

YANGON CITY DEVELOPMENT COMMITTEE



Water Supply, Sewerage System and The Improvement Projects for Yangon City

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(Water and Sanitation)

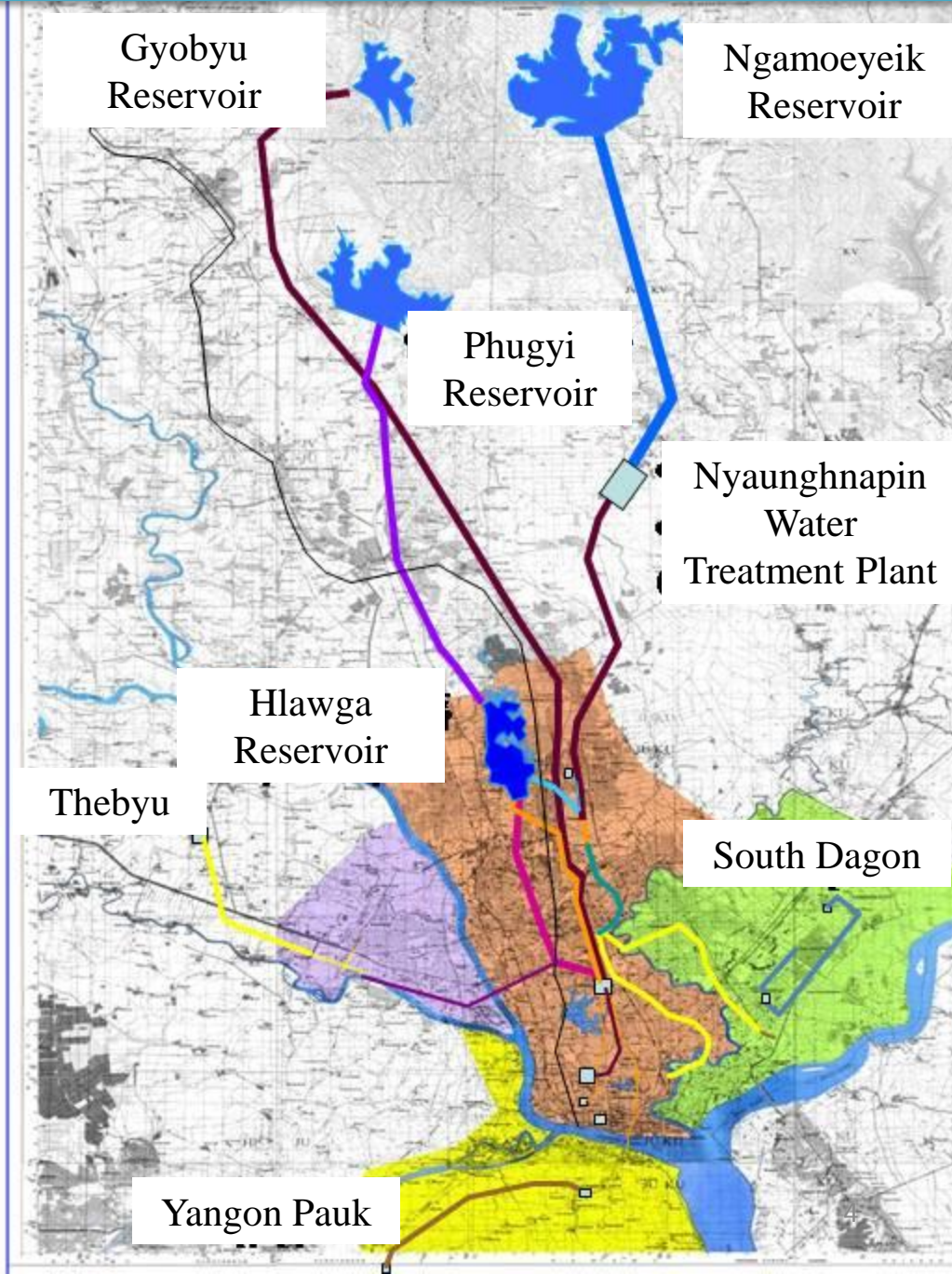
Main Content

- ❖ Introduction of Yangon City Water Supply System
- ❖ Implementing projects for strengthening of existing facilities
- ❖ Future projects from the river water resources, zoning systems and development of DMA
- ❖ Sewerage system of Yangon its future plan for development
- ❖ Water related project and development plan up to 2040

Introduction of Yangon City Water Supply System

HISTORY OF YANGON CITY WATER SUPPLY

- 1842 Dug Well (30)
- 1879 Kandawgyi lake
- 1884 Innya lake
- 1904 Hlawga Reservoir
- 1940 Gyobyu Reservoir
- 1992 Phugyi Reservoir
- 1995 Ngamoeyeik Reservoir
- 2005 Nyaunghnapin Water treatment Plant(1st Phase)
- 2014 Nyaunghnapin Water treatment Plant(2nd Phase)



DATAS OF FOUR MAIN RESERVOIRS

Hlawgha Reservoir

Catchment Area - 10.5 sq miles
 Water Surface Area - 4.4 sq miles
 Effective Capacity - $48 \times 10^6 \text{m}^3$
 Total Capacity - $54 \times 10^6 \text{m}^3$
 High Water Level - 62 Ft
 Low Water Level - 47 Ft



Gyobyu Reservoir

Catchment Area - 12.7 sq miles
 Water Surface Area - 2.8 sq miles
 Effective Capacity - $38 \times 10^6 \text{m}^3$
 Total Capacity - $75 \times 10^6 \text{m}^3$
 High Water Level - 215 Ft
 Low Water Level - 138 Ft



Phugyi Reservoir

Catchment Area - 27.27 sq miles
 Water Surface Area - 6.8 sq miles
 Effective Capacity - $90 \times 10^6 \text{m}^3$
 Total Capacity - $104 \times 10^6 \text{m}^3$
 High Water Level - 119 Ft
 Low Water Level - 90 Ft



Ngamoeyek Reservoir

Catchment Area - 160 sq miles
 Water Surface Area - 17.19 sq miles
 Effective Capacity - $207 \times 10^6 \text{m}^3$
 Total Capacity - $222 \times 10^6 \text{m}^3$
 High Water Level - 107 Ft
 Low Water Level - 81 Ft



Available Water Resources and Water Supply Amount

- Surface water Gyobyu, Phugyi, Hlawga, Ngamoeyeik Reservoirs
- Ground water 442 Tube Wells operated by YCDC
- Lakes and ponds Existing 261 nos-, used 108 nos in 12 township

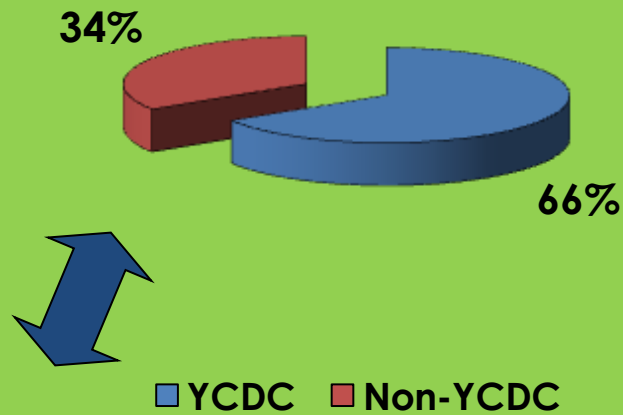
Daily Water Supply Amounts In Yangon City

1- Gyobyu Reservoir	- 27 MGD (122727 m ³ /day)
2- Phygyi Reservoir	- 54 MGD (245454 m ³ /day)
3- Hlawgha Reservoir	- 14 MGD (63637 m ³ /day)
4- Ngamoeyeik Reservoir (First phase)	- 45 MGD (204545 m ³ /day)
5- Ngamoeyeik Reservoir (Second Phase)	- 45 MGD (204545 m ³ /day)
6-Y.C.D.C Owned Tube Wells	- 20 MGD (90910 m ³ /day)

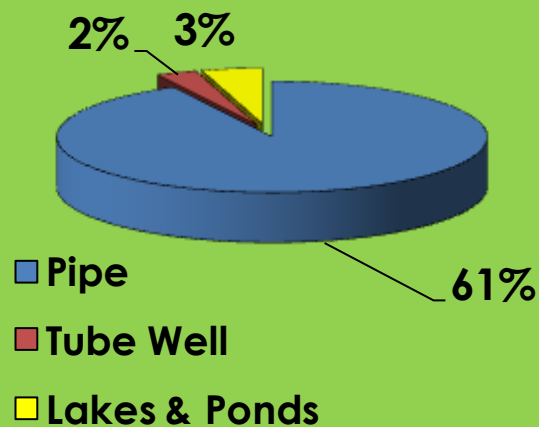
Total - 205 MGD (931818 m³/day)

