WSP-9

Eldoret WSP (ELDOWAS)

Project for Strengthening Capacity of Water Service Providers on Formulating Bankable Project Plans

Questionnaire (ELDOWAS)

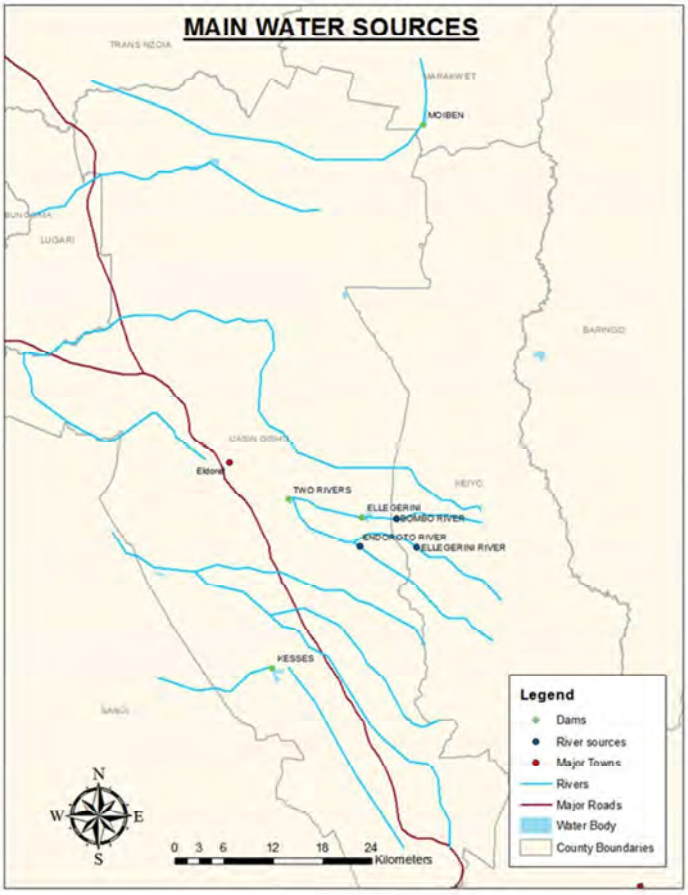
No.	Questions	Answers
1	Are you willing to borrow the money from commercial bank when selected as target WSP?	Yes
2	Kindly specify last 10 years project with major project comportment and amount, and source of fund for each project.	Refer to Table 1.
3	Kindly provide the WSP long term plan with annual budget for O&M and investment for water supply system.	【Business Plan 2022-2027】 【Strategic Plan 2022-2027】
4	Do you currently offer or intended to be offer any fund from doner, AOB, OBA, KPWF, own fund or any others? If yes, kindly provide the detail.	Yes. • Kimumu Sanitation Project: Discussions with Belgian Government are at preliminary stage • Sewer Supply System: KPWF put on hold • DMA Project: AOD • 45 km Sewer Network Project, ongoing by Central Rift Valley Water Works Development Agency: AFDB • Kipkaren Water Project (24,000 m^3) ongoing Central Rift Valley Water Works Development Agency: AFDB
5	Kindly provide the documents listed in Attachment 1 to 6 and Data Collection List.	Noted.
6	Kindly fill in the details for the overview of water supply facilities as shown in Attachment 1 to 6.	【Attachment 1 to 6】
7	What is the reason for the inactive connections?	■ No payment ■ No water due to technical problem such as no pressure, blockages and so on ■ There is any other alternative source. □ Deactivate the account during rainy season □ Any other reason, if any please specify
8	What kind of sensitization for the inactive connections to reconnection have been carried out?	• Public sensitization meetings • Water clinics • Radio shows • Road shows

No.	Questions	Answers
9	Kindly provide the current total water demand (m^3/day) with calculation method and excel file.	62,230 m^3/day (From the Water Master Plan Medium Variant)
10	Kindly provide the details for the water demand projection with calculation method and excel file.	【Water Resource Report June 2017】
11	Challenges Faced in the Water Supply Facilities 1) Potential of Water Source	■ Enough to develop the future demand (Moiben Dam) ■ Enough for current demand (Ellegrini Dam) ■ Not enough (Kesses Dam) ■ Need additional water sources (Two Rivers Dam)
	2) Raw Water Quality	□ Meet the standard for drinking purpose ■ Meeting the standard but deteriorating
	3) Intake Facility Intake Volume Facility Condition	 ■ Sufficient for future water demand □ Sufficient for current demand □ Not sufficient for current demand ■ Good □ Fair □ Deteriorating but can utilize □ Need rehabilitation and augmentation
	4) Raw Water Transmission System Transmission Volume Facility Condition	 ■ Sufficient for future water demand □ Sufficient for current demand □ Not sufficient for current demand ■ Good □ Fair □ Deteriorating but can utilize □ Need rehabilitation and augmentation

No.	Questions	Answers
	5) Water Treatment Plant Treatment Volume Facility Condition	 ■ Sufficient for future water demand (Has a design capacity of over 28,000 m^3/day currently operating at 22,500 m^3/day) □ Sufficient for current demand □ Not sufficient for current demand ■ Good □ Fair □ Deteriorating but can utilize □ Need rehabilitation and augmentation
	6) Water Distribution Systems Water Pressure	□ Meeting the standards for water pressure ■ Not all area meeting the standards for water pressure ■ Not meeting the standard when high demand □ Not meeting the standard
	7) Household Connection	■ Using the saddle clamp with cock □ Using the saddle clam □ Using the tee
	8) Water Meter	■ Using the piston type (Old connection) ■ Using propeller type (New connection) Reason of selecting above: The company has adopted use of velocity meters since they are more reliable and don't get blocked
	9) Non-Revenue Water (NRW) Reason and each percentage	■ Old pipe ■ Poor material use ■ High pressure ■ Meter inaccuracy ■ Illegal connection ■ Poor workmanship □ Others

No.	Questions	Answers
	10) Billing System	
	How do you read the water meter?	■ By manual ■ By smart Phone ■ By smart meter
	What kind of software for billing system is using?	□ Enterprise Resource Planning (ERP) □ JICS □ Other

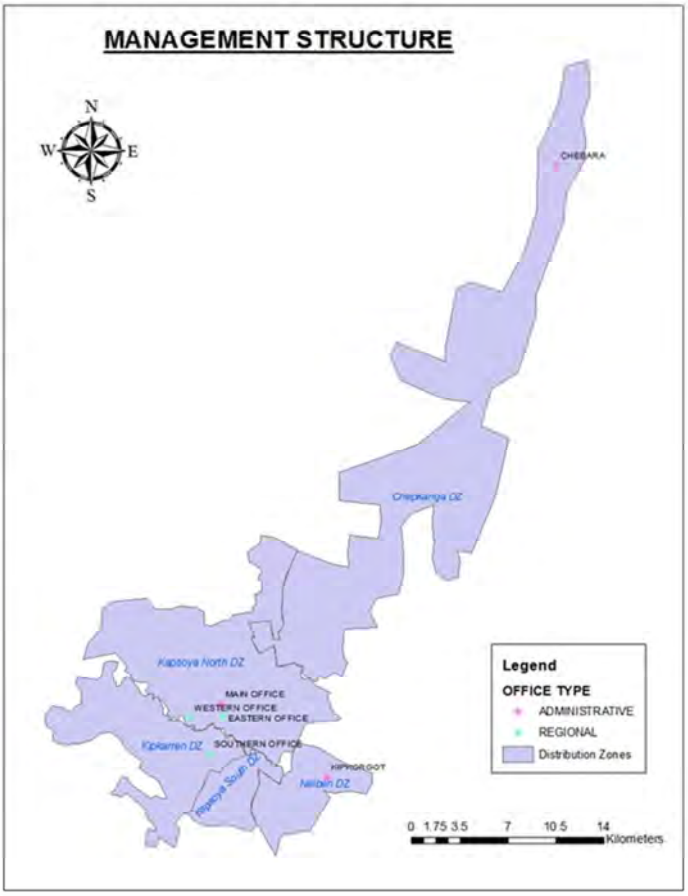
Attachment-1: Main Water Source

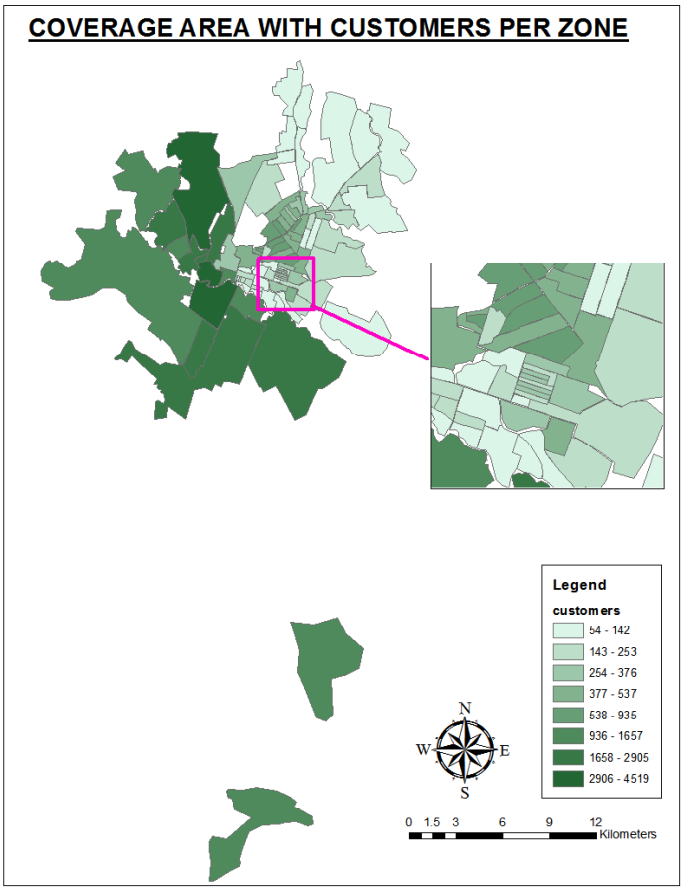
No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of water source and intake facility	① Moiben Dam along Moiben river. Located 60 kms Northeast of Eldoret Within Elgeyo Marakwet County.  		
2	Specifications of water source and intake facility	① Moiben Dam River commissioned in 1997	• Water source capacity: 34,000 m^3/day • Intake capacity: 1,416 m^3/hour, 34,000 m^3/day • Year Built: June 1994 - July1997 • Structure of intake facility (Elevation + 2346.23 masl): ◆ Earth Dam with 35 m high concrete intake tower	

		② Two Rivers Dam Reservoir	• Water source capacity: 14,950 m^3/day • Intake capacity: 622 m^3/hour, 14,950 m^3/day • Year Built: 1963 • Structure of intake facility (Elevation + N/A masl): ◆ Concrete Dame with a pipe intake	
		③ Ellegirini Dam	• Water source capacity: 9,000 m^3/day • Intake capacity: 375 m^3/hour, 9,000 m^3/day • Year Built: June 1994 - July1997 • Structure of intake facility (Elevation + N/A masl): ◆ Earth Dam with concrete intake tower	
3	Outstanding annual and seasonal fluctuation / trend, if any	① Moiben Dam	• Maximum intake: 974 m^3/h, 728,500 m^3/day (January 2021) • Minimum intake: The dam has been quite stable since commissioning and the spillway has never stopped overflowing • Moiben river is a permanent river. Refer to Source：ELDOWAS Figure 1.	
4	Future development plan	① Moiben Dam	• Intake capacity: The same intake to be maintained • Scheduled year: 2022/2023 • Purpose: To boost the water supply within Eldoret town and its environments.	
		② Two Rivers Dam	• Intake capacity: 74,000 m^3/day (New) • Scheduled year: 2023-2026 • Purpose: To be meet the expected future demand for Eldoret Town.	

Attachment-2: Management Structure and Area of Coverage

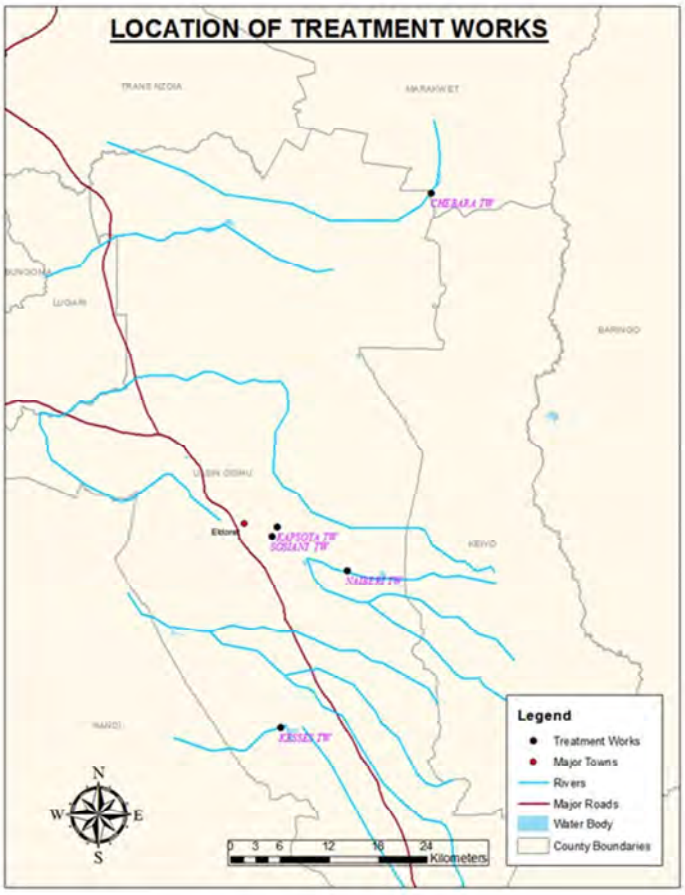
No.	Items	Details / Numbers / Specifications / Conditions	Note
1	Name and location of water supply area / county	① Eldoret Municipality area / Uasin Gishu county ② Kesses/Lessos area (Uasin Gishu-Nandi County) ③ Chebara and Chebiemit area (Elgeyo Marakwet County)	



				
2	General information of water supply area / county	① Eldoret Town and its environs (Uasin Gishu County)	• Population / Beneficiaries (2022): 424,190 • Household connections (2022): 64,460 • Water Kiosk: 59 • Total / coverage area: (2022): 420 km^2 • Average service hours (2020): 18 hours • Water Treatment Plant: Chebara, Kapsoya, Sosiani and Naiberi WTPs • Main water source: Moiben, Sosiani and Ellegrini Rivers • Current domestic water demand (year 2022: 62,000 m^3/day • Future domestic water demand (year 2040): 114,069 m^3/day	

		② Kesses Water Supply	• Population / Beneficiaries (2022): 24,845 • Household connections (2022): 1550 • Water Kiosk: 4 • Total / coverage area: (2022): N/A km^2 • Average service hours (2020): 24 hours • Water Treatment Plant: Kesses WTP • Main water source: Kesses Dam • Current domestic water demand (year 2020: 1707 m^3/day • Future domestic water demand (year 2040): 2748 m^3/day	

Attachment-3: Water Treatment Plant (WTP)

<table>
<tr><th>No.</th><th>Items</th><th colspan="2">Details / Numbers / Specifications / Conditions</th><th>Note</th></tr>
<tr><td>1</td><td>Name and location map of WTP</td><td colspan="2">① Chebara WTP
② Sosiani WTP
③ Kapsoya WTP
④ Naiberi WTP
⑤ Kesses WTP
 
</td><td></td></tr>
<tr><td>2</td><td>Specifications of WTP</td><td>① Chebara WTP</td><td>• Type of treatment: Rapid filtration with coagulation + chlorine disinfection
• Current treatment capacity (2022): 22,500 m^3/day
• Design treatment capacity: 28,300 m^3/day
• Year Built: 1995
• Structure of main facility:
◆ Receiving well: 107.25 m^3, 6.5 m×5.5 m ×3.0 m deep, retention time 1.5 min, RC
◆ Flocculation basin: None. Only chemical dosing channel, RC</td><td></td></tr>
</table>

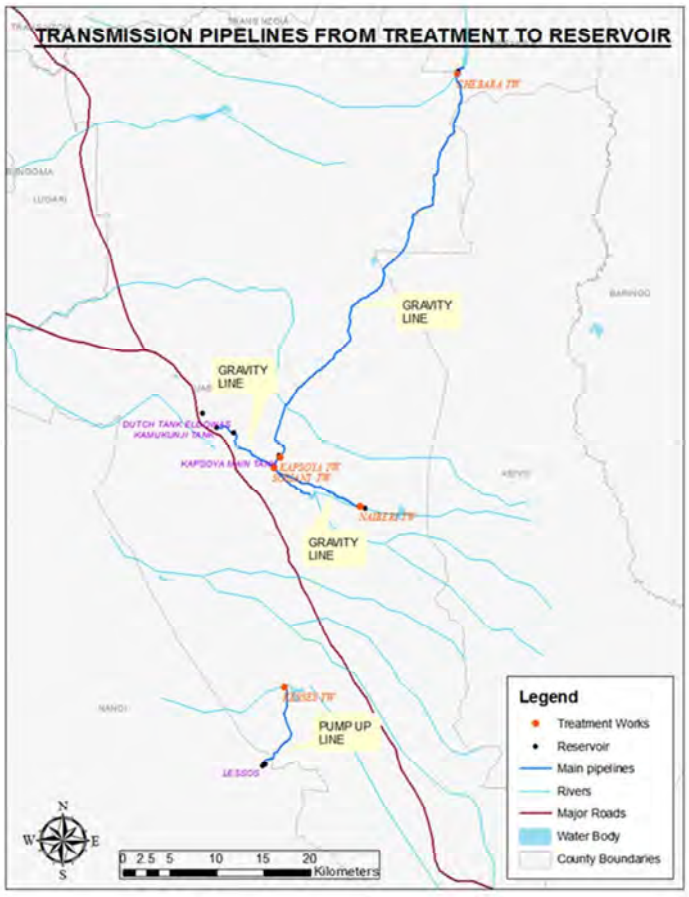
			◆ Sedimentation basin: N/A m^3, 13.7 m×10.2 m×4.6 m×7, Inclined plate 6 lines×7 set, RC ◆ Rapid sand filtration: Size Φ4.35 m×2.95 m×14, No. of cell: 14, filtration speed 5 $m^3/m^2/hr$, Material of filter: quartz sand media ◆ Clear water tank: 27 m x 7 m, Capacity: 550 m^3×2, RC	
		② Kapsoya WTP	• Type of treatment: Rapid filtration with coagulation + chlorine disinfection • Current treatment capacity (2022): 7000 m^3/day • Design treatment capacity: 7,000 m^3/day • Year Built: 2018 (Expansion) • Structure of main facility: ◆ Receiving well: 11.025 m^3, 2.1 m×2.1 m×2.5 m deep, retention time 1.5-2 min, RC ◆ Flocculation basin: None. Only chemical dosing channel RC with baffles ◆ Sedimentation basin: N/A m^3, 6.1m× 6.1 m×4.5 m×5 m, Inclined plate 6 lines×5 set, RC ◆ Rapid sand filtration: Size Φ4 m×3 m×5 m, No. of cell: 5, filtration speed 5.2 $m^3/m^2/hr$, Material of filter: quartz sand media ◆ Clear water tank: 1,360 m^3×2	

		③ Naiberi WTP	• Type of treatment: Rapid filtration with coagulation + chlorine disinfection • Current treatment capacity (2022): 1,200 m^3/day • Design treatment capacity: 2,000 m^3/day • Year Built: 2018 • Structure of main facility: ◆ Receiving well: 11.025 m^3, 2.1 m x 2.1m x 2.5m deep, retention time 1.5-2 min, RC ◆ Flocculation basin: helicoidal Flow Type (Spiral Flow Type) Hydraulic flocculator ◆ Sedimentation basin: 12 m×3 m×3.3 m×2, Inclined plate 2 lines×5 set, RC ◆ Rapid sand filtration: 4 m×3 m×2, No. of cell: 5, filtration speed 6.9 m^3/m^2/hr, Material of filter: quartz sand media ◆ Clear water tank: 500 m^3	
3	Water treatment conditions	① Chebara WTP	• Utilization of plant capacity: 83 % • Hours for WTP Utilization: 24/day • Flow diagram of the water treatment process: N/A • Type and amount of chemicals used during the process (2020) for during the dry and rainy seasons: ◆ PAC: N/A kg/day ◆ Sodium hypochlorite: 90 kg/day ◆ Concentrated sulfuric acid: N/A kg/day ◆ Lime: N/A kg/day • Annual Operation and maintenance cost and its breakdown: N/A Mil Ksh/year ◆ Labor cost: 8.5 Mil Ksh/year ◆ Chemical cost: 19.8Mil Ksh/year ◆ Electricity cost: 2.9 Mil Ksh/year ◆ Maintenance cost: N/A Mil Ksh/year ◆ Other cost: N/A Mil Ksh/year	

		② Kapsoya WTP	• Utilization of plant capacity: 83 % • Hours for WTP Utilization: 24/day • Flow diagram of the water treatment process: N/A • Type and amount of chemicals used during the process (2020) for during the dry and rainy seasons: ◆ PAC: N/A kg/day ◆ Sodium hypochlorite: 20 kg/day ◆ Concentrated sulfuric acid: N/A kg/day ◆ Lime: N/A kg/day • Annual Operation and maintenance cost and its breakdown: N/A Mil Ksh/year ◆ Labor cost: 5.4 Mil Ksh/year ◆ Chemical cost: 1.8 Mil Ksh/year ◆ Electricity cost: 0.38 Mil Ksh/year ◆ Maintenance cost: N/A Mil Ksh/year ◆ Other cost: N/A Mil Ksh/year	
		③ Naiberi WTP	• Utilization of plant capacity: 83 % • Hours for WTP Utilization: 24/day • Flow diagram of the water treatment process: N/A • Type and amount of chemicals used during the process (2020) for during the dry and rainy seasons: ◆ Sodium hypochlorite: 5 kg/day • Annual Operation and maintenance cost and its breakdown: N/A Mil Ksh/year ◆ Labor cost: 3.8 Mil Ksh/year ◆ Chemical cost: 0.66 Mil Ksh/year ◆ Electricity cost: 0.199 Mil Ksh/year ◆ Maintenance cost: N/A Mil Ksh/year Other cost: N/A Mil Ksh/year	
4	Water quality test	① Chebara WTP	• Main items to be tested in each process and frequency of the test (raw water, after treatment and so on) • Compliance with water quality standards Refer to Table 2.	

