style-type: none"> <li>Progress: <b>90%</b>, (Follow-up) <b>Completed in Gudu and Jabi Area Offices</b>, but <b>not completed in Garki I</b> because of unsuccessful NRW reduction.</li> <li>Revision will be done after the completion of Activity 2-10 to 2-15.</li> </ul>
2-17	Develop manuals for NRW reduction for Area Office managers and field operators (i.e. technical operators)	<ul style="list-style-type: none"> <li>Progress: <b>50%</b>, (Follow-up) <b>Revision ongoing</b>.</li> <li>Finalization will be done after the completion of Activity 2-10 to 2-16.</li> </ul>

### 4. Progress of Activity for Output-3

A medium-term strategic plan of FCTWB for NRW reduction is developed, utilizing the results of Output 1-2.

No	Activity	Current Monitoring (as at July 2017)
3-5	Develop the first medium-term strategic plan (2018-2022) for approval by FCTA	<ul style="list-style-type: none"> <li>Progress: <b>00%</b>, To be completed by March 2018.</li> </ul>
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	<ul style="list-style-type: none"> <li>Progress: <b>00%</b>, To be completed by March 2018.</li> </ul>
3-7	Develop a planning manual for NRW reduction	<ul style="list-style-type: none"> <li>Progress: <b>00%</b>, To be completed by March 2018.</li> </ul>
3-8	Review existing plans, activities and implementing structure, etc. related to water distribution management	<ul style="list-style-type: none"> <li>Progress: <b>80%</b>, To be completed by October 2017.</li> <li>Pipeline and customer information should be <b>entered extensively into GIS</b> for all service areas.</li> </ul>
3-9	Establish framework of water distribution management	<ul style="list-style-type: none"> <li>Progress: <b>25%</b>, To be completed by October 2017.</li> </ul>

### 4. Progress of Activity for Output-3

A medium-term strategic plan of FCTWB for NRW reduction is developed, utilizing the results of Output 1-2.

No	Activity	Current Monitoring (as at July 2017)
3-1	Establish a Working Group for NRW reduction planning	Reviewed and <b>completed</b> .
3-2	Review existing plans, implementation structure, on-the-job training mechanism, etc. related to NRW reduction at FCTWB	<ul style="list-style-type: none"> <li>Reviewed and <b>completed</b>.</li> <li><b>Lack of HRD planning</b> of FCTWB's staff.</li> <li>FCTWB should have comprehensive training programme including OJT and internal training.</li> </ul>
3-3	Conduct hydraulic and water pressure distribution analyses of the pipeline networks	<ul style="list-style-type: none"> <li>To be completed by November 2017.</li> <li>Pipeline and customer information should be <b>entered extensively into GIS</b> for all service areas.</li> </ul>
3-4	Develop outlines of the medium-term strategic plan and its annual NRW reduction plan (approval by the Director)	<ul style="list-style-type: none"> <li>Progress: <b>25%</b>,</li> <li><b>Draft content</b> was prepared and <b>officers</b> were selected provisionally.</li> <li><b>Scenarios for NRW reduction strategic plan</b> have been discussed. To be completed by November 2017.</li> </ul>

### 5. Achievement of Three Outputs

**Output-1: Level of NRW of both the service area of FCTWB and water distribution areas is monitored regularly.**

No	Indicator	Current Monitoring (as at July 2017)
1a	Record of <b>monthly NRW ratio</b> is kept by Distribution Department from the third quarter of the second (*replace by "second" in PDM2) year of the Project.	<b>delayed</b> as a result of delay in Activities 1-2 to 1-5.
1b	Monthly NRW ratio of the service area of FCTWB is reported to <b>its monthly Joint Management Meeting</b> from the third quarter of the first (*replace by "second" in PDM2) year of the Project.	<b>delayed</b> as a result of delay in Activities 1-2 to 1-5.
1c	Quarterly NRW ratio of the service area of FCTWB is reported to the <b>Board of Directors</b> (*replace by "Management" in PDM2) of FCTWB from the third quarter of the first (*replace by "second" in PDM2) year of the Project.	<b>delayed</b> as a result of delay in Activities 1-2 to 1-5.

## 5. Achievement of Three Outputs

No	Indicator	Current Monitoring (as at July 2017)
1d	Periodic records of <b>data on water distribution management</b> such as water flow of zonal meters and water pressure are kept by Distribution Department from the first quarter of the third year of the Project.	<b>delayed</b> as a result of delay in Activities 1-6 and 1-7.
<b>Output-2: Methods/operational procedures for effective NRW reduction are established through pilot projects at Pilot Metering Areas (PMAs) under pilot Area Offices.</b>		
2a	<b>Decrease rate of NRW ratio for each Sub Metering Area</b> of a PMA reaches at least 80% of its target at the end of the respective NRW reduction operations.	<b>Achieved in Gudu and Jabi pilot Area Offices, but not achieved in Garki I.</b>
2b	<b>Technical manuals for Area Office</b> managers and field operators, including audio visual materials, are approved by Head of Department (HoD) for Distribution and HoD for Commerce by the first quarter of the third year of the Project.	<b>Technical manuals were prepared and provisionally approved, but to be reviewed and updated in Phase-2.</b>

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## 5. Achievement of Three Outputs

No	Indicator	Current Monitoring (as at July 2017)
<b>Output-3: Level of NRW of both the service area of FCTWB and water distribution areas is monitored regularly.</b>		
3a	By <b>October 2017</b> , draft medium-term strategic plan for NRW reduction (2018-2022) is submitted by <b>FCTWB to FCTA for review and approval.</b>	None (as planned).
3b	By <b>October 2017</b> , an annual NRW reduction plan (2018) is <b>incorporated in FCWTB's annual recurrent and capital plan (2018)</b> for submission to FCTA for review and approval.	None (as planned).
3c	A planning <b>manual for NRW reduction is approved by the Director of FCTWB by the end of the Project.</b>	None (as planned).
3d	By November 2016, framework of water distribution management is established.	<b>None and delayed.</b> Framework has not been ready due to delay in Activity 1-6, 1-7, 3-8 and 3-9.

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## 6. Remarkable/Considerable Issues

- Personnel Reassignment of the FCTWB's Project Members
- Delay in Release of Counterpart Fund 2017
- Legal Instrument (Enabling Law) establishing autonomous FCTWB
- Administrative Complication with respect to Commerce Operations
- Project Vehicle

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## 6. Remarkable/Considerable Issues

- **Personnel Reassignment of the FCTWB's Project Members**  
FCTWB needs to assure **transfer of information, knowledge and lessons learned** in the Project activities to his/her successor and other members
- **Delay in Release of Counterpart Fund 2017**  
The Counterpart Fund 2017 has not been released yet. The Nigerian side needs to keep in touch with JICA Expert Team on the status of FCT budget approval and release of the Counterpart Fund.
- **Legal Instrument (Enabling Law) establishing autonomous FCTWB**  
In anticipation of autonomy in the near future, JICA Expert Team suggests FCTWB set up a **preparatory committee or task-force** to discuss solutions to various issues and challenges surrounding FCTWB as well as strengthening and improvement in management.

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## 6. Remarkable/Considerable Issues

- **Administrative Complication with respect to Commerce Operations**  
Mixture of customer categories, meter types, reading divisions and water tariff, etc. have caused **inefficiency in commerce operations** which leads to **financial losses** of FCTWB. JICA Expert Team suggests FCTWB to resolve the issues in consideration of **streamlining, simplification and uniform management** among relevant Units.
- **Project Vehicle**  
Investigation of conditions of the project vehicle damaged by the traffic accident in March 2017 and arrangement of an alternate vehicle for implementing project activities are necessary.

## 7. Actions raised in the past Monitoring

- **Involvement of Counterparts**  
As a good example, a member of the Project has a high **motivation** to implement the NRW reduction activities by his effort. He has identified a **candidate project site, materials** to be procured for the implementation and **prepared estimated cost**. However, the **budget has not been approved**.
- **Assignment of Counterparts**  
The Nigerian side **needs to enhance project management skill** for the Project activities. Remarkably, FCTWB created new unit “**NRW Unit**” consisting of a Unit Head and two staff in Distribution Department in March 2017.
- **Involvement of Relevant Organizations**  
Due to non-responsive action by AGIS and then no relaxation in AGIS security, FCTWB decided to establish its **own GIS** which is separated from AGIS security.

## 7. Actions raised in the past Monitoring

- **Involvement of Counterparts**
- **Assignment of Counterparts**
- **Involvement of Relevant Organizations**
- **Communication between Distribution Department and Commerce Department**
- **Necessity for Strengthening Partnership between FCDA and FCTWB**
- **Lack of the Quality Management**

## 7. Actions raised in the past Monitoring

- **Communication between Distribution Department and Commerce Department**  
Distribution Department and Commerce Department **have to implement the cross-cutting activities** for NRW reduction. The newly-created “**NRW Unit**” is expected to work in conjunction with all stakeholders.
- **Necessity for Strengthening Partnership between FCDA and FCTWB**  
The Project has communicated officially/bilaterally with FCDA for setting up **further relationship and information sharing**. Remarkably, **through** occasion of **participating in the third training in Japan** by delegation officials comprised of **FCDA and FCTWB, their partnership has been more strengthened through shared awareness and knowledges**.

## 7. Actions raised in the past Monitoring

- **Action for “Lack of the Quality Management”**  
For any organization to succeed on its mandate, quality management should be given priority especially in operation and maintenance.
- It should be noted that, Quality management of FCTWB has been improved through joint supervision of construction of bulk/zonal meter chambers and solar power system installation, etc. But, the Project continues to emphasize on quality management through the project implementation

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## 8. Delay of Work Schedule and/or Problems

- **Delay of the Project**  
Available **monitoring period** of Activities 1-2 to 1-5 is **insufficient**, so the Project needs at least six months for monitoring the Activities 1-2 to 1-5.

### Cause

- In the Phase-1, the **chamber construction and procurement of materials** had delayed and **suspended** activities **due to non-release of the Counterpart Fund 2015&2016**.

- These were solved by **JICA's intervention**, particularly taking over chamber construction.

### Actions

In the past monitoring, the **Nigerian side requested** to the Japanese side to **extend the project period**, then the Japanese side **agreed**. So, the Project period will be **extended** for six months for monitoring the Activities 1-2 to 1-5.

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## 8. Delay of Work Schedule and/or Problems

- Delay of the Project
- Data Acquisition by Bulk and Zonal Flow Meters (Output-1)
- Irregular Billing (Output-1)
- Unsuccessful Results of the Pilot Project (Output-2)

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## 8. Delay of Work Schedule and/or Problems

- **Data Acquisition by Bulk and Zonal Flow Meters (Output-1)**

- The Project found out that **data acquisition is not always available** due to **non-full of water flow** inside pipelines and also **electrical challenges** at bulk flow meters.

### Cause

- **Interference at the upstream injection point** of the meters by water flow from WTP (No.3&4) to water flow from WTP (No.1&2) along trunk mains.

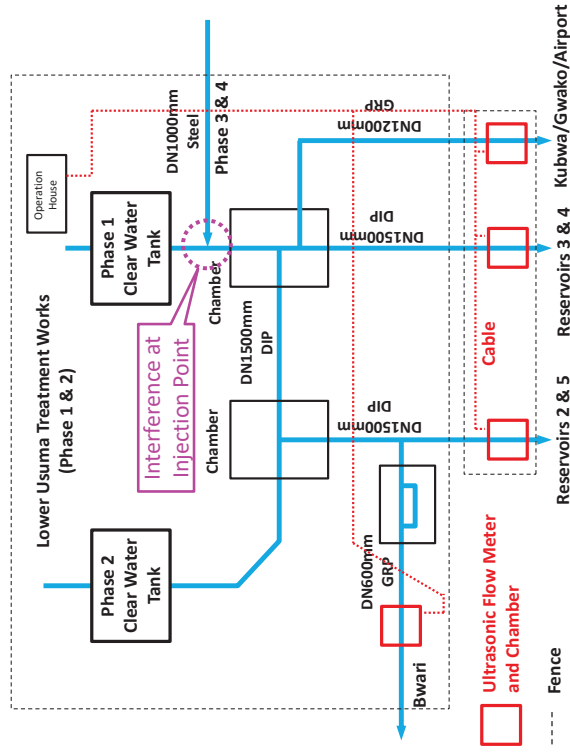
- **water supply does not meet water demand** in the whole system.

### Actions

- The Project will continue identify **how to estimate** water supply (production) based on **available and reliable data** which the Project can obtain with support of JICA Expert Team.
- FCTWB will solve electrical challenges of bulk meters immediately.

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## Bulk Flow Meters at LUD Outlet



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## 8. Delay of Work Schedule and/or Problems

### Irregular Billing (Output-1)

Billing has **not been regularly done** due to **non-constant power supply** and other **operational challenges**, however the situation has begun to improve. June bills were produced while July bills is in process.

#### Cause

The inability of regular billing is attributed to non-constant power supply. Also, **non-fully optimized billing application** has caused disorder of billing operations.

#### Actions

**Improvement in power supply conditions** for resumption of regular billing has been addressed in FCTWB since June 2017. The updated billing system and its operation are to be **re-evaluated holistically** and FCTWB **reviews and prepares SOP** for billing operations with support of JICA Expert Team.

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## 8. Delay of Work Schedule and/or Problems

### Unsuccessful Results of the Pilot Project (Output-2)

Follow-up activities and operations for NRW reduction in PMAs/ SMAs were completed in April 2017, however should be repeated and monitored particularly in **Garki I**, because the targeted reduction in NRW ratio was **not achieved**. See the next slide.

#### Cause

As a change of conditions, **inlet pipeline** into a SMA was discovered newly at the last minute in Garki I, which brought confusion to the implementation and analysis. Considering characteristics of Garki I, the Project assumes that **missing major consumers in the list** and **undiscovered inlet/outlet or connections** caused unexpected results.