❖ (MGD=Million Gallons Per Day)

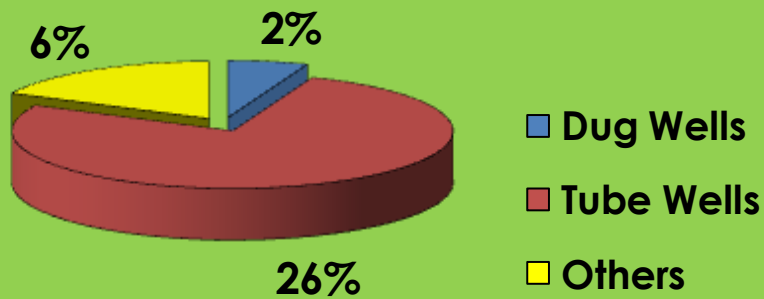
TYPES OF WATER SUPPLY



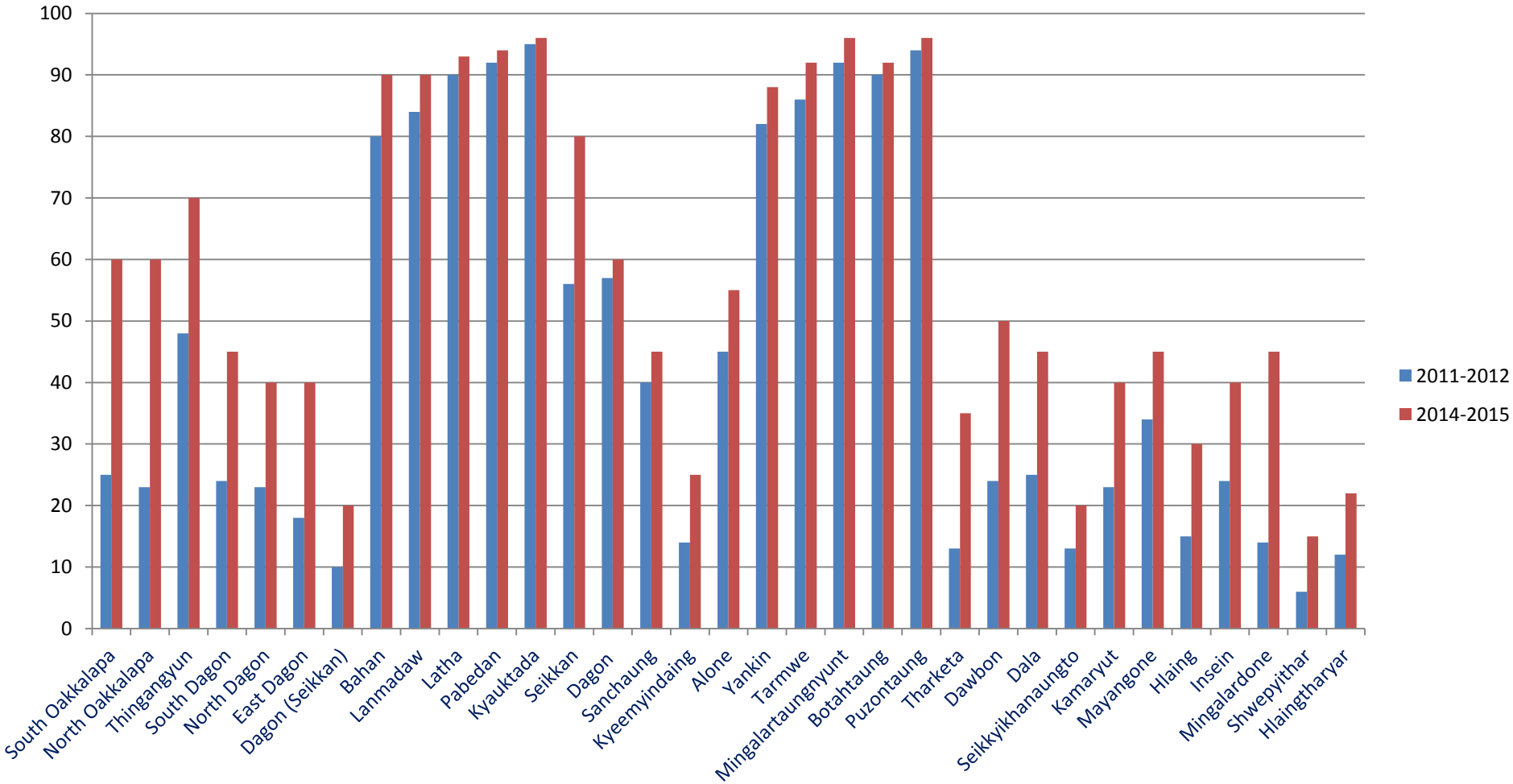
Type of YCDC Supplied Water



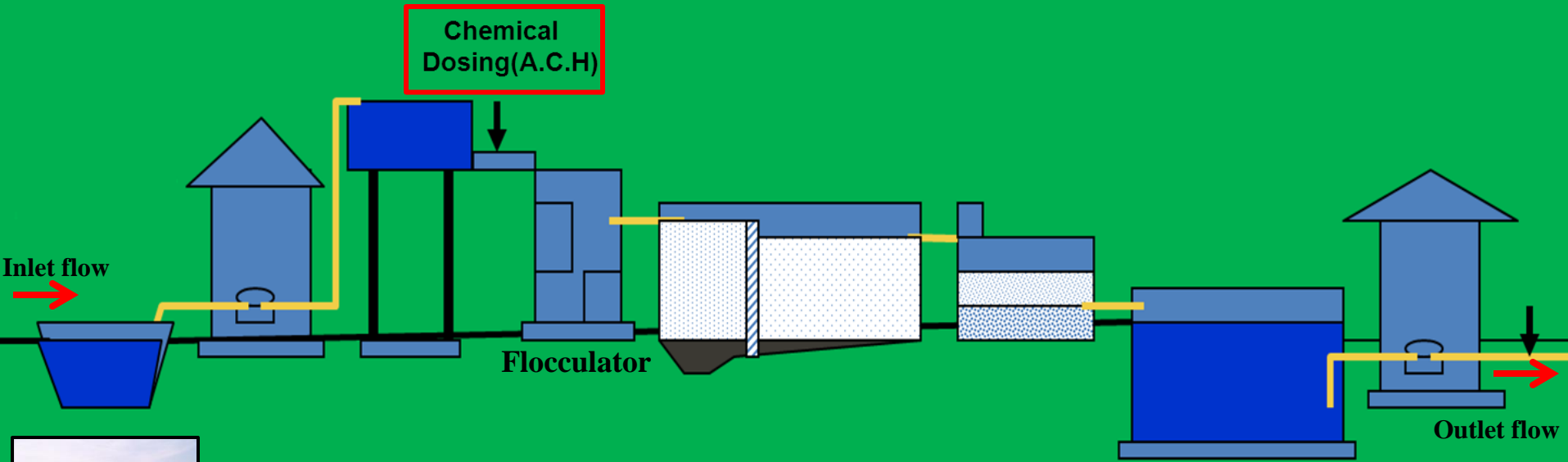
Type of non-YCDC Supplied Water



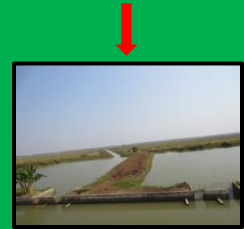
Water Supply, Coverage Ratio for each Township of Yangon