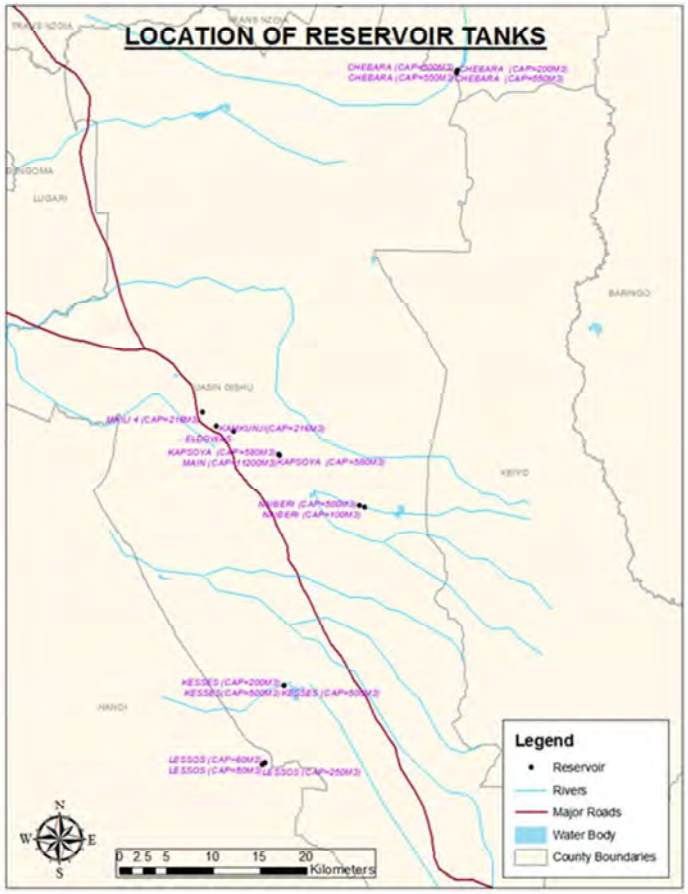
		② Kapsoya WTP	• Main items to be tested in each process and frequency of the test (raw water, after treatment and so on) • Compliance with water quality standards Refer to Table 3.	
		Naiberi WTP	• Main items to be tested in each process and frequency of the test (raw water, after treatment and so on) • Compliance with water quality standards Refer to Table 4.	
5	Future development plan	N/A	N/A	

Attachment-4: Water Transmission Mains to Reservoir

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of transmission pipeline	① Chebara Eldoret transmission line (Gravity) ② Kapsoya-Kao La Amani transmission line (Gravity) ③ Sosiani Dutch Church transmission line (Gravity) 		
2	Specifications of Pipeline	① Chebara Eldoret line	• DN 600 35 km cement coated steel pipe DN500 15.5 Km cement coated steel pipe • Year Built: 1993-1995 • NRW of main transmission line: 3% for last five years	
		② Kapsoya Kao La Amani	• DN 300 HDPE pipeline • Year Built: Replaced in 2018 • NRW of main transmission line: 1%	

		③ Sosiani Dutch line	• DN 500 bituminous coated steel pipe 6.5 km laid in 1986 • DN 400 AC pipe 7.5 km (Approx) laid in 1964 • NRW of main transmission line: 5% for last five years (Approximated)	
3	Future development plan	① Augmentation of Chebara line	• Scheduled year: 2022/2023 • Purpose: To be filled for your purpose of development such as to boost the water supply within Eldoret town to meet the demand in 2023	

Attachment-5: Reservoirs

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of Reservoir	① Kasoya Reservoirs ② Dutch Church Reservoirs ③ Huruma Reservoirs ④ Maili Nne Reservoirs 		
2	Specifications of reservoir	① Kapsoya reservoir	• Current capacity (2022): 11,200 m^3/day • Year Built: March, 1995 • Structure of main facility: ◆ Reservoir: Type: underground, RC, ◆ Distribution pump- Gravity system ◆ Water flow measurement facility: type of water meter 2 no. Mechanical (Woltman Dn500 and DN 400	
		② Dutch Church reservoirs	• Current capacity (2022): 11,200 m^3/day, 9,200 m^3/day, 4,600 m^3/day, 2,273 m^3/day and 455 m^3/day	

			• Year Built: 1963, 1976, 1986 and 1995 • Structure of main facility: ◆ Reservoir: Type: underground, RC ◆ Distribution by gravity ◆ No Water flow measurement facility installed	
		③ Huruma Reservoirs ④ Maili Nne Reservoirs	• Current capacity (2022): 216 m^3 x3 • Year Built: 2011 • Structure of main facility: ◆ Reservoir: Steel tanks on elevated steel tower ◆ Distribution by gravity ◆ No Water flow measurement facility installed	
3	Operation and maintenance and Water quality test	① Kasoya Reservoirs ② Dutch Church Reservoirs ③ Huruma Reservoirs ④ Maili Nne Reservoirs	• Flow diagram of reservoir: N/A • Type and amount of chemicals used before distribution if any: N/A ◆ Sodium hypochlorite: N/A • Annual Operation and maintenance cost and its breakdown: N/A ◆ Labor / maintenance cost: N/A ◆ Electricity cost: N/A ◆ Other cost: N/A • Main items to be tested in reservoir: N/A • Compliance with water quality standards: N/A	
4	Future development plan	① Ole Tepes Reservoir	• Design capacity 10,000 m^3 RC ground tank • Scheduled year: 2023 • Purpose: retaining10,000 m^3 to boost the service hours by a minimum of 12 hours in Southern part of Eldoret town to meet the demand in 2030.	

Attachment-6: Water Distribution Mains

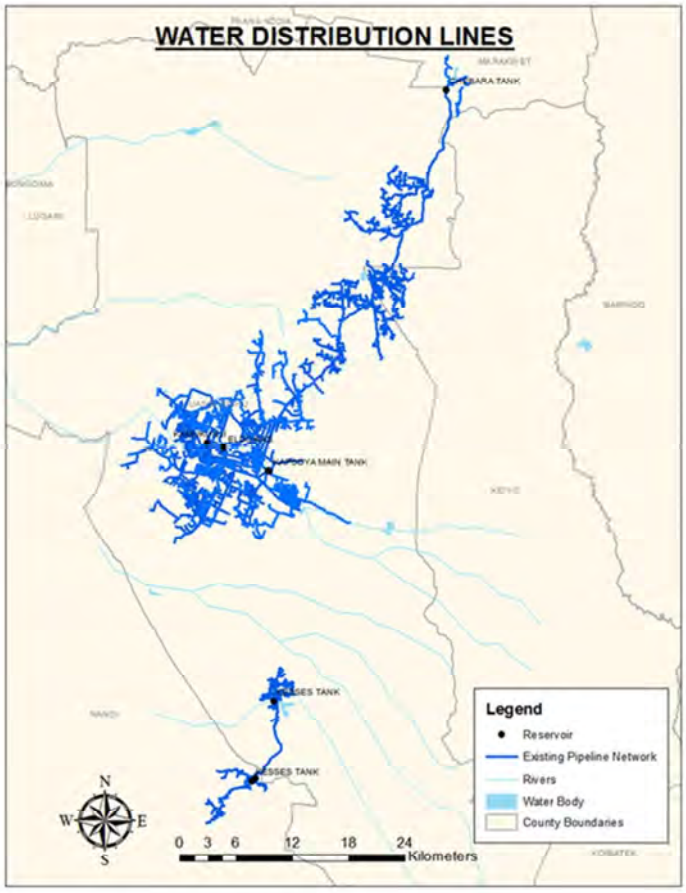
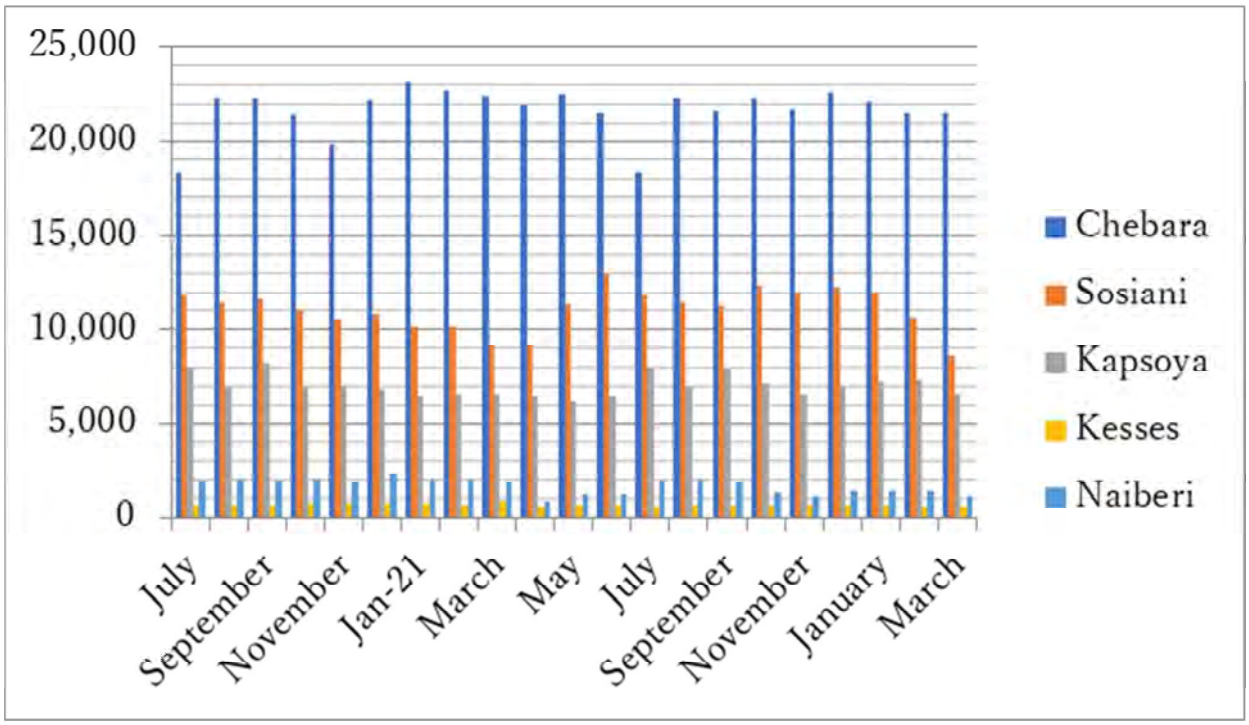
No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of distribution pipeline network			
2	Specifications of Pipeline	N/A	• Location, materials, diameter and length of each pipeline Refer to Table 5. • Year Built: for each pipeline: N/A • Distribution pump: N/A • NRW of main distribution line: N/A	
3	Future development plan	N/A	• Continuous upgrade/replacement of the old pipelines as per tariff	

Table 1 Major Projects for Last 10 Years

	DESCRIPTION/PROJECT	DISBURSED/LOAN AMOUNT(KES)	AGENCY	FINANCIER
2013-14	Expansion of Chebara water works	308,181,873	LVNWWDA	Word Bank
2013-14	Kesses/Lessos Augmentation works	208,433,786	LVNWWDA	Word Bank
2017-18	Kapsoya/Elligrini Water Project (New loan)	542,648,688	LVNWWDA	Word Bank
2015-2021	County project	96,263,262	CCUG	CCUG
2011-2021	WSTF	51,159,140	WSTF	WSTF
	TOTAL	**1,206,686,749**		

Source：ELDOWAS



Source：ELDOWAS

Figure 1 ELDOWAS WTP Seasonal Fluctuation Trend

Table 2 Main Items and Compliance (Chebara WTP)

Parameter	No. of samples	No. within Accepted Range	Compliance to the Standards (%)
Raw Water			
pH	90	90	100%
Turbidity	180	178	98.9
Treated Water			
Residual chlorine	90	90	100%
Physic-chemical (pH and Turbidity)	180	178	98.8%

Source：ELDOWAS

Table 3 Main Items and Compliance (Kapsoya WTP)

Parameter	No. of samples	No. within Accepted Range	Compliance to the Standards (%)
Raw Water			
pH	90	90	100%
Turbidity	180	178	98.9
Treated Water			
Residual chlorine	90	90	100%
Physic-chemical (pH and Turbidity)	180	179	99.4%

Source：ELDOWAS

Table 4 Main Items and Compliance (Naiberi WTP)

Parameter	No. of samples	No. within Accepted Range	Compliance to the Standards (%)
Raw Water			
pH	90	90	100%
Turbidity	90	88	97.7%
Treated Water			
Residual chlorine	90	90	100%
Physic-chemical (pH and Turbidity)	180	178	98.8%

Source：ELDOWAS

Table 5 Distribution Mains Breakdown

Pipe size(mm)	Asbestos Cement	Gi	Gs	UPVC	HDPE	Total	%
50	-	13.71	-	208.38	102.74	374.83	7%
65	-	-	-	6.93	-	71.93	1%
75	-	10.36	-	87.67	-	173.03	3%
80	-	0.02	-	-	-	80.02	1%
90	-	-	-	-	51.78	141.78	3%
100	-	21.47	-	93.21	10.85	225.53	4%
110	-	-	-	-	-	110	2%
125	0.86	5.37	-	-	-	131.23	2%
150	5.95	25.7	0.05	62.53	-	244.23	4%
200	12.57	34.53	0.91	39.74	-	287.75	5%
250	-	5.95	-	-	-	255.95	5%
300	-	0.4	-	2.81	-	303.21	6%
315	-	-	-	-	-	315	6%
350	-	3.43	-	11.91	-	365.34	7%
375	7.14	0.09	-	-	-	382.23	7%
400	-	11.82	-	3.07	-	414.89	8%
429	-	5.04	-	-	-	434.04	8%
500	-	26.3	-	-	-	526.3	10%
600	-	43.21	-	-	-	643.21	12%
Sum						5480.5	100%

Source：ELDOWAS

WSP-10

Kisumu WSP (KIWASCO)

Project for Strengthening Capacity of Water Service Providers on Formulating Bankable Project Plans

Questionnaire (KIWASCO)

No.	Questions	Answers
1	Are you willing to borrow the money from commercial bank when selected as target WSP?	Yes.
2	Kindly specify last 10 years project with major project comportment and amount, and source of fund for each project.	Refer to Table 1.
3	Kindly provide the WSP long term plan with annual budget for O&M and investment for water supply system.	【Strategic plan 2017-2022, pg 54-61】 • Strategic Priority 1: Water and Wastewater Infrastructure Development. • Objective 1.1: Increase Water Coverage from 73% to 87% • Objective 1.2: Increase Sewerage Coverage from 16% to 30% • Strategic Priority 2: Operational efficiency • Objective 2.1: Reduce Non-Revenue Water from 37% to 20% • Objective 2.2: Improve Operational Efficiency of the Sewer and Water Networks
4	Do you currently offer or intended to be offer any fund from doner, AOB, OBA, KPWF, own fund or any others? If yes, kindly provide the detail.	Yes. We are working on a proposal to the WSTF on AOD (Aid on Delivery) on 1) Proposed sewer network densification in Migosi - Lolwe Estate: KES 53,093,879.01 2) Proposed Kachok – Orongo Water Reticulation Improvement: KES 65,622,286.52 Project cost: KES118,716,165.53
5	Kindly provide the documents listed in Attachment 1 to 6 and Data Collection List.	Noted.
6	Kindly fill in the details for the overview of water supply facilities as shown in Attachment 1 to 6.	【Attachment 1 to 6】

No.	Questions	Answers
7	What is the reason for the inactive connections?	□ No payment ■ No water due to technical problem such as no pressure, blockages and so on □ There is any other alternative source. □ Deactivate the account during rainy season □ Any other reason, if any please specify
8	What kind of sensitization for the inactive connections to reconnection have been carried out?	• Customer care clinics by the corporate assistants
9	Kindly provide the current total water demand (m^3/day) with calculation method and excel file.	39,000 m^3/day (Both the qualitative and quantitative factors were considered, while using the Water Design Manual 2005.)
10	Kindly provide the details for the water demand projection with calculation method and excel file.	N/A.
11	Challenges Faced in the Water Supply Facilities 1) Potential of Water Source	□ Enough to develop the future demand ■ Enough for current demand (Not able to supply due to inadequate water at the source (Kajulu river), inadequate transmission mains and geographical locations) □ Not enough ■ Need additional water sources (To supply the Western and Eastern parts of the Lake Victoria to supply Riat Hills and areas bordering Nairobi road effectively)
	2) Raw Water Quality	■ Meet the standard for drinking purpose (Turbidity of river water goes up to 3,500 NTU during rainy season.) ■ Meeting the standard but deteriorating (Pollution of the Lake by industries effluents. Adverse effect of water hyacinth and new challenges of cyanobacteria.)

No.	Questions	Answers
	3) Intake Facility	
	Intake Volume	■ Not sufficient for future water demand (For river water due to climate change) ■ Sufficient for current demand (Lake water is sufficient but very high energy costs – efficiency challenges) □ Not sufficient for current demand
	Facility Condition	□ Good □ Fair □ Deteriorating but can utilize ■ Need rehabilitation and augmentation
	4) Raw Water Transmission System	
	Transmission Volume	□ Sufficient for future water demand ■ Sufficient for current demand □ Not sufficient for current demand
	Facility Condition	□ Good □ Fair ■ Deteriorating but can utilize (Old /C pipes from intake to TW) ■ Need rehabilitation and augmentation
	5) Water Treatment Plant	
	Treatment Volume	■ Not sufficient for future water demand □ Sufficient for current demand □ Not sufficient for current demand
	Facility Condition	□ Good ■ Fair (For TW 1 and 2 but not efficient) □ Deteriorating but can utilize ■ Need rehabilitation and augmentation (TW3)

No.	Questions	Answers
	6) Water Distribution Systems Water Pressure	□ Meeting the standards for water pressure ■ Not all area meeting the standards for water pressure (Due to old asbestos lines and weak uPVC pipes in the network, pressurized lines interconnected with gravity; old appurtenances therefore intermittency and inefficient and high cost O&M) □ Not meeting the standard when high demand □ Not meeting the standard
	7) Household Connection	□ Using the saddle clamp with cock ■ Using the saddle clam (with gate valves) ■ Using the tee (with gate valves)
	8) Water Meter	■ Using the piston type ■ Using propeller type Reason of selecting above: Piston type are used mainly for domestic accounts for efficiency. Propeller type are used in bulk meters and areas affected by silt and are also cost effective and easy to maintain.
	9) Non-Revenue Water (NRW) Reason and each percentage	■ Old pipe (39%) ■ Poor material use (5%) ■ High pressure (4%) ■ Meter inaccuracy (28%) ■ Illegal connection (10%) ■ Poor workmanship (3%) ■ Others: Vandalism by read constructors (11%)
	10) Billing System How do you read the water meter? What kind of software for billing system is using?	□ By manual ■ By smart phone (Physical visits) ■ By smart meter (Made in China, 124 number on large consumers) ■ Enterprise Resource Planning (ERP) □ JICS □ Other

Attachment-1: Main Water Source

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of water source and intake facility	① Kajulu River ② Dunga Lake Refer to Source：KIWASCO Figure 1.		
2	Specifications of water source and intake facility	① Kajulu River	• Water source capacity: 36,000 m^3/day • Intake capacity: 1,500 m^3/hour, 36,000 m^3/day • Year Built: 2014 • Structure of intake facility (Elevation + N/A masl): ◆ Intake well: N/A ◆ Grit chamber: N/A ◆ Pump: N/A	
		② Dunga Lake	• Water source capacity: 44,000 m^3/day • Intake capacity: 2,000 m^3/hour, 44,000 m^3/day • Year Built: 2011 • Structure of intake facility (Elevation + N/A masl): ◆ Intake well: N/A ◆ Grit chamber: N/A ◆ Pump: N/A	
3	Outstanding annual and seasonal fluctuation / trend, if any	① Kajulu River	• Maximum intake: 1,300 m^3/h, (7 months in 1 year) • Minimum intake: 500 m^3/h, (5 months in 1 year) • Permanent river or seasonal river: Seasonal	
4	Future development plan	① Kajulu River ② Dunga Lake	• Intake capacity: 30,000 m^3/day (Additional including source improvement, and efficiency improvement) • Scheduled year: Immediate • Purpose: To boost the water supply within service area, stabilize production	

Attachment-2: Management Structure and Area of Coverage

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location of water supply area / county	① 297 km^2 within Kisumu County Refer to Source：KIWASCO Figure 2.		
2	General information of water supply area / county	① 297 km^2 within Kisumu County	• Population / Beneficiaries (2021): 506,453 / 595,552 • Household connections: N/A • Water Kiosk: N/A • Total / coverage area: (2022): N/A km^2 • Average service hours (2020): N/A • Water Treatment Plant: N/A • Main water source: N/A • Current domestic water demand: N/A • Future domestic water demand: N/A	

Attachment-3: Water Treatment Plant (WTP)

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of WTP	① Kajulu WTP ② Dunga WTP Refer to Source：KIWASCO Figure 3.		
2	Specifications of WTP	① Kajulu WTP ② Dunga WTP	• Type of treatment: Conventional system rapid filtration with coagulation + chlorine disinfection • Current treatment capacity: N/A m^3/day • Design treatment capacity: N/A m^3/day • Year Built: N/A • Structure of main facility: N/A	
3	Water treatment conditions	① Kajulu WTP ② Dunga WTP	• Utilization of plant capacity: N/A % • Hours for WTP Utilization: N/A • Flow diagram of the water treatment process: N/A • Type and amount of chemicals used during the process for during the dry and rainy seasons: ◆ PAC: N/A kg/day ◆ Sodium hypochlorite: N/A kg/day ◆ Concentrated sulfuric acid: N/A kg/day ◆ Lime: N/A kg/day • Annual Operation and maintenance cost and its breakdown: N/A ◆ Labor cost: N/A ◆ Chemical cost: N/A ◆ Electricity cost: N/A ◆ Maintenance cost: N/A ◆ Other cost: N/A	
4	Water quality test	① Kajulu WTP ② Dunga WTP	• Main items to be tested in each process and frequency of the test (raw water, after treatment and so on): N/A • Compliance with water quality standards: N/A	
5	Future development plan	N/A	N/A	

Attachment-4: Water Transmission Mains to Reservoir

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of transmission pipeline	Refer to Source：KIWASCO Figure 4.		
2	Specifications of Pipeline	N/A	• Location, materials, diameter and length of each pipeline: Refer to Table 2. Year Built: for each pipeline: Refer to Table 2. • NRW of main transmission line: N/A% • Transmission pump: N/A	
3	Future development plan	N/A	N/A	

Attachment-5: Reservoirs

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of Reservoir	① Kajulu Contact Tank ② Obwolo Tank ③ Riat Ground and Elevated Tanks ④ Coptic Tank ⑤ Kanyamedha Tanks ⑥ Kibuye Reservoir Tanks ⑦ Watson Tank ⑧ Dunga Contact Tanks Refer to Source：KIWASCO Figure 5.		
2	Specifications of reservoir	① Kajulu Contact Tank ② Obwolo Tank ③ Riat Ground and Elevated Tanks ④ Coptic Tank ⑤ Kanyamedha Tanks ⑥ Kibuye Reservoir Tanks ⑦ Watson Tank ⑧ Dunga Contact Tanks	• Current capacity: Refer to Table 3. • Year Built: Refer to Table 3. • Structure of main facility: ◆ Reservoir: N/A ◆ Distribution pump: N/A ◆ Water flow measurement facility: N/A ◆ Generator facility: N/A	

3	Operation and maintenance and Water quality test	① Kajulu Contact Tank ② Obwolo Tank ③ Riat Ground and Elevated Tanks ④ Coptic Tank ⑤ Kanyamedha Tanks ⑥ Kibuye Reservoir Tanks ⑦ Watson Tank ⑧ Dunga Contact Tanks	• Flow diagram of reservoir: N/A • Type and amount of chemicals used before distribution if any: N/A ◆ Sodium hypochlorite: N/A • Annual Operation and maintenance cost and its breakdown: N/A ◆ Labor / maintenance cost: N/A ◆ Electricity cost: N/A ◆ Other cost: N/A • Main items to be tested in reservoir: N/A • Compliance with water quality standards: N/A	
4	Future development plan	N/A	N/A	

Attachment-6: Water Distribution Mains

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of distribution pipeline network	Refer to Source：KIWASCO Figure 6.		
2	Specifications of Pipeline	N/A	• Location, materials, diameter and length of each pipeline Refer to Table 4. Year Built: for each pipeline: Refer to Table 4. • Distribution pump: N/A • NRW of main distribution line: N/A	
3	Future development plan	N/A	N/A	