#### Actions

As further follow-up activities, the Project **repeats** NRW reduction operations with **focusing on major consumers** in Garki I pilot area. If the operations lead to unsuccessful results again, FCTWB will identify **factors responsible** and finalizes **cost-benefit** of pilot project

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## NRW Ratio (%)

	Before %	After %	Reduction Point	Target After Full (80%)	Status
Gudu					
SMA-1	52.0	14.3	37.7	26.0 (31.2)	OK
SMA-2	53.9	28.7	25.2	27.0 (32.3)	OK
Jabi					
SMA-2	45.6	21.1	24.5	22.8 (27.4)	OK
SMA-3	87.6	42.6	45.0	43.8 (52.6)	OK
Garki I					
SMA-1	85.1	62.2	22.9	42.6 (51.1)	No
SMA-2	74.8	78.2	-3.4	37.4 (44.9)	No
SMA-3	70.0	53.7	16.3	35.0 (42.0)	No

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## 9. Necessity of PDM&PO Revision

Arising from the result of project monitoring, (see other handout)

- Project period should be **extended** for six months.
- **Overall goal**, its **indicators** should be achievable in accordance with findings in the past Project implementation.
- Also, **indicators of project purpose** also should be achieved.
- **Timeline** in activities and indicators should suit the current situation.
- Due to **difficulty in data measurement** of water flow under Output-1 activities, “**estimation**” based on available/ reliable data should be accepted, and
- Other small modifications

## 10. Schedule of Activities

### • NRW Follow Up Activities in Garki I

Detail data of main distribution pipes  
Customer's water consumption data,  
Hourly factor information  
Setting of node, allocation of water demand  
Detail data of distribution pipes  
Learning EPANET  
Data input  
Preparation of fittings  
Selection of fire hydrant  
Measurement of pressure on the field  
collected flow data  
Measurement of elevation on the field  
Reflect collected elevation data to system

### • Hydraulic analysis

Data Confirmation  
Finding No-meter house  
Amendment of the Excel list  
Meter procurement  
Meter installation  
NRW rate calculation  
New meters harmonization with the billing system  
7days AMR/Conv Meter reading  
Data Input  
24hrs flow measurement  
Calculation of NRW ratio

### • Distribution Management

Hydraulic analysis  
Finding poor Quality, Quantity and Pressure points  
Re-modeling to improve poor points  
Zone NRW analysis  
Manual

### • GIS

Scale  
Collection of data  
Data input, print out  
Amendment of map by field staff & HQ staff



**Contents of the Medium-term Strategic Plan (Draft)**

Contents	Points to write Strategic Plan	Essence	Person in charge		Meeting		
			Leader	Deputy Leader	12 Sept.	26 Sept.	10 Oct.
<b>1. Introduction to NRW Reduction</b>							
1.1 Background	<ul style="list-style-type: none"> <li>Current situation on NRW, etc. which FCTWB has been facing.</li> </ul>	The following are included in the plan: <ul style="list-style-type: none"> <li>Current NRW ratio is high</li> <li>Regular leakage survey and water meter replacement have not been done</li> <li>Water has not been supplied for 24hour-7days in the whole area</li> <li>Water supply area is expanding</li> <li>Others</li> </ul>	Rabiu	Maso'ud			
1.2 Objective of NRW Reduction	<ul style="list-style-type: none"> <li>Objective that FCTWB needs to reduce NRW.</li> </ul>	The following are included in the plan: <ul style="list-style-type: none"> <li>Objective of NRW reduction.</li> <li>Impact due to NRW reduction</li> <li>Others</li> </ul>	Rabiu	Akpan			
<b>2. Scenario and Goal</b>							
2.1 Scenarios (see Attachment-1.1 and -1.2)	<ul style="list-style-type: none"> <li>Scenario which depend on goal, budget, etc.</li> </ul>	a. FCTWB will establish the NRW reduction team in each area office. The team will create DMA and take NRW reduction activities like the Pilot Project targeting on NRW ratio of 30% for the year of 2022. b. FCTWB will establish the NRW reduction team in each area office. The team will NOT create DMA, but will take NRW reduction activities such as leakage survey, illegal connection survey and water meter survey targeting on NRW ratio of 35% for the year of 2022. c. FCTWB will establish the NRW reduction team in each area office. The team will NOT create DMA, but will take NRW reduction activities such as water meter survey, monitoring for surface leakage and	Maso'ud	Rabiu			

Contents	Points to write Strategic Plan	Essence	Person in charge		Meeting		
			Leader	Deputy Leader	12 Sept.	26 Sept.	10 Oct.
		illegal connection targeting on NRW ratio of 40% for the year of 2022. d. <b>Only FCTWB headquarters will take NRW reduction activities such as leakage survey, illegal connection survey and water meter survey systematically but NOT create DMA. FCTWB will target on NRW ratio of 40% for the year of 2022.</b> e. FCTWB will establish the NRW reduction team in each area office. The team will NOT create DMA and will focus on developing the existing pipeline drawings and customer data and conduct water meter survey. The team will leakage survey and illegal connection survey targeting on NRW ratio of 50% for the year of 2022 and examine replacement plan of the existing pipelines as soon as the team completes development of the existing pipe drawings and customer data.					
2.2 Mid-term Goal by Scenario	<ul style="list-style-type: none"> <li>Mid-term goal of NRW ratio by scenario for the target year</li> </ul>	Same as above	Maso'ud	Rabiu			
<b>3. Staffing Plan and their Responsibilities</b>							
3.1 Staffing Plan	<ul style="list-style-type: none"> <li>Overall staffing plan with NRW reduction unit and area office</li> </ul>	Description which states the following information is included in the plan. <ul style="list-style-type: none"> <li>Structure of the overall staffing plan for NRW reduction activities</li> </ul>	Rabiu	Akpan			
3.2 NRW Reduction Unit	<ul style="list-style-type: none"> <li>Main role of NRW reduction unit</li> </ul>	Description which states the following information is included in the plan. <ul style="list-style-type: none"> <li>Structure of the NRW Reduction Unit in</li> </ul>	Rabiu	Abdulrahman Muhammed			

Contents	Points to write Strategic Plan	Essence	Person in charge		Meeting		
			Leader	Deputy Leader	12 Sept.	26 Sept.	10 Oct.
		Headquarters ● Main role of the NRW Reduction Unit ● Others					
3.3 Area Office	● Main role of area office	Description which states the following information is included in the plan. ● Structure of the area office on NRW reduction activities ● Main role of the NRW Reduction Unit on NRW reduction activities ● Others	Area Manger	A. Managers			
3.4 Responsibilities of Staff	● Responsibilities of each staff	Description which states the following information is included in the plan. ● Annual report about NRW reduction ● Leakage survey team ● Calculation and analyze NRW ● Test meters in meter laboratory ● Data collection and analysis related to NRW reduction such as leakage repair report, meter accuracy test ● Others.	Rabiu	Maso'ud			
<b>4. Human Resource Development (HRD) Plan</b>							
4.1 Contents of HRD	● All the contents including workshop and training on NRW reduction that FCTWB requires	Training for technical staff and plumbers for every area offices on leakage survey through lecture and OJT. ● Lecture for NRW reduction activities such as components of IWA water balance, definition of NRW ratio, DMA creation, data collection ● Lecture on annual report about NRW reduction ● Lecture and OJT on test meters, meter reading and data handlings ● Others	Maso'ud	Akpan			

Contents	Points to write Strategic Plan	Essence	Person in charge		Meeting		
			Leader	Deputy Leader	12 Sept.	26 Sept.	10 Oct.
4.2 Periodical Workshop	● Contents of workshop	The following are included in the plan: ● Name of the workshop ● Contents of the workshop ● Frequency of the workshop ● Schedule of the workshop ● Others	Maso'ud	Rabiu			
4.3 Periodical Training	● Contents of training	The following are included in the plan: ● Name of the training course ● Contents of the training ● Duration of the training ● Target of trainees ● Others	Maso'ud	Rabiu			
4.4 Schedule of HRD Plan	● Tentative schedule of HRD plan for the next five years (by the year of 2022)	Description which states the following information is included in the plan ● Implementing schedule for HRD plan until the year of 2022	Maso'ud	Rabiu			
<b>5. Summary of Results of the Pilot Projects</b>							
5.1 Outline of the Pilot Projects	● Outlines such as location, service population, NRW ratio before countermeasure, etc. of each pilot project	The following are included in the plan: ● Selection of the pilot project ● Location of the pilot project ● Isolation of the pilot project area ● NRW reduction activities ● Others	Rabiu	Ozumi Courage Abdulahaman Muhammed			
5.2 Result of the Pilot Projects	● NRW ratio before & after countermeasure, main causes, correlation between NRW and feature of area	NRW ratio before and after NRW reduction activities and reduction percentage points.	Rabiu	Ozumi Courage Abdulahaman Muhammed			
5.3 Causes of NRW and their Patterns by Features of Pilot Project Area	● Causes such as leakage, illegal connections, meter inaccuracy, etc. ● Correlation between causes and feature of	Numbers of illegal connections, leakage and defective water meters	Rabiu	Ozumi Courage Abdulahaman Muhammed			

Contents	Points to write Strategic Plan	Essence	Person in charge		Meeting		
			Leader	Deputy Leader	12 Sept.	26 Sept.	10 Oct.
	areas						
5.4 Current Issues	<ul style="list-style-type: none"> <li>Current issues through pilot project activities</li> </ul>	Issues like the following examples are included in the plan: <ul style="list-style-type: none"> <li>Ensure budget for NRW reduction activities</li> <li>Manage information on all the customers under each area office</li> <li>Carry on regular activities such as leakage survey and illegal connection survey</li> <li>Calibration of test meters</li> <li>Others</li> </ul>	Rabiu	Maso`ud			
5.5 Lessons Learnt	<ul style="list-style-type: none"> <li>Lessons learnt from pilot project activities towards NRW reduction</li> </ul>	Examples of lessons learnt from the pilot project are included in the plan: <ul style="list-style-type: none"> <li>Difficulty in isolation due to lack of the existing pipe information</li> <li>Difficulty in management of customer's information</li> <li>Difficulty in management of multiple water meter readings such as conventional, AMR and pre-paid meters</li> <li>Difficulty in smooth procurement of materials because of release of budget</li> <li>Difficulty in operation of Personal Computer (PC) in the area offices</li> <li>Others</li> </ul>	Rabiu	Ozumi Courage Abdulrahman Muhammed			
<b>6. NRW Reduction Operations Plan</b>							
6.1 Workflow of NRW Reduction	<ul style="list-style-type: none"> <li>Overall workflow required for NRW reduction</li> </ul>	Workflow of five types such as Scenario 'a' to 'e'	Courage	Abdulhaman Muhammed			
6.2 NRW Reduction Operation Plan (see Attachment-2)	<ul style="list-style-type: none"> <li>Points of concern</li> </ul>						
(1) Network Drawings and		The following are included in the plan (Refer	Suleiman	Abdulhaman			

Contents	Points to write Strategic Plan	Essence	Person in charge		Meeting		
			Leader	Deputy Leader	12 Sept.	26 Sept.	10 Oct.
Data		to NRW reduction manual). <ul style="list-style-type: none"> <li>Compilation of as-built drawings</li> <li>Procure the shelves to keep the drawings in the room</li> <li>Procure printers and PCs</li> <li>Develop GIS data by every area office</li> <li>Update GIS</li> <li>Keeping printed GIS data and drawings in FCTWB's headquarters and the area offices</li> <li>Others</li> </ul>		Muhammed A.S. Sani Dauda			
(2) Customer Listing		Description which states the following information is included in the plan (Refer to NRW reduction manual). <ul style="list-style-type: none"> <li>Plot No.</li> <li>House No.</li> <li>User name</li> <li>Water meter No. , type and diameter</li> <li>Bank account No.</li> <li>Others</li> </ul>	Akpan	Okechuku			
(3) Design and Creation of DMA or Equivalent, Prioritization in NRW Reduction		Description which states the following information is included in the plan (Refer to NRW reduction manual). <ul style="list-style-type: none"> <li>Number of households</li> <li>Boundary</li> <li>Location of flow meter and isolation valve</li> <li>Others</li> </ul>	Maso`ud	Abubakar Ubale			
(4) Prioritization of each Zone		Description which states the following information is included in the plan (Refer to NRW reduction manual). <ul style="list-style-type: none"> <li>Selection criteria</li> <li>Others</li> </ul>	Maso`ud	Abubakar Ubale			
(5) Field Inspection of Existing Valves, etc.		Description which states the following information is included in the plan (Refer to	Ozumi	Leo			

Contents	Points to write Strategic Plan	Essence	Person in charge		Meeting		
			Leader	Deputy Leader	12 Sept.	26 Sept.	10 Oct.
		NRW reduction manual). <ul style="list-style-type: none"> <li>● Purpose of isolation</li> <li>● Appropriate isolation of area for accurate IWA water balance analysis</li> <li>● Others</li> </ul>					
(6) Installation of Flow-meter and Isolation valves		Description which states the following information is included in the plan (Refer to NRW reduction manual). <ul style="list-style-type: none"> <li>● Choosing types of flow meter (Mechanical or Ultra-sonic)</li> <li>● Preparation of location map</li> <li>● Examination of commercial power supply and photovoltaic system</li> <li>● Others</li> </ul>	Maso'ud	Dauda			
(7) Step-test in DMA		Description which states the following information is included in the plan (Refer to NRW reduction manual). <ul style="list-style-type: none"> <li>● Purpose of step-test</li> <li>● Process of step-test</li> <li>● Others</li> </ul>	Maso'ud	Dauda			
(8) Measurement of Minimum Night Flow (MNF) by Zone		Description which states the following information is included in the plan (Refer to NRW reduction manual). <ul style="list-style-type: none"> <li>● Purpose of MNF measurement</li> <li>● Process of MNF measurement</li> <li>● Others</li> </ul>					
(9) Leakage Detection		Description which states the following information is included in the plan (Refer to NRW reduction manual). <ul style="list-style-type: none"> <li>● Point survey</li> <li>● Line survey</li> <li>● Others</li> </ul>	Ozumi	Leo			
(10) Patrol of Surface Leakage and Illegal Connections		Description which states the following information is included in the plan (Refer to					

Contents	Points to write Strategic Plan	Essence	Person in charge		Meeting		
			Leader	Deputy Leader	12 Sept.	26 Sept.	10 Oct.
		NRW reduction manual). <ul style="list-style-type: none"> <li>● Structure of team</li> <li>● Reporting system</li> <li>● Others</li> </ul>					
(11) Repair of Leaks and Recording		Description which states the following information is included in the plan (Refer to NRW reduction manual). <ul style="list-style-type: none"> <li>● Record of address, pipe size, pipe materials, pipe position, place of leaks, condition of pipe laying, leakage volume</li> <li>● Others</li> </ul>	Ozumi	Abdulahman Muhammed			
(12) Identification of Illegal Connections and Meter Inaccuracy		Description which states the following information is included in the plan (Refer to NRW reduction manual). <ul style="list-style-type: none"> <li>● Types of illegal connection survey (e.g. inspection by gate valve control, inspection by residual chlorine test, etc.)</li> <li>● Process of illegal connection survey</li> <li>● Process for identifying defective water meter</li> <li>● Others</li> </ul>	Maso'ud	Abubakar Danladi			
(13) Data Collection of Billed Consumption Before/After NRW Reduction		Description which states the following information is included in the plan (Refer to NRW reduction manual). <ul style="list-style-type: none"> <li>● Frequency of data collection for billed consumption</li> <li>● Responsible section to collect information on billed consumption]</li> <li>● Others</li> </ul>	Akpan	Okechuku			
(14) Measures against Illegal Connections and Meter Inaccuracy		Description which states the following information is included in the plan (Refer to NRW reduction manual) <ul style="list-style-type: none"> <li>● Disconnection for illegal connection</li> <li>● Penalize illegal households</li> </ul>	Maso'ud	Courage			

Contents	Points to write Strategic Plan	Essence	Person in charge		Meeting		
			Leader	Deputy Leader	12 Sept.	26 Sept.	10 Oct.
		<ul style="list-style-type: none"> <li>● Replace water meters with new ones in case of accuracy water meter of which is over +/-10%.</li> <li>● Others</li> </ul>					
(15) Water Balance Analysis before/ after NRW Reduction Operations		Description which states the following information is included in the plan (Refer to NRW reduction manual) <ul style="list-style-type: none"> <li>● Purpose of IWA water balance analysis</li> <li>● Frequency of IWA water balance analysis</li> <li>● Evaluation of IWA water balance analysis</li> </ul>	Rabiu	Maso`ud			
(16) Examination of Pipe Replacement Plan		Description which states the following information is included in the plan (Refer to NRW reduction manual) <ul style="list-style-type: none"> <li>● Data collection of leakage occurrence frequency by materials, area, age of pipelines. Pipe laying condition</li> <li>● Examination of pipe replacement</li> <li>● Approximate cost</li> <li>● Others</li> </ul>	Suleiman	Courage			
<b>7. Cost-Effectiveness</b>							
7.1 Total Cost Estimate for NRW Reduction	<ul style="list-style-type: none"> <li>● Cost which is composed of personnel cost, consumable cost of fuel for vehicle, etc., cost of material and equipment such as valves, pipes and water meters to be installed</li> </ul>	Description which states the following information is included in the plan <ul style="list-style-type: none"> <li>● Process of cost estimation</li> <li>● Composition of cost                             <ul style="list-style-type: none"> <li>➢ Install meters to all customers</li> <li>➢ Replace inaccurate meters and faulty meters</li> <li>➢ Logistics</li> <li>➢ Staff to allocate additional meter reading and inspector</li> <li>➢ Awareness of water use, leakage and illegal water use</li> <li>➢ Installation of zonal meter at all reservoirs</li> </ul> </li> </ul>	Maso`ud	Dauda			