❖ Profile of Nyaunghnapin water treatment plant



Open channel



Intake reservoir



Low lift pumps



Water tower



Sedimentation tank



Rapid sand filter



Clear water tank



Pump station

Pre Sedimentation



Flocculator



Preclear Well



Sedimentation Basin

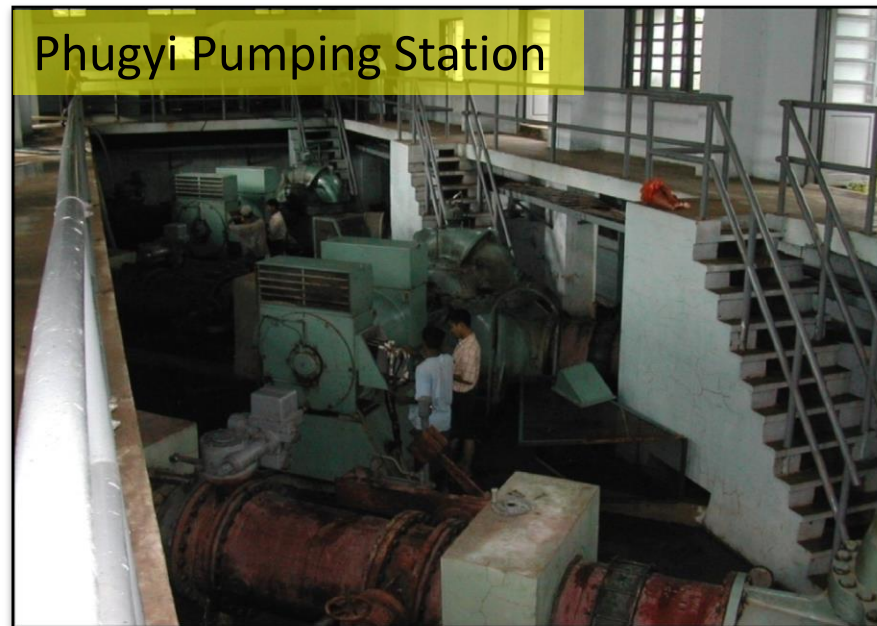


MAIN PUMPING STATIONS IN YANGON CITY WATER SUPPLY SYSTEM

Nyaunghnapin Pumping Station



Phugyi Pumping Station



Hlawga Pumping Station






Yegu Pumping Station



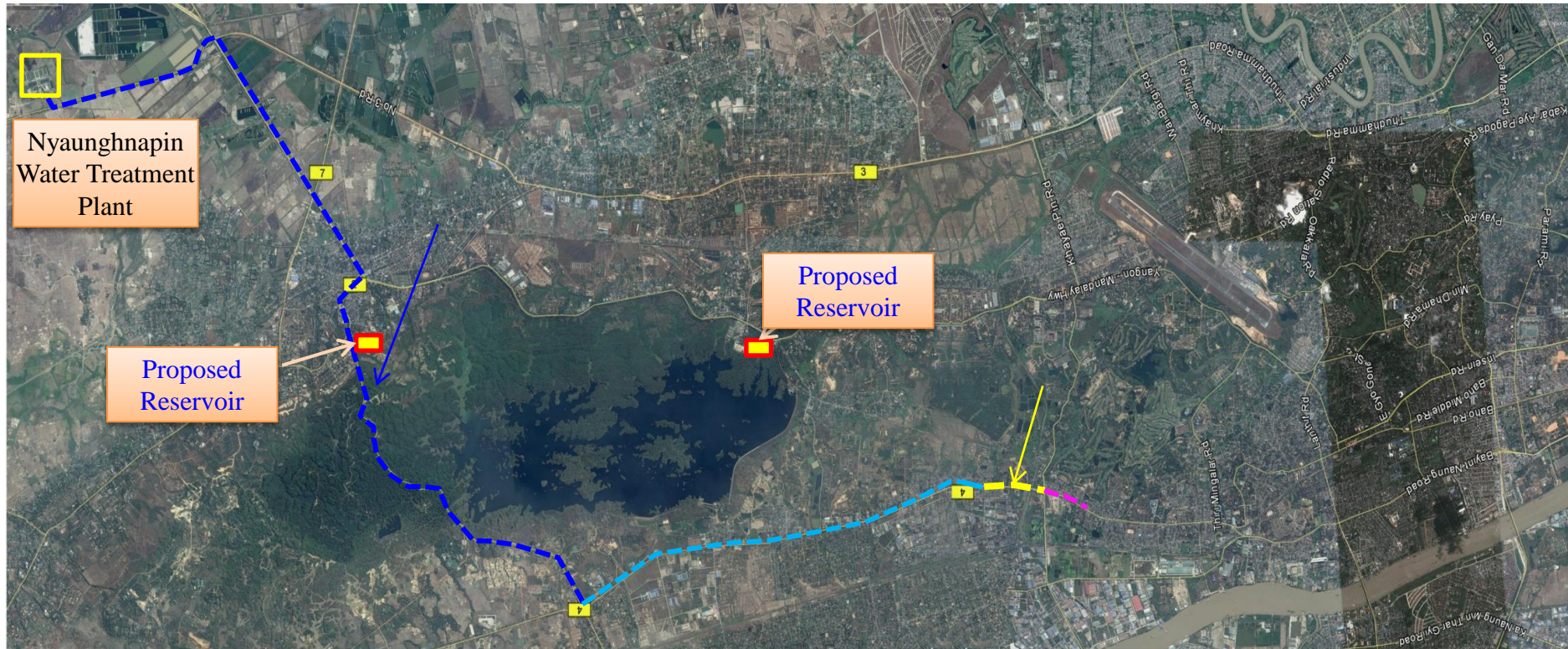
Implementing projects for strengthening
of existing facilities

Installation of 20 " HDPE Pipeline for Ahlone Township



-  20"Ø HDPE Pipeline 6450'
-  16"Ø HDPE Pipeline 2200'
-  12"Ø HDPE Pipeline 3600'

HDPE pipe laying project to Shwepyithar Township



Japanese Grassroot Grant

Project Title: NRW reduction project in [Mayangon Township](#)

Component: Replacement of distribution pipe
Installation of Pumping station
Installation of water meter

Grant Amount : US\$ 610317

Japanese Grant Aid Project

Project Title: The project for Urgent Improvement of Water Supply System in Yangon City

Component: Facilities Lot (1)

Construction of Nyaunghnapinn Pump Station

Facilities Lot (2)

Improvement of the pipeline for Kabaraye pagoda road and Yankin township

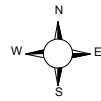
Grant Amount : US\$ (19) million

Construction of Nyaunhnapin Pump Station

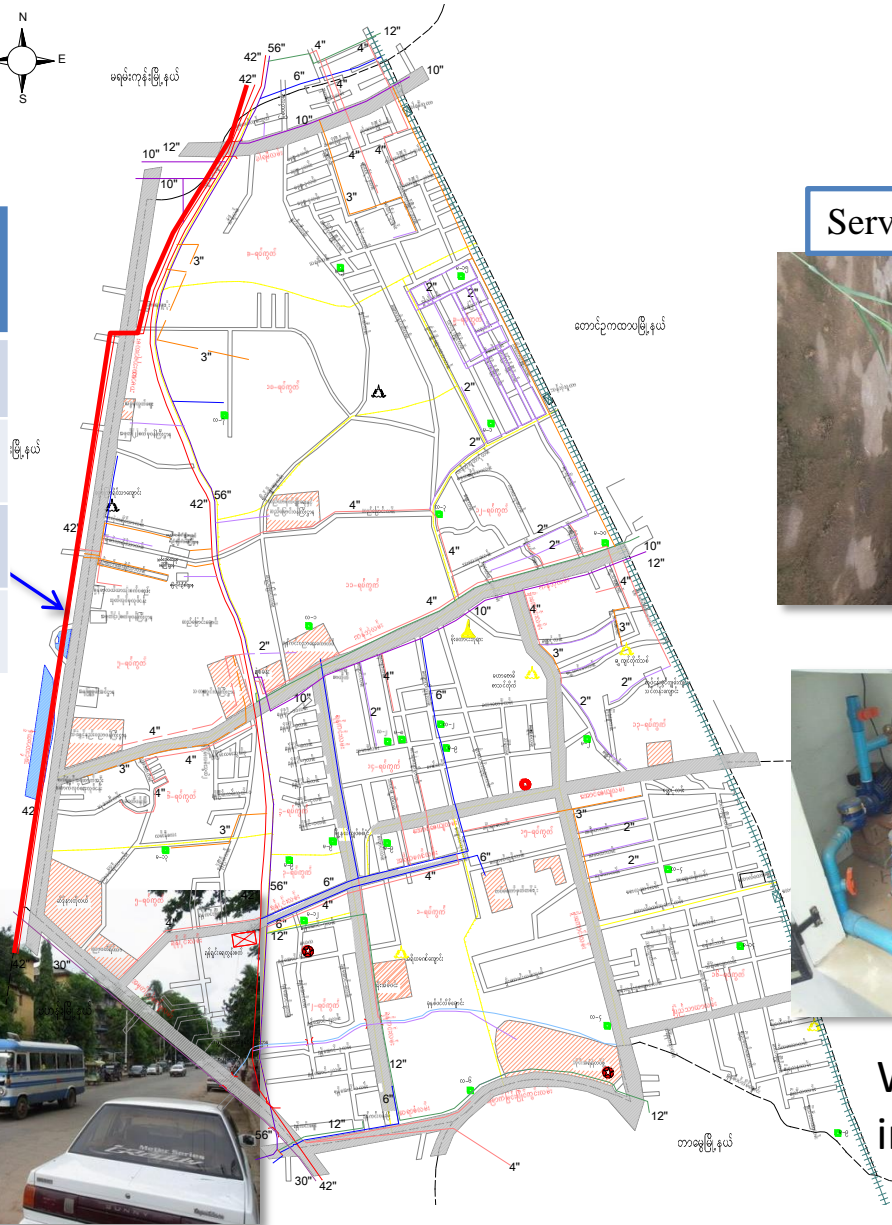
Project Duration 10.3.2014 - 31 .5. 2015