Table 1 KIWASCO Last 10 Years Project

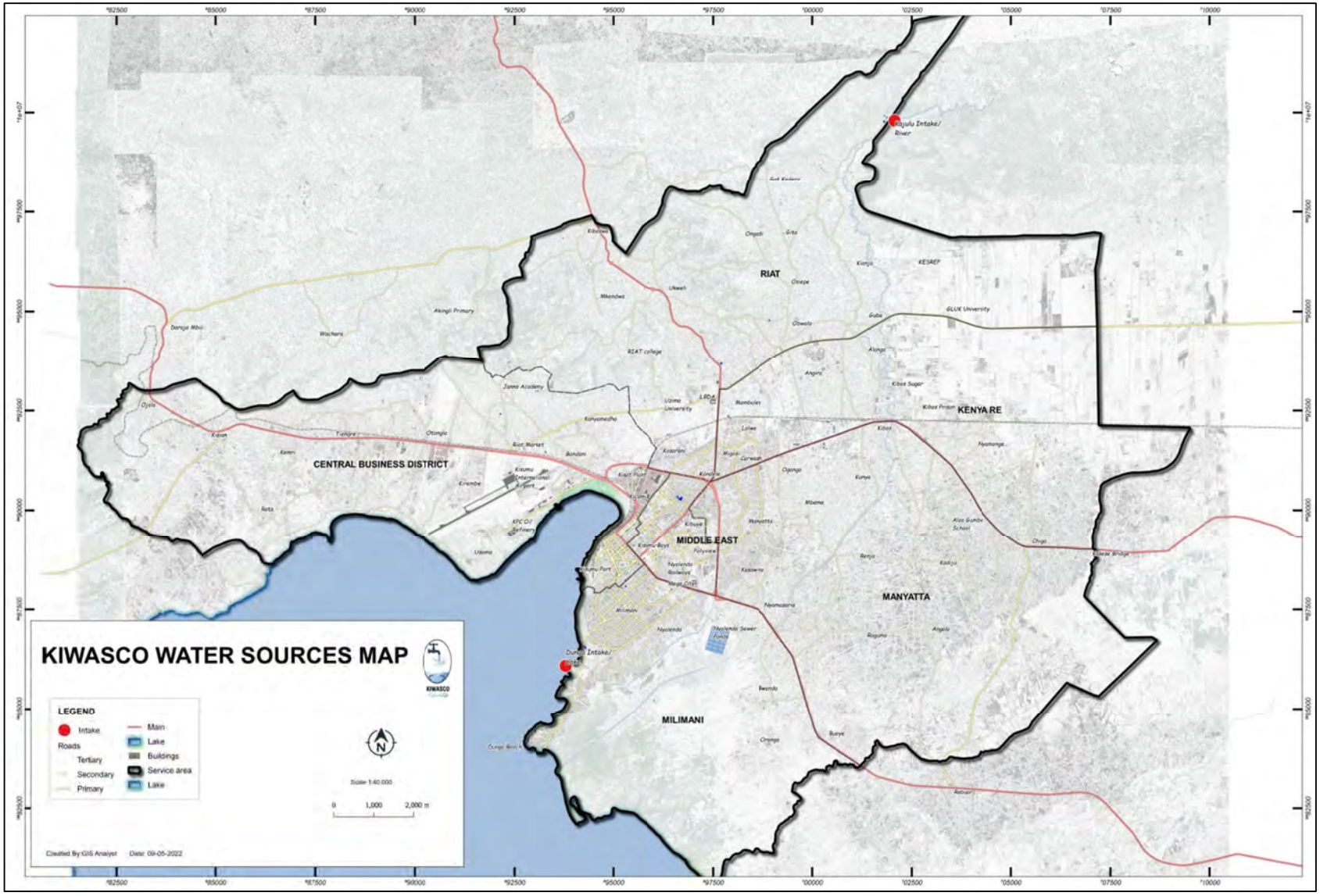
Project Name	Contractor	Client / Financier	Commence Date	Completion Date	Scope	Status	Project Cost
Kisumu Water Supply and Sanitation Project		GoK, World Bank					
Phase 1 Short term action plan			2006	2007	Restoring Capacity of Dunga Intake to 21,500m3/day	100% complete	2,500,000,000
Phase 2 Long term action plan Phase 1: Emergency works Phase 2:			2009	2013	Improving Dunga Source to 45,000m3/d Improvement of Water distribution systems and Reservoirs, Kajulu Intake works, 36,000m3/day Kajulu Water Treatment Plant, Raw Water Pipeline, Rehabilitation of Wastewater at Nyalenda Lagoon and Pumping Stations	100% complete	
OBA Project	Punjani Electrical & Hardware Ltd.	KIWASCO/ WSTF/ WB	Aug-17	Feb-19	Construct a Pump house, 5m wide access road to the pump house with: Drainage to the structure above ground, Gutters (Including all fittings), Downpipes (Including fittings) and Cover to internal floor drains and ducts; Pipework, fittings and valves to and from the pumps; Supply and installation pumps and electrical works	100% complete	113,000,000

Project Name	Contractor	Client / Financier	Commence Date	Completion Date	Scope	Status	Project Cost
OBA Project	IRRICO International Ltd.	KIWASCO/ WSTF/ WB	Aug-17	Feb-19	Construction of approximately 33km of pipeline, gravity mains from high level tanks at Riat hills, rising mains from ground level tanks at Riat, construction of 21m high Elevated pressed steel tank of 75m3 and construction of 229m3 ground level Pressed Steel tank.	100% complete	
KISIP		Kisumu County Government	Early 2018	Apr-19	Construct Trunk Main lines and Laterals within Obunga and Bandani	100% complete	
Nehru Road	Ricardo Building Contractors & Titan Building Concepts	KIWASCO	Oct-18	Feb-19	Construct an 8" sewer line and manhole chambers in Millimani's Nehru Road	100% complete	6,123,864.28
DAGO Phase II Network Extension	Rawelo Construction Company	KUAP	Dec-18	Jan-19	Construction of 2,656m of Water network (7Number Lines) - Provision, Excavating, laying, backfilling and testing of the 2" UPVC pipelines and installation of the appurtenances; Cutting off Lines off-taking from the main lines and connecting them to the created DMM lines; Construction of 2 Number Kiosks	100% complete	2,107,330.00

Project Name	Contractor	Client / Financier	Commence Date	Completion Date	Scope	Status	Project Cost
Sondu Overhaul & Relocation Works	Jaycon Services Kenya Ltd.	KIWASCO-NYANAS/KeNHA	August 21, 2020	SUSPENDED	Relocation of 7,152m of assorted sizes of uPVC Pipelines with appurtenances and connections along the Kisii-Ahero A1 Highway	<50% Complete	51,757,758.80
	Planet Technical Solutions Limited	KIWASCO-NYANAS/KeNHA	August 21, 2020	SUSPENDED	Relocation of 2,039m of uPVC pipeline within Sondu town from the Kisii-Ahero A1 Highway to Agai Secondary School	>70% Complete	3,046,714.00
	Titan Building Concept Limited	KIWASCO-NYANAS/KeNHA	August 21, 2020	SUSPENDED	Relocation of 11,032m of uPVC pipeline within Sondu town from Nyabondo hospital to Nyakach Girls' High School	>80% Complete	31,903,059.95
Improvement of Water Supply to Nyabondo Trauma Centre	Titan Building Concept Limited	KIWASCO-NYANAS/ KeNHA			Extension of 120m of Pipeline to Trauma Centre	100% Complete	502,200.00
PA/Safaricom Mpesa Foundation Project	WADU Construction Company	PA/SAFARICOM			Connection of 150Number households in Nyalenda B	100% Complete	3,166,487.70
Tumaini Roundabout Monument Construction	Building Concepts Ltd	KIWASCO	July 15th 2021	October 25th 2021		95% Complete	2,345,664.00
WSTF CLSG (QSQF) PROJECT	Building Concepts Ltd	WSTF/GoK	April 1st 2021	June 30, 2021	Construction of 11Number Handwash Points at vulnerable areas in Kisumu town	11 out of 11 complete	905,590.80

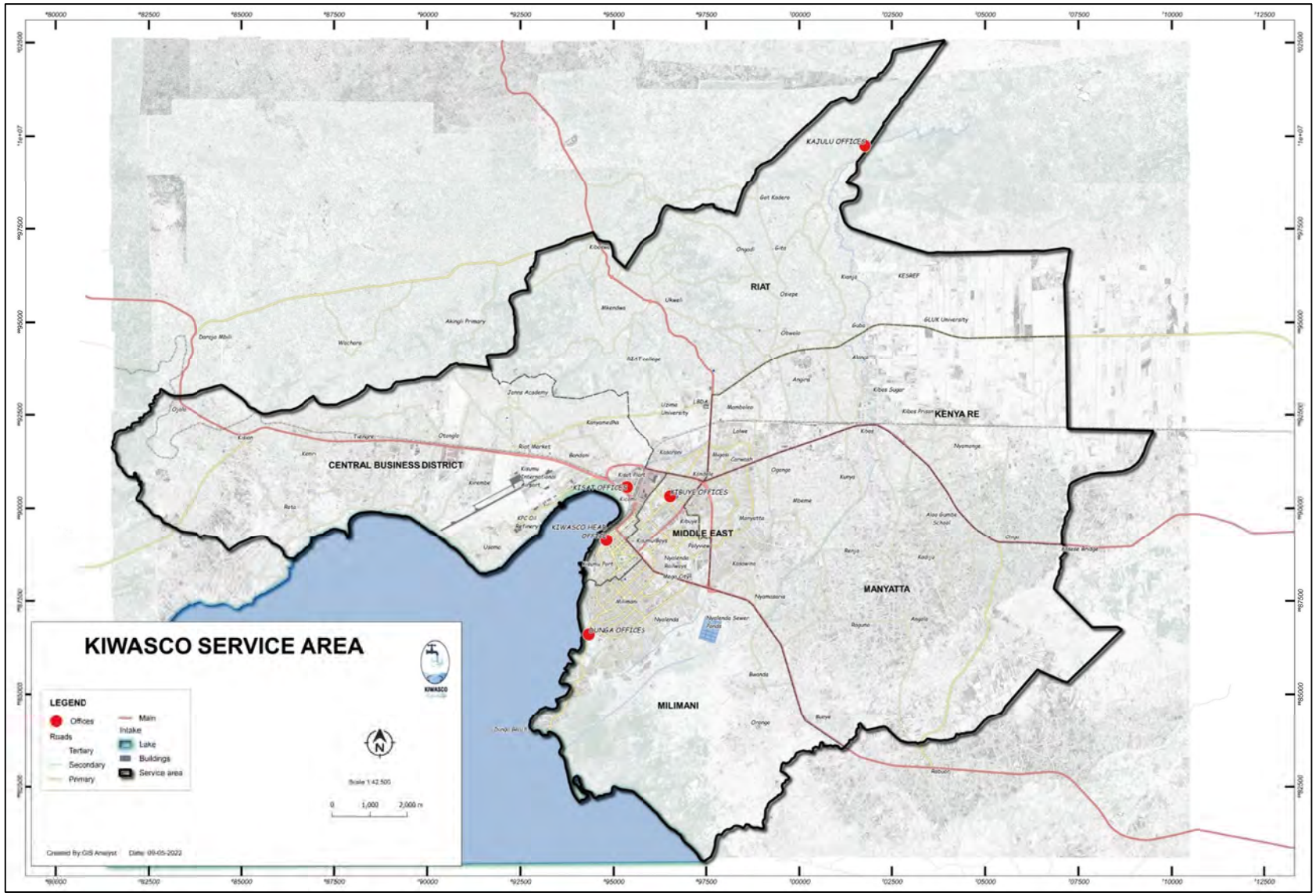
Project Name	Contractor	Client / Financier	Commence Date	Completion Date	Scope	Status	Project Cost
	Framoc Agencies & Shavanna Contractor		April 1st 2021	June 30, 2021	Connection of 200Number households	100% Complete	4,284,000.00
	Ricardo Building Contractors & Titan Building Concepts		April 1st 2021	June 30, 2021	Extensions and overhauls of 1,943m of pipeline in Bandani and Kogony Low-Income areas	100% Complete	3,526,353.04
Rehabilitation of 20Nr Migosi Sewer manholes	Framoc Agencies Ltd	KIWASCO	October 18th 2021	December 18th 2021	Raising of 20Nr sewer manholes c/w Insitu cast RCC covers	100% complete	1,112,830.00
Construction and Repair of 41Nr DMM Chambers	Okquims General Supplies Agencies Ltd	KIWASCO	October 18th 2021	December 18th 2021	Demolition and construction of RCC chambers c/w Insitu cast RCC concrete covers with lockable accesses	100% Complete	2,126,590.00

Source：KIWASCO



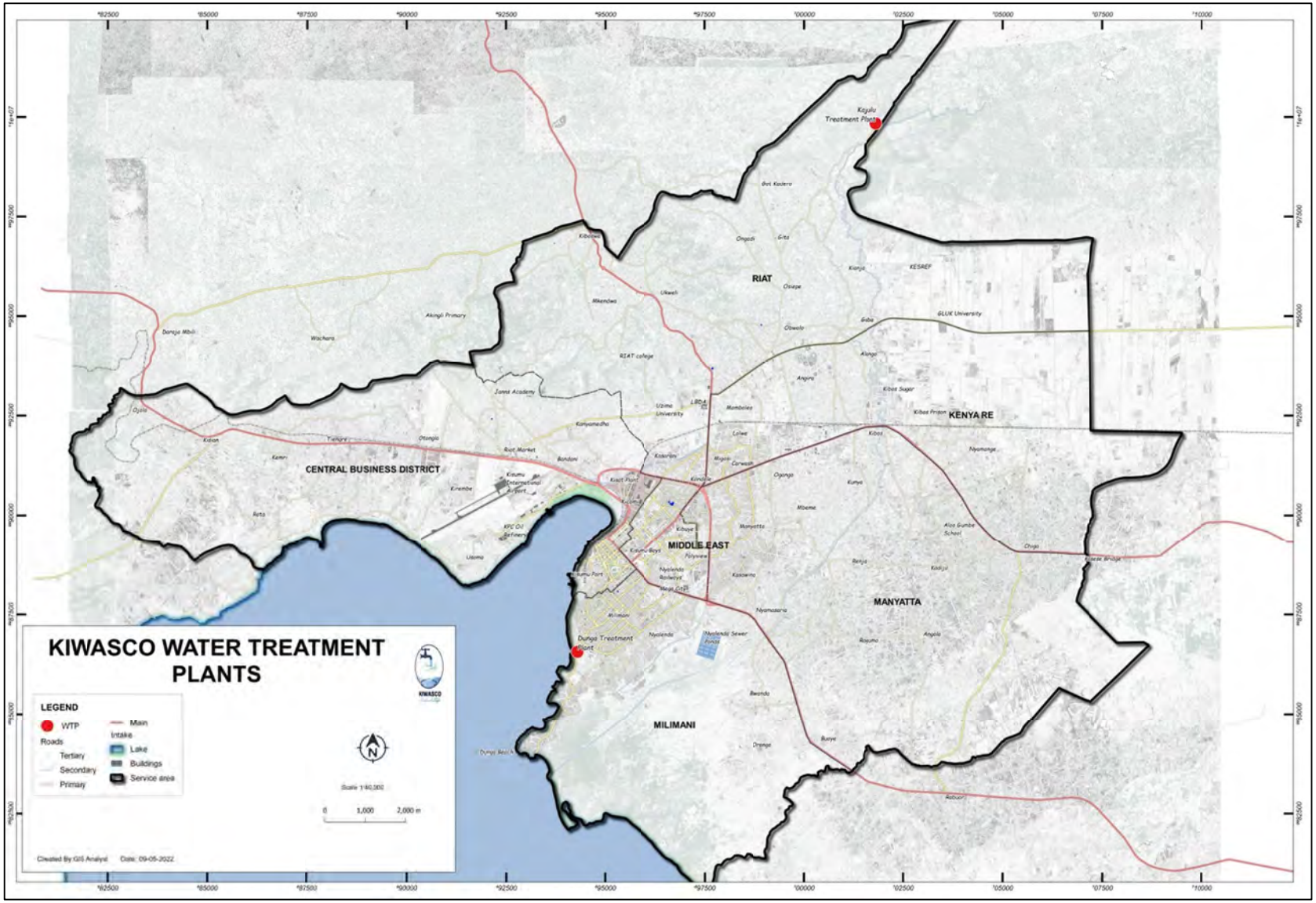
Source：KIWASCO

Figure 1 KIWASCO Water Source



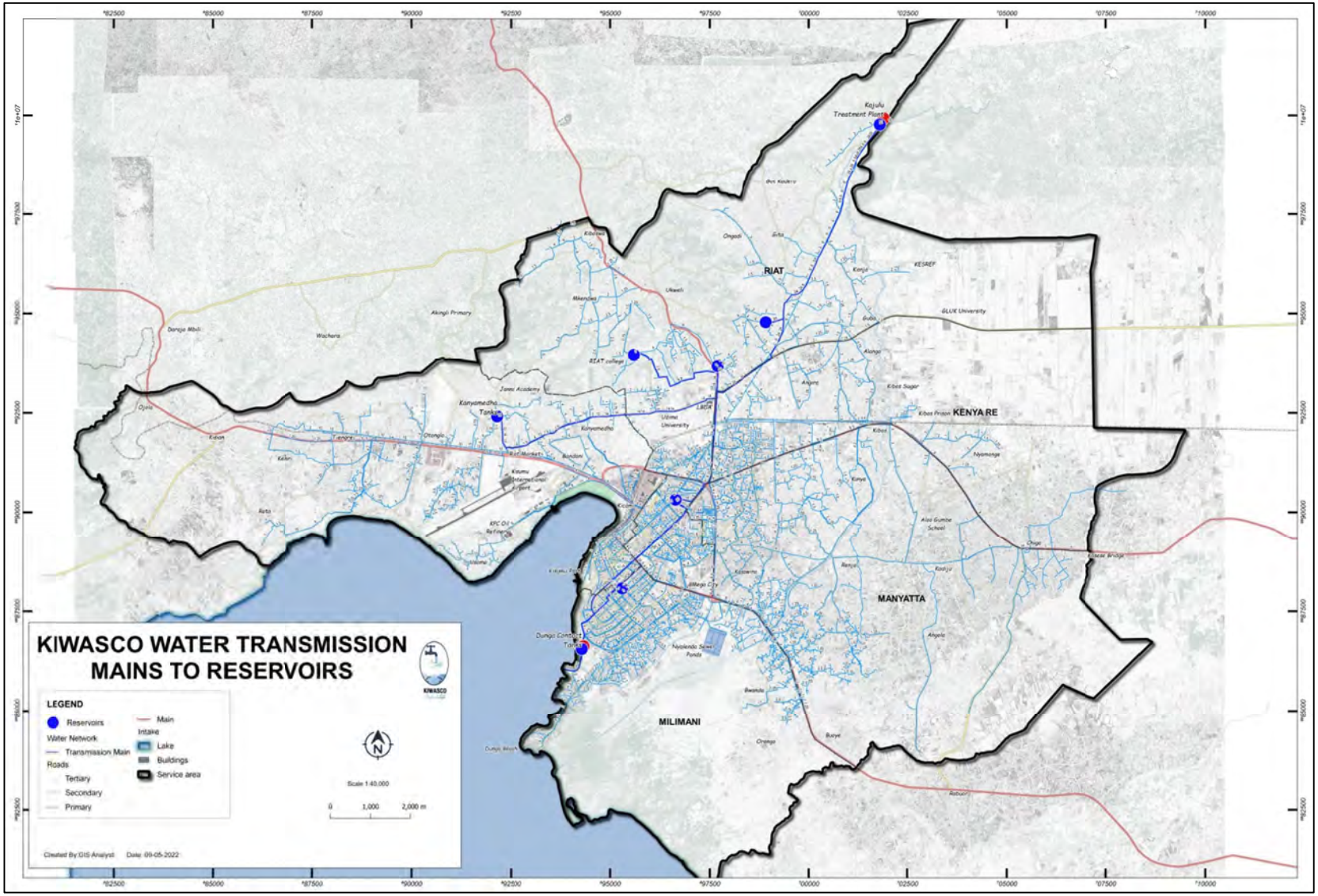
Source：KIWASCO

Figure 2 KIWASCO Service Area



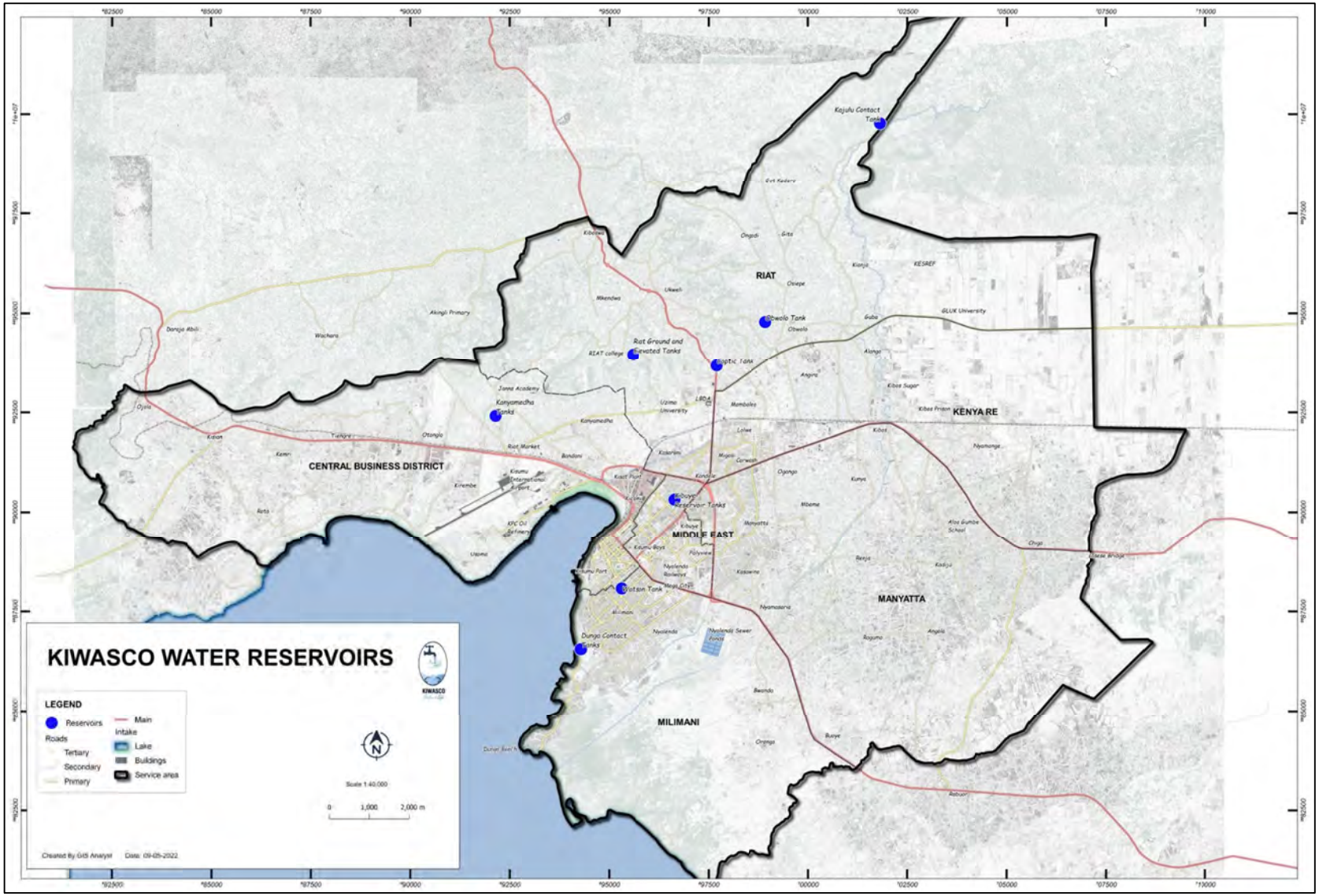
Source：KIWASCO

Figure 3 KIWASCO WTP



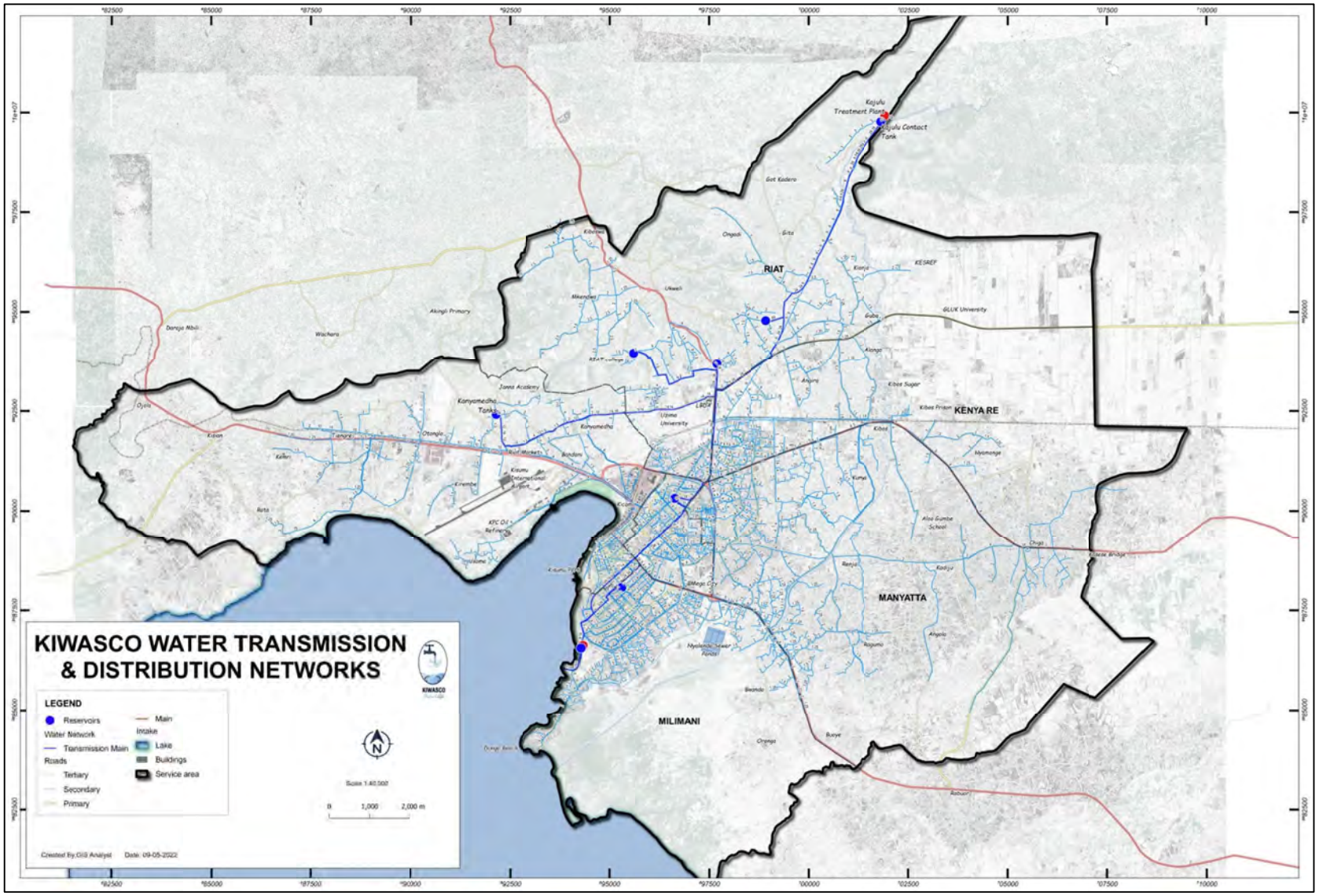
Source：KIWASCO

Figure 4 KIWASCO Water Transmission Mains to Reservoirs



Source：KIWASCO

Figure 5 KIWASCO Water Reservoirs



Source：KIWASCO

Figure 6 KIWASCO Water Transmission & Distribution Networks

Table 2 Water Transmission Mains Breakdown

Pipe Size (inches)	Length (km)	Pipe Material	Year of Installation	Condition
28	4.970	Epoxy coated cement lined steel pipe	2011	New
26	0.225	Epoxy coated cement lined steel pipe	2011	In use
24	13.681	Epoxy coated steel pipe	2011	In use
16	2.008	Epoxy coated steel pipe	2011	In use
14	12.915	Epoxy coated Steel pipe/uPVC	2011	In use
12	3.612	Epoxy coated Steel pipe/uPVC	-	In use
10	8.319	Asbestos Cement	-	In use