Contents	Points to write Strategic Plan	Essence	Person in charge		Meeting		
			Leader	Deputy Leader	12 Sept.	26 Sept.	10 Oct.
		<ul style="list-style-type: none"> <li>➢ PC for analysis at all area offices</li> <li>➢ Meter replacement in fixed interval years</li> <li>➢ Leakage survey equipment at all area offices</li> <li>➢ Leakage survey training yard</li> <li>➢ Meter laboratory</li> <li>➢ DMA creation</li> <li>➢ Others</li> <li>● Total approximate cost</li> <li>● Others</li> </ul>					
7.2 Total Revenue Estimate yielded through NRW Reduction	<ul style="list-style-type: none"> <li>● Revenue which the increase in revenue water multiplied by unit price is figured out</li> </ul>	Description which states the following information is included in the plan <ul style="list-style-type: none"> <li>● Process of revenue estimation process</li> <li>● Total approximate revenue</li> <li>● Others</li> </ul>	Akpan	Okechuku			
7.3 Estimate of Benefits	<ul style="list-style-type: none"> <li>● Benefit equals '7.2' - '7.1'</li> </ul>	Description which states the following information is included in the plan <ul style="list-style-type: none"> <li>● Process of benefit estimation</li> <li>● Total approximate benefit</li> <li>● Others</li> </ul>	Akpan	Okechuku			
<b>8. Implementing Schedule</b>							
8.1 Budget Allocation for NRW Reduction	<ul style="list-style-type: none"> <li>● Budget allocation until the year of 2022</li> </ul>	Description which states the following information is included in the plan <ul style="list-style-type: none"> <li>● Yearly budget allocation required for NRW reduction until the year of 2022</li> </ul>	Rabiu	Maso`ud			
8.2 Implementing Schedule	<ul style="list-style-type: none"> <li>● Implementing schedule for NRW reduction activities</li> </ul>	Description which states the following information is included in the plan <ul style="list-style-type: none"> <li>● Implementing schedule for NRW reduction until the year of 2022</li> </ul>	Rabiu	Maso`ud			
<b>9. Autonomy and Improvement in Financial Situation required for sustaining NRW Reduction Activities</b>	<ul style="list-style-type: none"> <li>● Various issues that must be solved for FCTWB to get autonomous</li> </ul>	Autonomy implementation, without autonomy implementation	Advisory-Level-Group	Advisory-Level-Group			

# **The Federal Capital Territory Reduction of Non-Revenue Water project**

## **Technical Notes on Monthly Technical Meeting**

28<sup>th</sup> September 2017

Engr. A. R. Lawal, Ag. HoD Distribution as the chairperson of the meeting gave an opening remark to officially start the meeting and handed over facilitation of the meeting to Engr. Usman A. Aliyu, Assistant Director halfway through it (see Appendix 1).

Mr. Choji S.D. PAM, Garki-I Acting Area Manager and Engr. Abdullahi MASUD, Head of Metering reported process of follow-up of the Pilot project in Garki-I and achievement on NRW ratio (see Appendix 2). Attendee questioned cost of water meter installation, number of unrecorded customers that were now been recorded into the billing database, etc.

On behalf of Engr. M.K.Rabiu, Head of NRW Unit, Engr. Abdullahi MASUD reported current progress on Distribution Management (see Appendix 3) and Zonal Meter installation. In addition, he requested all the participants to accelerate to formulate outlines of the Medium-term Strategic Plan based on Appendix 4. On the other hand, Engr. Usman A. Aliyu, Assistant Director introduced some challenges on Non-full flow of water transmission main lines at USUMA and their suggested solution.

Mr. Shehu SULEIMAN, Head of GIS and Engr. Abdulrahman MUHAMMED, Senior Engineer reported current progress of developing database required for hydraulic analysis, and progress of hydraulic analysis (see Appendix 5) respectively. Attendee questioned types of attribute in pipeline design that are included in development of database.

All the participants confirmed the current progress of the activities and some technical issues as reported.

Appendix 1: Attendance List

Appendix 2: Garki-I Pilot Project Follow up

Appendix 3: Water Distribution Management

Appendix 4: Guideline of formulating Medium-term Strategic Plan

Appendix 5: Hydraulic Analysis

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Engr. A.R. Lawal  
Ag. HoD, Distribution  
Federal Capital Territory Water Board,  
Federal Republic of Nigeria

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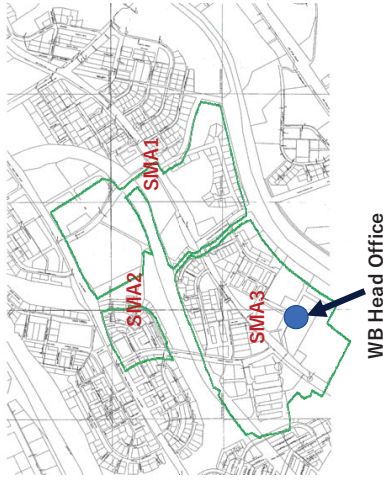
Mr. Akinori Miyoshi  
Chief Advisor for  
FCT Reduction of NRW Project  
Japan International Cooperation Agency  
(JICA)

**Appendix 1****FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER PROJECT  
TECHNICAL MEETING ATTENDANCE**28<sup>th</sup> September 2017

S/N	Name	Job Title
1.	Abolade R. Lawal	HOD/ Distribution
2.	Usman A. Aliyu	Distribution Dept.
3.	Shehu Suleiman	Head GIS
4.	Abdullahi Masaud	Head Metering
5.	Abdulahman Shehu Sani	Head Prepaid Meter
6.	Courage I. O	NRW Unit, Distribution Dept.
7.	Abubakar Ubale A.	Senior Civil Engineer
8.	Abdulrahman Mohammed	Senior Civil Engineer
9.	Muhammed Dauda	Pipeline Unit
10.	Mumini Adekunle Raifu	Assistant Area Manager, Structure Engineer
11.	Kenneth Madu	Senior Craftsman, Distribution Dept.
12.	Ibrahim Yauri	Senior Foreman
13.	Raymond Olowokere	Senior Foreman
14.	Ezeh C. Hillary	Surveyor, GIS Unit
15.	Akujobi Obianuju E.	Senior Auditor (Internal Audit Unit)
16.	Odinga B. E	Chief Planning Officer (P.R.S Unit)
17.	Leo Yunusa	S.W/ Metering Unit
18.	Ahmed Gambo Adamu	Distribution/ Procurement Unit
19.	Yetunde Olaniyan	ACE/ Water Monitoring Unit
20.	Isak Sharafadeen	Metering Unit
21.	Hamsat Risikay	HOU/ Audit
22.	Choji Pam	A.g. Area Manager Garki-I
23.	Iliya M. Galadima	Work Superintendent, Garki-I Area Office
24.	Mercy Egwu	Commerce Department Officer Garki
25.	Fatima A. Abdullahi	Commerce Department Officer Garki
26.	Yahuza Ibrahim	Distribution Officer Garki
27.	Abdul Ozumi	A.g. Area Manager (Distribution) Gudu
28.	Abdul Yusuf	Superintendent P&P Estate Gudu
29.	Titus Dawan	Meter Reader/ Bill Distributor Gudu
30.	Abubakar Shaibu	Senior Craftman Gudu & Garki
31.	Mr. Hiroyuki Morita	JICA Expert Team
32.	Mr. Takeshi Yajima	JICA Expert Team
33.	Mr. Taketoshi Fujiyama	JICA Expert Team

# GARKI I Pilot Project Follow up

- **Data of May 2017**
- Number of general customer
  - SMA1: 31
  - SMA2: 123
  - SMA3: 242
- Number of Major customer: 33



## NRW rate as of May, 2017

GARKI	Before %	After %	Improvement
SMA1	85.1	62.2	22.9
SMA2	74.8	78.2	up
SMA3	70.0	53.5	16.5
PMA	74.8	60.3	14.5

**Not Good Result**

## Re-try on NRW measurement

Main Reason of high NRW rate may be not correct Basic information to Calculate the NRW rate

- We targeted water consumption volume
- Number of customer and Meter reading
- **AMR meter have been installed ⇒ no need field meter reading**
- **Many apartments, restaurants, carwashes**

### Thoroughgoing Investigation

- Need Conformation of number of customer & state of meter installation to all consumer

## Investigation of Real Customer number

S/N	CUSTOMERS NAME	CUSTOMERS ADDRESS	ACCOUNT NO	AMR NO	METER NO	DATE OF INSTALLATION
1	Mama Hava Garden	Plot. 4464 F. Ramsome kuti road Area 3.		1820671728	51498058	08/09/2017
2	Owerri Garden	Plot. 2022. F. Romsome road area 3 Gk1		1821118201	51487636	08/09/2017
3	Friendly Garden	By Ngwa close		182118245	51495991	08/09/2017
4	Jacob place	By Ngwa close		1821104271	51487579	08/09/2017
5	Bamitale Onile	Block. 19. Flat 2. Baure close area 3		1821111772	51487595	08/09/2017
6	Christ Embassy church	Behind Savannah suite area 3 Garki		1821115266	51487560	08/09/2017
7	Car Wash	Inside Air wave garden area 3		1820253934	51289790	08/09/2017
8	Nepa (sub station)	Plot. 25. kaure Namoda street. Area 3 garki		1820253904	51289792	08/09/2017
9	Church	Plot. 4964 F. Ramsome kuti road. Area 3 garki		1820253321	51289791	08/09/2017
10	Nigerian Scrabble Federation	O. Ihiala close. off plateau street area 3	GAE 00404	1820253912	51289794	09/09/2017
11	Mr Uche Dike Garden	Plot. 1877. Bachtia area 2, section 2. Garki	GAE 00011	1821138680	51487987	09/09/2017
12	Car Wash Garden	Plot. 1877. Bachtia Area 2		1820256796	51289795	09/09/2017
13	Mrs Shola Edom	Garden 17/45. Bachtia close	GAE 004081	1821128710	51497541	09/09/2017
14	Ruth Restaurant Garden	Ihiala close off plateau streets. Area 2 section 2	GAE 00406	1821125820	51491765	09/09/2017
15	D. Bamboob Garden	Plot. 1862 Ihiala street area2 section2		1820256916	51489793	08/09/2017
16	The Occupant.	Block 41. flat. 779 Iafanchian area 2, section 2	GAE00264	1821125511	51497747	11/09/2017
17	Amadon Cuisine	Ihiala close. off plateau street area 2, section 2		1821104193	51493627	11/09/2017
18	Ufe. Style Garden	Behind Garki secondary sch area 3	GRA00167	1821136396	51491829	11/09/2017
19	Abubike Marie. N.	Block 17. flat. 1. C/Rivers Area 3. Garki		1820653541	51491829	12/09/2017
20	Osho Khamelele	Plot 3,block 5. 2 Cross River close (A01)Garki	A01-094.11.76K1	1820647298	51491830	12/09/2017
21	Festival Road primary sch, Garki	Festival road primary school opp U.T.C Area 10		1820653282	51491831	12/09/2017
22	Abuja Shopping Complex	Abuja shopping mall		1820656867	51491834	12/09/2017
23	Unity Bank.	Unity bank area 3, garki	GRA0024A	1820647331	51491833	13/09/2017
24	ATM Mustapha A.	Block 19. flat 2. Baure close. area 3		1820653538	51491832	14/09/2017

**Found No Meter Users**

**New Meter Installation**



# Investigation of Real Customer number

SNo	Account Number	SMA	Customer Name	Address	Usage Type (Res/1.C/comm/1)	Meter Type (AMR, Co meter)
<b>Garkil AMR Customers List</b>						
<b>GARKIL Customer List SMA2</b>						
1	1401-08651-CK1	2	MRS SIKUMI	JIHALA STREET	RESI	AMR
2	1401-08655-CK1	2	MRS LINDA GEGZALIP	JIHALA STREET	RESI	AMR
3	1401-08656-CK1	2	SUKUMI	JIHALA STREET	RESI	CONVE
4	1401-08657-CK1	2	SUKUMI	JIHALA STREET	RESI	CONVE
5	1401-08658-CK1	2	KELLY S. AWALA	WILKINS STREET	RESI	CONVE
6	1401-08659-CK1	2	SHAYLA S. BELLE	WILKINS STREET	RESI	CONVE
7	1401-08660-CK1	2	MELINDA DIXON	WILKINS STREET	RESI	CONVE
8	1401-08661-CK1	2	MRS ROBINSON	WILKINS STREET	RESI	CONVE
9	1401-08662-CK1	2	NATHANIEL CHERLU	WILKINS STREET	RESI	CONVE
10	1401-08663-CK1	2	MIC TORIA ZABAYO	KAFANCHAN STREET	RESI	CONVE
11	1401-110888-CK1	2	MRS IKICHUKWU CLEMENT	Flat 6 Block 4	RESI	AMR
12	1401-08889-CK1	2	THE OCCUPANT	KAFANCHAN STREET	RESI	AMR
13	1401-08890-CK1	2	NO. NAME	KAFANCHAN STREET	RESI	AMR
14	1401-08891-CK1	2	DOBANIE ABEL M	KAFANCHAN STREET	RESI	AMR
15	1401-08892-CK1	2	ODION EYEKE	KAFANCHAN STREET	RESI	CONVE
16	1401-08893-CK1	2	ODION EYEKE	KAFANCHAN STREET	RESI	CONVE
17	1401-08894-CK1	2	OLUFEMI FESTUS	KAFANCHAN STREET	RESI	CONVE
18	1401-08895-CK1	2	MRS JOHN DASHIE	KAFANCHAN STREET	RESI	AMR
19	1401-08896-CK1	2	MRS B.M. MUSTOPHA	KAFANCHAN STREET	RESI	CONVE
20	1401-08897-CK1	2	MRS S. UNWERRHARWE	FLAT 7 BLOCK 2 BRASS STREET	RESI	AMR
21	1401-08898-CK1	2	MRS STELLA EYENDEKA	FLAT 7 BLOCK 2 BRASS STREET	RESI	AMR
22	1401-08899-CK1	2	MRS AIFER	FLAT 7 BLOCK 2 BRASS STREET	RESI	AMR