Improvement of the pipeline for Kabaraye pagoda road and Yankin township



Pipe Size	Measurement
42"Ø	5600
12"Ø	4000
8"Ø	4600
Total	14200



Service pipeline



Water meter installation



Japanese ODA Loan Project: Greater Yangon Water Supply Improvement Project

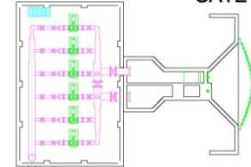
Loan Amount: 239
US\$(million)



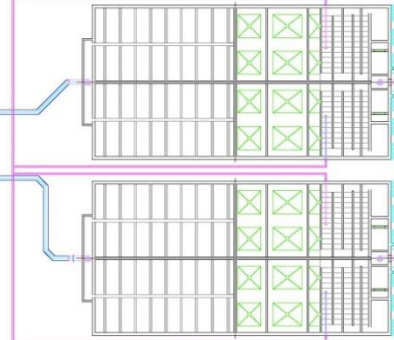
LAGUNPYIN WATER TREATMENT PLANT (40 MGD)

INTAKE
PUMPING HOUSE

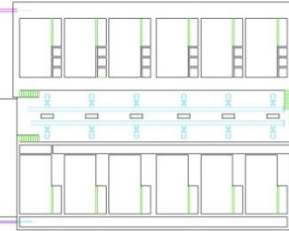
INTAKE
GATE



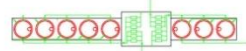
SEDIMENTATION BASIN (2-UNITS)



RAPID SAND FILTER



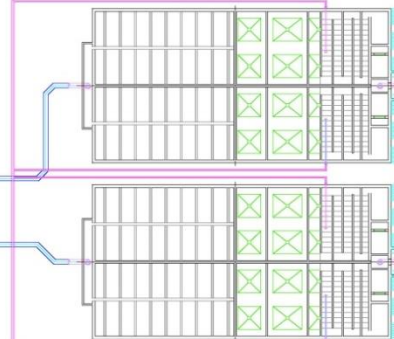
CHLORINE DOSING FACILITIES



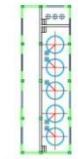
RAPID SAND FILTER



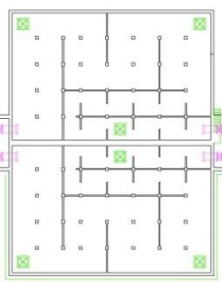
SEDIMENTATION BASIN (2-UNITS)



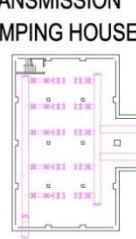
PAC DOSING FACILITIES



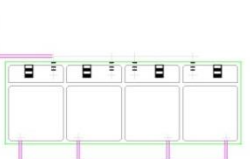
CLEAR WATER
RESERVOIR



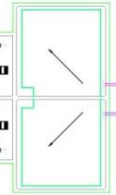
TRANSMISSION
PUMPING HOUSE



YEN LOAN YCDC



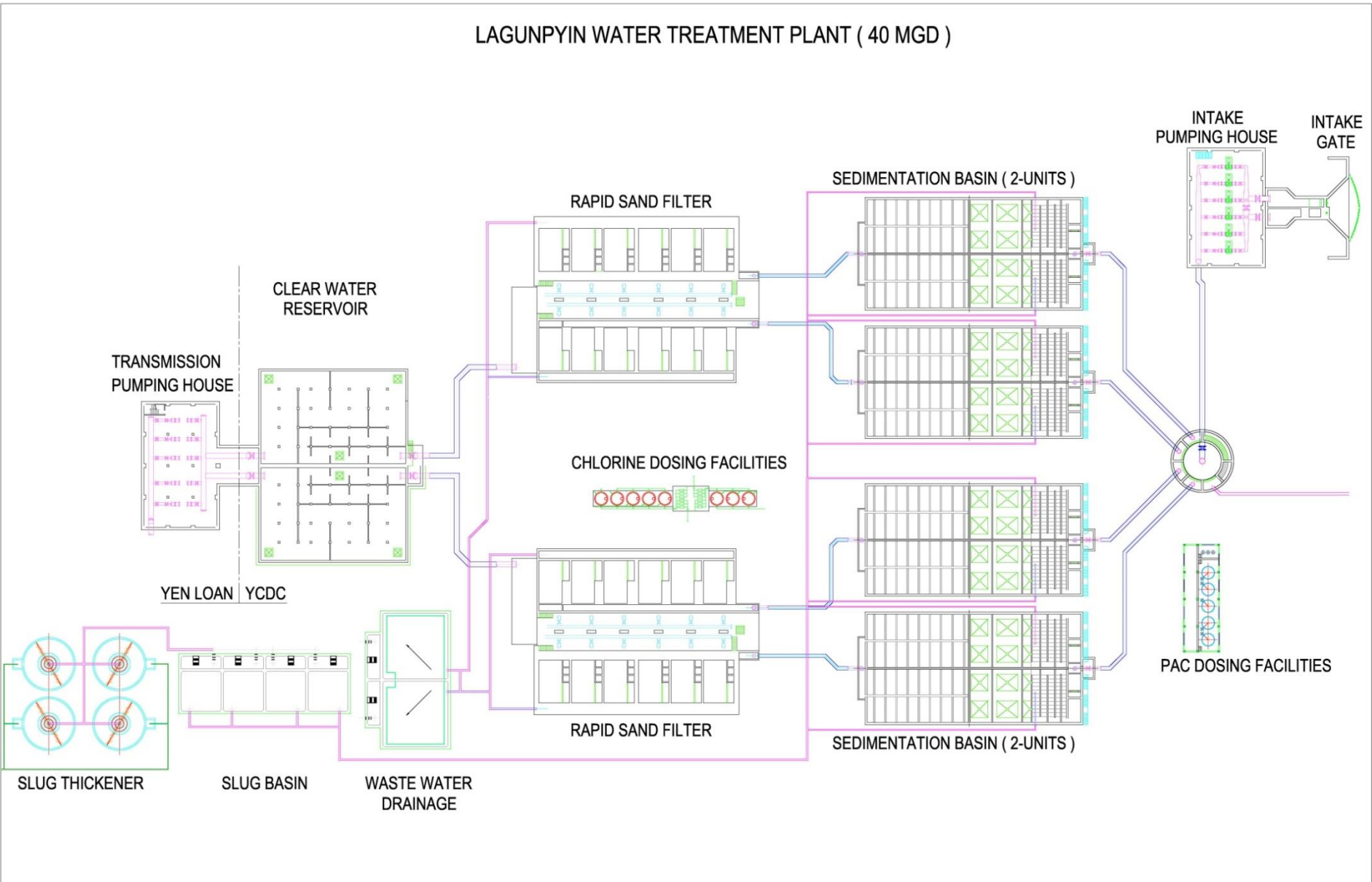
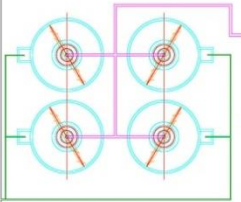
WASTE WATER
DRAINAGE