Source：KIWASCO

Table 3 KIWASCO Water Reservoirs

Location (area)	Type	Year of installation	Capacity (m^3)	In use/not in use (reason)
Watson Bank	Masonry	1954	2,000	In Use
Kanyamedha	Masonry	2012	2,100	In Use
Coptic	Masonry	2012	5,000	In Use
Obwolo	Masonry	2012	1,300	In Use
Riat Elevated	Steel	2018	82	In Use
Riat Ground tank	Masonry	2018	229	In use
Kibuye A1	Masonry	2011	6,000	In Use
Kibuye A2	Masonry	2011	6,000	In Use
Kibuye Rectangular	Masonry	1985	5,000	Not in use (Leaking)
Kibuye B	Masonry	1958	910	In Use
Kibuye C	Masonry	1958	455	In Use
Kibuye Domestic I	Elevated steel	1958	100	In Use
Kibuye Domestic II	Elevated steel	1958	125	Not in use (Leaking)
Dunga T/Works A	Masonry	1954	1,400	In Use
Dunga T/Works B	Masonry	1958	700	In Use
Dunga T/Works C	Masonry	2011	500	In Use
Kajulu T/Works	Masonry	2012	5,000	In use
TOTAL Active			31,776	
Total inactive			5,125	
TOTAL			37,901	

Source：KIWASCO

Table 4 Water Distribution Mains Breakdown

Pipe Size (inches)	Length (km)	Pipe Material	Year of Installation	Condition
9	8.325	Asbestos/uPVC	Were constructed in different years cutting across the whole water network	Good
8	27.267	uPVC	2011	Good
24	3.180	Epoxy coated Steel pipes	2011	Good
16	2.008	Epoxy coated steel pipe	2011	
6	39.756	Asbestos	2011	Good
12	1.1100	HDPE	-	Good
5	3.017	Asbestos	-	Good
Grand Total	506.016			

Source：KIWASCO

WSP-11

Nzoia WSP (NZOWASCO)

Project for Strengthening Capacity of Water Service Providers on Formulating Bankable Project Plans

Questionnaire (NZOWASCO)

No.	Questions	Answers
1	Are you willing to borrow the money from commercial bank when selected as target WSP?	Yes.
2	Kindly specify last 10 years project with major project comportment and amount, and source of fund for each project.	• Kibabii - Chebyuk Water Supply: USD 5.36M (Korea International Cooperation Agency (Koïca))
3	Kindly provide the WSP long term plan with annual budget for O&M and investment for water supply system.	【Strategic Plan 2019-2022, Annex 1】
4	Do you currently offer or intended to be offer any fund from doner, AOB, OBA, KPWF, own fund or any others? If yes, kindly provide the detail.	Yes. 【Strategic Plan 2019-2022, Annex 2】
5	Kindly provide the documents listed in Attachment 1 to 6 and Data Collection List.	Noted.
6	Kindly fill in the details for the overview of water supply facilities as shown in Attachment 1 to 6.	【Attachment 1 to 6】
7	What is the reason for the inactive connections?	■ No payment ■ No water due to technical problem such as no pressure, blockages and so on □ There is any other alternative source. □ Deactivate the account during rainy season □ Any other reason, if any please specify
8	What kind of sensitization for the inactive connections to reconnection have been carried out?	• Billing messages • Marketing teams • Barazas
9	Kindly provide the current total water demand (m^3/day) with calculation method and excel file.	N/A
10	Kindly provide the details for the water demand projection with calculation method and excel file.	N/A

No.	Questions	Answers
11	Challenges Faced in the Water Supply Facilities	
	1) Potential of Water Source	□ Enough to develop the future demand □ Enough for current demand ■ Not enough (Kimilili water supply plant needs rehabilitation of the intake. The intake is shared with a community irrigation scheme. During drought, abstraction is completely reduced to an extend that no water is available for treatment and supply.) □ Need additional water sources
	2) Raw Water Quality	□ Meet the standard for drinking purpose ■ Meeting the standard but deteriorating
	3) Intake Facility	
	Intake Volume	□ Sufficient for future water demand ■ Sufficient for current demand □ Not sufficient for current demand
	Facility Condition	□ Good □ Fair □ Deteriorating but can utilize ■ Need rehabilitation and augmentation (Nzoia Treatment Plant needs rehabilitation. There is enough water for abstraction but the plant is old and needs urgent attention)
	4) Raw Water Transmission System	
	Transmission Volume	□ Sufficient for future water demand □ Sufficient for current demand ■ Not sufficient for current demand
	Facility Condition	□ Good ■ Fair □ Deteriorating but can utilize □ Need rehabilitation and augmentation

No.	Questions	Answers
	5) Water Treatment Plant Treatment Volume Facility Condition	 □ Sufficient for future water demand □ Sufficient for current demand ■ Not sufficient for current demand □ Good □ Fair ■ Deteriorating but can utilize □ Need rehabilitation and augmentation
	6) Water Distribution Systems Water Pressure	 □ Meeting the standards for water pressure □ Not all area meeting the standards for water pressure ■ Not meeting the standard when high demand □ Not meeting the standard
	7) Household Connection	□ Using the saddle clamp with cock ■ Using the saddle clam (with gate valve) ■ Using the tee (with gate valve)
	8) Water Meter	□ Using the piston type ■ Using propeller type Reason of selecting above:
	9) Non-Revenue Water (NRW) Reason and each percentage	 ■ Old pipe □ Poor material use □ High pressure ■ Meter inaccuracy ■ Illegal connection □ Poor workmanship □ Others
	10) Billing System How do you read the water meter? What kind of software for billing system is using?	 ■ By manual ■ By smart Phone □ By smart meter □ Enterprise Resource Planning (ERP) □ JICS □ Other: Manual

Attachment-1: Main Water Source

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of water source and intake facility	① Kapolet River ② Nzoia River ③ Bungoma (Matisi) River ④ Webuye (Nabuyole) River ⑤ Kimili (Kamtiong) River ⑥ Terem River ⑦ Kapkateny River ⑧ Chesikaki River		
2	Specifications of water source and intake facility	① Kapolet River ② Nzoia River ③ Bungoma (Matisi) River ④ Webuye (Nabuyole) River ⑤ Kimili (Kamtiong) River ⑥ Terem River ⑦ Kapkateny River ⑧ Chesikaki River	• Water source capacity: N/A. • Intake capacity: N/A. • Year Built: N/A • Structure of intake facility (Elevation +N/A masl): ◆ Intake well: N/A ◆ Grit chamber: N/A ◆ Pump: N/A	
3	Outstanding annual and seasonal fluctuation / trend, if any	N/A	• Maximum intake: N/A • Minimum intake: N/A • Permanent river or seasonal river: N/A	
4	Future development plan	N/A	N/A	

Attachment-2: Management Structure and Area of Coverage

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location of water supply area / county	① Bungoma County ② Trans-Nzoia Refer to Source：NZOWASCO Figure 1.		
2	General information of water supply area / county	① Bungoma County ② Trans-Nzoia	• Population / Beneficiaries: Refer to Table 1. • Household connections: N/A • Water Kiosk: N/A • Total / coverage area: (2022): N/A km^2 • Average service hours: N/A • Water Treatment Plant: N/A • Main water source: N/A • Current domestic water demand: N/A • Future domestic water demand: N/A	

Attachment-3: Water Treatment Plant (WTP)

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of WTP	① Kapolet WTP ② Matisi WTP ③ Kimilili WTP ④ Nabuyole WTP ⑤ Nzoia WTP ⑥ Kapkateny WTP ⑦ Terem WTP Refer to Source：NZOWASCO Figure 2.		
2	Specifications of WTP	① Kapolet WTP ② Matisi WTP ③ Kimilili WTP ④ Nabuyole WTP ⑤ Nzoia WTP ⑥ Kapkateny WTP ⑦ Terem WTP	• Type of treatment: Refer to Table 2 • Current treatment capacity: Refer to Table 2. • Design treatment capacity: Refer to Table 2. • Year Built: Refer to Table 2 • Structure of main facility: N/A	

3	Water treatment conditions	① Kapolet WTP ② Matisi WTP ③ Kimilili WTP ④ Nabuyole WTP ⑤ Nzoia WTP ⑥ Kapkateny WTP ⑦ Terem WTP	• Utilization of plant capacity: N/A % • Hours for WTP Utilization: N/A • Flow diagram of the water treatment process: N/A • Type and amount of chemicals used during the process for during the dry and rainy seasons: ◆ PAC: N/A kg/day ◆ Sodium hypochlorite: N/A kg/day ◆ Concentrated sulfuric acid: N/A kg/day ◆ Lime: N/A kg/day • Annual Operation and maintenance cost and its breakdown: N/A ◆ Labor cost: N/A ◆ Chemical cost: N/A ◆ Electricity cost: N/A ◆ Maintenance cost: N/A ◆ Other cost: N/A	
4	Water quality test	① Kapolet WTP ② Matisi WTP ③ Kimilili WTP ④ Nabuyole WTP ⑤ Nzoia WTP ⑥ Kapkateny WTP ⑦ Terem WTP	• Main items to be tested in each process and frequency of the test (raw water, after treatment and so on): N/A • Compliance with water quality standards: N/A	
5	Future development plan	N/A	N/A	

Attachment-4: Water Transmission Mains to Reservoir

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of transmission pipeline	① Bungoma Town: 189km ② Kitale Town: 250km ③ Webuye: 167km ④ Kimilili: 165km		
2	Specifications of Pipeline	① Bungoma Town ② Kitale Town ③ Webuye ④ Kimilili	• Location, materials, diameter and length of each pipeline: CPVC and ferrous steel for main lines. • Year Built: for each pipeline: N/A • NRW of main transmission line: N/A % • Transmission pump: N/A	
3	Future development plan	N/A	N/A	

Attachment-5: Reservoirs

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of Reservoir	① Mabanga Water Reservoir ② Nabuyole Storage ③ Southern Compound Kitale Storage Tanks ④ Nothern compound Kitale Storage Tanks ⑤ Chwele Water Storage Tank		
2	Specifications of reservoir	① Mabanga Water Reservoir ② Nabuyole Storage ③ Southern Compound Kitale Storage Tanks ④ Nothern compound Kitale Storage Tanks ⑤ Chwele Water Storage Tank	• Current capacity: Refer to Table 3. • Year Built: Refer to Table 3. • Structure of main facility: ◆ Reservoir: N/A ◆ Distribution pump: N/A ◆ Water flow measurement facility: N/A ◆ Generator facility: N/A	

3	Operation and maintenance and Water quality test	① Mabanga Water Reservoir ② Nabuyole Storage ③ Southern Compound Kitale Storage Tanks ④ Nothern compound Kitale Storage Tanks ⑤ Chwele Water Storage Tank	• Flow diagram of reservoir: N/A • Type and amount of chemicals used before distribution if any: N/A ◆ Sodium hypochlorite: N/A • Annual Operation and maintenance cost and its breakdown: N/A ◆ Labor / maintenance cost: N/A ◆ Electricity cost: N/A ◆ Other cost: N/A • Main items to be tested in reservoir: N/A • Compliance with water quality standards: N/A	
4	Future development plan	N/A	N/A	

Attachment-6: Water Distribution Mains

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of distribution pipeline network	Webuye distribution network: Refer to Source：NZOWASCO ① Figure 3. Kimilili distribution network or DMA: Refer to Source：NZOWASCO ② Figure 4. Bungoma Water distribution network: Refer to Source：NZOWASCO ③ Figure 5. Kitale Water distribution network: Refer to Source：NZOWASCO ④ Figure 6.		
2	Specifications of Pipeline	① Webuye distribution network ② Kimilili distribution network or DMA ③ Bungoma Water distribution network ④ Kitale Water distribution network	• Location, materials, diameter and length of each pipeline: N/A • Year Built: for each pipeline: N/A • Distribution pump: N/A • NRW of main distribution line: N/A	
3	Future development plan	N/A	N/A	

Table 1 NZOWASCO Service Area

Water Supply Scheme	Town Served	Current Target Population	Population Served	Scheme Type
Kapolet	Kitale	139,671	122,344	Kapolet – Gravity
Nzoia	-	-	-	Nzoia – Two stage Pumping
Bungoma (Matisi)	Bungoma	94,500	55,124	Two stage Pumping
Webuye. (Nabuyole)	Webuye	67,870	58,922	Single stage Pumping
Kimilili (Kamtiong)	Kimilili	78,567	63,127	Gravity
Terem.	Chwele	39,000	12,000	Gravity
Kapkateny	Chwele, Bokoli	35,000	9,600	Gravity
Chesikaki	Sirisia	32,000	12,000	Gravity

Source：NZOWASCO

Table 2 NZOWASCO WTP

WTP	Location	Type	Year of Installation	Design Capacity	Current Capacity
Kapolet	Kitale	Conventional	2006	10,500	9,000
Nzoia	Kitale	Conventional	1982	10,500	3,000
Matisi	Bungoma	Conventional	2006	7,500	5,250
Nabuyole	Webuye	Conventional	2006	7,500	4,400
Terem	Chwele	Conventional	2018	2,500	2,000
Kapkateny	Chwele	Conventional	2014	5,000	3,500
Kimilili	Kimilili	Conventional	2004	5,000	1,600
Chesikaki	Chwele	Conventional	-	4,000	2,000

Source：NZOWASCO

Table 3 NZOWASCO Reservoirs

Reservoirs	Material	Year of Installation	Capacity (m^3)	In use
Mabanga Water Reservoir	Precast Concreate	1986 New tank 2010	-	-
Nabuyole Storage	Precast Concreate	1972 Renovated 2010	1,000 550 550	In use
Southern Compound Kitale storage Tanks	Elevated Steel. Precast Concrete	1984	1,500 1,135	In use
Northern Compound Kitale Storage Tanks	Elevated Steel Precast Concrete	1984	3,250 3,250	In use
Chwele Water Storage Tank	Masonry Ground	1986	225	In use
Total			**11,460**	

Source：NZOWASCO

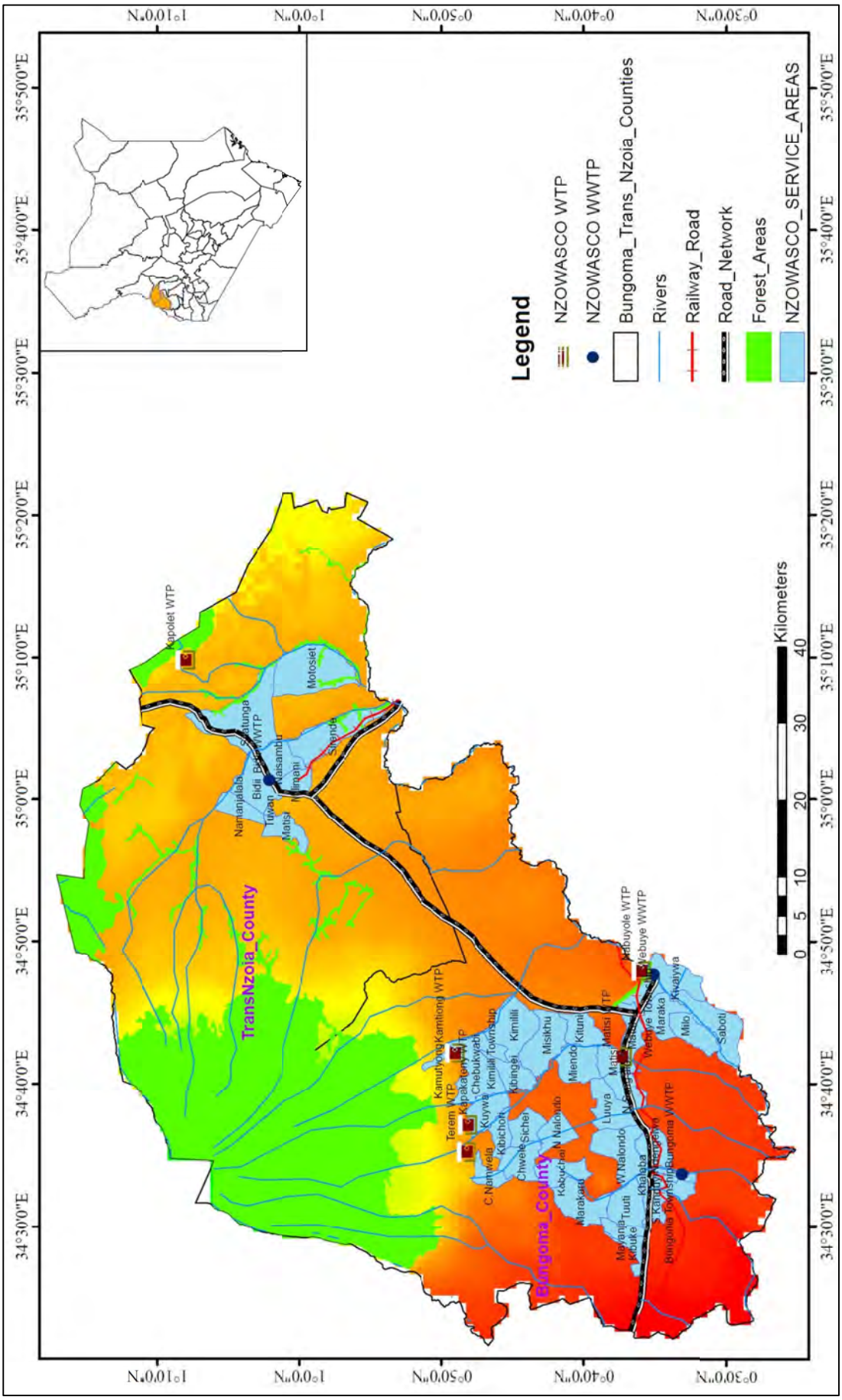
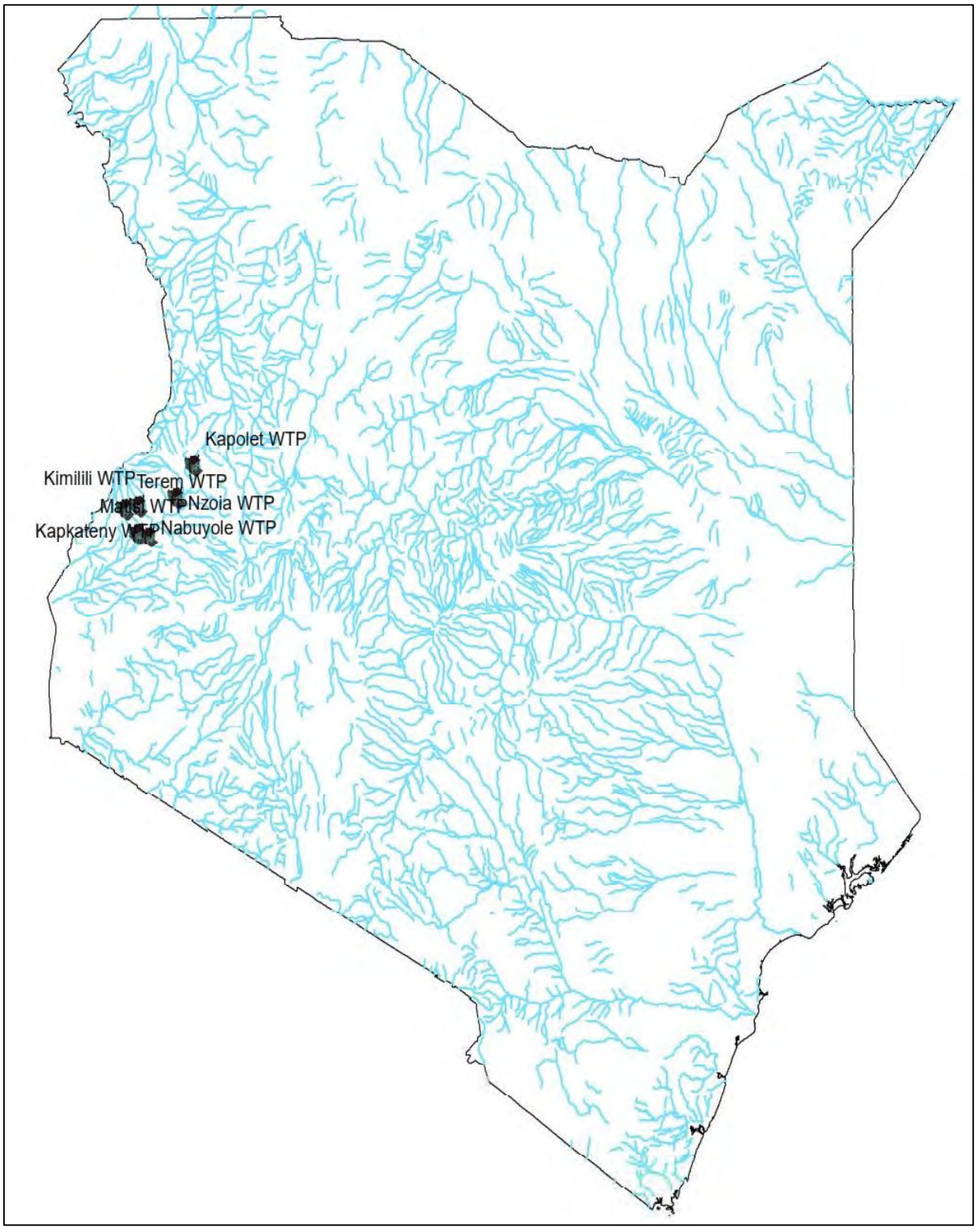