Found Not Recorded Customers

Add on the List

Adding SAM2:21

# Investigation of Real Customer number

SNo	Account Number	SMA	Customer Name	Address	Usage Type (Res/1.C/comm/1)	Meter Type (AMR, Co meter)
<b>Garkil AMR Customers List</b>						
<b>GARKIL Customer List SMA2</b>						
1	1401-08651-CK1	2	MRS SIKUMI	JIHALA STREET	RESI	AMR
2	1401-08655-CK1	2	MRS LINDA GEGZALIP	JIHALA STREET	RESI	AMR
3	1401-08656-CK1	2	SUKUMI	JIHALA STREET	RESI	CONVE
4	1401-08657-CK1	2	SUKUMI	JIHALA STREET	RESI	CONVE
5	1401-08658-CK1	2	KELLY S. AWALA	WILKINS STREET	RESI	CONVE
6	1401-08659-CK1	2	SHAYLA S. BELLE	WILKINS STREET	RESI	CONVE
7	1401-08660-CK1	2	MELINDA DIXON	WILKINS STREET	RESI	CONVE
8	1401-08661-CK1	2	MRS ROBINSON	WILKINS STREET	RESI	CONVE
9	1401-08662-CK1	2	NATHANIEL CHERLU	WILKINS STREET	RESI	CONVE
10	1401-08663-CK1	2	MIC TORIA ZABAYO	KAFANCHAN STREET	RESI	CONVE
11	1401-110888-CK1	2	MRS IKICHUKWU CLEMENT	Flat 6 Block 4	RESI	AMR
12	1401-08889-CK1	2	THE OCCUPANT	KAFANCHAN STREET	RESI	AMR
13	1401-08890-CK1	2	NO. NAME	KAFANCHAN STREET	RESI	AMR
14	1401-08891-CK1	2	DOBANIE ABEL M	KAFANCHAN STREET	RESI	AMR
15	1401-08892-CK1	2	ODION EYEKE	KAFANCHAN STREET	RESI	CONVE
16	1401-08893-CK1	2	ODION EYEKE	KAFANCHAN STREET	RESI	CONVE
17	1401-08894-CK1	2	OLUFEMI FESTUS	KAFANCHAN STREET	RESI	CONVE
18	1401-08895-CK1	2	MRS JOHN DASHIE	KAFANCHAN STREET	RESI	AMR
19	1401-08896-CK1	2	MRS B.M. MUSTOPHA	KAFANCHAN STREET	RESI	CONVE
20	1401-08897-CK1	2	MRS S. UNWERRHARWE	FLAT 7 BLOCK 2 BRASS STREET	RESI	AMR
21	1401-08898-CK1	2	MRS STELLA EYENDEKA	FLAT 7 BLOCK 2 BRASS STREET	RESI	AMR
22	1401-08899-CK1	2	MRS AIFER	FLAT 7 BLOCK 2 BRASS STREET	RESI	AMR

Found Not Recorded Customers

Add on the List

Adding SAM3:90

# Water Consumption by Statistical Analysis

Aggregation of Water Consumption from the Customer Record and Meter Reading

Meter Reading have been conducted 6-time

Category	Meter Type	Number of customer			Number of Estimate (Consumption)			Water Volume		
		SMA1	SMA2	SMA3	total	Water Type	SMA1	SMA2	SMA3	total
Domestic	CONVE	0	31	15	46	ESTIMATE	0	2	6	8
	RESI	0	0	0	0	RESI	0	1	0	1
						COMM1	0	1	0	1
Commercial	AMR	21	103	294	418	TOTAL	0	3	6	9
	Unknown	0	0	0	0	Sub-total	21	143	232	402
						CONVE	0	0	0	0
Commercial	AMR	5	3	12	20	AMR	5	3	12	20
	Unknown	0	0	0	0	Unknown	0	0	0	0
						Sub-total	5	3	12	20
TOTAL		21	143	232	402	Counter	21	143	232	402

# Water Consumption by Statistical Analysis

Result of Meter Reading Sep.2017

Category	Meter Type	Number of customer			Number of Estimate (Consumption)			Water Volume		
		SMA1	SMA2	SMA3	total	Water Type	SMA1	SMA2	SMA3	total
Domestic	CONVE	0	49	49	98	ESTIMATE	0	2	7	9
	RESI	0	0	0	0	RESI	0	1	0	1
						COMM1	0	1	0	1
Commercial	AMR	21	100	236	407	TOTAL	0	3	7	10
	Unknown	0	0	0	0	Sub-total	21	173	305	499
						CONVE	0	0	0	0
Commercial	AMR	13	2	23	38	AMR	13	2	23	38
	Unknown	0	0	0	0	Unknown	0	0	0	0
						Sub-total	13	2	23	38
TOTAL		34	175	328	537	Counter	34	175	328	537

402

## NRW Rate of GARKI PMA(Before June,2016)

GARKI PMA Water Balance Analysis		Before	m3/D	%	m3/D
②Revenue Water	Billed Metered Consumption	④	409.3	12.8%	④-1 347.1
	Billed Unmetered Consumption (Flat Rate)	⑤	396.9	12.4%	④-2 62.2
①System Input Volume	806	⑥	386.6	12.1%	⑤-1 185.3
		⑦	41.0	1.3%	⑤-2 211.6
③Non Revenue Water	3,197	⑧	26.8	0.8%	⑥-1 151.9
		⑨	11.9	0.4%	⑥-2 234.6
2,391	Commercial Losses	⑩	1,171.0	36.6%	⑦-1 6.0
		⑪	753.7	23.6%	⑦-2 35.0
74.8%	Physical Losses				9

Extremely High

Annex4-205

## NRW Rate of GARKI PMA (May,2017)

GARKI PMA After Water Balance Analysis		Ex post	m3/D	%	m3/D
②Revenue Water	Billed Metered Consumption	④	1,236.4	36.8%	④-1 651.6
	Billed Unmetered Consumption (Flat Rate)	⑤	95.6	2.8%	④-2 584.8
①System Input Volume	1,332	⑥	85.7	2.6%	⑤-1 14.8
		⑦	128.2	3.8%	⑤-2 80.8
3,356	③Non Revenue Water	⑧	0.0	0.0%	⑥-1 12.1
		⑨	0.0	0.0%	⑥-2 73.6
2,024	Commercial Losses	⑩	1,809.7	53.9%	⑦-1 1.9
		⑪	0.0	0.0%	⑦-2 126.3
60.3%	Physical Losses				

10

## NRW Rate of GARKI PMA (Sep,2017)

GARKI PMA After Water Balance Analysis		Ex post:2017 September	m3/D	%	m3/D
②Revenue Water	Billed Metered Consumption	④	1,443.5	50.8%	④-1 910.7
	Billed Unmetered Consumption (Flat Rate)	⑤	185.6	6.5%	④-2 532.8
①System Input Volume	1,629	⑥	150.2	5.3%	⑤-1 104.8
		⑦	128.2	4.5%	⑤-2 80.8
2,852	③Non Revenue Water	⑧	0.0	0.0%	⑥-1 76.6
		⑨	0.0	0.0%	⑥-2 73.6
1,223	Commercial Losses	⑩	944.5	33.1%	⑦-1 1.9
		⑪	0.0	0.0%	⑦-2 126.3
42.9%	Physical Losses				

Major consumer data is same as May, 2017 and Newly installed meters consumption are average data



## The Federal Capital Territory Reduction of NRW Project (Phase-2)

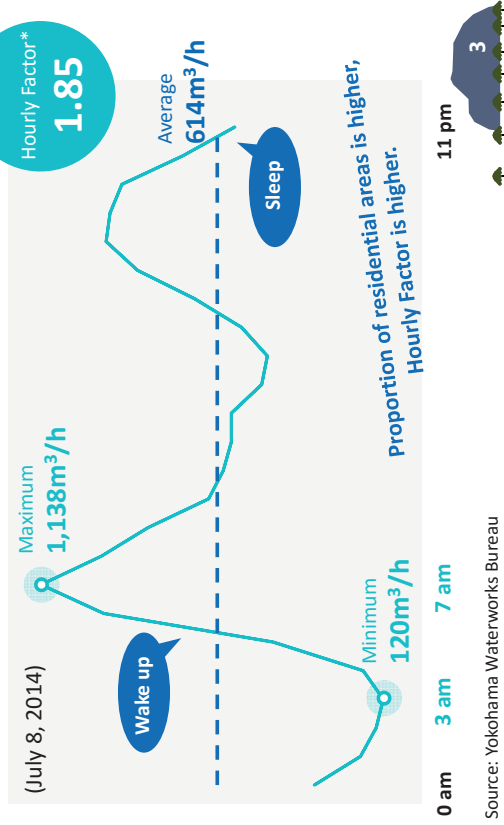
### Water Distribution Management

28<sup>th</sup> September, 2017

Engr. Abdullashi Mas'ud & M. K. Rabi  
HoU NRW, FCTWB

## Water demand also varies with time

Water Supply in Miho Pumping Area [m<sup>3</sup>/h]  
\*Hourly Factor = Max. / Ave.



## Concept of Water Distribution Management

Water supply utilities have to control **Water Volume**, **Water Pressure**, **Water Quality**.

**Water Volume**

Water supply utilities have to supply **necessary and sufficient water** even at peak and in future.

**Water Pressure**

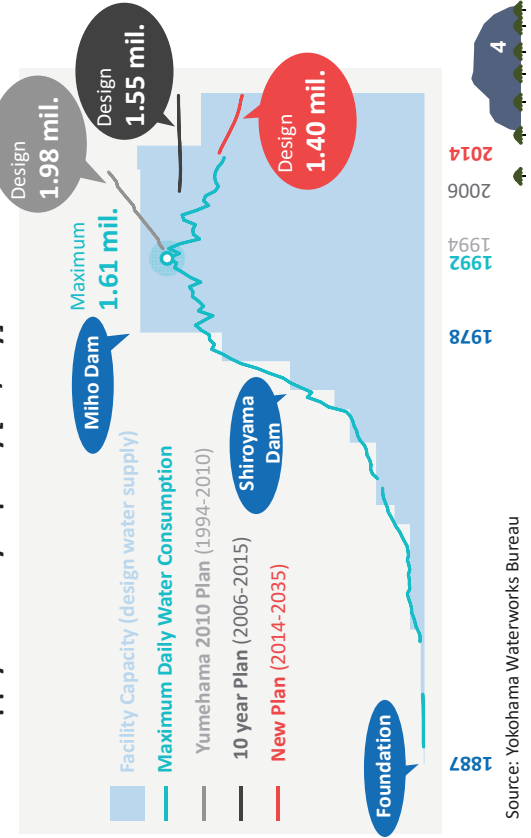
Water supply utilities have to supply water **at proper water pressure** at each service point.

**Water Quality**

Water supply utilities have to supply **safety water** (Ensuring residual chlorine at each service point).

## Water Demand Forecasting

Water Supply & Facility Capacity [m<sup>3</sup>/day]



# Proper Water Pressure in Japan

Design criteria for waterworks facilities of JWWA

## 7.5.3 Water Pressure

The water pressure of a distribution pipeline shall conform to the following conditions:

- [1] The minimum hydrodynamic pressure shall be ensured **more than 0.15MPa** in principle.
- [2] The maximum hydrostatic pressure shall **not exceed 0.74MPa** in principle.

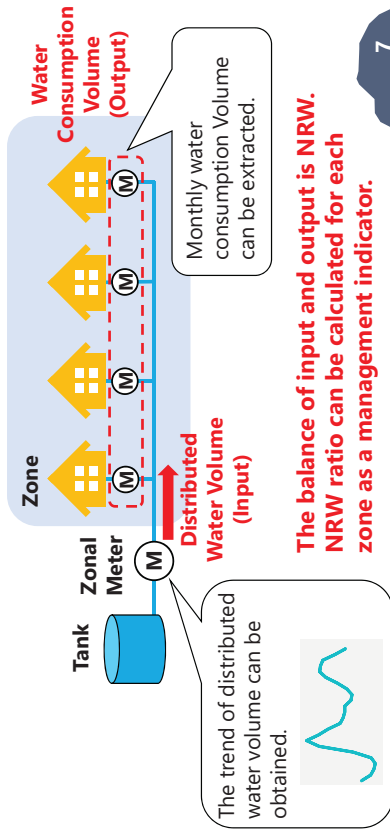
Water pressure of 0.15MPa can secure the direct water supply for two-storied building.

YWWB ensures the minimum hydrodynamic pressure more than 0.20MPa for the three-storied building.

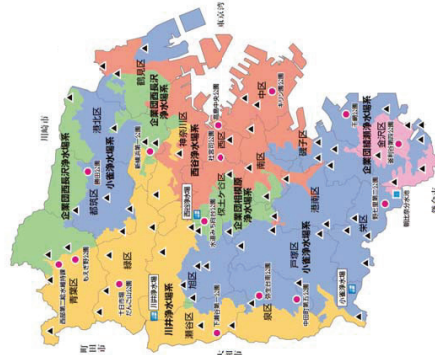


# Water volume control

- In this project, JICA installs zonal meters (ultrasonic flow meters) to each outlet pipe from Tank.



# Water Quality Management in Yokohama



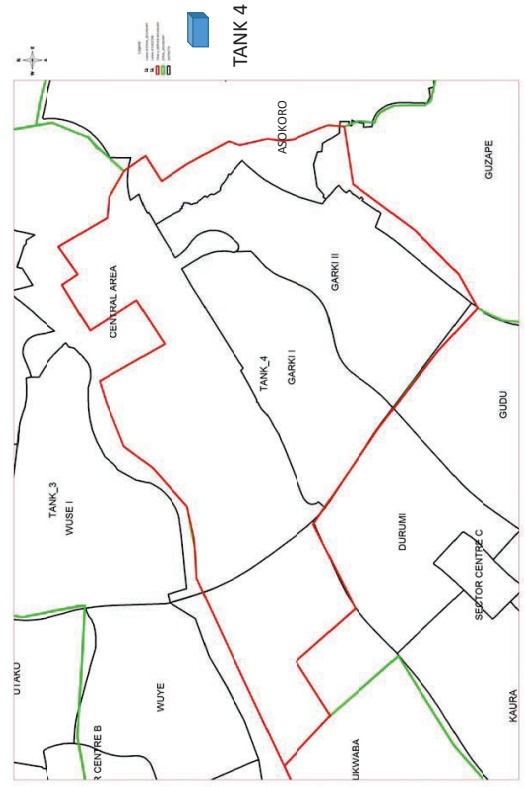
Water Resources	Count
WTP	3
Tap (every day)	62
Tap (monthly)	15
Diversion Reservoir	1
<b>Total</b>	<b>81</b>



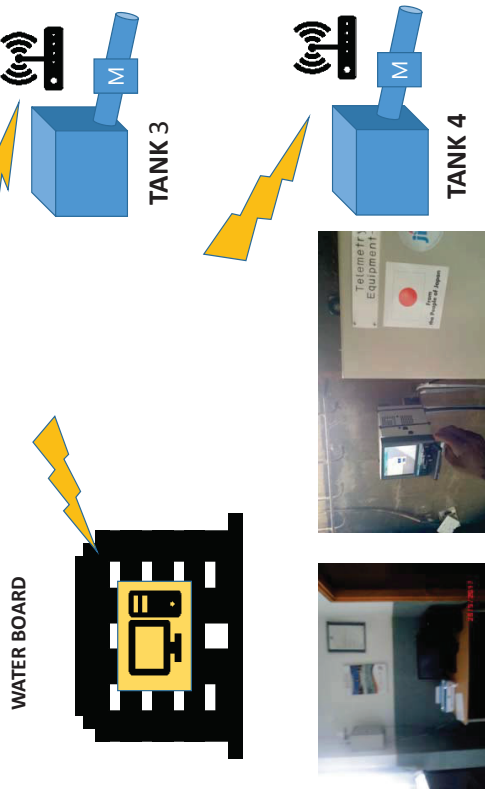
Automatic water quality measuring instrument (62 sampling points)