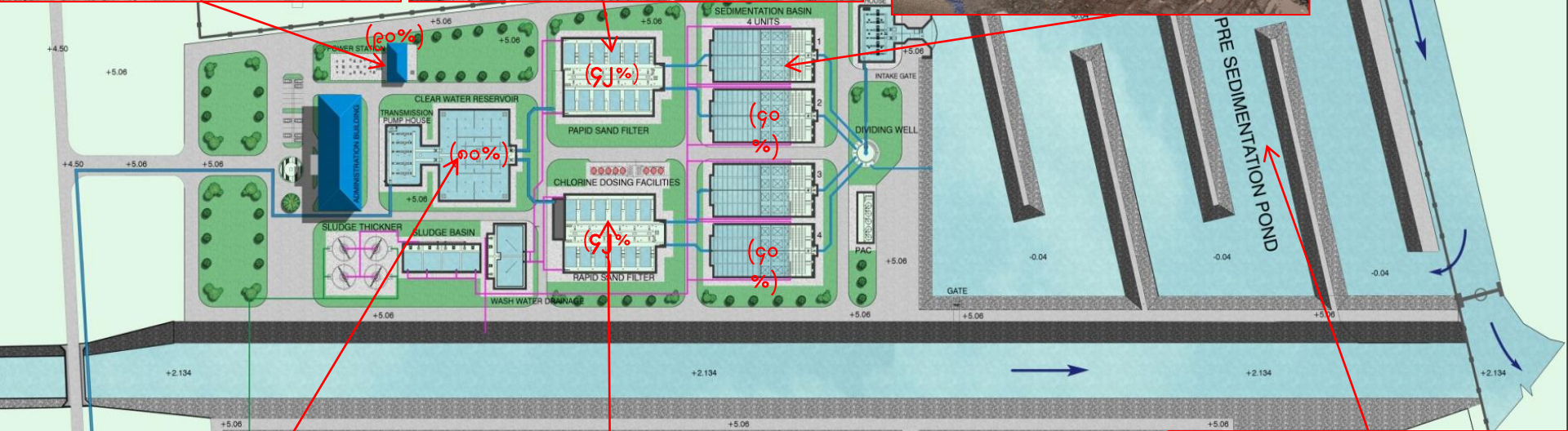
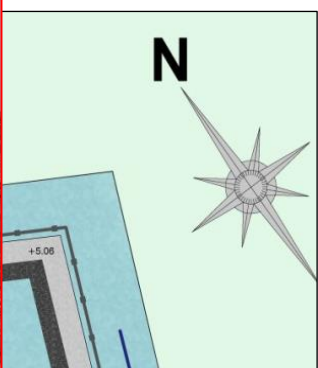


SLUG BASIN

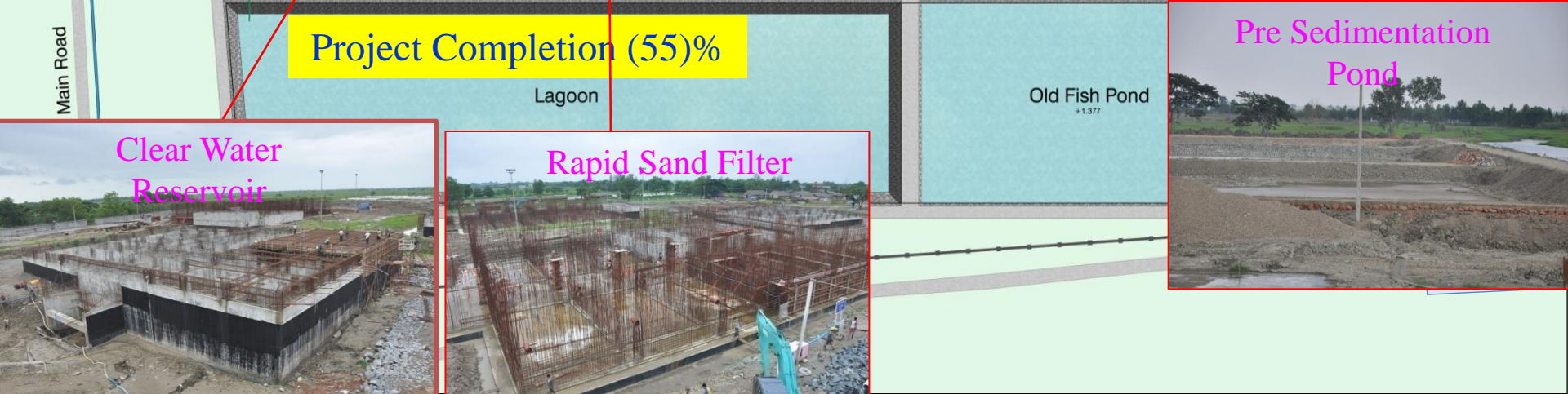


SLUG THICKENER





Project Completion (55%)



Future projects from the river water resources,
zoning systems and development of DMA

River Source:

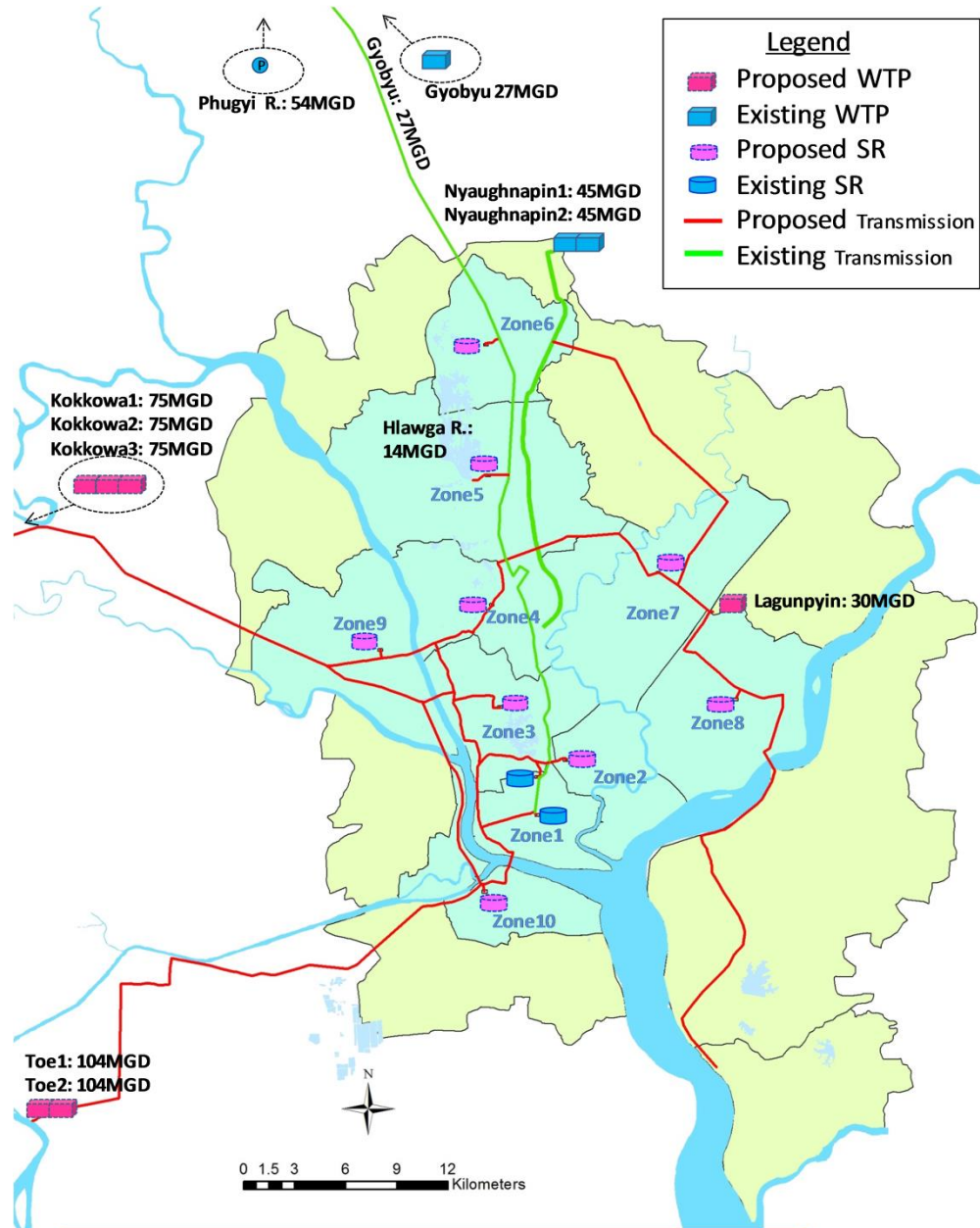
1. Kokkowa River
2. Toe River

WTP:

1. Gyobyu
2. Nyaughnapin 1 & 2
3. Lagunpyin
4. Kokkowa
5. Toe

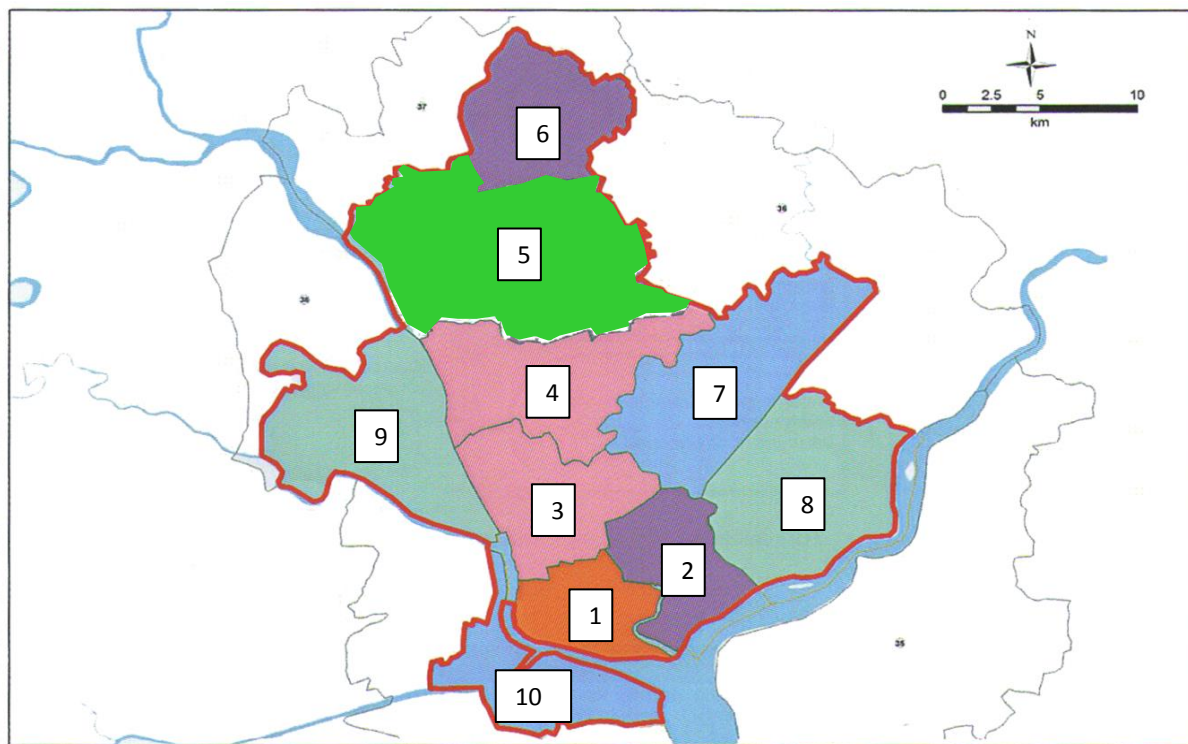
Ground water:

0 in 2040



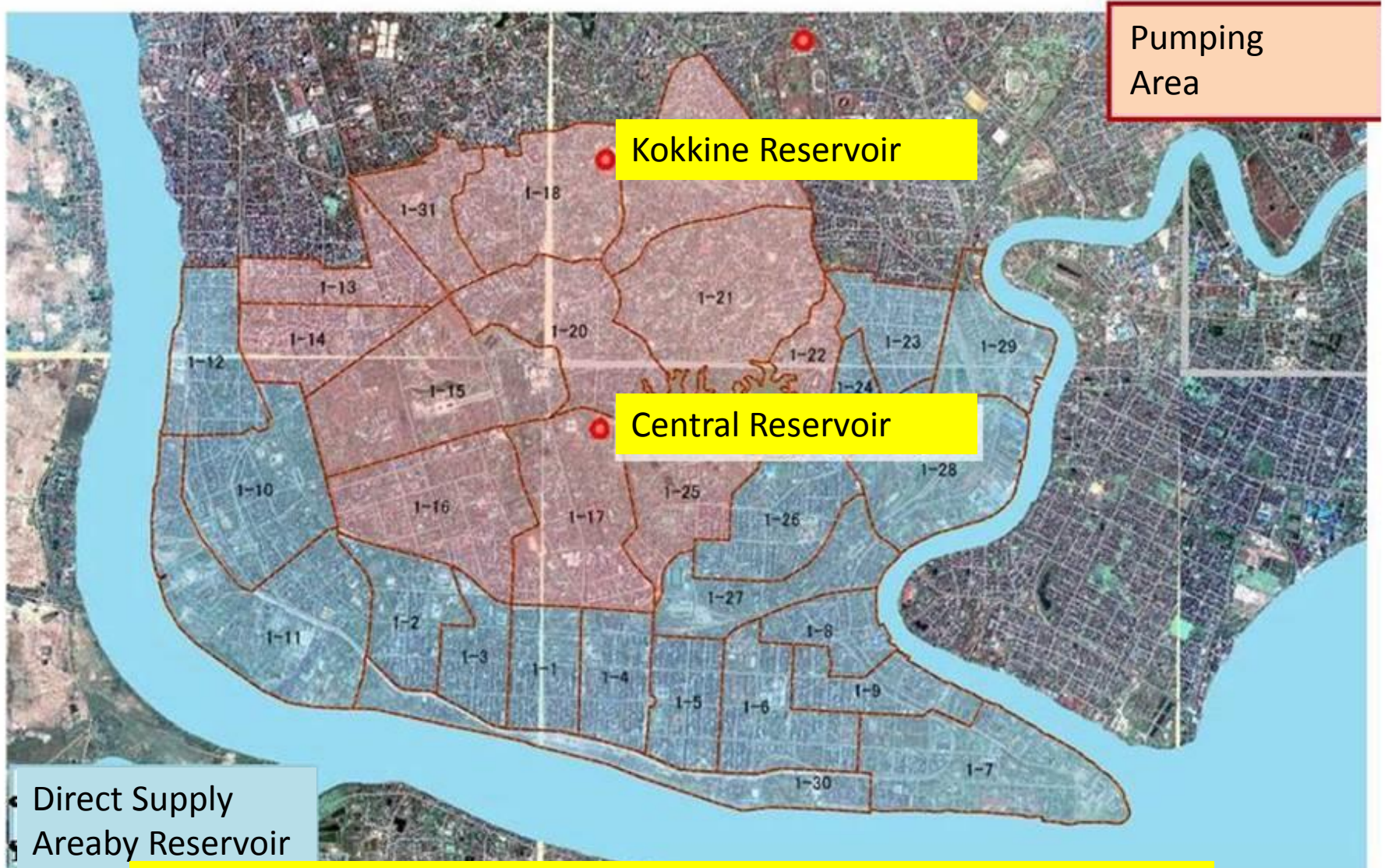
Water Supply System in 2040

LOCATION PLAN FOR ZONELY WATER SUPPLY SYSTEM IN FUTURE



Zone	Township
1	Botahtaung, Puzundaung, Kyauktada, Pebedam, Mingalar Taung Nyunt, Tarmwe Lanmadaw, Latha, Alone, Kyeemyintdaing, Dagon, Bahan, Sanchaung, Seikkan
2	Yankin, Thingangyun, Taketa, Dawbon, Tamwe
3	Yankin, Kamaryut, Mayangone, Hlaing, Insein, South Okkalapa
4	North Okkalapa, Mayangone, Insein, Mingalardone
5	Mingalardone, Shwepyithar, Insein, North Okkalapa
6	Mingalardone
7	North Dagon, East Dagon
8	South Dagon, Dagon Seikkan
9	Hlaingtharyar
10	Dala, Seikkyikhanaungto, Kyeemyintdaing (West)