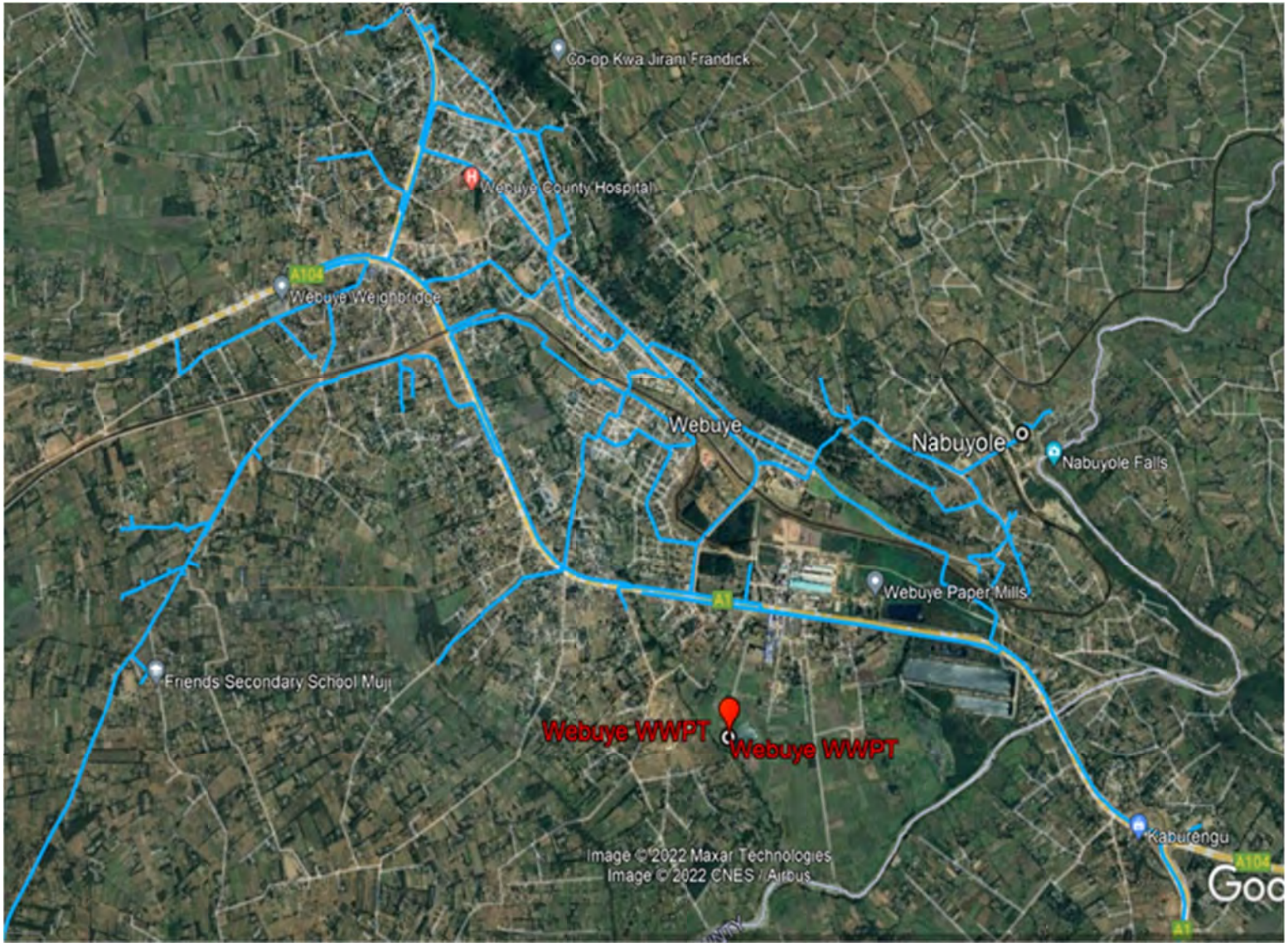
Figure 1 NZOWASCO Service Area

Source：NZOWASCO



Source：NZOWASCO

Figure 2 NZOWASCO WTP

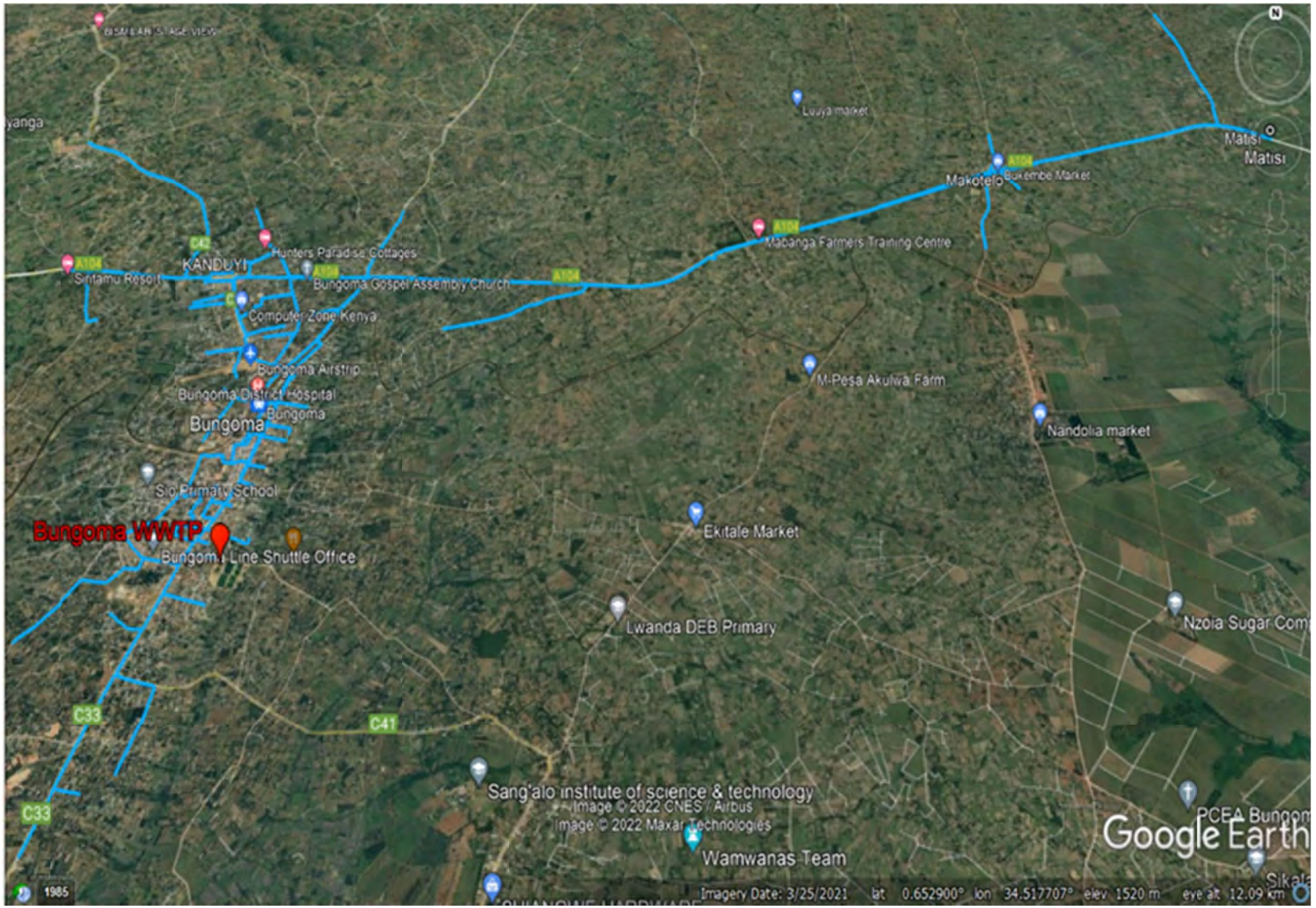


Source：NZOWASCO

Figure 3 Webuye Distribution Network

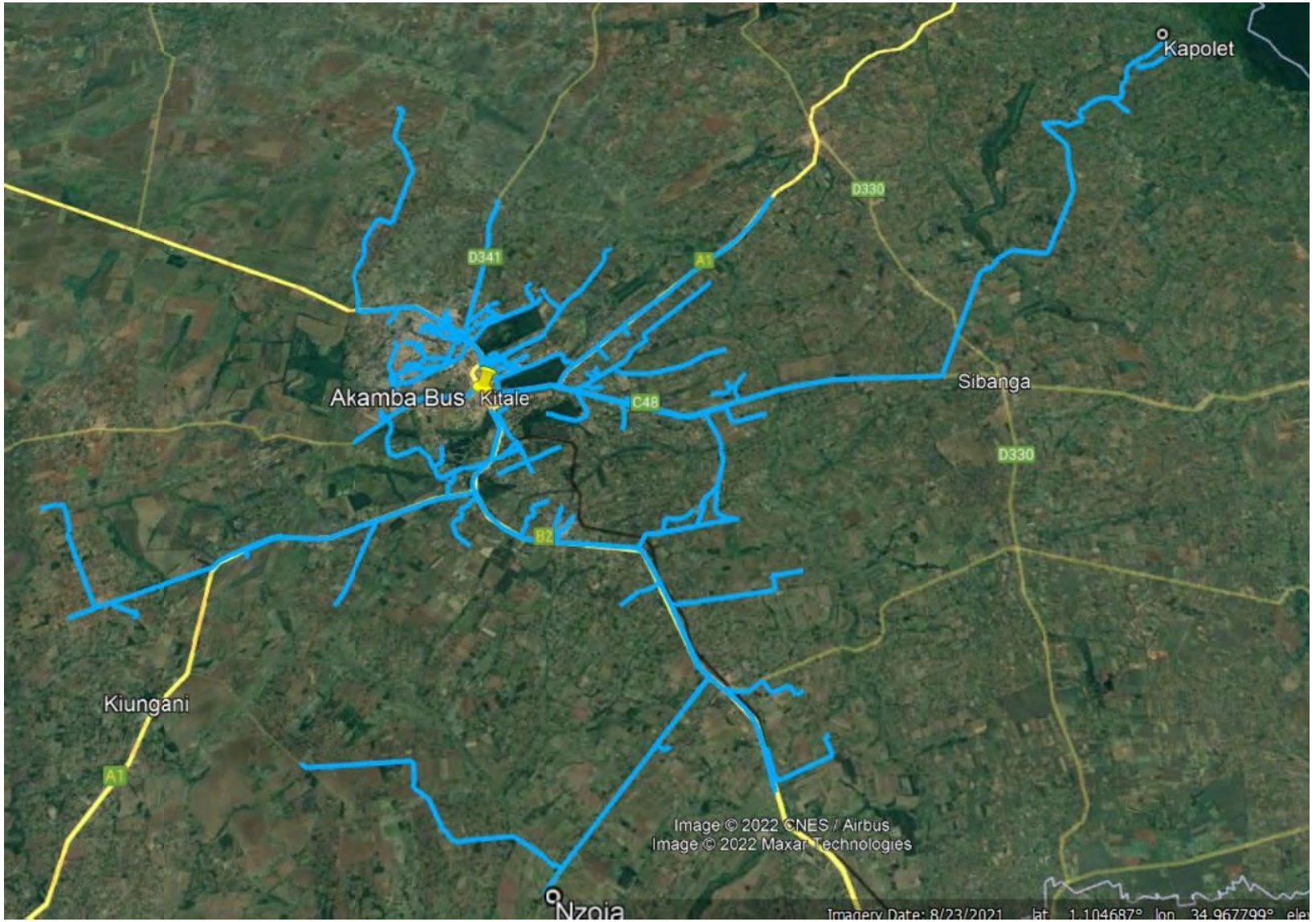
Source：NZOWASCO

Figure 4 Kimilili Distribution Network or DMA



Source：NZOWASCO

Figure 5 Bungoma Water Distribution Network



Source：NZOWASCO

Figure 6 Kitale Water Distribution Network

WSP-12

Isiolo WSP (IWASCO)

Project for Strengthening Capacity of Water Service Providers on Formulating Bankable Project Plans

Questionnaire (IWASCO)

No.	Questions	Answers
1	Are you willing to borrow the money from commercial bank when selected as target WSP?	No.
2	Kindly specify last 10 years project with major project comportment and amount, and source of fund for each project.	• Last Mile Connectivity (extension of service lines for 9 km for water (63 mm – 110 mm HDPE), 12 km for sewer): MWSI (KES 73 million) • Drilling of one borehole equipped with solar panel, extension 4 km pipelines (110 m HDPE), rehabilitation of storage tank (50 m3) and boreholes: Catholic Relieve Services (Grant of KES 22 million) • Rehabilitation and solarized of boreholes, new system (ERP) being implemented, capacity building: Kenya Market Trust (Unknown) • During COVID-19, relieve activities being carried out such as solarized of 2 boreholes to increase service hours, and one borehole is drilled and equipped with solar panel, water treatment chemicals being purchased, Conditional Liquidity Support Grant (CLSG): WB through WSTF (KES 12 million)
3	Kindly provide the WSP long term plan with annual budget for O&M and investment for water supply system.	【Strategic Plan 2019-2023】
4	Do you currently offer or intended to be offer any fund from doner, AOB, OBA, KPWF, own fund or any others? If yes, kindly provide the detail.	Yes. Proposal for Grant Project (Urban Project Concept (UPC) Kiwanjani Project under WSTF, only pay VAT 16%)
5	Kindly provide the documents listed in Attachment 1 to 6 and Data Collection List.	Noted.

No.	Questions	Answers
6	Kindly fill in the details for the overview of water supply facilities as shown in Attachment 1 to 6.	【Attachment 1 to 6】
7	What is the reason for the inactive connections?	■ No payment □ No water due to technical problem such as no pressure, blockages and so on □ There is any other alternative source. □ Deactivate the account during rainy season □ Any other reason, if any please specify
8	What kind of sensitization for the inactive connections to reconnection have been carried out?	• Water bills paid in installment • Enforcement of payment
9	Kindly provide the current total water demand (m^3/day) with calculation method and excel file.	12,000 m^3/day
10	Kindly provide the details for the water demand projection with calculation method and excel file.	2028: 20,649 m^3/day
11	Challenges Faced in the Water Supply Facilities 1) Potential of Water Source	□ Enough to develop the future demand □ Enough for current demand ■ Not enough ■ Need additional water sources (boreholes)
	2) Raw Water Quality	■ Meet the standard for drinking purpose (Turbidity of river water deteriorates to 2,000 NTU during rainy season. Some boreholes have high salinity) □ Meeting the standard but deteriorating
	3) Intake Facility Intake Volume	□ Sufficient for future water demand □ Sufficient for current demand ■ Not sufficient for current demand (3,000 m^3/d from river and boreholes during dry seasons, 6,000 m^3/d during rainy seasons)
	Facility Condition	□ Good ■ Fair □ Deteriorating but can utilize □ Need rehabilitation and augmentation

No.	Questions	Answers
	4) Raw Water Transmission System Transmission Volume	 □ Sufficient for future water demand ■ Sufficient for current demand □ Not sufficient for current demand
	Facility Condition	□ Good ■ Fair (New WTP) ■ Deteriorating but can utilize (Old WTP) □ Need rehabilitation and augmentation
	5) Water Treatment Plant Treatment Volume	 □ Sufficient for future water demand ■ Sufficient for current demand □ Not sufficient for current demand
	Facility Condition	□ Good ■ Fair □ Deteriorating but can utilize □ Need rehabilitation and augmentation
	6) Water Distribution Systems Water Pressure	 □ Meeting the standards for water pressure ■ Not all area meeting the standards for water pressure □ Not meeting the standard when high demand □ Not meeting the standard
	7) Household Connection	□ Using the saddle clamp with cock ■ Using the saddle clam (For big diameter pipe) ■ Using the tee (With valve for small diameter pipe)
	8) Water Meter	■ Using the piston type ■ Using propeller type Reason of selecting above: N/A

No.	Questions	Answers
	9) Non-Revenue Water (NRW) Reason and each percentage	■ Old pipe □ Poor material use □ High pressure ■ Meter inaccuracy ■ Illegal connection □ Poor workmanship □ Others: Faulty meters (Failed to read the numbers)
	10) Billing System How do you read the water meter? What kind of software for billing system is using?	□ By manual ■ By smart Phone □ By smart meter ■ Enterprise Resource Planning (ERP) □ JICS □ Other

Attachment-1: Main Water Source

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of water source and intake facility	① Isiolo River ② Boreholes		
2	Specifications of water source and intake facility	① Isiolo River	• Water source capacity: N/A m^3/day • Intake capacity: N/A m^3/hour, N/A m^3/day • Year Built: N/A • Structure of intake facility (Elevation + N/A masl): ◆ Intake well: N/A ◆ Grit chamber: N/A ◆ Pump: N/A	
		② Boreholes	• Water source capacity: Refer to Table 1. • Intake capacity: Refer to Table 1. • Year Built: N/A • Structure of intake facility (Elevation +N/A masl): ◆ Intake well: N/A ◆ Grit chamber: N/A ◆ Pump: N/A	
3	Outstanding annual and seasonal fluctuation / trend, if any	① Isiolo River ② Boreholes	• Maximum intake: N/A • Minimum intake: N/A • Permanent river or seasonal river: N/A	
4	Future development plan	N/A	N/A	

Attachment-2: Management Structure and Area of Coverage

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location of water supply area / county	N/A		
2	General information of water supply area / county	N/A	• Population / Beneficiaries: N/A • Household connections: N/A • Water Kiosk: N/A • Total / coverage area: N/A ㎢ • Average service hours: N/A • Water Treatment Plant: N/A • Main water source: N/A • Current domestic water demand: N/A • Future domestic water demand: N/A	

Attachment-3: Water Treatment Plant (WTP)

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of WTP	① Isiolo WTP Phase I ② Isiolo WTP Phase II		
2	Specifications of WTP	① Isiolo WTP Phase I	• Type of treatment: N/A • Current treatment capacity: N/A m^3/day • Design treatment capacity: 3,000 m^3/day • Year Built: N/A • Structure of main facility: N/A	
		② Isiolo WTP Phase II	• Type of treatment: N/A • Current treatment capacity: N/A m3/day • Design treatment capacity: 4,500 m3/day • Year Built: N/A • Structure of main facility: N/A	
3	Water treatment conditions	① Isiolo WTP Phase I ② Isiolo WTP Phase II	• Utilization of plant capacity: N/A % • Hours for WTP Utilization: N/A • Flow diagram of the water treatment process: N/A • Type and amount of chemicals used during the process for during the dry and rainy seasons: ◆ PAC: N/A kg/day ◆ Sodium hypochlorite: N/A kg/day ◆ Concentrated sulfuric acid: N/A kg/day ◆ Lime: N/A kg/day • Annual Operation and maintenance cost and its breakdown: N/A ◆ Labor cost: N/A ◆ Chemical cost: N/A ◆ Electricity cost: N/A ◆ Maintenance cost: N/A ◆ Other cost: N/A	
4	Water quality test	① Isiolo WTP Phase I ② Isiolo WTP Phase II	• Main items to be tested in each process and frequency of the test (raw water, after treatment and so on): N/A • Compliance with water quality standards: N/A	

5	Future development plan	N/A	N/A	

Attachment-4: Water Transmission Mains to Reservoir

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of transmission pipeline	N/A		
2	Specifications of Pipeline	N/A	• Location, materials, diameter and length of each pipeline: N/A • Year Built: for each pipeline: N/A • NRW of main transmission line: N/A % • Transmission pump: N/A	
3	Future development plan	N/A	N/A	

Attachment-5: Reservoirs

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of Reservoir	N/A		
2	Specifications of reservoir	N/A	• Current capacity: N/A • Year Built: N/A • Structure of main facility: ◆ Reservoir: N/A ◆ Distribution pump: N/A ◆ Water flow measurement facility: N/A ◆ Generator facility: N/A	
3	Operation and maintenance and Water quality test	N/A	• Flow diagram of reservoir: N/A • Type and amount of chemicals used before distribution if any: N/A ◆ Sodium hypochlorite: N/A • Annual Operation and maintenance cost and its breakdown: N/A ◆ Labor / maintenance cost: N/A ◆ Electricity cost: N/A ◆ Other cost: N/A • Main items to be tested in reservoir: N/A • Compliance with water quality standards: N/A	
4	Future development plan	N/A	N/A	

Attachment-6: Water Distribution Mains

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of distribution pipeline network	N/A		
2	Specifications of Pipeline	N/A	• Location, materials, diameter and length of each pipeline: N/A • Year Built: for each pipeline: N/A • Distribution pump: N/A • NRW of main distribution line: N/A	
3	Future development plan	N/A	N/A	

Table 1 IWASCO Boreholes

Borehole	Location	Yield (m3/hr)	Yield (m3/d)	Status	Source Of Funding
Chief Camp	Kiwajani	7.8	93.6	Functional	
Uhuru Polytechnic	Uhuru	10	120	Functional	
Soko Borehole	Soko	14.2	170.4	Functional	
Wabera Primary	Wabera	13.9	166.8	Functional	
Kambi Odha	Kambi Odha	18.3	219.6	Functional	
DWO Office	DWO Office	10	120	Functional	
Ramadhan	Asharaf	7.8	93.6	Functional	
Kambi Garba Primary	Kambi Garba	20	240	Not functional	Donor (CRS)
Kambi ya Juu	Kambi Ya Juu	12	144	Not functional	Tariff
Bula Mpya	Bula Mpya	25.6	307.2	Not functional	Donor (CRS)
Police line	Police line	30	360	Not functional	Donor (CRS)
Phase 1	Phase 1	11	132	Not Functional	Tariff
Kiwanjani Primary	Kiwajani	13	156	Not Functional (Saline)	Donor (CRS)
Showground	Checheles	13.8	0	Not functional (Saline)	
Kisima Primary	Kisima	15	0	Not Functional	
Mwangaza Primay	Mwangaza	9	0	Not Functional (Saline)	
Total			2,323.2		

Source：IWASCO

WSP-13

Mombasa WSP (MOWASSCO)

Project for Strengthening Capacity of Water Service Providers on Formulating Bankable Project Plans

Questionnaire (MOWASCO)

No.	Questions	Answers
1	Are you willing to borrow the money from commercial bank when selected as target WSP?	Yes.
2	Kindly specify last 10 years project with major project comportment and amount, and source of fund for each project.	• Rehabilitation/Extension of Mombasa water supply network -Lot 1A(NMLD) under WaSSIP-AFD: KES 781,423,747.64 (WB) • Rehabilitation/Extension of Mombasa water supply network (KWS&CP): KES 404,375,960.86 (WB) • Rehabilitation/Extension of Mombasa water supply network- Nyali Phase 1. (NMLD - WSDP): KES 516,443,375.84 (WB) • Rehabilitation/Extension of Mombasa Water Supply Distribution Network-Lot 2B. (WSDP): KES 984,529,033.00 (WB) • Rehabilitation/Extension of Mombasa Water Supply Network – Committed: KES 1,585,395,349 (AfD).
3	Kindly provide the WSP long term plan with annual budget for O&M and investment for water supply system.	Noted.
4	Do you currently offer or intended to be offer any fund from doner, AOB, OBA, KPWF, own fund or any others? If yes, kindly provide the detail.	No.
5	Kindly provide the documents listed in Attachment 1 to 6 and Data Collection List.	Noted.
6	Kindly fill in the details for the overview of water supply facilities as shown in Attachment 1 to 6.	【Attachment 1 to 6】

No.	Questions	Answers
7	What is the reason for the inactive connections?	■ No payment ■ No water due to technical problem such as no pressure, blockages and so on □ There is any other alternative source. □ Deactivate the account during rainy season ■ Any other reason, if any please specify: Inadequate water supply
8	What kind of sensitization for the inactive connections to reconnection have been carried out?	• Door to door visits • Public meetings • Social media campaigns
9	Kindly provide the current total water demand (m^3/day) with calculation method and excel file.	214,877 m^3/day (ARTELIA / MIB Design Report)
10	Kindly provide the details for the water demand projection with calculation method and excel file.	2025: 245,144 m^3/day 2030: 278,735 m^3/day 2035: 317,534 m^3/day
11	Challenges Faced in the Water Supply Facilities 1) Potential of Water Source	□ Enough to develop the future demand □ Enough for current demand ■ Not enough ■ Need additional water sources
	2) Raw Water Quality	■ Meet the standard for drinking purpose □ Meeting the standard but deteriorating
	3) Intake Facility Intake Volume	□ Sufficient for future water demand □ Sufficient for current demand ■ Not sufficient for current demand
	Facility Condition	□ Good □ Fair ■ Deteriorating but can utilize □ Need rehabilitation and augmentation

No.	Questions	Answers
	4) Raw Water Transmission System Transmission Volume Facility Condition	 □ Sufficient for future water demand □ Sufficient for current demand □ Not sufficient for current demand □ Good □ Fair □ Deteriorating but can utilize □ Need rehabilitation and augmentation
	5) Water Treatment Plant Treatment Volume Facility Condition	 □ Sufficient for future water demand □ Sufficient for current demand □ Not sufficient for current demand □ Good □ Fair □ Deteriorating but can utilize □ Need rehabilitation and augmentation
	6) Water Distribution Systems Water Pressure	 □ Meeting the standards for water pressure ■ Not all area meeting the standards for water pressure □ Not meeting the standard when high demand □ Not meeting the standard
	7) Household Connection	■ Using the saddle clamp with cock □ Using the saddle clam ■ Using the tee
	8) Water Meter	□ Using the piston type ■ Using propeller type Reason of selecting above: Stalling/clogging of piston type