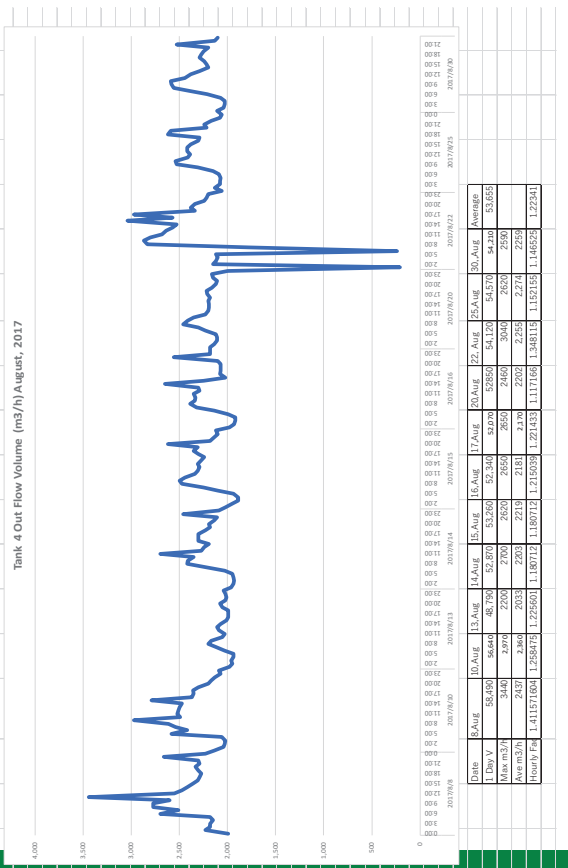
# Target Area in this Term: Tank4 Area



# Data Collection by telemetry

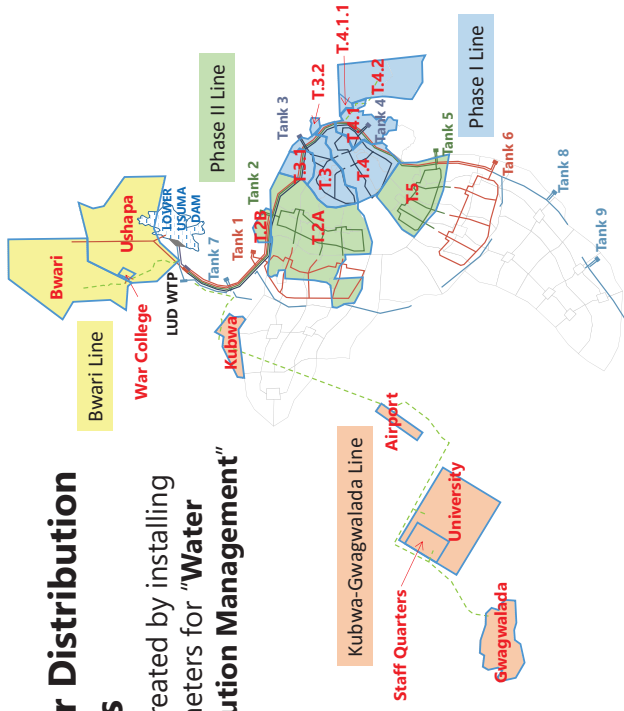


# Tank 4 Out flow by Telemetry



# Water Distribution Zones

To be created by installing zonal meters for "Water Distribution Management"



# UWTP Out Flow Data Collection



# Appendix 4

Japan International Cooperation Agency  
Federal Capital Territory Administration  
Federal Republic of Nigeria

## The Federal Capital Territory Reduction of Non-Revenue Water Project

### Medium-term Strategic Plan

November 2017

Yachiyo Engineering Co., Ltd.

Yokohama Water Co., Ltd. (Draft)

Federal Republic of Nigeria

The Federal Capital Territory Reduction of Non-Revenue Water Project  
Medium-term Strategic Plan (1<sup>st</sup> Draft)

<b>1. Introduction to NRW Reduction</b> .....	
1.1 Background .....	
1.2 Objective of NRW Reduction .....	
<b>2. Scenario and Goal</b> .....	
2.1 Scenarios .....	
2.2 Mid-term Goal by Scenario .....	
<b>3. Staffing Plan and their Responsibilities</b> .....	
3.1 Staffing Plan .....	
3.2 NRW Reduction Unit .....	
3.3 Area Office .....	
3.4 Responsibilities of Staff .....	
<b>4. Human Resource Development (HRD) Plan</b> .....	
4.1 Contents of HRD .....	
4.2 Periodical Workshop .....	
4.3 Periodical Training .....	
4.4 Schedule of HRD Plan .....	
<b>5. Summary of Results of the Pilot Projects</b> .....	
5.1 Outline of the Pilot Projects .....	
5.2 Result of the Pilot Projects .....	
5.3 Causes of NRW and their Patterns by Features of Pilot Project Area .....	
5.4 Current Issues .....	
5.5 Lessons Learnt .....	
<b>6. NRW Reduction Operations Plan</b> .....	
6.1 Workflow of NRW Reduction .....	
6.2 NRW Reduction Operation Plan .....	
(1) Network Drawings and Data .....	
(2) Customer Listing .....	
(3) Design and Creation of DMA or Equivalent, Prioritization in NRW Reduction .....	
(4) Prioritization of each Zone .....	
(5) Field Inspection of Existing Valves, etc. ....	
(6) Installation of Flow-meter and Isolation valves .....	
(7) Step-test in DMA .....	
(8) Measurement of Minimum Night Flow (MNF) by Zone .....	

- (9) Leakage Detection .....
  - (10) Patrol of Surface Leakage and Illegal Connections .....
  - (11) Repair of Leaks and Recording .....
  - (12) Identification of Illegal Connections and Meter Inaccuracy .....
  - (13) Data Collection of Billed Consumption Before/After NRW Reduction .....
  - (14) Measures against Illegal Connections and Meter Inaccuracy .....
  - (15) Water Balance Analysis before/ after NRW Reduction Operations .....
  - (16) Examination of Pipe Replacement Plan .....
- 7. Cost-Effectiveness** .....
- 7.1 Total Cost Estimate for NRW Reduction .....
  - 7.2 Total Revenue Estimate yielded through NRW Reduction .....
  - 7.3 Estimate of Benefits .....
- 8. Implementing Schedule** .....
- 8.1 Budget Allocation for NRW Reduction .....
  - 8.2 Implementing Schedule .....

**1. Introduction to NRW Reduction**

1.1 Background

The following are included in this section:

- Current NRW ratio is high
- Regular leakage survey and water meter replacement have not been done
- Water has not been supplied for 24hour-7days in the whole area
- Water supply area is expanding
- Others

1.2 Objective of NRW Reduction

Objective and necessity in NRW reduction will be described in this section. In addition, impact and effect due to NRW reduction will be stated as well.

**2. Scenario and Goal**

2.1 Scenarios

Five scenario will be summarized in terms of goal of NRW ratio, overview, budget, etc. required for reduction activities.

2.2 Mid-term Goal by Scenario

NRW ratio by scenario will be indicated by using matrix for five years (2019 to 2023) in this section.

**3. Staffing Plan and their Responsibilities**

3.1 Staffing Plan

Description which states Structure of the overall staffing plan for NRW reduction activities is included in this section. In addition, structure of the overall staffing plan will be indicated by the means of a diagram.

3.2 NRW Reduction Unit

Description which states the following information will be included in this section.

- Structure of the NRW Reduction Unit in Headquarters
  - Main role of the NRW Reduction Unit
  - Others
- Structure of the NRW Reduction Unit will be indicated by the means of a diagram. Role of each section under NRW reduction Unit will be described in this '3.2'.

3.3 Area Office

Description which states the following information will be included in the plan.

- Structure of the Area Office on NRW reduction activities
  - Main role of the Area Office on NRW reduction activities
  - Others
- Structure of the Area Office will be indicated by the means of a diagram. Role of Area Office on NRW reduction will be described in this '3.3'.

3.4 Responsibilities of Staff

Description which states the following are included in this section. Each staff and or group will be responsible for the following activities. It must be clarified in this section.

- Annual report about NRW reduction
- Leakage survey team
- Calculation and analyze NRW
- Test meters in meter laboratory
- Data collection and analysis related to NRW reduction such as leakage repair report, meter accuracy test
- Revision of Medium-term Strategic Plan
- Others.

4. Human Resource Development (HRD) Plan

4.1 Contents of HRD

- There are mainly three types of lectures; first one is NRW reduction activities, second one is annual report, third one is the activities required for billing and last one is the planning on NRW reduction activities. Necessity in each course will be stated in this section.
- Lecture for NRW reduction activities such as components of IWA water balance, definition of NRW ratio, DMA creation, data collection
  - Lecture on preparation of annual report about NRW reduction
  - Lecture and OJT on the activities required for billing such as water meter reading, billing, test meters and data handlings
  - Lecture on formulation of annual action plan and revision of medium-term strategic plan
  - Others

Training for technical & non-technical staff and plumbers for every Area Office on leakage survey through lecture and OJT will be carried out. Therefore, it is requested to describe that what kinds of trainings will be conducted in this section. In addition, differences between periodical training and workshop and their definition will be mentioned in this section.

4.2 Periodical Workshop

The following will be included in this section:

- Name of the workshop
- Contents of the workshop
- Frequency of the workshop
- Schedule of the workshop
- Others

This section will be shown in Diagram like a time table. For instance,

Workshop	Contents	2019				2020			
		1/4	2/4	3/4	4/4	1/4	2/4	3/4	4/4
XXX-Workshop	Basic knowledge on Leakage detection		*		*				
...	...								
...	...								
...	...								



#### 4.3 Periodical Training

The following will be included in the plan:

- Name of the training course
- Contents of the training
- Duration of the training
- Target of trainees
- Others

This section will be shown in Diagram like a time table. For instance,

Training	Contents	Trainees	2019				2020	
			1/4	2/4	3/4	4/4	...	...
XXX Training course	Analysis of IWA water balance and Review of NRW reduction activities	Group head of FCTWB headquarters			*			
...	...	...						
...	...	...						
...	...	...						

#### 4.4 Schedule of HRD Plan

If necessary:

### 5. Summary of Results of the Pilot Projects

#### 5.1 Outline of the Pilot Projects

The following are included in this section:

- Selection of the pilot project: Flow chart will be indicated (see Phase 1 - Final Report).
- Location of the pilot project: Pilot areas will be indicated in a plan view drawing (see Phase 1- Final Report).
- Isolation (PMA and SMA) of the pilot project area: Describe what kind of points were considered in order to isolate PMA and SMA.
- Population by PMA and SMA: Population by PMA and SMA will be summarized in one table.
- NRW reduction activities: Describe all the activities with flow chart will be summarized in this section.

#### 5.2 Result of the Pilot Projects

Summary sheet which NRW ratio before and after-countermeasure and NRW reduction (percentage point) is indicated will be prepared.

PMA	NRW Ratio (%)		NRW Reduction (Percentage Point)
	Before-countermeasure	After-countermeasure	
Guidu			
PMA			
SMA-1			
SMA-2			
...			
Jabi			
...			
Garki-I			
...			

#### 5.3 Causes of NRW and their Patterns by Features of Pilot Project Area

- Causes such as leakage, illegal connections, meter inaccuracy, etc. Numbers of illegal connections, leakage and defective water meters will be summarized.
- Correlation between NRW ratio and causes
- Correlation between causes and feature of areas

Data	PMA	
	Gudu	Jabi
Service Population		Garki-I
Number of Total Connections		
Year of Construction (Major pipes)		
Range of Pipe Diameter (mm)		
Total Pipe Distance (m)		
PVC (m)		
GS (m)		
DIP (m)		
CP (m)		
P.P (m)		
S.P. (m)		
A.C. (m)		
Number of System Input (Nr.)		
Number of Isolation Valves (Nr.)		
Fulfilled customer information for domestic (%)		
Fulfilled customer information for large consumer such as commercial and institution (%)		
Availability of As-built Drawings (%)		

Data	Before-Countermeasure		After-Countermeasure		Difference	
	Gudu	Jabi	Garki-I	Jabi	Gudu	Jabi
NRW Ratio (%)						
Number of Authorized Customers (Domestic)						
Number of Authorized Customers (Large Consumers)						
Number of Illegal Connections (Nr.)						
Number of Defective (inaccuracy) Water Meters (Nr.)						
Number of Leaks (Nr.)						
Number of Flat Rate (Nr.) Meters (Nr.)						
Number of Pre-paid Meters (Nr.)						
Number of AMRs (Nr.)						
Number of Conventional Meters (Nr.)						
Cost incurred for the Activities (NGN)						
Period for the Activities (days)						

5.4 Current Issues

Issues like the following examples are included in this section:

- Ensure budget for NRW reduction activities
- Compile information on all the customers under each area office and reflect it to billing system at FCTWB headquarters
- Develop information on the existing pipelines
- Carry on regular activities such as leakage survey and illegal connection survey
- Calibration of test meters
- Establish the measures of NRW reduction activities as easy as possible in terms of '6.1'.
- Others (Issues that you observed through pilot project should be described in this sections as much as possible.)

5.5 Lessons Learnt

Examples of lessons learnt from the pilot project are included in this section:

- Difficulty in isolation due to lack of the existing pipe information
  - Describe at least three solutions what we have to do in order to solve difficulties.
- Difficulty in management of customer's information
  - Describe at least three solutions what we have to do in order to solve difficulties.
- Difficulty in management of multiple water meter readings such as conventional, AMR and pre-paid meters
  - Describe at least two solutions what we have to do in order to solve difficulties.
- Difficulty in smooth procurement of materials because of release of budget
  - Describe at least one solution what we have to do in order to solve difficulties.
- Difficulty in operation of Personal Computer (PC) in the area offices
  - Describe at least two solutions what we have to do in order to solve difficulties.
- Others (Lessons that you learnt through pilot project should be described in this sections as much as possible.)

## 6. NRW Reduction Operations Plan

### 6.1 Workflow of NRW Reduction

Overall workflow required for NRW reduction will be indicated in this section.  
See NRW reduction manual for preparing workflow of five types such as Scenario 'a' to 'e'.

### 6.2 NRW Reduction Operation Plan

- (1) Network Drawings and Data

First of all, purpose of developing network drawing and data will be described in this section.

The following are included in this section (Refer to NRW reduction manual).

- Compilation of as-built drawings
- Procure the shelves to keep the drawings in the room
- Procure printers and PCs
- Develop GIS data by every area office
- Update GIS
- Keeping printed GIS data and drawings in FCTWB's headquarters and the area offices
- Others

Summary of each activity, points of concern by activity will be described in this section. In addition, some issues that staff may face when the above activities are carried out will be described.

- (2) Customer Listing

First of all, purpose of preparing customer listing will be described in this section.

Description which states the following information is included in this section (Refer to NRW reduction manual).

- Plot No.
- House No.
- User' name
- Water meter No. , type and diameter
- Bank account No.
- Others

Summary of customer listing, its points of concern will be described in this section. In addition, some issues on customer listing will be described.

- (3) Design and Creation of DMA or Equivalent, Prioritization in NRW Reduction

First of all, purpose of designing and creating DMA will be described in this section. The following information of DMA will be indicated in a plan view (Refer to NRW reduction manual).

- Number of households
- Boundary
- Location of flow meters and isolation valve
- Others

Points of concern will be described in this section. In addition, some issues on Design and Creation of DMA and prioritization of DMA will be described.

(4) Prioritization of each Zone

First of all, purpose of prioritizing zone in FCT will be described in this section. Following information is described in the plan (Refer to NRW reduction manual).

- Selection criteria to prioritize zone
  - Others
- Are there any selection criteria other than NRW ratio?

Criteria	1) Initial Points	2) Weighting Coefficient	3) Final Score = 1) x 2)
1. Quick impact	XXX points	50%	XXX points
2. Zone where lots of large consumers gather	XXX points	...	XXX points
3. NRW ratio	XXX points	...	XXX points
....	XXX points	...	XXX points
....	XXX points	...	XXX points
<b>Total</b>			

**Quick Impact**

Criteria	Initial Points
Countermeasure to be completed less than two week	3 points
Countermeasure to be completed less than a month	2 points
Countermeasure to be completed less than one and half month	1 point

**Zone where lots of Large Consumers gather**

Criteria	Initial Points
Large consumers of at least 50% gather in the zone	3 points
Large consumers of 20 to 40% gather in the zone	2 points
Large consumers of 10% or less gather in the zone	1 point

**NRW Ratio**

Criteria	Initial Points
More than 60%	3 points
40 to 50%	2 points
30% or less	1 point

Points of concern will be described in this section. In addition, some issues on Prioritization of each Zone will be described.