Zoning System and DMA System

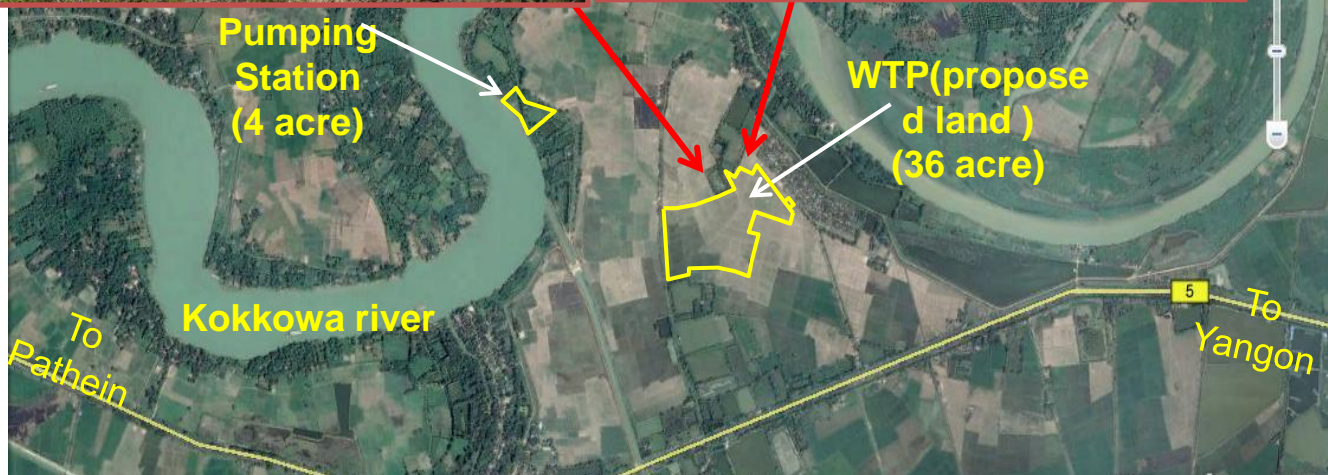


Total water metered connection= 212000 Nos

KOKKOWA WATER PROJECT

PLACE - HTANTABIN TOWNSHIP
CAPACITY - 225 MILLION GALLON
DISTANCE TO BE CONNECTED - 18 MILES



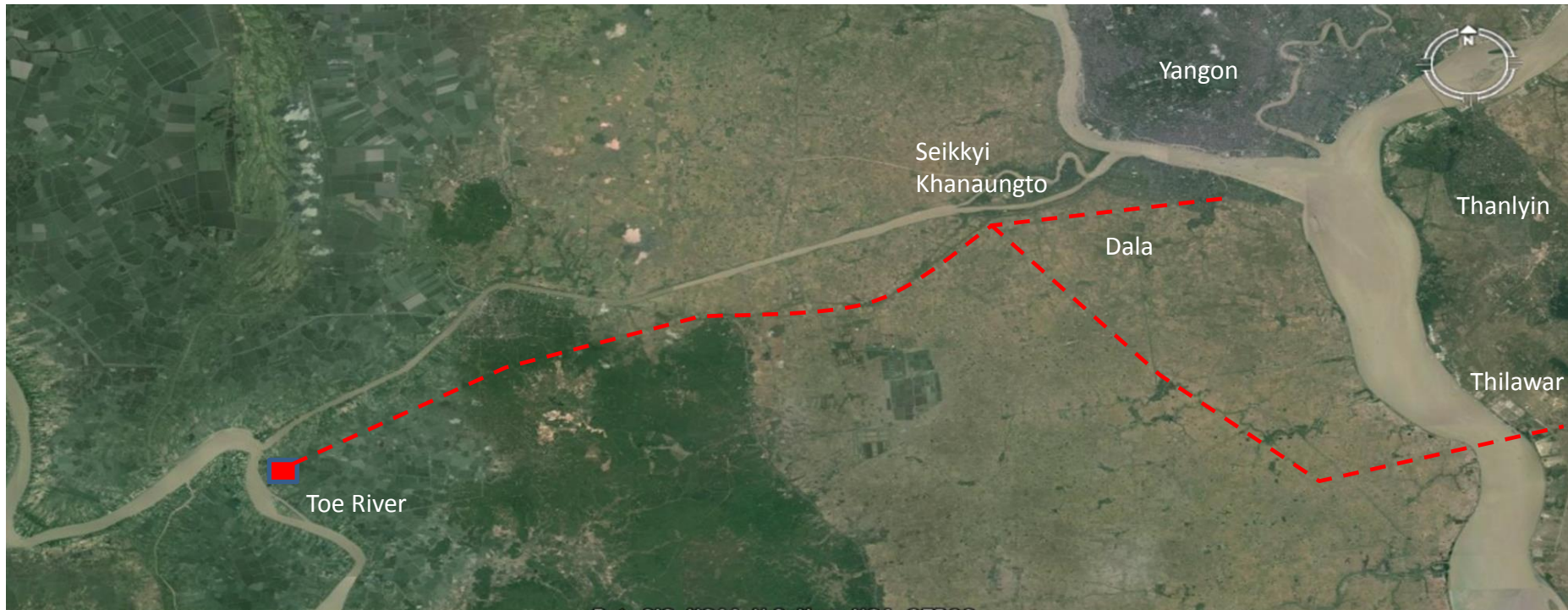


TOE RIVER WATER SUPPLY PROJECT

PLACE - TONTAE TOWNSHIP

CAPACITY - 886363 M3/DAY

**DISTANCE TO
BE CONNECTED** - 46.8 KM



Sewerage System of Yangon and its future plan for development

- ❑ Sanitation and sewerage for the Yangon City area is main responsibility of Engineering Department (Water and Sanitation) under Yangon City Development Committee.
- ❑ Existing system, conventional sewerage, consists of :-
 - △ Gravity sewers
 - △ 39 pneumatic ejector stations
 - △ Air distribution main
 - △ Two sewage force mains and outlet
- ❑ At present Existing Sewerage System covers only 4.33 km² area of CBD and serves around 350,000 peoples, 7% of the city population.
- ❑ Daily Volume of sewage disposal - 111840 gal.(508 m³)
- ❑ Major Issues in Existing Sewerage System:-
 - △ To establish proper treatment process for the existing sewerage system.
 - △ To expand and set up the existing sewerage system.
 - △ To improve urban sanitation environment in Yangon City Area

MAP OF EXISTING SEWERAGE SYSTEM IN DOWNTOWN AREA



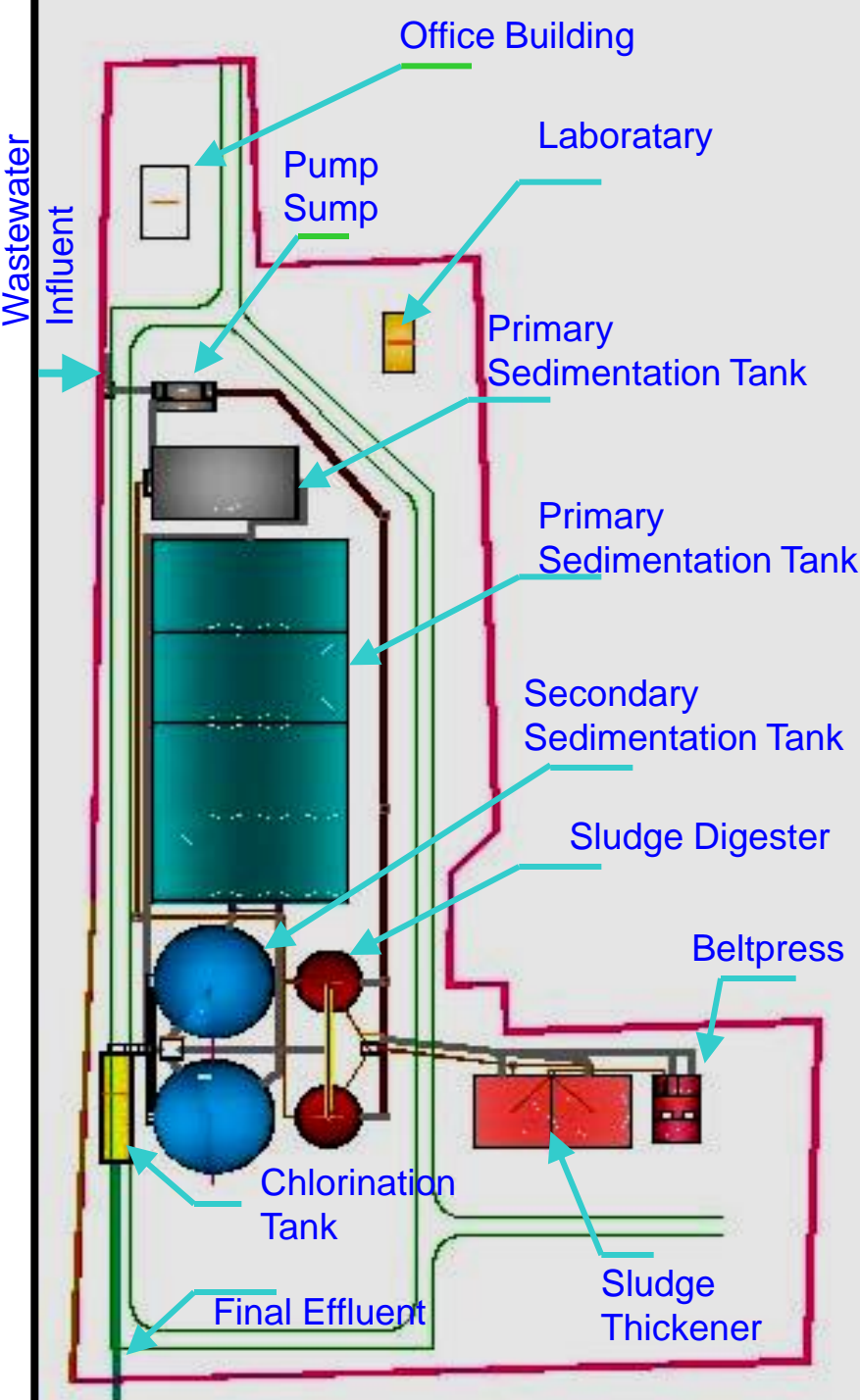
Establishment of Sewage Treatment Plant

Programme for Sewage Treatment Project

- Detail Design
- Implementation
- Installation
- Commissioning
- Installation
- Training