No.	Questions	Answers
	9) Non-Revenue Water (NRW) Reason and each percentage	■ Old pipe (Frequent bust on trunk mains due to aged pipelines. i.e. (Mzima North & South sections in West mainland)) ■ Poor material use (Customer lines are mostly done with poor materials) □ High pressure ■ Meter inaccuracy (Most of the Customer meters are dormant, Estimating and have outlived their useful life span) ■ Illegal connection (Due to low pressure, most customers are on disconnection, some has resulted to ground water tanks and the presence of spaghetti lines, this has provided a favorable condition for illegal water practices) ■ Poor workmanship (presence of spaghetti lines) ■ Others (Projects from other Government sectors, i.e. Roads, Power, Railway, telecom.)
	10) Billing System How do you read the water meter? What kind of software for billing system is using?	■ By manual ■ By smart Phone □ By smart meter □ Enterprise Resource Planning (ERP) □ JICS ■ Other: Edams (Outdated)

Attachment-1: Main Water Source

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of water source and intake facility	① Baricho Water Works Boreholes (Baricho Kilifi County) ② Mzima Springs (Taita Taveta County) ③ Marere Springs (Kwale County) ④ Tiwi Boreholes (Kwale County) Refer to Figure 1.		
2	Specifications of water source and intake facility	① Baricho Water Works Boreholes	• Water source capacity: 180,000 m^3/day • Intake capacity: 4.000 m^3/hour, 96,000 m^3/day • Year Built: 1980 • Structure of intake facility (Elevation + N/A masl): ◆ Intake well: N/A ◆ Grit chamber: N/A ◆ Pump: N/A	
		② Mzima Springs	• Water source capacity: 294,000 m^3/day • Intake capacity: 1458.33 m^3/hour, 35,000 m^3/day • Year Built: 1957 • Structure of intake facility (Elevation + N/A masl): ◆ Intake well: N/A ◆ Grit chamber: N/A ◆ Pump: N/A	
		③ Marere Springs	• Water source capacity: 12,000 m^3/day • Intake capacity: 333.33 m^3/hour, 8,000 m^3/day • Year Built: 1923 • Structure of intake facility (Elevation + N/A masl): ◆ Intake well: N/A ◆ Grit chamber: N/A ◆ Pump: N/A	

		④ Tiwi Boreholes	• Water source capacity: 15,000 m^3/day • Intake capacity: 333.33 m^3/hour, 8,000 m^3/day • Year Built: 1970 • Structure of intake facility (Elevation + N/A masl): ◆ Intake well: N/A ◆ Grit chamber: N/A ◆ Pump: N/A	
3	Outstanding annual and seasonal fluctuation / trend, if any	N/A	• Maximum intake: N/A • Minimum intake: N/A • Permanent river or seasonal river: N/A	
4	Future development plan	① Mwache Dam-Kwale County	• Intake capacity: 186,000 m^3/day (ongoing) • Scheduled: 2022-2027 • Purpose: To boost the water supply within Mombasa town	
		② Pemba Dam-Kwale County	• Intake capacity: 3000 m^3/day (New-ongoing) • Scheduled year: 2022-2023 Purpose: To boost the water supply within (Mombasa County - west mainland)	

Attachment-2: Management Structure and Area of Coverage

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location of water supply area / county	① Island ② North Mainland (Kisauni, Nyali) ③ West Mainland ④ South Mainland 		
2	General information of water supply area / county	① Island	• Population / Beneficiaries (2020): 154,171 • Household connections (2022): 25,081 • Water Kiosk: 156 • Total / coverage area: (2022): 25.85 /30.41 km² • Average service hours (2020): 6 hours • Main water source: Mzima, Marere Springs & Baricho Boreholes • Current domestic water demand: 11,318,760 m³/yr, 31,441 m³/day • Future domestic water demand: 14,030,640 m³/yr, 38,974 m³/day	

		② North Mainland (Kisauni, Nyali)	• Population / Beneficiaries (2020): 508,507 • Household connections (2022): 39,007 • Water Kiosk: 932 • Total / coverage area: (2022): 68.51 / 119.71 km^2 • Average service hours (2020): 6 hours • Main water source: Baricho Boreholes • Current domestic water demand: 27,257,760 m^3/yr, 75,716 m^3/day • Future domestic water demand: 46,067,400 m^3/yr, 127,965 m^3/day	
		③ West Mainland	• Population / Beneficiaries (2020): 295,297 • Household connections (2022): 16,293 • Water Kiosk: 797 • Total / coverage area: (2022): 25.69 /42.81 km^2 • Average service hours (2020): 6 hours • Main water source: Mzima & Marere Springs • Current domestic water demand: 19,359,720 m^3/yr, 53,777 m^3/day • Future domestic water demand: 29,763,000 m^3/yr, 82,675 m^3/day	
		④ South Mainland	• Population / Beneficiaries (2020): 250,358 • Household connections (2022): 3,568 • Water Kiosk: 134 • Total / coverage area: (2022): 7 / 30.42 km^2 • Average service hours (2020): 6 hours • Main water source: Tiwi & Marere Springs • Current domestic water demand: 12,155,400 m^3/yr, 33,765 m^3/day • Future domestic water demand: 24,451,560 m^3/yr, 67,921 m^3/day	

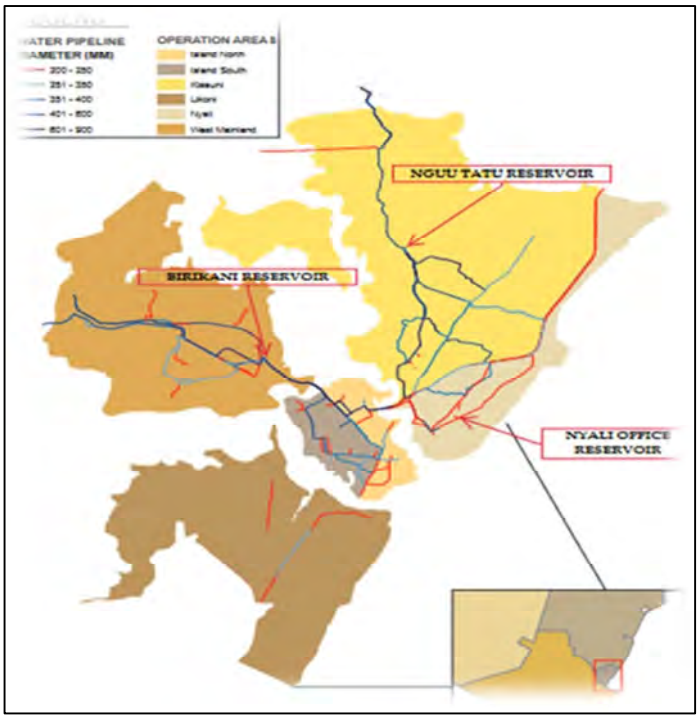
Attachment-3: Water Treatment Plant (WTP)

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of WTP	Receive treated water from CWWDA.		
2	Specifications of WTP	N/A	• Type of treatment: N/A • Current treatment capacity: N/A m^3/day • Design treatment capacity: N/A m^3/day • Year Built: N/A • Structure of main facility: N/A	
3	Water treatment conditions	N/A	• Utilization of plant capacity: N/A % • Hours for WTP Utilization: N/A • Flow diagram of the water treatment process: N/A • Type and amount of chemicals used during the process for during the dry and rainy seasons: ◆ PAC: N/A kg/day ◆ Sodium hypochlorite: N/A kg/day ◆ Concentrated sulfuric acid: N/A kg/day ◆ Lime: N/A kg/day • Annual Operation and maintenance cost and its breakdown: N/A ◆ Labor cost: N/A ◆ Chemical cost: N/A ◆ Electricity cost: N/A ◆ Maintenance cost: N/A ◆ Other cost: N/A	
4	Water quality test	N/A	• Main items to be tested in each process and frequency of the test (raw water, after treatment and so on): N/A • Compliance with water quality standards: N/A	
5	Future development plan	N/A	N/A	

Attachment-4: Water Transmission Mains to Reservoir

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of transmission pipeline	Managed by CWWDA		
2	Specifications of Pipeline	N/A	• Location, materials, diameter and length of each pipeline: N/A • Year Built: for each pipeline: N/A • NRW of main transmission line: N/A % • Transmission pump: N/A	
3	Future development plan	N/A	N/A	

Attachment-5: Reservoirs

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of Reservoir	① Nguu Tatu Reservoir ② Changamwe / Birikani Reservoirs ③ Nyali Reservoir 		
2	Specifications of reservoir	① Nguu Tatu Reservoir	• Current capacity (2020): 27,000 m^3/day ◆ Tank 1: 4,500 m^3/day ◆ Tank 2: 4,500 m^3/day ◆ Tank 3: 18,000m^3/day ◆ Material: RC • Year Built: March, 1980 • Structure of main facility: ◆ Reservoir: Type: ground Material: RC ◆ Distribution: type by Gravity ◆ Water flow measurement facility: Inlet type of water meter: Electromagnetic and size DN 400mm.	

		② Changamwe / Birikani Reservoirs	• Current capacity (2020): 26,000 m^3/day • Tank 1: 3,000 m^3/day • Tank 2: 3,100 m^3/day • Tank 3: 2,500 m^3/day • Tank 4: 3,500 m^3/day • Tank 5: 4,200 m^3/day • Tank 6: 9,700 m^3/day • Year Built: March, 1957 • Structure of main facility: ◆ Reservoir: Type: Under ground Material: RC ◆ Distribution: type by Gravity ◆ Water flow measurement facility: Outlet & inlet has no working meters, meter: inlet DN 500 Steel Marere line, DN 575 Concrete Mzima North and Mzima South , Outlets fitted with DN 600mm & DN900 Electromagnetic Meters but not working.	
3	Operation and maintenance and Water quality test	① Nguu Tatu Reservoir	• Flow diagram of reservoir: N/A • Type and amount of chemicals used before distribution if any: N/A ◆ Sodium hypochlorite: 45 kg/day • Annual Operation and maintenance cost and its breakdown: N/A ◆ Labor / maintenance cost: N/A ◆ Electricity cost: N/A ◆ Other cost: N/A • Main items to be tested in reservoir: N/A • Compliance with water quality standards: N/A	

4	Future development plan	① West mainland reservoir	• Design capacity / specification: 14,000 m^3/day • Scheduled year: 2027 • Purpose: retaining 14,000 m^3 to boost the service hour from 6 to 16 within town to meet the demand in West Mainland area. Refer to Source：MOWASCO Figure 2.	
		② New Nguuni Reservoir constructed in Nguu Tatu	• Treatment capacity: 14,000 m^3/day (New) • Scheduled year: 2022～2027 • Purpose: To increase coverage of the drinking water to underserved and un-served areas (Kisauni & Nyali Sub County) (North Mainland)	
		③ New Changamwe Reservoir constructed in Nguu Tatu	• Treatment capacity: 14,000 m^3/day (New) • Scheduled year: 2022～2027 • Purpose: To increase coverage of the drinking water to underserved and un-served areas (Island area of Mombasa County.)	
		④ Dongo kundu Reservoir	• Treatment capacity: 28,000 m^3/day (New) • Scheduled year: 2022～2027 • Purpose: To increase coverage of the drinking water to underserved and un-served areas (South Mainland Area of Mombasa County.)	

Attachment-6: Water Distribution Mains

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of distribution pipeline network	① Kisauni Business Unit distribution network or DMA ② Nyali Business Unit distribution network or DMA ③ Island Business Unit distribution network or DMA ④ West Mainland Business Unit distribution network or DMA ⑤ South Mainland/Likoni Business Unit distribution network or DMA. Refer to Source：MOWASCO Figure 3.		
2	Specifications of Pipeline	① Kisauni Business Unit Lines	• Location, materials, diameter and length of each pipeline: Refer to Table 1. • Year Built: for each pipeline 1980 (with some ongoing network upgrading) • Distribution is by Gravity from Nguu Tatu reservoirs • NRW of main distribution line: 49% (2020), 50% (2021), 50% (2022)	
		② Nyali Business Unit Lines	• Location, materials, diameter and length of each pipeline: Refer to Table 2. • Year Built: for each pipeline 1980 (with some ongoing network upgrading) • Distribution is by Gravity from Nguu Tatu reservoirs • NRW of main distribution line: 49% (2020), 50% (2021), 50% (2022)	

		③ Island Business Unit Lines	• Location, materials, diameter and length of each pipeline: Refer to Table 3. • Year Built: for each pipeline 1923 (with minor network upgrading) • Distribution is by Gravity from Nguu Tatu & Changamwe reservoirs • NRW of main distribution line: 22% (2020), 38% (2021), 15% (2022)	
		④ West Mainland Business Unit Lines	• Location, materials, diameter and length of each pipeline: Refer to Table 4. • Year Built: for each pipeline 1923, 1957 and 2020. • Distribution is by Gravity from Mazeras reservoirs • NRW of main distribution line: Last 5 years NRW 2020-62%, 2021-61%, 2022-60%	
		⑤ South Mainland/Likoni Business Unit Lines	• Location, materials, diameter and length of each pipeline: Refer to Table 5. • Year Built: for Marere pipeline 1923, Tiwi piplines with south mainland in 1980, upgraded in 2020. • Distribution is by Gravity from Kayabombo Reservoirs • NRW of main distribution line: 62% (2020), 36% (2021), 37% (2022)	

<table>
<tr>
<td>3</td>
<td>Future development plan</td>
<td>① Rehabilitation/Expansion of Mombasa water supply distribution Network.-Lot 1B Island Mombasa county</td>
<td>
<table>
<tr><td>LOCATION</td><td>Island</td></tr>
<tr><td>MATERIAL</td><td>Steel, HDPE</td></tr>
<tr><td>LENGTH</td><td>94.59 km</td></tr>
<tr><td>SCHEDULED YEAR</td><td>2022 - 2027</td></tr>
<tr><td>PURPOSE</td><td>Reduces Physical NRW. Reduce O&M cost. Increase absorption capacity and access to water to meet the demand 38,974 m^3/day</td></tr>
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<td>② Rehabilitation / Expansion of Mombasa Water Supply Network -Lot 2C Island Mombasa county</td>
<td>
<table>
<tr><td>LOCATION</td><td>Island</td></tr>
<tr><td>MATERIAL</td><td>Steel, HDPE</td></tr>
<tr><td>LENGTH</td><td>40 km</td></tr>
<tr><td>SCHEDULED YEAR</td><td>2022 - 2027</td></tr>
<tr><td>PURPOSE</td><td>Reduces Physical NRW. Reduce O&M cost. Increase absorption capacity and access to water to meet the demand 38,974 m^3/day</td></tr>
<tr><td>Population</td><td>154,171 (census 2019)</td></tr>
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</table>

		③ Rehabilitation/Expansion of Mombasa Water Supply Distribution Network. North Mainland Mombasa County	<table><tr><td>LOCATION</td><td>North Mainland</td></tr><tr><td>MATERIAL</td><td>Steel, HDPE</td></tr><tr><td>LENGTH</td><td>39.94 km</td></tr><tr><td>SCHEDULED YEAR</td><td>2022 - 2027</td></tr><tr><td>PURPOSE</td><td>Reduces Physical NRW. Reduce O&M cost. Increase absorption capacity and access to water to meet the demand 127,965 m^3/day</td></tr><tr><td>Population</td><td>508,507 (census 2019)</td></tr></table>	

		④ Rehabilitation/Extension of Mombasa Water supply distribution Network. South Mainland Mombasa County	LOCATION	North Mainland	
			MATERIAL	Steel, HDPE	
			LENGTH	39.94 km	
			SCHEDULED YEAR	2022 - 2027	
			PURPOSE	Reduces Physical NRW. Reduce O&M cost. Increase absorption capacity and access to water to meet the demand 67,921 m^3/day	
			Population	250,328 (census 2019)	
		⑤ 76 DMA Formation to cover the whole of the service area	LOCATION	North Mainland	
			MATERIAL	Steel, HDPE	
			LENGTH	As shall be to the design	
			SCHEDULED YEAR	2022 - 2027	
			PURPOSE	Create 33 DMAs, Isolation of Water Storage Tanks, Customer Meter Survey and database upgrading, customer meter accuracy	

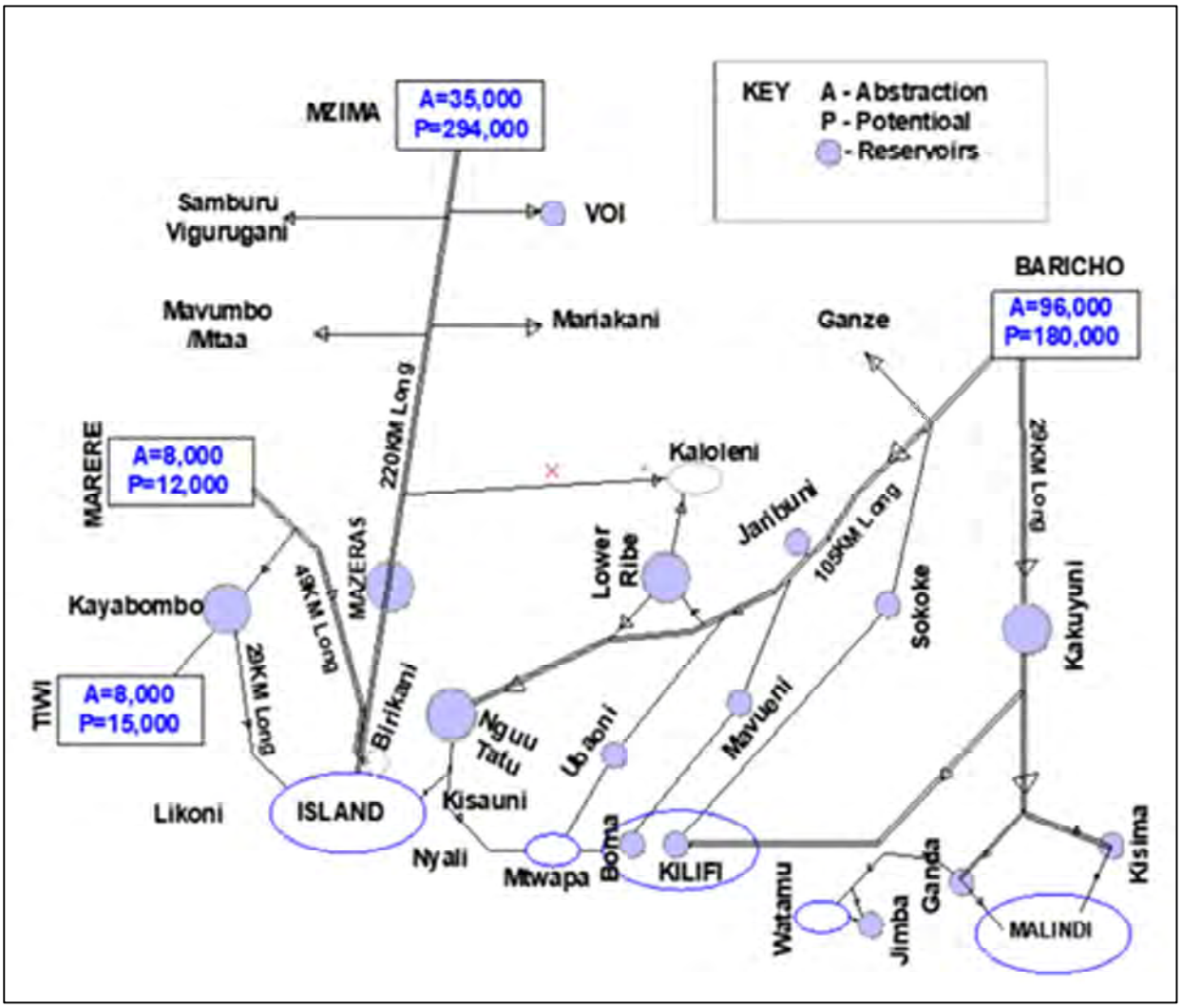
					survey, replacing reactivation, and installing of new connections, design of DMAs, restructuring network and removal of spaghetti lines, staff needs assessment, relocation of duties to align with the NRW Procedures and training and equipping.	
				Proposed DMAs	33	
				Population	250,328 (census 2019)	
				Household Connections	39,007	
				New Meters	40,000 considering increase in new connection due to Mwache	

		⑥ 76 DMA Formation to cover the whole of the service area	LOCATION	Island	
			MATERIAL	Steel, HDPE	
			LENGTH	As shall be to the design	
			SCHEDULED YEAR	2022 - 2027	
			PURPOSE	Create 11 DMAs, Isolation of Water Storage Tanks, Customer Meter Survey and database upgrading, customer meter accuracy survey, replacing reactivation, and installing of new connections, design of DMAs, restructuring network and removal of spaghetti lines, staff needs assessment, relocation of duties to align with the NRW Procedures and training and equipping.	
			Proposed	11	

			DMAs		
			Population	154,171 (census 2019)	
			Household Connections	25051	
			New Meters	25,000 considering increase in new connection due to Mwache	
		⑦ 76 DMA Formation to cover the whole of the service area	LOCATION	West Mainland	
			MATERIAL	Steel, HDPE	
			LENGTH	As shall be to the design	
			SCHEDULED YEAR	2022 - 2027	
			PURPOSE	Create 11 DMAs, Isolation of Water Storage Tanks, Customer Meter Survey and database upgrading, customer meter accuracy survey, replacing reactivation, and installing of new connections, design of DMAs, restructuring network and	

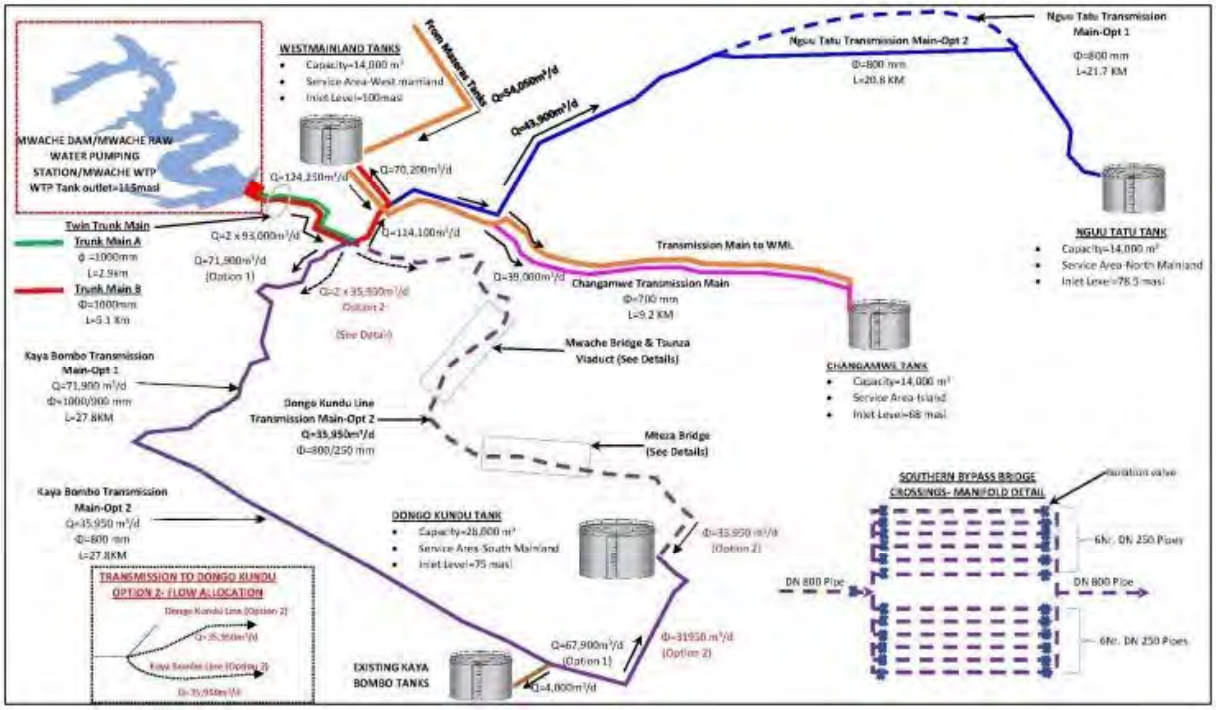
					removal of spaghetti lines, staff needs assessment, relocation of duties to align with the NRW Procedures and training and equipping.
				Proposed DMAs	17
				Population	295,297 (census 2019)
				Household Connections	16,293
				New Meters	20,000 considering increase in new connection due to Mwache
		⑧ 76 DMA Formation to cover the whole of the service area.		LOCATION	South Mainland
				MATERIAL	Steel, HDPE
				LENGTH	As shall be to the design
				SCHEDULED YEAR	2022-2027
				PURPOSE	Create 13 DMAs, Isolation of Water Storage Tanks, Customer Meter Survey and database upgrading, customer meter

					accuracy survey, replacing reactivation, and installing of new connections, design of DMAs, restructuring network and removal of spaghetti lines, staff needs assessment, relocation of duties to align with the NRW Procedures and training and equipping. Pressure management	
				Proposed DMAs	13	
				Population	250,393 (census 2019)	
				Household Connections	3,568	
				New Meters	15,000 considering increase in new connection due to Mwache	