(5) Field Inspection of Existing Valves, etc.

First of all, purpose of field inspection of existing valves will be described in this section. Description which states the following information is included in this section (Refer to NRW reduction manual).

- Purpose of isolation
- Appropriate isolation of area (DMA) for accurate IWA water balance analysis
- Measures to check if area is isolated by using valves appropriately
- Others

Points of concern will be described in this section. In addition, some issues on Field Inspection of Existing Valves, etc. will be described.

(6) Installation of Flow-meter and Isolation valves

First of all, purpose of installation of flow-meter and isolation valves for DMA will be described in this section.

Description which states the following information is included in this section (Refer to NRW reduction manual).

- Choosing types of flow meter (Mechanical or Ultra-sonic)
  - How to choose types of flow-meter
- Preparation of location map
  - Describe plotting location of flow-meters and valves and show example which can be abstracted from Phase-I Final Report
- Examination of commercial power supply and photovoltaic system
  - Describe current condition of power supply by zone and a necessity of photovoltaic system
- Others

Points of concern will be described in this section. In addition, some issues on installation of flow-meter and isolation valves will be described.

(7) Step-test in DMA

First of all, purpose of step-test in DMA will be described in this section.

Description which states the following information is included in this section (Refer to NRW reduction manual).

- Process of step-test showing diagram
- Others

Points of concern will be described in this section. In addition, some issues on step-test in DMA will be described.

(8) Measurement of Minimum Night Flow (MNF) by Zone

First of all, purpose of measurement of Minimum Night Flow (MNF) in DMA will be described in this section.

Description which states the following information is included in this section (Refer to NRW reduction manual).

- Process of MNF measurement showing diagram (workflow, etc.)
- Others

Points of concern will be described in this section. In addition, some issues on measurement of Minimum Night Flow (MNF) by Zone will be described.

(9) Leakage Detection

First of all, purpose of leakage detection will be described in this section. Description which states the following information is included in this section (Refer to NRW reduction manual).

- Point survey
  - Definition, what is this survey useful for; required equipment
- Line survey
  - Definition, what is this survey useful for; required equipment
- Area survey
  - Definition, what is this survey useful for; required equipment

Table may be useful as follows:

Survey	Definition	Effect by Survey	Required Equipment	...	.....
Point Survey					
Line Survey					
Area Survey					

Points of concern will be described in this section. In addition, some issues on leakage detection by zone will be described.

(10) Patrol of Surface Leakage and Illegal Connections

First of all, purpose of patrol of surface leakage and illegal connections in DMA will be described in this section.

Description which states the following information is included in this section (Refer to NRW reduction manual).

- Structure of team who patrol site of surface leakage and illegal connections in DMA
  - Indicate structure in diagram
- Reporting system
  - Describe how staff report the record of patrol to division in charge of dealing
- Others

Points of concern will be described in this section. In addition, some issues on patrol of surface leakage and illegal connections will be described.

(11) Repair of Leaks and Recording

First of all, purpose of repair of leaks and recording will be described in this section.

Description which states the following information is included in this section (Refer to NRW reduction manual).

- Record of address, pipe size, pipe materials, pipe position, place of leaks, condition of pipe laying, leakage volume
- Others

Points of concern will be described in this section. In addition, some issues on repair of leaks and recording will be described.

(12) Identification of Illegal Connections and Meter Inaccuracy

First of all, purpose of identification of illegal connections and meter inaccuracy will be described in this section.

Description which states the following information is included in this section (Refer to NRW reduction manual).

- Types of illegal connection survey (e.g. inspection by gate valve control, inspection by residual chlorine test, etc.)
  - Describe types of illegal connections and method to find illegal connections by their type
- Process of illegal connection survey
  - Describe process of illegal connections by method and type of illegal connection
- Process for identifying defective water meter
  - Describe process of identifying defective water meter
- Others

Points of concern will be described in this section. In addition, some issues on identification of illegal connections and meter inaccuracy will be described.

(13) Data Collection of Billed Consumption Before/After NRW Reduction

First of all, purpose of data collection of billed consumption before/after NRW reduction will be described in this section.

Description which states the following information is included in this section (Refer to NRW reduction manual).

- Frequency of data collection for billed consumption
- Responsible section to collect information on billed consumption
  - Responsible section depends on domestic customers and large consumption customers such as commercial, institution, etc. Describe how to compile data for billing in order to avoid missing data
- Others

Points of concern will be described in this section. In addition, some issues on data collection of billed consumption before/after NRW reduction will be described.

(14) Measures against Illegal Connections and Meter Inaccuracy

First of all, purpose of measures against illegal connections and meter inaccuracy will be described in this section.

Description which states the following information is included in the plan (Refer to NRW reduction manual)

- Disconnection for illegal connection
  - Describe process of disconnecting illegal connections
- Penalize illegal households
  - Describe penalty of illegal connections
- Replace water meters with new ones in case of accuracy water meter of which is over +-10%
  - Describe measures to eliminate meter inaccuracy

Points of concern will be described in this section. In addition, some issues on measures against illegal connections and meter inaccuracy will be described.

(15) Water Balance Analysis before/ after NRW Reduction Operations

First of all, purpose of water balance analysis before/ after NRW reduction operations will be described in this section.

Description which states the following information is included in this section (Refer to NRW reduction manual)

- IWA water balance sheet
- Frequency of IWA water balance analysis
- Evaluation of IWA water balance analysis

Points of concern will be described in this section. In addition, some issues on water balance analysis before/ after NRW reduction operations will be described.

(16) Examination of Pipe Replacement Plan

First of all, purpose of examination of pipe replacement plan will be described in this section.

Description which states the following information is included in this section (Refer to NRW reduction manual)

- Data collection of leakage occurrence frequency by materials, area, age of pipelines.
  - Pipe laying condition
- Examination of pipe replacement
- Approximate cost

Points of concern will be described in this section. In addition, some issues on examination of pipe replacement plan will be described.

**7. Cost-Effectiveness**

7.1 Total Cost Estimate for NRW Reduction in the Pilot Project

*First of all, purpose of total cost estimate for NRW Reduction in the pilot areas will be described in this section.*

*Description which states the following information is included in this section.*

- *Composition of cost*
  - The following will be compiled by using table. Basic cost consists of personnel, fuel, equipment such as water meters, valves, etc.*
    - *SMA and PMA creation*
    - *One week interval meter reading*
    - *Leakage survey*
    - *Leakage repair*
    - *Illegal connection survey*
    - *Measure against illegal connection*
    - *Tank investigation*
    - *Meter test*
    - *Measurement of one week water flow*
    - *Measurement of 24 hours water flow*
    - *Step test*
  - *Total approximate cost*
- Points of concern will be described in this section. In addition, some issues on total cost estimate for NRW Reduction in the pilot areas will be described.*

#### 7.2 Total Revenue Estimate yielded through NRW Reduction in the Pilot Project

*First of all, purpose of total revenue estimate yielded through NRW Reduction will be described in this section.*

*Description which states the following information is included in this section.*

- *Process of revenue estimation process*
  - *Total approximate revenue*
- Points of concern will be described in this section. In addition, some issues on total revenue estimate yielded through NRW Reduction will be described.*

#### 7.3 Estimate of Benefits in the Pilot Project

*First of all, purpose of estimate of benefits in the Pilot Project will be described in this section.*

*Description which states the following information is included in this section.*

- *Process of benefit estimation*
  - *Total approximate benefit*
- Points of concern will be described in this section. In addition, some issues on estimate of benefits in the Pilot Project will be described.*

#### 7.4 Future Cost Benefit in Midterm Strategic Plan

*First of all, purpose of future cost benefit in Midterm Strategic Plan will be described in this section.*

*Description which states the following information is included in this section.*

- *Total cost incurred for NRW reduction by scenario*
  - *Total approximate revenue by scenario*
  - *Total approximate future cost benefit by scenario*
- Points of concern will be described in this section. In addition, some issues on future cost benefit in Midterm Strategic Plan will be described.*

## 8. Implementing Schedule

### 8.1 Prioritization of Scenario

*Description which states the following information is included in this section.*

- *Selection Criteria of the best scenario*

### 8.2 Budget Allocation for NRW Reduction



First of all, purpose of budget allocation for NRW Reduction will be described in this section.

Description which states the following information is included in this section.

- Yearly budget released in the past three years
- Yearly budget allocation required for NRW reduction until the year of 2023

Points of concern will be described in this section. In addition, some issues on budget allocation for NRW Reduction will be described.

### 8.3 Implementing Schedule

First of all, purpose of implementing schedule will be described in this section.

Description which states the following information is included in the plan

- Implementing schedule for NRW reduction until the year of 2023

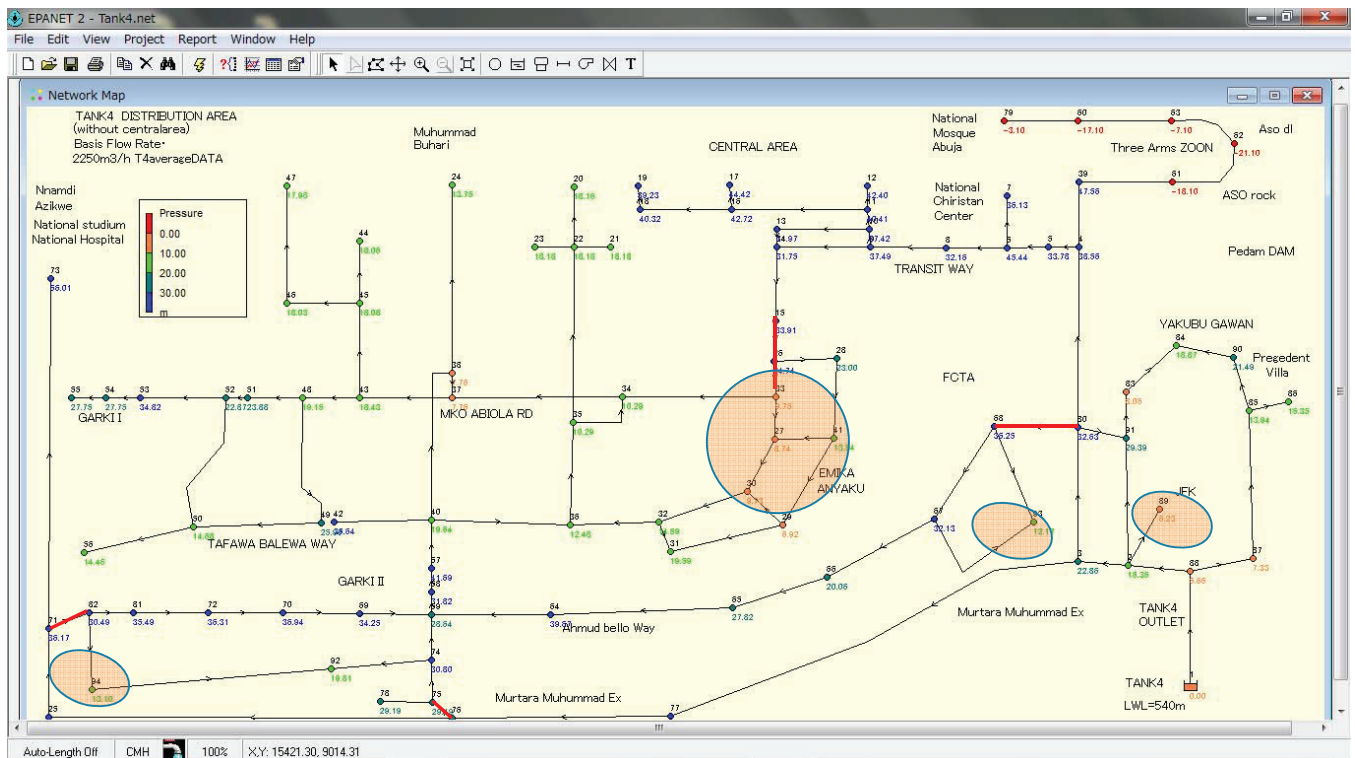
Points of concern will be described in this section. In addition, some issues on implementing schedule will be described.

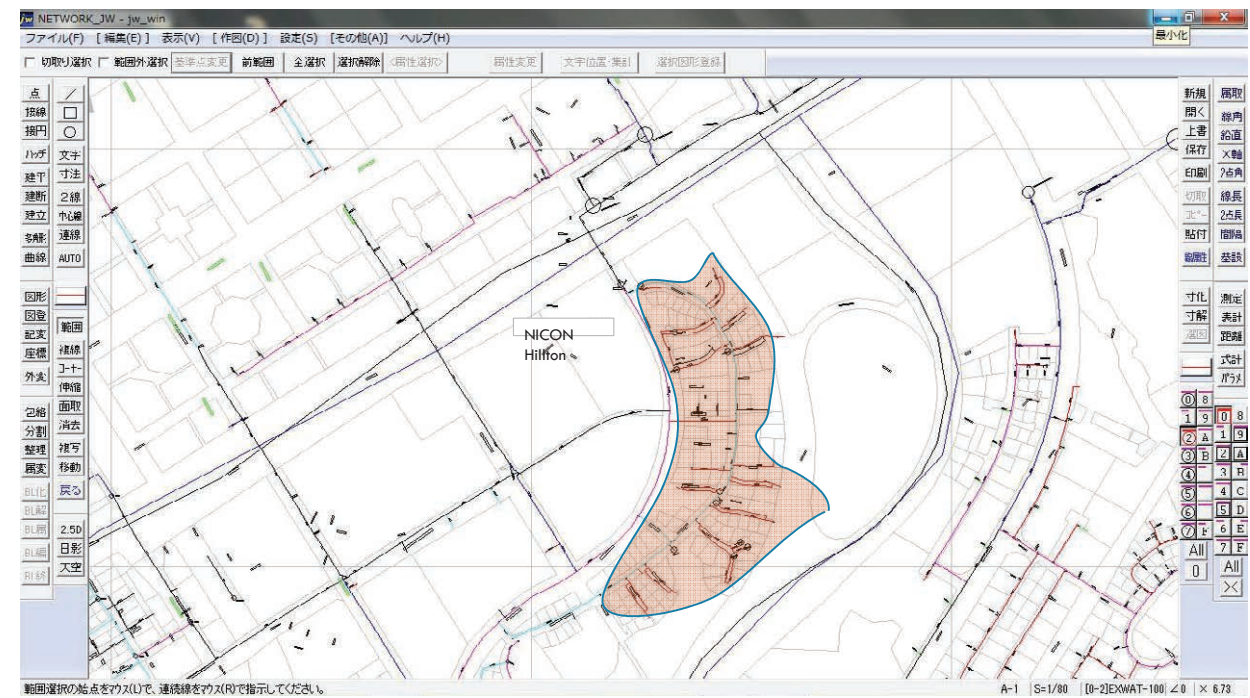
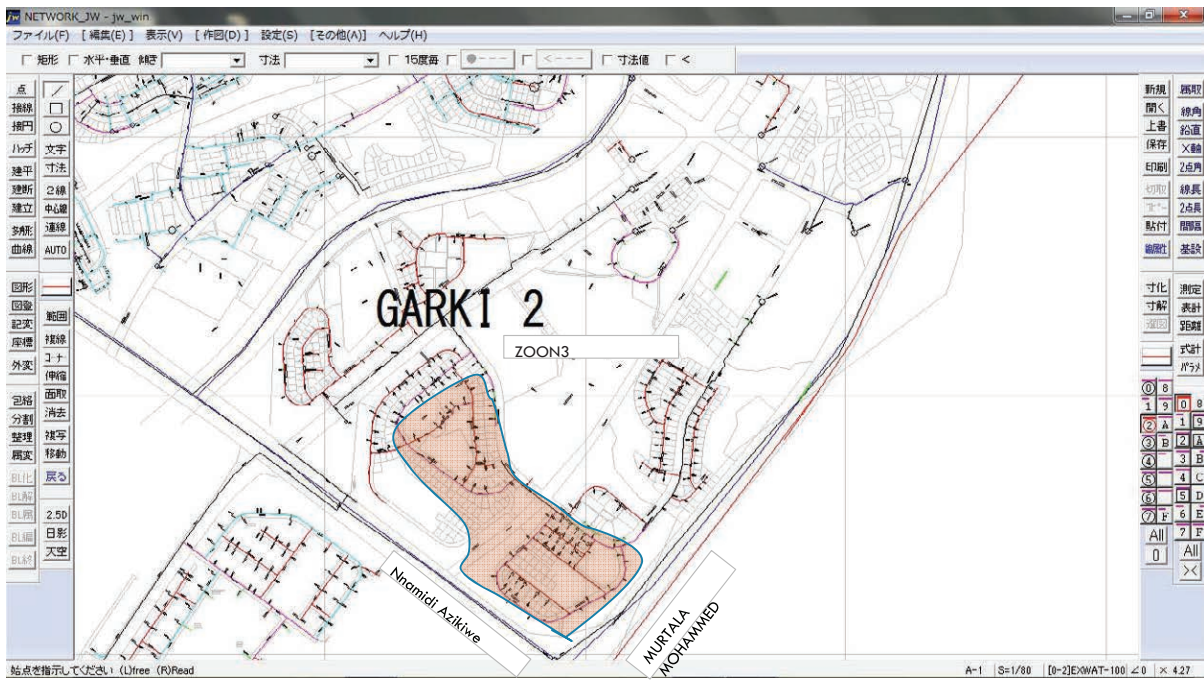
NRW Reduction Activities	Cost (NGN)	2019	2020	2021	2022	2023
NRW reduction activities						
XXXX area in XXXX Zone						
NRW reduction activities						
XXXX area in XXXX Zone						
....						
....						
....						
....						
....						
Annual Total Cost (NGN)						