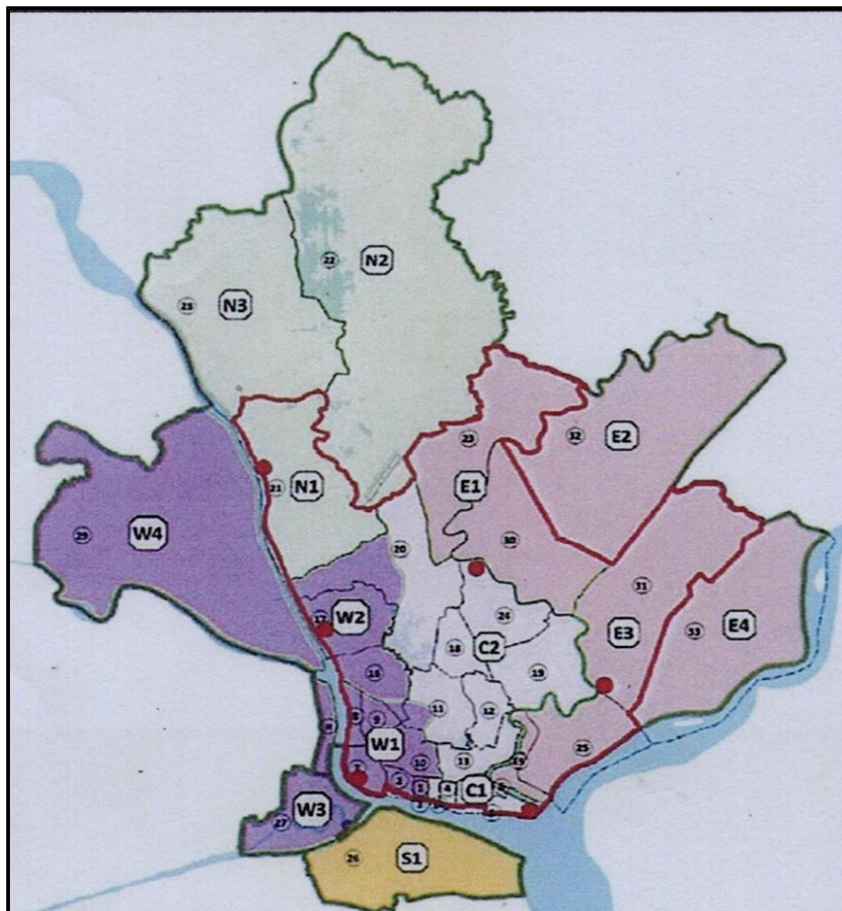
Design Criteria:

- Area of Plant - 5.56 acres
- Design population - 300,000
- Daily wastewater discharge- - 14775 m³/day
- BOD influent - 600mg / l
- BOD effluent - 60 mg / l
- Suspended solid influent- 700 mg / l
- Suspended solid effluent- 40 mg / l



Layout Plan of Sewage Treatment Plant

LOCATION PLAN FOR ZONELY SEWERAGE SYSTEM IN FUTURE



Zone	Township
C1	Botathaung, Puzundaung, Kyauktada, Pebedam,
W1	Lanmadaw, Latha, Alone, a part of Kyeemyintdaing, Dagon, a part of Bahan, a part of Kamaryut, Sanchaung
C2+E1	a part of Bahan, Mingalartaungnyunt, Yankin, Thingangyun, Tamwe, S-Okkalapa, a part of Mayangone, N-Okkalapa, N-Dagon
W2	a part of Kamaryut, Hlaing, a part of Mayangone
E3	Taketa, Dawbon, S-Dagon
N1	Insein
E4	Dagon Seikkan
E2	East Dagon
N2	Mingalardon
N3	Shwepyithar
S1	Dala
W3	a part of Kyeemyintdaing, Seikgyi khanaungto, Seikkan
W4	Hlaing Tharyar

Water related project and development plan up to 2040

Future Project and Budget Requirement

No	Project Name	Implementation Period	Water Supply Capacity (MGD)	Estimated Project Cost (US\$ million)	Remark
1	Lagunpyin Project	2013-2018	40	289	
2	Kokkowa River Project (First Phase)	2014-2019	60	369	
3	Toe River Project (First Phase)	2020-2023	30	174	
4	Kokkowa River Project (Second Phase)	2022-2025	60	161	
5	Toe River Project (Second Phase)	2030-2034	30	218	
6	Kokkowa River Project (Third Phase)	2034-2038	60	409	
	Total		280	1620	

Non-Revenue Reduction & DMA (District Meter Area) Installation Project

No	Project Name	Implementation Period	Estimated Project Cost (US\$ million)	Remark
1	Formation of Water Supply Zone(1)	2015-2018	123	
2	Formation of Water Supply Zone(2)	2018-2021	134	
3	Formation of Water Supply Zone(3)	2021-2024	191	
4	Formation of Water Supply Zone(4)	2024-2027	164	
5	Formation of Water Supply Zone(5)	2027-2029	310	
6	Formation of Water Supply Zone(6)	2030-2032	81	
7	Formation of Water Supply Zone(7)	2032-2035	208	
8	Formation of Water Supply Zone(8)	2034-2037	213	
9	Formation of Water Supply Zone(9)	2036-2038	159	
10	Formation of Water Supply Zone(10)	2039-2040	69	
11	Installation of Transmission Main	2015-2040	177	
12	Installation of Pumping Station	2015-2040	26	
	Total		1855	

Future Water Demand , Water Supply Capacity & Coverage Ratio

No	Year	Population	Daily Water Demand (MGD)	Daily Water Supply (MGD)	NRW %	Coverage Ratio	Remark
1	2014	5.2	156	205	50	66	
2	2020	5.9	224	245	35	71	Lagunpyin 40 MGD
3	2025	6.5	272	335	28	88	Kokkowa(first)60 MGD Toe (first) 30 MGD
4	2030	7.0	339	395	20	93	Kokkowa(Second) 60 MGD
5	2040	8.5	543	545	10	90	Toe (Second) 30 MGD Kokkowa(Third) 120 MGD

Cooperation with International Organization

No	Project Name	MOU Signing Date	Organization & Country	Remark
1	Water Supply Plan in (Koke Ko Wa) River Water Project	16.11.2012	Tah Moe Nye' Chan Thar Co., Ltd & China,CLIC-CCIC Consortium	
2	NRW Project in Yangon	27.2.2013	M.Y Associates & Denmark Danish Water Services	
3	Water Supply Project for the Hlaing Thar Yar township and Western district in Yangon City	17.5.2013	Korea,SK Engineering and Construction	
4	For the Collaboration on Development and improvement of the water supply system in Yangon City	26.9.2013	Japan, Japan Consortium (Bureau of Waterworks, Tokyo Metropolitan Government, Tokyo Suido Services, Mitsui Co.Ltd, Toyo Engineering Corporation)	
5	The Project for Urgent Improvement of Water Supply System in Yangon City	28.9.2013	Japan, Japan International Cooperation Agency	

No	Project Name	MOU Signing Date	Organization & Country	Remark
6	Development of Water Supply in southern areas of Yangon City	23.1.2014	Shwe Taung Co.Ltd & Korea,K-Water	
7	Pilot District Metered area project for Non-Revenue water reduction in Yangon City	17.3.2014	Japan, Mitsubishi Corporation & Philippine, Manila Water Company	
8	Development of water supply from Ngamoeyeik reservoir to Yangon City	26.3.2014	Israel,Mekorot Development and Enterprise Ltd	
9	Consultancy Services for Rehabilitation Program of Yangon Water Supply Systems-Pilot Project	8.5.2014	France, Egis Eau in association with WMI	
10	Cooperation and Support for Urban Development	15.5.2014	Japan, Fukuoka City	
11	Cooperation in Key Areas of Yangon City	25.9.2014	Japan, Osaka City	

Thank you very much.