Source：MOWASCO

Figure 1 MOWASCO Water Source



Source：MOWASCO

Figure 2 West Mainland Reservoir

Source：MOWASCO

Figure 3 MOWASCO Water Distribution Networks

Table 1 Kisauni Business Unit Lines

DIAMETER	DI	GI	HDPE	PVC	PPR	STEEL	CI	AC	CONCRETE	TOTAL	SHARE (%)
900	3077.143	0.000	0.000	0.000	0.000	1253.199	0.000	0.000	0.000	4330.342	2.175
800	0.000	46.952	0.000	0.000	0.000	0.000	3899.890	0.000	0.000	3946.841	1.982
700	0.000	4042.931	0.000	0.000	0.000	0.000	4175.077	0.000	0.000	8218.008	4.127
600	8310.641	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8310.641	4.173
550	0.000	0.000	0.000	0.000	0.000	0.000	40.645	0.000	0.000	40.645	0.020
525	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
500	0.000	2393.056	0.000	0.000	0.000	3759.525	3525.954	0.000	0.000	9678.535	4.860
400	0.000	3601.527	0.000	3655.016	0.000	0.000	127.584	0.000	0.000	7384.128	3.708
375	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
350	0.000	0.000	0.000	205.265	0.000	0.000	0.000	0.000	0.000	205.265	0.103
315	0.000	0.000	0.000	7929.304	0.000	0.000	0.000	0.000	0.000	7929.304	3.982
300	0.000	2937.643	0.000	225.118	0.000	0.000	0.000	3364.150	0.000	6526.911	3.278
250	0.000	34.083	0.000	0.000	0.000	9.942	87.508	3959.752	0.000	4091.286	2.055
200	0.000	26.565	0.000	1746.875	0.000	0.000	0.000	0.000	0.000	1773.440	0.891
170	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
160	0.000	0.000	0.000	10694.179	0.000	0.000	0.000	0.000	0.000	10694.179	5.370
150	0.000	301.552	0.000	3514.562	0.000	0.000	2.220	865.422	0.000	4683.755	2.352
125	0.000	1539.710	0.000	471.501	0.000	0.000	0.000	0.000	0.000	2011.211	1.010
110	0.000	0.000	3198.107	9103.914	0.000	0.000	0.000	0.000	0.000	12302.021	6.178
100	0.000	2608.782	245.048	18.822	0.000	141.175	0.000	8054.351	0.000	11068.178	5.558
< 100	0.000	15537.322	22914.272	42896.893	14155.229	0.000	0.000	430.448	0.000	95934.164	48.177
GRAND TOTALS	11387.783	33070.123	26357.427	80461.448	14155.229	5163.842	11858.878	16674.123	0.000	199128.853	

Source：MOWASCO

Table 2 Nyali Business Unit Lines

DIAMETER	DI	GI	HDPE	PVC	PPR	STEEL	CI	AC	CONCRETE	TOTAL	SHARE (%)
900	""	""	""	""	""	""	""	""	""	0	0
800	""	""	""	""	""	""	""	""	""	0	0
700	""	""	""	""	""	""	""	""	""	0	0
600	""	""	""	""	""	""	""	""	""	0	0
550	""	""	""	""	""	""	""	""	""	0	0
525	""	""	""	""	""	""	""	""	""	0	0
500	""	2204.013	""	""	""	""	""	""	""	2204.0127	1.461692102
400	""	3549.105	""	""	""	""	""	""	""	3549.1046	2.353751535
375	""	""	""	""	""	""	""	""	""	0	0
350	""	""	""	6199.471	""	""	""	2.970054	""	6202.4415	4.113433598
315	""	""	""	""	""	""	""	""	""	0	0
300	""	""	""	21.04692	""	""	""	38.2795	""	59.326418	0.039345035
250	""	14.11959	""	4923.819	""	""	""	8019.556	""	12957.494	8.593356451
200	""	""	""	13399.14	""	""	""	6717.97	""	20117.111	13.34158524
170	""	""	""	""	""	""	""	""	""	0	0
160	""	""	""	""	""	""	""	""	""	0	0
150	""	4315.615	""	6233.899	""	""	""	2595.853	""	13145.367	8.717953392
125	""	""	""	""	""	""	""	""	""	0	0
110	""	""	3485.99	6652.737	""	""	""	""	""	10138.727	6.723961842
100	""	7483.186	""	""	""	13.1159	15.12	16069.87	""	23581.291	15.63901456
< 100	""	21418.87	19930.98	9448.248	611.26	0	0	6996.347	424.432018	58830.14	39.01590625
GRAND TOTALS	0	38984.91	23416.97	46878.36	611.26	13.1159	15.12	40440.84	424.432018	150785.02	

Source：MOWASCO

Table 3 Island Business Unit Lines

DIAMETER	DI	GI	HDPE	PVC	PPR	STEEL	CI	AC	CONCRETE	TOTAL	SHARE (%)
900	-	-	-	-	-	1507.533	-	-	-	1507.533	1.238
800	-	-	-	-	-	-	-	-	-	0.000	0.000
700	-	-	-	-	-	2858.093	-	-	-	2858.093	2.346
600	-	-	-	-	-	4190.675	-	-	-	4190.675	3.440
550	-	-	-	-	-	-	-	-	-	0.000	0.000
525	-	-	-	-	-	-	-	-	-	0.000	0.000
500	-	-	-	-	-	497.579	-	-	-	497.579	0.408
400	-	-	-	-	-	3222.502	-	-	-	3222.502	2.646
375	-	-	-	-	-	5091.695	-	-	-	5091.695	4.180
350	-	-	-	-	-	-	-	-	-	0.000	0.000
315	-	-	-	-	-	-	-	-	-	0.000	0.000
300	-	245.266	-	-	-	1653.274	-	1615.905	-	3514.445	2.885
250	-	-	-	-	-	-	-	-	-	0.000	0.000
200	458.900	216.739	-	-	-	1156.910	317.049	7846.481	-	10006.080	8.214
170	-	-	-	-	-	-	-	-	-	0.000	0.000
160	-	-	-	587.738	-	-	-	-	-	587.738	0.483
150	-	1908.449	-	7258.273	-	183.167	5958.839	25513.761	-	40424.486	33.186
125	-	-	-	-	-	-	-	-	-	0.000	0.000
110	-	-	-	-	-	-	-	-	-	0.000	0.000
100	-	7251.196	-	479.178	-	-	853.064	13507.994	-	22091.431	18.136
<100	-	6842.238	2486.664	725.797	-	-	-	17763.577	-	27818.276	22.837
GRAND TOTALS	458.900	16463.888	2486.664	9050.986	0.000	20361.428	6728.948	66249.718	0.000	121810.533	

Source：MOWASCO

Table 4 West Mainland Business Unit Lines

DIAMETER	DI	GI	HDPE	PVC	PPR	STEEL	CI	AC	CONCRETE	TOTAL	SHARE (%)
900	**	**	**	**	**	3867.127	**	**	**	3867.127	2.155
800	**	**	**	**	**	**	**	**	**	0.000	0.000
700	**	**	**	**	**	**	**	**	**	0.000	0.000
600	1726.182	**	**	**	**	345.616	**	**	0.442	2072.240	1.155
550	**	**	**	**	**	**	**	**	**	0.000	0.000
525	**	**	**	**	**	**	**	**	16905.676	16905.676	9.420
500	173.964	**	**	**	**	9324.926	**	**	**	9498.889	5.293
400	**	**	**	3981.614	**	0.123	**	**	**	3981.737	2.219
375	**	**	**	**	**	**	**	**	**	0.000	0.000
350	909.287	**	**	**	**	3685.834	**	**	**	4595.121	2.560
315	**	**	**	**	**	**	**	**	**	0.000	0.000
300	12050.450	**	**	3585.892	**	**	**	**	**	15636.342	8.712
250	**	625.092	**	607.324	**	**	**	983.052	**	2215.468	1.234
200	**	15.956	**	6745.086	**	793.491	**	4165.286	**	11719.818	6.530
170	**	**	**	**	**	**	**	**	**	0.000	0.000
160	**	**	**	**	**	**	**	**	**	0.000	0.000
150	**	2160.952	1230.759	11996.837	**	2398.741	**	17828.173	**	35615.461	19.845
125	**	**	**	**	**	**	**	**	**	0.000	0.000
110	**	**	271.983	**	**	**	**	**	**	271.983	0.152
100	**	6515.104	1844.938	21513.767	14.744	**	**	8293.701	**	38182.254	21.275
< 100	**	12639.353	6698.309	13059.371	2436.141	**	**	75.967	**	34909.142	19.451
GRAND TOTALS	14859.883	21956.457	10045.989	61489.890	2450.885	20415.858	0.000	31346.179	16906.118	179471.258	

Source：MOWASCO

Table 5 West Mainland Business Unit Lines

DIAMETER	DI	GI	HDPE	PVC	PPR	STEEL	CI	AC	CONCRETE	TOTAL	SHARE (%)
900	""	""	""	""	""	""	""	""	""	0.000	0.000
800	""	""	""	""	""	""	""	""	""	0.000	0.000
700	""	""	""	""	""	""	""	""	""	0.000	0.000
600	""	""	""	""	""	""	""	""	""	0.000	0.000
550	""	""	""	""	""	""	""	""	""	0.000	0.000
525	""	""	""	""	""	""	""	""	""	0.000	0.000
500	""	""	""	""	""	""	""	""	""	0.000	0.000
400	""	""	""	""	""	""	""	""	""	0.000	0.000
375	""	""	""	""	""	""	""	""	""	0.000	0.000
350	""	""	""	""	""	2474.406	""	""	""	2474.406	5.359
315	""	""	""	""	""	""	""	""	""	0.000	0.000
300	""	""	""	""	""	""	""	""	""	0.000	0.000
250	""	""	""	""	""	""	""	""	""	0.000	0.000
200	""	2079.072	""	1801.146	""	""	285.288	2022.412	""	6187.918	13.402
170	""	1.527	""	""	""	""	""	""	""	1.527	0.003
160	""	""	""	""	""	""	""	""	""	0.000	0.000
150	""	2448.592	458.850	4145.887	""	""	""	5636.666	""	12689.995	27.483
125	""	""	""	""	""	""	""	""	""	0.000	0.000
110	""	""	""	""	""	""	""	""	""	0.000	0.000
100	""	3666.331	""	3084.191	""	""	""	1199.751	""	7900.273	17.110
< 100	""	4795.908	5766.872	5313.045	""	""	""	1043.314	""	16919.139	36.643
GRAND TOTALS	0.000	12991.430	6225.722	14294.270	0.000	2474.406	285.288	9902.143	0.000	46173.258	

Source：MOWASCO

Appendix - 5

Water Supply Projects of the 13 Candidate WSPs Listed in Strategic Plan

(1) **Embu WSP**

Table 2.1 Investment Budget for Water Supply Facilities of EWASCO (Mid-Term Plan: 2021-2025)

No.	Purpose	Investment in Facilities and Other Activities	Implementation Year	Budget (KSH million)
1	Increase water production capacity from 30,000 m^3/d to 55,000 m^3/d	Identify and procure land, undertake DD review for Kanyuambora WTP	2021-2022	15.5
		Construction of Kanyuambora WTP	2022-2025	900
		Kanyuambora Scheme Construction of storage (1,200 m^3 and 3,000 m^3)	2022-2023	75
		Kanyuambora Scheme Construction of 10 km raw water mains, 15 km of transmission mains, and 160 km distribution mains	2022-2024	474
		Construction works on the intake weir and Mukangu WTP	2022-2023	250
		Construction of new intake and WTP at Thiba river	2023-2024	250
2	Increase water coverage area by connecting 30,000 new households	Construction of five 1,000 m^3 storage water tanks	2021-2023	125
		Installation of 25 km distribution pipeline		75
		Expansion of 80 km water distribution pipeline	2021-2025	240
		Installation of 30,000 connections	2021-2025	300
3	Reduce the NRW from 43% to 20%	Rehabilitation of 50 km water pipeline	2021-2025	176
		Relocation of 16 km of DN 160 pipeline	2021-2022	166
		Improvement of mechanical customer meters	2021-2025	56
		Installation of smart meters	2021-2025	15
		Enhancement of NRW Units (including preparation of annual plans, equipment purchases, training, quarterly reviews, etc.)	2021-2025	46
4	Reduce operational costs to total revenue ratio from 93% to 70%	Enhancements of ICT (including ERP implementation and integration with existing billing system)	2021-2025	27
		Acquisition of ISO and other certifications for quality control	2021-2023	23
5	Increase customer satisfaction from 74% to 85%	Review and implementation of the Customer Service Charter, improvement of customer communication and awareness-raising, management to improve customer relations, etc.	2021-2025	45

No.	Purpose	Investment in Facilities and Other Activities	Implementation Year	Budget (KSH million)
6	Increase revenue from KSH 432 million to KSH 619 million	Attract new customers, commercialize water quality testing laboratories, introduce a rate structure tailored to the market, etc.	2021-2025	76
7	Increase collection efficiency from 90% to 98%	Improved accuracy and timing of billings, increased arrear collections and efficiency, etc.	2021-2025	1.5

Source: EWASCO Strategic Plan (June 2021)

(2) Meru WSP

Table 2.2 Investment Budget for Water Supply Facilities of MEWASS (Mid-Term Plan: 2021-2026)

No.	Purpose	Investment in Facilities and Other Activities	Implementation Year	Budget (KSH million)
1	Mutwaru Project	-	2023-2025	500
2	Construction of intake (pre-sedimentation basin for Kathita)	Construction of raw parallel line from Kathita to Milimani Treatment Plant and elevated tank	2021-2022	60
		Purchase of air blowers	2023-2024	12
		Construction / rehabilitation of intake	2022-2024	20
3	Kithaku Constructed Intake Project	-	2022-2023	800
4	Customer Meters	Installation of new meter connections	2021-2026	30
		Reactivation of dormant connections	2021-2026	4
5	Replacement of old and faulty customer meters	Replacement of 3,000 meters	2021-2026	15
6	Installation of smart meters	Smart mete (300 mm)	2022-2026	2
		Smart mete (250 mm)	2021-2022	0.45
		Smart mete (200 mm)	2021-2022	1.4
		Smart mete (150 mm)	2022-2025	0.645
		Smart mete (100 mm)	2021-2026	1.5
7	Installation of raw water supply line	Installation of 4 km	2022-2023	40
8	Construction of storage tank	Construction of 5,000 m^3 capacity	2022-2023	90
9	Installation of distribution line from storage to Thuura	Installation of 5 km	2023-2024	7
10	Installation of transmission line to Irinda Storage Tank	Installation of 3 km	2021-2022	6
		Reticulation / extensions / construction of 50 km pipelines in urban & LIAs	2023-2024	150
11	Construction of recycling plant for backwash water	8,000 m^3 of water recycled	2024-2025	30
12	Solar powered boreholes	Solarization of 6 boreholes	2021-2026	45
13	Installation of water kiosk	Installation of 6 Nos.	2021-2026	0.3
		No. of offices fully furnished	2025-2026	1

Source: MEWASS Strategic Plan (June 2021)

(3) Ngagaka WSP

Table 2.3 Investment Budget for Water Supply Facilities of NGAWASCO (Mid-Term Plan: 2019-2024)

No.	Purpose	Investment in Facilities and Other Activities	Implementation Year	Budget (KSH million)
1	Increase water production capacity from 3,833 m^3/d to 9,017 m^3/d	Install DN 250 transmission main from Thuchi Intake to Murram	June 2024	26
2	Rehabilitate distribution network in KCC Area	Install DN 50 pipe from KCC to Kang'ethiri	June 2020	2.5
3	Rehabilitate distribution network in Gikuuri Area	Install DN 75 pipeline to Gikuuri Village	June 2020	2.5
4	Install transmission line from Kathuri to Kiriari Market	Install DN 150 transmission line to Kiriari Market	June 2024	5
5	Setting up of a functional NRW unit	Install Master/Zonal meters ・Check meter accuracy on quarterly basis ・Analyze daily consumption trends	2019-2024	0.5
		Install 4 sub-zonal meters	2019-2024	0.5
		Customer meters ・Investigate abnormal consumptions ・Adopt GIS platform for meter reading	2019-2024	1
		Replace meters more than 8 years old	2019-2024	10
		Improve customer management systems and outreach	2019-2024	0.5
6	To increase active water connections from 7,443 to 10,693	Customer recruitment ・SMS, e-mail and/or call to resolve pending issues ・Reactivation of 27% dormant connections	2019-2024	1
7	Increase collection efficiency by 0.5% per annum	Proper meter reading	2019-2024	1
		Timely bill verification & generation		
		Timely notification of the due dates of bills		
		Improve debt collection efforts		
		Encourage customers to settle bills on time to avoid disconnection		
		Effective communication with customers		
		Specific staff assigned to debt collection		
		Customer database updated with mobile phone number of all active customers		
		Conduct sensitization forums quarterly on early bill payment		
8	To increase billing efficiency and procure	Ensure accurate monthly actual meter reading	2019-2024	5

No.	Purpose	Investment in Facilities and Other Activities	Implementation Year	Budget (KSH million)
	new technologies (e.g. smart meter reading gargets)	GIS mapping of the supply area		
		Monitor meter reading staff		
		Call customers to arrange meter reading		

Source: NGAWASCO Strategic Plan

(4) Murang'a WSP

Table 2.4 Investment Budget for Water Supply Facilities of MUWASCO (Mid-Term Plan: 2020-2025)

No.	Purpose	Investment in Facilities and Other Activities	Implementation Year	Budget (KSH million)
1	Reduce NRW to 15 %	Installation of master meters	2021-2025	5
2	Train staff on NRW	In-house and sponsored training events	2021-2025	1
3	Enhance resource mobilization	Preparation of business proposals	2021-2025	1.88
		Identify development partners as stakeholders		
		Formulate development partners engagement policy / framework		
4	Adhere to budgetary lines	Preparation of sectional budgets	2021-2025	1
		Budget consolidation		
		Approval by BOD		
		Monthly analysis of actual vs budgeted expenditure		
		Budget review		
5	Enhance resource conservation through Enterprise Resource Planning (ERP)	Identification and assessment of needs	2021-2025	9.5
		Market assessment		
		End users training		
		Implementation and contract management		
6	Cost optimization	Use of quality materials	2021-2025	1
7	Prepare, implement and review annual workplan	Coordination and time frame for annual workplan	2021-2025	0.1
8	Prepare and implement resource mobilization strategies and policies	Draft strategy policy	2021-2022	0.25
		Approval by BoD		
9	Review service tariffs to sustainable levels	Cost recovery assessment	2024-2025	1.2
		Preparation tariff		
		Review proposals		
		Advertisement and call for proposals		
		Presentation of the stakeholder views		
10	Improve revenues	Project research and impact assessment	2021-2025	223
		Business planning		
		Project execution		

Source: MUWASCO Strategic Plan 2020 - 2025

(5) Ruiru-Juja WSP

Table 2.5 Investment Budget for Water Supply Facilities of RUJWASCO (Mid-Term Plan: 2022-2027)

No.	Purpose	Investment in Facilities and Other Activities	Implementation Year	Budget (KSH million)
1	Construction of water production facilities	Construction of Githurai water project to increase production by 13,000 m^3/d	2023-2024	-
		Construction of Karimenu II dam project to increase production by 47,000 m^3/d	2023-2025	-
2	Rehabilitation of treatment plant	Repair of JICA membrane technology plant to increase production by 110 m^3/d	2022-2023	3
		Establish a water bottling facility	2023-2024	5
3	Acquire treated bulk water from other bodies (AWWDA, Gatundu Water)	engage AWWDA to provide bulk supply of approximately 15,000 m^3/d	2024-2026	0.1
		Construction of main transmission line for bulk supply	2025-2027	100
4	Sinking and equipping of boreholes	drilling, equipping and elevated storage of 5 Nos. boreholes in Mwihoko Area to increase production by 2,000 m^3/d	2022-2027	75
		Drilling and equipping of boreholes in Ruiru and Juja Areas to increase production by 4,000 m^3/d	2022-2027	180
		Installation of 2 units of defluoridation plants capacity (Q = 40 m^3/hr and 15 m^3/hr)	2023-2025	40
5	Protection of water sources	Desilting of the intakes	2022-2027	30
		Rehabilitation of the gabion at Jacaranda intake works	2023-2024 2025-2026	6
		Construction of a scour valve at Juja Intake Works	2023-2024	0.8
6	Standby generators for treatment plants	Supply and installation of 500 Kva standby generator for Juja Treatment Plant	2022-2023	15
		Supply and installation of 350Kva standby generator for Ruiru Office Treatment Plant	2024-2025	10
7	Promote rainwater harvesting	Hold 20 sensitization sessions	2022-2027	2
		Install rainwater harvesting system in all 4 company facilities and 13 public institutions	2022-2027	5.1
8	Improvement of water treatment facilities	Construction of an access road to Ndarugo Treatment Plant	2022-2023	1.7
		Construction of guard houses at Ndarugo Treatment Plant	2022-2023	0.5
		Upgrading of the pump house access road at Jacaranda Intake	2023-2024	1.5

Source: RUJWASCO Strategic Plan

(6) Mavoko WSP

Table 2.6 Investment Budget for Water Supply Facilities of MAVWASCO (Mid-Term Plan: 2016-2021)

No.	Purpose	Investment in Facilities and Other Activities	Implementation Year	Budget (KSH million)
1	KMC dam development (dam, treatment plant and intake work)	Design of the dam	October 2015	20
		Desilt and Construction	October 2017	200
		Operationalize the dam	December 2017	220
2	Expand Portland Dam/Treatment Plant	Redesigning of the dam	January 2015	20
		Desilt and Reconstruction	December 2016	118
		Building new sedimentation tank	December 2016	10
		Commission of the dam	December 2016	2
3	Drill new boreholes	Carry out hydrological survey	December 2016	2
		Implement the recommendations of the survey	December 2018	15
4	Development of Ndarugu	Collaborate with the relevant stakeholders during the design, construction and commissioning of the dam	December 2016	2
5	Rehabilitation of Nolturesh line	Follow-up with TAWSB for the rehabilitation of Noltruresh line	March 2016	10
6	Implementation of GIS	Procure GIS software and hardware	December 2016	3
		Data collection on customers	February 2016	2
		Digitization of customer data and area of jurisdiction.	February 2017	3
		Mapping area under jurisdiction	June 2017	1
7	Use of technology-based meters	Procure smart meters	2016-2021	2
		Sensitize developers/customers on the merits of smart meters	2016-2021	0.2
8	Use technology in meter reading	Procure meter reading system	December 2016	3.5
		Operationalize the system	March 2016	0.3
9	Leak detection and management	Undertake surveillance of the infrastructure by NRW unit	2016-2021	0.4
		Procure leak detection machine	December 2016	3
		Develop a repair response framework	December 2015	1.5
10	Staff, customers and community Sensitization	Sensitization staff on reporting of leaks	2016-2021	0.2
		Sensitize the public on the available channels and procedures for reporting of leaks	2016-2021	0.2
11	Water distribution balance	Demarcate area of jurisdiction into water distribution zones	December 2016	0.5
		Install master meters	January 2017	1.2
12	Continuous maintenance of water infrastructure	Undertake identification exercise on weak sections of the water infrastructure	2016-2021	10
		Procure the necessary materials and expertise		
		Carryout replacement of the identified		

No.	Purpose	Investment in Facilities and Other Activities	Implementation Year	Budget (KSH million)
		weak sections		
13	Strengthen the NRW Unit to enhance enforcement	Undertake capacity building of the unit through training	2016-2021	-
		Provide adequate resources to the unit	2016-2021	-
		Undertake inspection and surveillance	2016-2021	-
		Meter servicing	2016-2021	0.2
14	Benchmarking with best performing water companies	Identify best performing companies in terms of NRW	2016-2021	0.2
		Make visits to these companies		

Source: MAVWASCO Strategic Plan 2016 - 2021

(7) Nakuru WSP

Table 2.7 Investment Budget for Water Supply Facilities of NAWASSCO (Mid-Term Plan: 2020-2023)