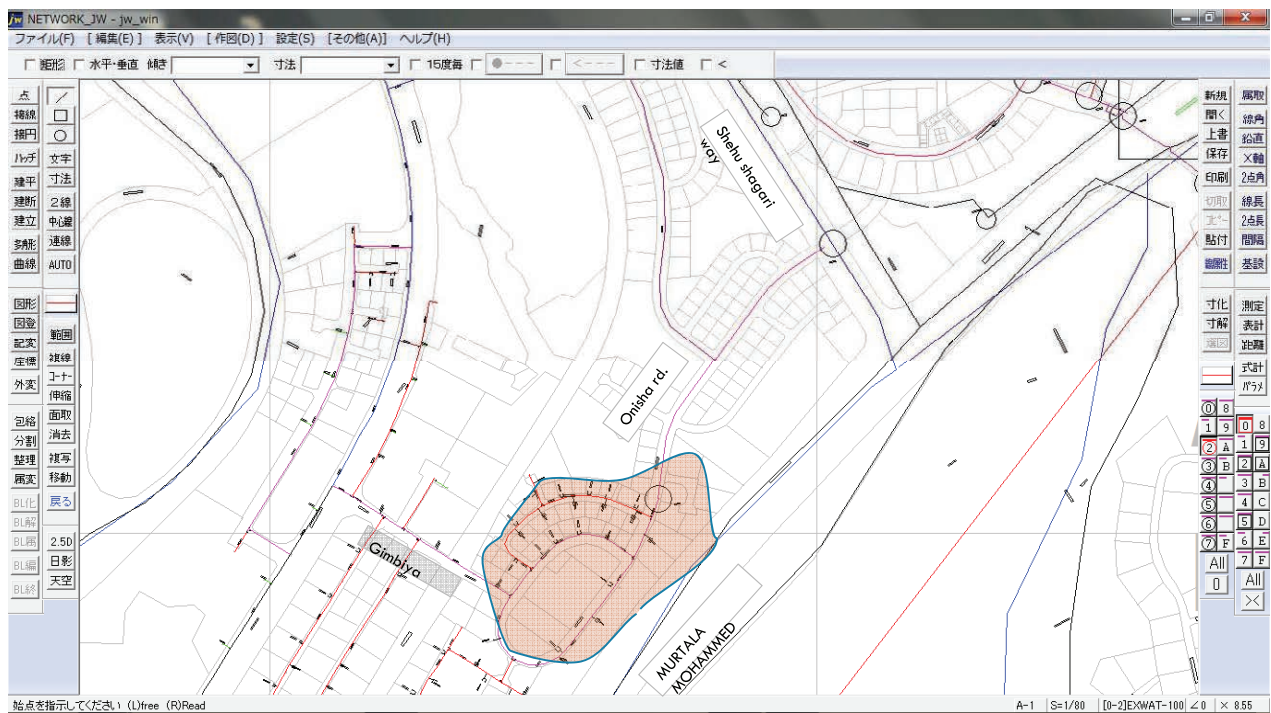
# Appendix 5

PMA WEEKLY TOTAL INFLOW			
		7-Aug-17	13-Aug-17
		PMA01	
		PMA02	
Item		Daily Total Flow	Daily Total Flow
Unit		CMH	CMH
11-Aug-17	Friday	870	2,289
12-Aug-17	Saturday	407	2,092
13-Aug-17	Sunday	1,339	2,033
14-Aug-17	Monday	2,172	2,172
15-Aug-17	Tuesday	1,038	2,204
16-Aug-17	Wednesday	1,325	2,138
17-Aug-17	Thursday	545	2,024
Weekly Total		7,696	14,952
Average		1,099	2,136
Maximum		2,172	2,289
Minimum		407	2,024

## EPANET HYDRAULIC ANALYSIS FOR TANK 4







始点を指示してください (L)free (R)Read



範囲選択の始点をマウス(L)で、連続線をマウス(R)で指示してください。

**THE FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER**  
**PROJECT.**

**Technical Notes on Monthly Technical meeting**

**Date:** February 6, 2018

**Vanue:** FCT Water Board Room

**Time:** 10:20am

**Attendance:** See appendix 1

The meeting commenced at 10:20am with an opening remark from the Director, after welcoming members to the meeting he then apologized for not holding the meeting in January. He called on the Head (NRW Unit) to continue with the coordination of the meeting.

**1. Replacement of UFM at Tank 2**

The Head (NRW Unit) called on Head Metering to give an update. Head Metering responded by informing the meeting that the channel 1 of the UFM at Tank 2 had been replaced by a new one and is working well.

**2. Data logger at Garki PMA**

Engr. Amos Bulus informed the meeting that the record of reading from the Data logger cannot be accessed because of power outage at the point. He said it was decided that an inverter with Two Batteries be installed to check the problem of power outage and a cubicle be provided to secure the items which he had brought up a design with the cost implication and had submitted to the Head (NRW Unit).

**3. Collection of flow rate Data**

The Head (NRW Unit) informed the meeting that the entire flow rate from 12 (Twelve) metering area had been collected and that the flow rate Data from Tank 4.1 was not collected due to low flow of Water in the Pipe which the sensor could not read but it was resolved to use portable ultra-sonic flow meter to record a 24hrs reading. On compilation and estimation of the daily flow, he said that the JICA expert team did the compilation but subsequently Water Board staff will be the ones to do it.

**4. Zonal coding**

Mr. Suleiman Shehu called on Engr. Ubale to update the meeting on progress of the first item on the Zonal Coding which has to do with compilation of consumption volume of the zones. Engr. Ubale informed the meeting that the bills for the 13 zones were secured but there is challenge sorting them out into the various district. Mr. Suleiman informed the meeting that only zones 2,3 and 4 have been demarcated with 10 zones left. The director gave a timeline of 10 days to achieve the remaining 10 zones. He said the Trunk mains information is all he needs every other things will fall in line. On the work schedule he promised to give it before the end of the day's work.

#### **5. Trunk Mains Data of Distribution line**

Mr. Suleiman informed the meeting that only that of zones 2 and 3 had been captured.

#### **6. Hydraulic analysis**

Engr. Ubale informed the meeting that the data for zone 2 had been secured but that of the pre-paid was in Microsoft word and need to be converted to Microsoft excel this process caused the delay, he however, informed the meeting that the rectified data will be receive today from Head Metering and the analysis carried out today also.

#### **7. Telemetry system**

Engr. Ubale informed the meeting that report was received from Yokogawa Company that the discrepancies of daily and monthly reading have been corrected via internet. But this morning he could not record any reading from the Telemetry system of both Tanks 3 and 4.

#### **8. Preparation of report to solve non –full flow at Usuma**

Engr. Aliyu Kumo informed the meeting that the report had been submitted to the PS by FCDA, they await the approval from the PS to engage one of their contractors to carry out the work.

#### **9. Data logger at Kubwa**

Engr. Amos Bulus informed the meeting that his attention was drawn to the malfunctioning of the system in Kubwa last Month. He visited the Site and discovers the system was off, he checked the solar system it was also off, he then put it on and discovered that the system was on but the screen of the data logger was blank. He tested the output of the inverter and found it to be too high; this had caused the damage to the screen. The Contractor (Mid-night Sun) was informed and he carried the inverter for replacement but the data logger screen remained damaged.

Fujiyama san said he will discuss with the Contractor for a way forward. The Director insisted that whatever may be the outcome the logger should be taken back to the manufacturer for proper handling.

## **10. Solar system at Tank 3.2**

Engr. Amos Bulus informed the meeting that the issue at Tank 3.2 is that of design and not from the solar system. Whenever there is power outage from the commercial source, the change-over switch must be switch over to solar system; He said he had told the people at the Tank that whenever that happens they should switch the system on.

### **Closing:**

Osakabe San commented that the tariff is not bad but the Board can do better when the autonomy is in place.

The Director in his closing remarks call on members to rededicate their commitment to the Board. He thanked members for attending. The meeting ends at 11:30am.

-----  
**Engr.A.R.Lawal**  
Technical Manager  
FCT Water Board

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**Abdulrahman M.**  
Secretary  
FCT Water Board

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**Teketoshi Fujiyama**  
Deputy Chief Advisor for  
NRW Reduction Project  
JICA

**THE FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER**  
**PROJECT**

**Technical Notes on Monthly Technical meeting**

**Date:** March 15, 2018

**Vanue:** FCT Water Board Room

**Time:** 11:20am

**Attendance:** See page 4

**1. Opening**

The meeting commenced at 11:20am with an opening remark from the Chairman, Engr. Usman A. Aliyu, after welcoming members to the meeting he then called on members to read through the record of discussion of the last meeting for any correction after which, he called for its adoption. The motion for adoption was moved by Engr. Abdullahi Mas'ud and was seconded by Mr. Fabikun Adedeji. He called on the Chief Advisor for FCT Reduction of NRW Project, Mr. Miyoshi to brief members on the schedule of the remaining activities in the project by using handout (see the attached).

**2. Schedules of the project**

The Chief Advisor for FCT Reduction of NRW Project expressed on behalf of the JICA expert Team their appreciation for the concern shown by FCT Water Board when TiyodaSan was indisposed and for the warm reception accorded to their National Councilors who visited the Projects executed by JICA. He then explained the schedules of activities in the remaining six Months of the duration of the project.

**3. Update on solar syatem related problems (Kubwa Tank,Tank 5 and Earth grounding).**

Engr. Amos Bulus informed the meeting that a meeting was held with the Contractor (Midnight Sun Nig. ltd) on the issue of the damaged Data logger at Kubwa Tank and the Contractor had taken the responsibility to fix the Data logger locally as the problem that led to the damage of the logger is not covered by manufacturer's warranty, he however, promised to handover the damaged logger to the Contractor after the meeting (15/3/2018).

On the replacement of stolen solar panel at Tank 5, he said that fresh panels from the spare parts in LUD Store had been applied for and a more secured location had been



selected to install the panels. He informed the meeting that the extra cost that will be incurred had been forwarded to the Head (NRW Unit).

On the issue of Earth grounding of all the installed Solar panel stations, he informed the meeting that it's been delayed due to paucity of funds (counterpart fund). The HOD Finance made additional statement that huge progress had been made on the issue of counterpart fund as they expect it release today or at most next week.

#### **4. Update on Zonal coding and Telemetry system**

Mr. Suleiman Shehu informed the meeting that the zonal coding has three basic steps; Creation of Zonal codes which has been completed, Zonal boundary which has also been completed and update of zones by assigning Customers to the Zones which is ongoing, Kubwa and G/gwalada Zones had been completed. He also informed the meeting that Zone 4 had been completed but Zones 2 and 3 still ongoing due to the overlap that need to be sort out, the remaining Zones are been taken one after the other. 4.1 had been given to Ubale for sorting out the overlap before submitting to the billing unit.

Mr.Miyoshi drew the attention of members that Customers connected on the Trunk mains need to be captured. Pipeline unit and commerce department were given the responsibility to capture such Customers and report next week. He also point out the need to capture the consumptions at the Water lifting points and that the commerce department should provide information on the consumption. The acting HOD (Distribution) mandated the metering unit to carry out the reading of the meters at the Water lifting point every Wednesday.

On the issue of Telemetry, Mr. Miyoshi informed the meeting that Ubale complained to him last week that the Telemetry is out of Data for the internet service and that he had given him money to recharge and he believed the Telemetry is working perfectly.

#### **5. Update on strategic planning**

Mr. Miyoshi informed the meeting that him, Mr. toyoda, Kimiko and the working group will finalize inputs on the midterm strategic plan and forward it to the General Manager and advisory group for confirmation before presenting it at the JCC meeting for approval.

#### **6. Update on over flow at LUD**

Engr. Usman A. Aliyu informed the meeting that he has not relented in the follow up at FCDA, he expressed the hope that it will be carried out this year.

#### **7. Update on FCT Water Board Autonomy**

The acting HOD (Admin&supply) informed the meeting that success had been achieved in this regard as the act had been signed into law by Mr. President. The implementation of the act had commenced last week with the inauguration of the Board members and the confirmation of the acting Director as the General Manager.

#### **8. Introduction of Kimiko (JICA expert)**

Mr. Miyoshi introduced to members Kimiko and her roles which is to support the preparation of midterm strategic plan and assisting FCT Water Board on benchmarking of other autonomous agencies, she will also carry out the proper documentation of the 3 Pilots areas.

#### **9. Update on store room development and project vehicle**

Engr.M.K. Rabiou informed the meeting that Mr. Miyoshi suggested that shelves be constructed at the store rooms of the NRW Office to properly store the Tools and that the Board's carpenter had been engaged to bring up the cost estimate.

On the issue of project vehicle, Mr. Miyoshi inquired about the update on the replacement of the accidental vehicle, acting HOD (dist.) responded by informing the meeting that it has been budgeted for in the counterpart fund as soon as it is released the vehicle will be replaced.

#### **10. Closing**

The Chairman in his closing remarks thanked members for attending. The meeting ends at 12:48pm.