No.	Purpose	Investment in Facilities and Other Activities	Implementation Year	Budget (KSH million)
1	Increase water production from the current 40,000 m^3/d to 60,700 m^3/d	Establish Kiundo borehole	2020-2021	14
		Rerouting 8 km of Mereroni raw water mains to produce 2,000 m^3/d		
		Add 5 Nos. boreholes to have additional 15,680 m^3	2021-2023	878
		Work closely with CRWWDA/County Government for provision of services	2020-2023	<1
2	Increase water coverage from 93% to 95%	Pipeline Extensions in Koinange And environs	2021-2022	
		Mwariki East water network extension and metering	2021-2022	19.9
		Barnabas water network extension and metering	2020-2021	9.7
		Complete pump sets and equipment	2020-2023	10.3
		Automation of boreholes	2020-2023	32.3
		6,000 Nos. water meters	2020-2023	66.3
		Bulk metering (10 meter/year)	2020-2023	10.5
		Zonal and territory metering	2021-2023	20
3	Increase and maintain water supply hours from 18 to 20 hours	Ensure supply reliability does not fall below supply hours per d at required pressures	2020-2023	57
4	Reduce NRW from the 31% to 25%	Accurate reading by placing QR codes on all the meters	2020-2021	5
		Changing consumer meters to smart ready meters	2020-2021	1
		Rehabilitation of the network in all zones	2020-2023	30
5	To improve water quality	Enhance the quality compliance rate for water from current 97% to 100%	2020-2023	-
		Regular replacement of filter media at treatment works	2021-2023	3

Source: NAWASSCO Strategic Plan 2020-2023

(8) Nanyuki WSP

Table 2.8 Investment Budget for Water Supply Facilities of NAWASCO (Mid-Term Plan: 2019-2023)

No.	Purpose	Investment in Facilities and Other Activities	Implementation Year	Budget (KSH million)
1	Conduct detailed design for water distribution network	Detailed technical designs; ESIA; and tender documents	2019-2020	10
2	Increase water source by 3,000 m^3/d	4 Number of boreholes drilled	2019-2020	41
3	Upgrade and Rehabilitation of water distribution network	256 km of various sizes/diameter water pipelines	2020-2023	852
		500 m^3 recycling water basin / tank	2019-2020	20
4	Development of low-income areas policy and strategy	6,957 additional water connections	2019-2023	25
		5 waters kiosks	2019-2021	3
		3 Nos. of 1,000 m^3 of balance tanks	2019-2020 2023	45
		Construction of 200 Nos. yard taps	2019-2023	1
		Low-income areas policy developed and implemented	2019-2023	2.5
5	Undertake detailed NRW assessment	Detailed report on current NRW status	2019-2020	7
6	Develop NRW Policy	-	2019	0.3
7	Carry out hydraulic analysis	12 Pressure Reducing Valves (PRVs) installed	2019-2023	3
8	Isolation of distribution network	Establish 10 DMAs	2019	0.1
		Installation of 10 DMAs meters	2019-2023	12.5
9	Mapping of all water pipeline and associated appurtenances	GIS database/digital maps	2019-2023	5
10	Replacement of aged infrastructure/plants, equipment and machines	Streamline Repair and Maintenance Schedule	2019-2023	25
		ICT infrastructure upgraded	2019-2023	3

Source: NAWASCO Strategic Plan 2019 - 2023

(9) Eldoret WSP

Table 2.9 Investment Budget for Water Supply Facilities of ELDOWAS (Mid-Term Plan: 2022-2027)

No.	Purpose	Investment in Facilities and Other Activities	Implementation Year	Budget (KSH million)
1	Construction of new infrastructure and expansion of existing infrastructure	Augmentation of the Chebara water supply (7,000 m^3)	2022	550
		Completion of Kipkaren water supply project (24,000 m^3)	January 2022	1,300
		Improve efficiency of Sosiani Treatment Plant through swabbing / augmentation (3,000 m^3)	2022	20
		Construction of Two Rivers Dam (53,000 m^3) and expansion of Sosiani treatment works.	2023-2026	9,000
		Expansion of Kesses treatment works (Additional of 900 m^3)	2022-2023	30
2	Increase water distribution network by 10 km/year	Pipeline extension (Kapsaret, Kuinet, Maili Nne, Marakwet Farm)	2022-2026	75
3	Automation of meters	Sourcing and procurement of smart meters as per the procurement policy	2022-2026	240
		Installation of smart metering infrastructure		
4	Facilitate effective and efficient project monitoring methods	Implementation of monitoring tool-SCADA	2023-2024	50
5	Replacement of aged infrastructure (meters, pipes)	Conduct an infrastructure assessment	2022-2026	250
		Implement Assessment Report		
6	Creation of DMAs	-	2022-2023	65
7	Advocacy on the cons of use of illegal water connections and theft	To push for review of the county laws on penalties for illegal use of water	2022-2026	5
		Sensitization of staff and consumers.		
8	Increase revenue collection efficiency	Implement fully the debt collection policy	2022-2026	50
		Implementation of the new tariff structure	2022-2026	10

Source: ELDOWAS Strategic Plan 2021

(10) Kisumu WSP

Table 2.10 Investment Budget for Water Supply Facilities of KIWASCO (Mid-Term Plan: 2017-2022)

No.	Purpose	Investment in Facilities and Other Activities	Implementation Year	Budget (KSH million)
1	Improve the water treatment facilities for Kajulu and Dunga plants.	Re-construct the existing barriers at the Dunga plant to make them more effective in controlling the invasion of the water weeds	2021-2022	200
		Rehabilitation and equipping of microbiological laboratory	2017-2022	10
		Rehabilitation of leaking clear water tanks and sedimentation tanks, backwash tanks	2019-2022	25
		Installation of the 3 No variable speed drives on pumps at the Dunga plant	-	12
		Replacement of old pumps and motors with energy efficient pump sets	2019-2022	30
		Carry out Energy audits in the organization	2019-2022	5
		Construction of sludge holding basin at the Kajulu and Dunga plants	2019-2020	100
2	Improve the water distribution network.	Replace old parts and equipment – 15 years for pipes using HDPE pipes, and 8 years for meters	2017-2022	200
		Installation of washouts, valves, pressure gauges, tank level indicators, etc. at strategic points in the network	2017-2022	10
		Installation of post chlorination points in the distribution	2019-2022	0.5
		Installation of water quality monitors at the Tanks and the distribution network	2019-2022	2
3	Increase water service coverage through network expansion	Extend network to un-served areas (Appr.250 km)	2017-2022	100
		Expand network to under-served areas	2017-2022	50
4	Leakage Detection and Control	Improve leakage response time though the reporting system (CRM, ERP, MOBILE) -	2019-2020	2
		Conduct customer sensitization and awareness campaign / advocacy	2017-2022	5
		Procure active leak detection and control equipment	2020-2022	5
		Conduct active leak detection and control	2017-2022	3.6
		Prepare and implement leak reporting award scheme	2020-2022	1.5
		Undertake quarterly massive line patrols	2019-2022	1.5
5	Pressure management	Procure digital pressure loggers	2021-2022	2
		Procure and install Pressure Reducing Valves (PRVs), Surge Protectors and	2020-2022	10

No.	Purpose	Investment in Facilities and Other Activities	Implementation Year	Budget (KSH million)
		Pressure Safety Valves (PSVs)		
		Installation and calibration of pressure switches in Treatment Works	2019-2020	1
		Procure pressure monitoring software	2021-2022	1
6	Enhance asset management	Procure Install new and overhaul sectional valves and air valves and chambers	2017-2022	30
		Develop and implement a network asset management plan	2020-2021	0.2
		Improve asset management through GIS	2021-2022	1.5
7	Improve customer meter accuracy	Review & implement meter management policy	2017-2022	0.1
		Frequent meter servicing, testing and calibration	2017-2022	0.5
		Research and pilot prepaid meters for high volume consumers	2017-2022	10
		Meter replacement – Old, non-functional, faulty meters	2017-2022	10
		Carry out meter resizing and re-orientation	2017-2022	3
8	Illegal consumption	Mass installation of meter tamper-proof seals, pilot meter tracking system	2019-2022	1.5
		Meter and monitor all fire hydrants	2017-2022	2.5
		Train inspection team and meter readers to detect illegal connection	2019-2022	0.6
		Sweep through dormant, dead accounts and major accounts	2019-2022	5
9	Eliminate Meter reading errors	Pilot remote meter reading	2020-2022	6
		Procure and implement meter reading software	2019-2022	50
10	DMA strategy	Revamp old and establish new DMAs including procurement of master meters	2017-2022	25
		Conduct Minimum night flow and step tests	2017-2022	2
		Implement DMA caretaker management	2019-2022	10
		Conduct network pressure surveys to inform leak detection	2017-2022	3
		Develop and implement company water balance	2021-2022	0.5
11	Review NRW reduction framework	Review NRW Reduction Strategy	2017-2022	05
		Staff and train NRW section staff	2017-2022	10

Source: KIWASCO Strategic Plan (April 2020)

(11) Nzoia WSP

Table 2.11 Investment Budget for Water Supply Facilities of NZOWASCO (Mid-Term Plan: 2019-2022)

No.	Purpose	Investment in Facilities and Other Activities	Implementation Year	Budget (KSH million)
1	Improve customer service hours	Develop a schedule to review emergency response plans	2022	6
		Well balanced water supply to all zones across the cluster		
		Increase storage capacity		
		Alternative power sources		
		Reduce delay of restoring water interruptions to within a d		
2	Grow water connection	Identify all classes of customers	2022	20
		Reduce inactive links		
		Reactivate 90% of all idle connections that have remained inactive		
		Expand water distribution networks		
3	Improve water coverage	Construct / rehabilitate and hand over two WTPs at Chesikaki, Kapkateny and Teremi and auxiliary works	2022	100
		Rehabilitate and power existing four boreholes using solar energy		
		Reactivate 50% of all inactive connections		
		Increase total population coverage to over 0.6 million		
		Increase Water Produced in 8,000,000 m^3		
		Increase number of towns served		
		Increase domestic water kiosks to 2,500,000 m^3		
		Construct a scheme service tank		
		Construct a transmission main water pipeline from Kanduyi to Kibabii		
4	Reduce non-revenue water (NRW)	Set up NRW section	2022	40
		Adopt technology in the management of NRW		
		Enhance quick response to leaks and bursts by repairing team		
		Establishment of DMAs		
		Adoption of use of smart meters		
		Install pressure loggers		
		Remote meter reading		
		Installation and monitoring of zonal meters in all-region		
		Protect damage of water pipelines from construction works		

No.	Purpose	Investment in Facilities and Other Activities	Implementation Year	Budget (KSH million)
5	Enhance metering of water distributed	Implement the pro-poor policy low-income members of the society within service area	2020	10
		Map out the pro-poor areas		
		Reduce illegal connections		
6	Improve water infrastructure	Maintain coordinated Master Plans for all facilities and assets	2022	100
		Meet operational needs and reliability goals by effectively maintaining the infrastructure		
		Implement the Master Plans and set priorities in the operating and capital budget process to reflect the needs identified in those plans		
		Optimize infrastructure performance and increase infrastructure reliability		
		Plan and secure additional water resources		
7	Enhance water quality	Develop proactive managing and monitoring practices from the source to tap	2021	10
		Develop the internal capacity to model water quality in the distribution system		
		Comply with set water quality standards		

Source: NZOWASCO Strategic Plan (March 2019)

(12) Isiolo WSP

Table 2.12 Investment Budget for Water Supply Facilities of IWASCO (Mid-Term Plan: 2019-2023)

No.	Purpose	Investment in Facilities and Other Activities	Implementation Year	Budget (KSH million)
1	Increase access to safe and clean drinking water from the current 79% to 90% by the year 2023.	Identify alternative sources of water by drilling boreholes	2019-2023	25
		Rehabilitating dysfunctional boreholes	2019-2022	2
		System upgrade to cope with expanded and improve abstraction and production capacity from 4,500 m^3 to 9,000 m^3	2021-2023	120
		Water pipeline expansion	2019-2023	50
		Build water kiosks to Increase access of water in low-income areas	2019-2023	2.5
		Conduct community sensitization on catchment area protection	2019-2023	0.5
2	Reduce NRW from the current 34% to 30% by 2023	Establishing NRW unit inclusive of personnel	2019-2023	4
		Improve response time to bursts and leaks	2019-2023	10
		Replacement of old infrastructure by introducing HDPE pipes	2019-2023	37.5
		Train staff on NRW	2019-2023	1
		Sensitize customers on NRW	2019-2023	1
3	Increase O&M cost recovery from the current 99% to above 120% by 2023	Install modern billing system and mobile meter reading system	2019-2023	8
		Identify and uproot all illegal connection.	2019-2023	1
		Revision and adjustment of tariff to attain full cost recovery	2019-2020	0.5
		Replacement of faulty meters	2019-2023	20

Source: IWASCO Strategic Plan 2019 - 2023

(13) Mombasa WSP

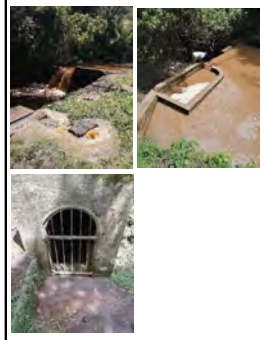
Table 2.13 Investment Budget for Water Supply Facilities of MOWASSCO (Mid-Term Plan: 2018-2022)

No.	Purpose	Investment in Facilities and Other Activities	Implementation Year	Budget (KSH million)
1	Public-Private Partnerships (PPP) with the private sector	Eliminate illegal connections	2018-2022	5
		Ensure 100% accurate billing and collection	2018-2022	ND
		Prompt repair of non-working meters	2018-2022	ND
		Increase active customer base by reconnecting inactive accounts	2018-2022	64.75
		Get financing for installing 200 smart meters for majors and 15,000 new robust meters	2018-2022	154
2	Reduction of Overall NRW from 54% to 30% by 2022	Improve billing accuracy	2018-2022	ND
		Improvement of the quality of the water infrastructure and the improvement of the O&M organization	2018-2022	4,641
		Implementing the NRW/DMA program financed by the KWSCRP1-AF	2018-2022	2,263
		Enforce tough measures for any illegal water activities	2018-2022	ND

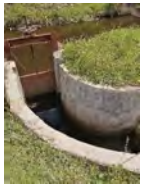
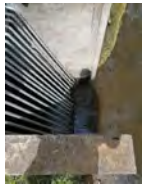
ND: No Data
Source: MOWASSCO Strategic Plan 2018 - 2022

Appendix - 6
Existing Water Supply Facilities
of the 13 Candidate WSPs

Current Status of Intake, WTP and Reservoir of 13 Candidate WSPs (1/8)

Facility	Embu WSP (EWASCO)	Nakuru WSP (NAWASSCO)	Kisumu WSP (KIWASCO)	Eldoret WSP (ELDOWAS)	Nzoia WSP (NZOWASCO)	Ngagaka WSP (NGAWASCO)
Intake	Mwiria intake (28,000 ㎥/d, 2006)  Condition: Good	Mereroni Intake (6,000 ㎥/d, 1913)  Condition: Deteriorating	Dunga Intake (44,000 ㎥/d, 2011)  Condition: Fair Kajulu Intake (36,000 ㎥/day, 2014)  Condition: Good	Ellegerini Intake (9,000 ㎥/d, 1997)  Condition: Good Moiben Dam (34,000 ㎥/d, 1997)  Condition: Good	Bungoma Intake (7,500 ㎥/d, 2006)  Condition: Deteriorating Kapolet intake (10,500 ㎥/d,2006)  Condition: Deteriorating	Thambana Intake (9,900 ㎥/d, 1982)  Condition: Fair Irangi intake (9,000 ㎥/d, 2012)  Condition: Fair
WTP 1	Mukangu WTP (28,000 ㎥/d, 2006) Receiving / Coagulant Dosing  Flocculation Basin 	Mereroni WTP (6,000 ㎥/d, 1913) Receiving / Coagulant Dosing  Flocculation Basin 	Dunga WTP (45,600 ㎥/d, 2011) Receiving / Coagulant Dosing  Flocculation Basin 	Sosiani WTP (14,950 ㎥/d, 1986) Receiving / Coagulant Dosing  Flocculation Basin 	Bungoma WTP (7,500 ㎥/d) Receiving / Coagulant Dosing  Flocculation Basin 	Kathuniri WTP (6,825 ㎥/d, 1982) Sedimentation basin 

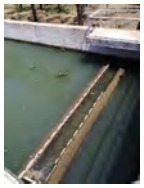
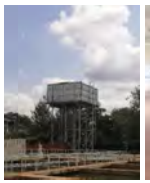
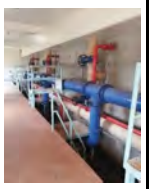
Current Status of Intake, WTP and Reservoir of 13 Candidate WSPs (2/8)

Facility	Meru WSP (MEWASS)	Isiolo WSP (IWASCO)	Nanyuki WSP (NAWASCO)	Mavoko WSP (MAVWASCO)	Murang'a WSP (MUWASCO)	Ruiru-Juja WSP (RUJWASCO)
Intake	Kathita Intake (6,000 m³/d, 1985)   Condition: Good	Isiolo Intake - 1 (1,500 m³/d, 2016)  Isiolo Intake - 2 (1,500 m³/d, 2016)   Condition: Fair	Nanyuki Intake (14,658m³/d, 1983)    Condition: Deteriorating	Kasoito Intake (3,000 m³/d, 2021)   KMC Intake (8,000 m³/d, 2021)   Condition: Deteriorating	Irati Intake (15,000 m³/d, 2013)   Condition: Good Kayahwe Intake (5,000 m³/d, 1975)   Condition: Fair	Jacaranda Intake (13,000 m³/d, 2013)   Juja intake (6,500 m³/d, 1986)   Condition: Good
WTP 1	Milimani WTP (13,944 m³/d, 2017) Receiving / Coagulant Dosing  Flocculation Basin 	Isiolo WTP (3,000m³/d) Receiving / Coagulant Dosing  Flocculation Basin 	Kanyoni WTP (11,248 m³/d, 1983) Receiving / Coagulant Dosing  Flocculation Basin 	Mavoko (New) WTP (10,000m³/d, 2021) Receiving / Pre-sedimentation 	Kiawambeu WTP (15,000 m³/day, 2014) Receiving / Coagulant Dosing  Flocculation Basin 	Jacaranda WTP (13,000 m³/d, 2013) Receiving / Coagulant Dosing  Flocculation Basin 

Current Status of Intake, WTP and Reservoir of 13 Candidate WSPs (3/8)

Facility	Embu WSP (EWASCO)	Nakuru WSP (NAWASSCO)	Kisumu WSP (KIWASCO)	Eldoret WSP (ELDOWAS)	Nzoia WSP (NZOWASCO)	Ngagaka WSP (NGAWASCO)
WTP 1	Sedimentation Basin  Filtration Basin  Backwashing / Chlorination   Condition: Fair	Sedimentation Basin  Filtration Basin  Chlorination  Condition: Good	Sedimentation Basin  Filtration Basin  Backwashing  Condition: Deteriorating	Sedimentation Basin  Filtration Basin  Backwashing / Chlorination  Condition: Good	Sedimentation Basin  Filtration Basin  Backwashing  Condition: Deteriorating	Sedimentation Basin  Chlorination  Condition: Deteriorating

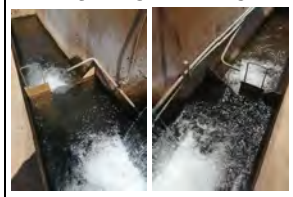
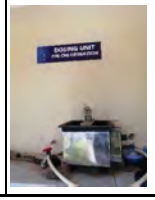
Current Status of Intake, WTP and Reservoir of 13 Candidate WSPs (4/8)

Facility	Meru WSP (MEWASS)	Isiolo WSP (IWASCO)	Nanyuki WSP (NAWASCO)	Mavoko WSP (MAVWASCO)	Murang'a WSP (MUWASCO)	Ruiru-Juja WSP (RUJWASCO)
WTP 1	Sedimentation Basin  Composite Unit   Condition: Good	Sedimentation Basin   Filtration Basin   Backwashing  Condition: Fair	Sedimentation Basin   Filtration Basin / Chlorination   Clear Water Tank  Backwashing   Condition: Deteriorating	Sedimentation Basin   Filtration Basin   Clear Water Tank   Backwashing   Condition: Good	Sedimentation / Filtration Basin   Pre-chlorination / Chlorination   Clear Water Tank   Backwashing   Condition: Good	Sedimentation basin   Filtration Basin   Clear Water Tank   Backwashing   Condition: Good

Current Status of Intake, WTP and Reservoir of 13 Candidate WSPs (5/8)

Facility	Embu WSP (EWASCO)	Nakuru WSP (NAWASSCO)	Kisumu WSP (KIWASCO)	Eldoret WSP (ELDOWAS)	Nzoia WSP (NZOWASCO)	Ngagaka WSP (NGAWASCO)
WTP 2		Makewa WTP (2,500m³/day, 1952) Coagulant / Flocculation Basin  Sedimentation Basin  Filtration / Chlorination  Backwashing  Condition: Good	Kajulu WTP (36,000m³/d, 2014) Receiving / Coagulant Dosing  Flocculation Basin  Filtration Basin  Condition: Fair	Chabara WTP (28,300m³/day, 1995) Receiving / Coagulant Dosing  Sedimentation Basin  Filtration Basin  Condition: Good	Kapolet WTP (10,500m³/d, 2006) Receiving / Coagulant Dosing  Sedimentation Basin  Filtration Basin  Backwashing  Condition: Deteriorating	

Current Status of Intake, WTP and Reservoir of 13 Candidate WSPs (6/8)

Facility	Meru WSP (MEWASS)	Isiolo WSP (IWASCO)	Nanyuki WSP (NAWASCO)	Mavoko WSP (MAVWASCO)	Murang'a WSP (MUWASCO)	Ruiru-Juja WSP (RUJWASCO)
WTP 2	Kigure WTP (1,850 ㎥/d, 2013) Receiving / Coagulant Dosing  Direct Filtration Unit 	Mwangaza WTP (4,500 ㎥/d, 2016) Receiving / Coagulant Dosing  Flocculation Basin  Sedimentation Basin  Filtration Basin  Chlorination 		Mavoko (Old) WTP (2,000㎥/d, 2012) Receiving / Coagulant Dosing  Flocculation Basin  Composite unit  Composite unit 	Kayahwe WTP (5,000 ㎥/d, 1975) Receiving / Flocculation Basin  Sedimentation Basin  Filtration Basin  Pre-chlorination  Clear Water Tank 	Juja WTP (6,000 ㎥/d, 2013) Receiving / Coagulant Dosing  Flocculation Basin  Sedimentation Basin  Filtration Basin  Composite Unit 

Current Status of Intake, WTP and Reservoir of 13 Candidate WSPs (7/8)						
Facility	Embu WSP (EWASCO)	Nakuru WSP (NAWASSCO)	Kisumu WSP (KIWASCO)	Eldoret WSP (ELDOWAS)	Nzoia WSP (NZOWASCO)	Ngagaka WSP (NGAWASCO)
Reservoir		Mereroni Reservoir (3,375m³, 1983)  Condition: Good Malewa reservoir (1,000m³, 1952)  Condition: Good	Kibuye Reservoir (12,000m³, 2011)  Condition: Good Obwolo Reservoir (1,300m³, 2012)  Condition: Good			
Others		Nairobi Road Boreholes (3,375m³, 1964)  Condition: Fair				

Current Status of Intake, WTP and Reservoir of 13 Candidate WSPs (8/8)

Facility	Meru WSP (MEWASS)	Isiolo WSP (IWASCO)	Nanyuki WSP (NAWASCO)	Mavoko WSP (MAVWASCO)	Murang'a WSP (MUWASCO)	Ruiru-Juja WSP (RUJWASCO)
WTP 2	Clear Water Tank  Storage and Backwashing Tank  Condition: Good	Clear Water Tank  Backwashing  Condition: Fair		Backwashing  Condition: Fair	Backwashing  Gikoe WTP (Potential Site)  Condition: Fair	Clear Water Tank  Backwashing  Condition: Good
Reservoir / Others	Kinoru Reservoir (988 ㎥, 2003)  Condition: Good	Borehole (Isiolo WTP)  Condition: Good Solar Panel  Condition: Good	Katheri Elevated Steel Tank (108 ㎥, 2019)  Condition: Good Borehole (Katheri-Nyariginu)  Condition: Good			Borehole (Mugutha)   Condition: Good