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**Engr.A.R.Lawal**  
Technical Manager  
FCT Water Board

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**Abdulrahman M.**  
Secretary  
FCT Water Board

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**Akinori Miyoshi**  
Chief Advisor for  
NRW Reduction Project  
JICA

**FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER PROJECT**

**TECHNICAL MEETING ATTENDANCE LIST**

<b>S/N</b>	<b>NAME</b>	<b>DEPARTMENT/UNIT</b>
1	Aliyu U.A	DD (Civil) Distribution
2	Lawal A.R	H.O.D Distribution
3	Hasfat Ahmed Lawi	H.O.D Finance
4	Pheobe Ocheja	H.O.D Admin&Supply
5	Hamzat T.R	Head Audit
6	Adeyemi Taiwo A	Ag/ H.O.D Commerce
7	Rose Akpan	Head Billing
8	Abbas A. Ahmed	Head PRO
9	Rabiu M. Kabir	Head N.R.W
10	Abdulrahman Muhammed	S.E/ N.R.W Unit
11	Bernard Odinga	Head P.R.S
12	Fabikun Adedeji	Head M.I. S
13	Shehu Suleiman	Head G.I.S/ Distribution
14	Abdullahi Masaud	Head Metering
15	Choji Pam	AM Garki 1
16	Aluko Tope	Distribution
17	Sulaiman Aminat Muhammed	AM Jabi
18	Igbinosa Courage	N.R.W
19	Amos Bulus	P.E.E (M&E)
20	Abdulrahman Shehu Sani	Head Prepaid
21	Abdul Ozumi	AAM(D) Gudu
22	Kimiko Tamotsu	JICA Expert Team
23	Toru Toyoda	JICA Expert Team
24	Akinori Miyoshi	JICA Expert Team
25	Nda Idris Usman	Head Procurement
26	Nnaji Glory H.O	Head A.P.D
27	Husanni Muhammed	Commerce Dept. Jabi

**THE FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER  
PROJECT**

**Technical Notes on Monthly Technical Meeting  
(Draft)**

**Date: June 8, 2018**

**Venue: FCT Water Board Secretariat**

**Time: 10: 45am**

**Attendance: See Appendix 1**

The meeting commenced with a brief opening speech by Head of Pipeline and Monitoring Unit Engr. Musa Dikko who was representing the Deputy Director of Distribution, Engr. Aliyu U. A. The agenda for the day was the presentation of;

- Medium-term Strategic Plan for 2019-2023
- Annual Plan for NRW Reduction for 2019.

**1. Medium-term Strategic Plan for 2019 – 2023.**

The presentation of this report was prepared by the Project Team with the NRW Unit Head, Engr. Kabir Rabiou representing the Project Team. He stated that the presentation is made up of;

- 1) Introduction
- 2) Assessment of the pilot projects
- 3) Scenarios, goals and cost-effectiveness
- 4) NRW reduction operation plan
- 5) Selected scenario by the Board
- 6) Implementing schedule and budget allocation
- 7) Staffing plan and responsibilities.

Emphasis was on the scenario-d which was selected for the implementation of this strategic plan with several benefits if properly carried out.

**2. Annual Plan for NRW Reduction 2019**

This presentation was also handled by Engr. Kabir Rabiou with references drawn from the first presentation as most of the points have been mentioned from the first presentation save for the fact that this only has to do with one year period. The report of output 1 & 2 was applied here considering the current situation.

### ***QUESTIONS/ANSWERS/OBSERVATION/COMMENTS***

- I. Area Manager (Gwarimpa), Engr. Abdullahi Masaud raised the issue of leakage training yard, reminding the house of the Jabi area office compound being proposed for this project and a local workshop.
- II. Engr. Aliyu U. A said the delay has to do with budget as plans are ongoing to come up with a plan for the project.
- III. Mr. Fujiyama, the JICA Expert in attendance said it is very important to ensure that the budget of N35million for 2019 is achieved as according to GDP rank, Nigeria is first in Africa, while 25<sup>th</sup> in the world. We should strive to upgrade and take pride in our work here since we now have our autonomy approved by the minister, making sure that budget is strictly ensured. Adding that if we put in an effort to reduce NRW, the board will gain a lot. He mentioned that JCC will take place on the 28<sup>th</sup> of June 2018 and they may discuss how the budget is made because feasibility is very important.
- IV. Engr. Musa Dikko assured the expert's comments that since we have a full house, with the Head of Distribution, Head of Administration, a representative from the Audit, commerce and finance, the issues raised will be discussed and worked on.
- V. Engr. Kabir Rabiú advised the finance department especially the Budget Unit on the need to address the counterpart fund inclusion under the capital project as this slows down the process of accessing fund when needed.
- VI. Engr. Aliyu U. A said that they have tried to separate it but the Director of Treasury (DOT), FCTA assured them for the year 2019 that once any request is approved,, we should always look for a way to access it. He added that our major problem is the Commerce Department but he encouraged all to be dedicated to their job, to be committed and to be satisfied with whatever we get, calling for the need to sit up. His words were re-echoed by Engr. Musa Dikko, adding that we should always be punctual to meetings.

The meeting came to a close at about 12:23 pm.

Appendix 1: Attendance List

Appendix 2: Medium-term Strategic Plan 2019-2023

Appendix 3: Annual Plan for NRW Reduction 2019

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Engr. Aliyu Usman  
Deputy Director, Distribution  
FCT Water Board

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Mr Akinori Miyoshi  
Chief Advisor  
JICA Expert

**Appendix****FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER PROJECT**  
**TECHNICAL MEETING ATTENDANCE LIST****June 07, 2018**

<b>S/N</b>	<b>NAME</b>	<b>DEPARTMENT/UNIT</b>
1	Pheobe Ocheja	H.O.D Admin & Supply
2	Aliyu U.A	DD (Civil) Distribution
3	Rose Akpan	Head Billing
4	Abbas A. Ahmed	Head PRO
5	Rabiu M. Kabir	Head N.R.W
6	Fabikun Adedeji	Head M.I. S
7	Shehu Suleiman	Head G.I.S/ Distribution
8	Abdullahi Masaud	Area Manager Gwarinpa
9	Igbinosa Courage	N.R.W
10	Amos Bulus	P.E.E (M&E)
11	Abdulrahman Shehu Sani	Head Metering
12	Abdul Ozumi	AAM(D) Gudu
13	Isah Danjuma	HOU Major Consumers/ Monitoring
14	Shehu Sulaiman	Head G.I.S
15	Mogbo Stella N	PRS/ Admin Unit
16	Leo Yunusa	Metering Department
17	Muhammed Dauda	Pipeline Unit
18	Abubakar Danladi	Senior Foreman
19	Dikko Musa	Head Pipeline
20	Taketoshi Fujiyama	JICA Expert Team

**FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER PROJECT**

**SEMINAR PREPARATORY & COMMERCE MEETING ATTENDANCE LIST DAY 1**

**October 17, 2018**

<b>S/N</b>	<b>NAME</b>	<b>DEPARTMENT/UNIT</b>
1	Rabiu M. Kabir	Head N.R.W
2	Shehu Suleiman	Head G.I.S/ Distribution
3	Igbinosa Courage	N.R.W
4	Abdul Ozumi	AAM(D) Gudu
5	Muhammed Dauda	Pipeline Unit
6	Isah Danjuma	Head Major Consumer
7	Abdulrahman Muhammed	NRW
8	Ibrahim Umar	Area Manager Gudu
9	Abubakar Danladi	Distribution Jabi
10	Kenneth Madu	Distribution Garki 1
11	Ezechiedo Norah O.	Representing HOU (B)
12	Amos Bulus	PEE (M&E)
13	Abdul Yusuf	Sup. P&P Estate Gudu
14	Akinori Miyoshi	JICA Expert Team

**FEDERAL CAPITAL TERRITORY REDUCTION OF NON-REVENUE WATER PROJECT**

**SEMINAR PREPARATORY & COMMERCE MEETING ATTENDANCE LIST DAY 2**

**October 18, 2018**

<b>S/N</b>	<b>NAME</b>	<b>DEPARTMENT/UNIT</b>
1	Rabiu M. Kabir	Head N.R.W
2	Shehu Suleiman	Head G.I.S/ Distribution
3	Igbinosa Courage	N.R.W
4	Abdul Ozumi	AAM(D) Gudu
5	Isah Danjuma	Head Major Consumer
6	Abdullahi Masaud	Area Manager Gwarinpa0
7	Rose Akpan	Head Billing
8	Abubakar Danladi	Distribution Jabi
9	Kenneth Madu	Distribution Garki 1
10	Leo Yunusa	Metering (Unit)
11	Abdulsamad Abubakar	NRW (Intern)
12	Akinori Miyoshi	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 SEMINAR (DRAFT)

**Venue:** Bolton White Hotel & Apartments, 7 Gwandu St., Opposite Sahad Stores,  
Area11, Garki 2, Abuja

**Date:** Monday, 22<sup>nd</sup> October 2018

**MC:** Mr/Ms. \*\*\*\*\* (\*\*\*\*, FCTWB)

9:00 - 9:30 Registration of Participants

9:30 - 9:35 Opening Prayer

9:35 - 9:45 Welcome Address (Project Director, Mr. Sani Pai, Director: EPRS/FCTA)

9:45 - 9:55 Keynote Address (Mr. Katsutoshi Komori, Chief Representative, JICA Nigeria Office)

9:55 - 10:10 Introduction and Project Outline (Engr. A. R. Lawal, HoD Distribution, FCTWB)

#### **Session 1 The Medium-Term Strategic Plan for NRW Reduction (2019-2023)**

10:15 - 10:30 Current Status of FCTWB and NRW in Abuja (Mr. Bamidele Olatunji)

10:30 - 11:15 The Medium-Term Strategic Plan of NRW Reduction (Engr. Moh. Kabir Rabi)

11:15 - 11:30 Approval of the Medium-Term Strategic Plan of NRW Reduction and Driving Force of implementing NRW Reduction (Engr. A. A. Nahuche)

#### **Photo Session**

#### **Session 2-1 Results and Impact of the Federal Capital Territory Reduction of Non-Revenue Water Project**

11:40 - 11:55 NRW Calculation/Estimation and Monitoring (Engr. Abdullahi Masaud)

11:55 - 12:25 Results of NRW Reduction Pilot Projects (Ozumi, Abdulrahman, Courage)

12:25 - 12:45 Distribution Management (Engr. Abubakar Ubale)

12:50 - 13:45 Tea/Coffee Break

#### **Session 2-2 Results and Impact of the Federal Capital Territory Reduction of Non-Revenue Water Project**

13:50 - 14:10 Findings and Lessons learnt (Engr. Moh. Kabir Rabi)

14:10 - 14:30 Case Sample of Voluntarily-initiated NRW Reduction (Engr. Abdullahi Masaud)

#### **Session 3 Questions & Answers, Discussion and Way Forward**

14:35 - 15:05 Questions & Answers, and Discussion

15:05 - 15:15 Way Forward

15:15 - 15:25 Closing Remarks (Project Manager, General Manager, Engr. A. A. Nahuche, FCTWB)

15:25 - 15:30 Closing Prayer

15:35 - Lunch

# The Analysis of FCTWB Commerce Section

JICA Expert Team

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1. Purpose of the Survey
2. Summary of the Survey
3. Problem of Collection Bills
  - 3-1. Payment No Reflection
  - 3-2. Identical Data Management
4. Problem of Service Delivery
  - 4-1. Lack of Equipment on Area Office
  - 4-2. Absence of Work Regulation
5. Proposal for Medium-Long Term Plan

## 1. Purpose of the Survey

- ▶ Purpose: Clarification of problem and solution in Commerce Section of FCTWB
- ▶ Back ground: There are several requirements to settle the independent fiscal soundness financial plan for autonomous FCTWB.
- ▶ Goal: The analyze and improvement of commerce section will contribute gaining the profit.

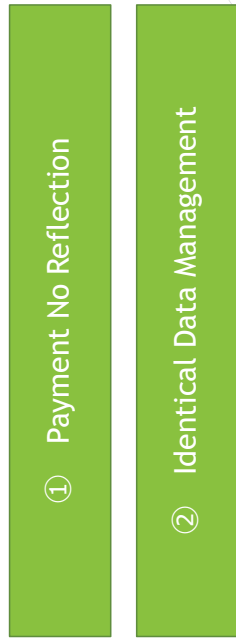


## 2. Summary of the Survey

- A) Interview for Area Office  
Target Office: Gudu, Jabi and Garki (Pilot Area)  
Target Persons: Manager, Deputy Manager(Commerce and Distribution)  
Period: 16<sup>th</sup> March to 6<sup>th</sup> April
- B) Interview for Head Quarter  
Target Section: Administration, Finance, Commerce and Customer Care  
Target Persons: Section Manager, Section Staff  
Period: 22<sup>nd</sup> March to 6<sup>th</sup> April

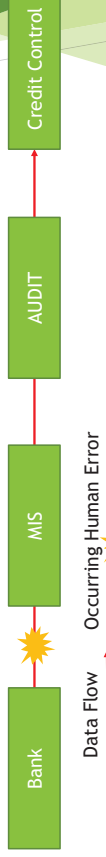
### 3. Problem of Collection Bills

- ▶ There are two main problem recognized such as below;



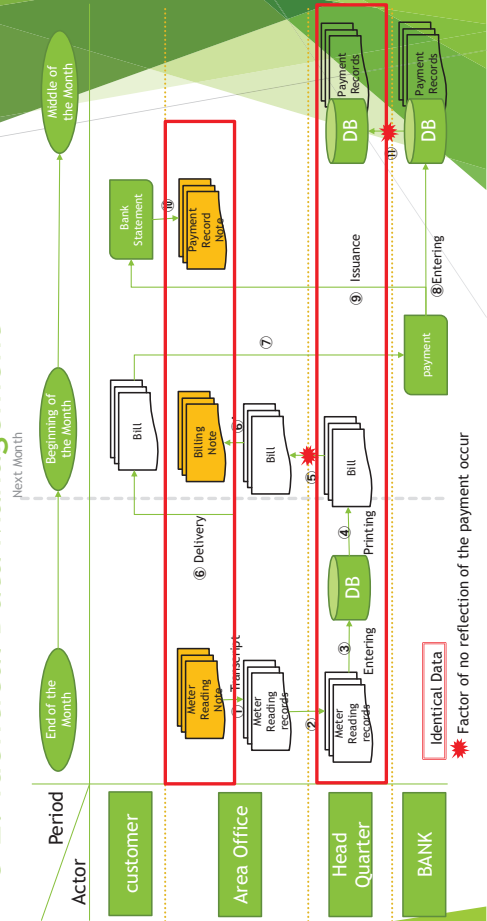
### 3-1. Payment No Reflection

- ▶ “Payment no reflection” are address of two factors.
  1. Delay of information reflection; cause of human error and system error on data connecting transaction.



2. Few issuance of bills; cause of lower electricity, procurement of paper for receipt from FTA. Achievement of 2017 were 5 times, 2018 will be appear in April based on data of March.

### 3-2. Identical Data Management



### 3-2. Identical Data Management -Duplicated/returned Bills

- ▶ Duplicated bill has been hide actual situation of non revenue water..
- ▶ The number of duplicated bills are as below;

	Gudu	Garki 1	Jabi
Bills Raised	1,120	3,054	4,430
Bills Distributed	1,120	2,910	3,374
Estimation Number of Duplicated bills	0	144	1,056
Number of Conventional Meter	1,593	2,207	2,273
Total Number of Meter	1,593	4,896	2,273

Site: Data from HQ(Commerce Section)

## 4. Problem of Service Delivery

- ▶ Two Main Problem recognized.
- ▶ 1. Lack of Equipment in Area Office
- ▶ 2. Absence of Work Regulation

## 4-1. Lack of Equipment on Area Office

- ▶ Area Office cannot correspond.....
- ▶ troubles on time because of lack of equipment.
- ▶ Meter reading because of lack of transportation.

Troubles with customer relations.

## 4-2. Absence of Work Regulation

- ▶ No work regulation issue the conflict among the workers.

